# FUTURE OF WORK

**10 | 2021**

*Edited by*
**Mr. Robert Hör**
**Mr. Thomas Hesketh**

# DIGITAL INSIGHTS

**ABOUT EUROCHAM CAMBODIA**

EuroCham Cambodia was created in 2011 by the existing French, German and British business associations to act as the official chamber of the European business community in the Kingdom. Since then, it has grown to over 330+ members and 6 national chapters, comprising 11 European countries. EuroCham Cambodia's core activities are to promote, support and represent its members and European business interests in dialogue with the Royal Government of Cambodia, with the aim of developing a more efficient and fertile business and investment environment.

**ABOUT KONRAD-ADENAUER-STIFTUNG**

Freedom, justice and solidarity are the basic principles underlying the work of the Konrad-Adenauer-Stiftung (KAS). The KAS is a political foundation, closely associated with the Christian Democratic Union of Germany (CDU). As co-founder of the CDU and the first Chancellor of the Federal Republic of Germany, Konrad Adenauer (1876-1967) united Christian-social, conservative and liberal traditions. His name is synonymous with the democratic reconstruction of Germany, the firm alignment of foreign policy with the trans-Atlantic community of values, the vision of a unified Europe and an orientation towards the social market economy. His intellectual heritage continues to serve both as our aim as well as our obligation today. In our European and international cooperation efforts, we work for people to be able to live self-determined lives in freedom and dignity. We make a contribution underpinned by values to helping Germany meet its growing responsibilities throughout the world.

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# FOREWORD

Human beings must be the starting point in the effort to bring about social justice and democratic freedom while promoting sustainable economic activity. With this publication we have gathered research and opinions from different sectors and backgrounds in Cambodia, and hope that this knowledge on the future of work will shape a human-centered digital workplace along more socially equitable, ecologically sustainable and economically efficient lines. The diverse backgrounds of the authors, coming from the government and private sector as well as civil society, underline the complexity and multi-dimensionality, but also that the future of work is a societal team effort.

The Covid-19 pandemic has accelerated changes triggered by generational shifts, new working cultures and digital enhancement in our work space. It has also forced us to implement events, meetings and gatherings digitally and to find new ways of organizing tasks. At the same time, there is a demand to make the future of work more human. For example, the International Labor Organization (ILO) demands a human-centered agenda for the future of work, increased investments in people's capabilities and in decent and sustainable work.

To shape the future of work in a humane way, a holistic multi-level approach is necessary. Therefore, the 4th edition of Digital Insights is a collaborative project jointly implemented by EuroCham Cambodia and Konrad-Adenauer-Foundation Cambodia (KAS).

The main takeaway is to invest in human capital, decrease hierarchies and let new cultures in organizations evolve. It is also important to ensure the best possible performance through targeted governance support and framework measures. When individuals, organizations and governments work together across all levels, the future of work will change society as a whole for the better.

We hope that this book will inspire, serve its purpose of facilitating and forwarding discussion and academic debate, raising public awareness, and serve as a useful resource for interested stakeholders at all levels in Southeast Asia and beyond. We would also like to thank all the authors for their excellent cooperation and great commitment, without whom the implementation of this project would not have been possible. Of course, we would also like to thank the staff of EuroCham and Konrad-Adenauer-Foundation, who ensured the successful implementation of this publication.

We wish you, dear reader, a fruitful reading experience!

**Isabel Weininger and Tassilo Brinzer**

# EDITORIAL NOTE

What will the future of work look like? How will leadership and management change? Will we all be more innovative and creative? How do you see yourself working, and what matters to you?

The answers to these questions and many more are brought to us in the latest Digital Insights publication. At its center, beside many disruptive trends, was also the aspect of Covid19. The new issue of Digital Insights is a collaborative project between EuroCham Cambodia and the Konrad-Adenauer-Foundation Cambodia (KAS). EuroCham and KAS bring together a diverse group of authors, academics, and practitioners, to view the future of work from different perspectives in a constructive manner. Our distinguished authors enlighten us with groundbreaking insights into the impact of disruptive technological innovations that are shaping the future of work, specifically within the Cambodian context.

The world of work is changing at a rapid pace. Innovations in technology are becoming more widespread and are increasingly finding their way into the most diverse areas of work. The increasing use of Artificial Intelligence will greatly change the future of work. New technologies and digitalization have an impact on the way we work and how we organize our work. Questions around big data and cybersecurity challenges concern not only organizations but also policymakers. These developments are of course also related to the workforce in general. Many of the articles in this edition focus on how Cambodian businesses and their employees can most effectively take advantage of the opportunities presented by digitalization, and how they can meet the challenges that go hand in hand with these opportunities. Some professions will disappear, new professions will emerge, and immense opportunities will be offered to young people who are performance-oriented, flexible and tech-savvy. The framework for work, such as corporate culture and leadership style, will also have to adapt if companies and organizations want to be successful in the competition for the talents of the future.

The technological changes mentioned above will continue to disrupt the structure of the economy. We can get an idea of what lies ahead by examining the development of E-commerce since the millennium. As Yang et. al. have shown in chapter 12, the E-commerce sector offers an opportunity for Cambodians in particular to generate economic growth. This development should be promoted through a targeted strategy to increase ICT literacy. There are also great potentials in other areas, which will have immense positive effects through the use of disruptiv technologies. Chum et. al. vividly demonstrates how an AI-based mobile app will help Cambodian farmers manage their business more effectively and efficiently (chapter 11).

The transformation process ahead can only have a positive impact in a holistic sense if it is supported by effective governance measures. Especially for Cambodia, support for the

development of human capital is of particular importance in this context. Fidero et. al. explain in chapter 19 how SMEs in Cambodia can be specifically promoted by providing targeted support for the development of human capital. In light of the threat of cyber threats, Ou et. al. emphasised programmes to raise awareness of these (chapter 8). A broad approach is provided by Hildebrandt et. al., using the examples of other Asian countries such as Japan or Singapore. In chapter 3, they illustrate how Cambodia can develop into a learning society through targeted policy deployment.

Actors at all levels are needed to shape the future of work in a pro-human way. In the coming years, not only will jobs be created in sectors that we cannot yet imagine, but also completely new forms of organizational teamwork across national, cultural and age boundaries will emerge. These developments require a great deal of flexibility on the part of organizations and individuals. Only if we embrace change together can we shape the future of work for the benefit of all. One major issue will be knowledge and skill development, which runs as a common thread through all chapters. In particular, Ra et. al.'s excellent article in chapter 1 impressively links the new demands on leadership in the context of corporate culture with the increasing need for continuous skills development. In order to meet the challenge of the continuous development of human capital, i.e. skills, not only individuals but also organisations and of course policy makers are needed to create a learning ecosystem.

With the new edition of Digital Insights, we want to play a decisive role in shaping this process. We thank our contributors who have provided us with both insightful academic studies and more direct explorations of how to make the future of work the best it can be. The articles gathered here cover a wide range of topics, from technological change, organizational culture and the psychology of the future of work. A special focus of this issue of Digital Insights is, of course, what the future of work holds for Cambodia and Cambodians. What path will Cambodian companies take in light of the challenges described above? How will leadership styles change? What challenges does the Kingdom's government face? With this book, we hope to contribute to the discussion around these questions. Let's shape the future successfully together!

Enjoy reading!

**Thomas Hesketh and Robert Hör**

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**DIGITAL INSIGHT:** FUTURE OF WORK

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# Leadership - Cambodia Needs Leaders "Being Coaches" Not "Doing Coaching"

RA Joey  CHEA Sovannady

Coaching is now a familiar term in organizations worldwide and even in Cambodia. A large number of companies and NGOs train their managers in coaching methodologies, looking to build a "coaching culture". The motivation behind this trend is clear - coaching is undoubtedly effective. In a survey by the International Coaching Federation (ICF), 80% of people who received coaching reported increased self-confidence, and over 70% improved work performance, relationships, and more effective communication skills[1].

This is a commendable effort to shift away from a traditional model of leadership to address new demands of the economy, the volatile, uncertain, complex and ambiguous (VUCA) environment we find ourselves in, and also to meet the preferences of a new generation of the workforce. A survey at Google found that "being a good coach" was the top trait of a successful manager[2].

One potential trap that faces this welcome development is for people to misunderstand coaching as a formulaic process or technique to apply to their staff, what we will refer to as "doing coaching". Coaching is a mindset shift away from looking at human beings and the workforce as parts of a machine, a view that we inherited from previous industrial phases and one which will not serve us as we enter the new one.

This shift towards seeing people as what they truly are (the "being" of a coach), human beings full of potential, actually mirrors the Kingdom's longer-term plans to shift the economy away from garment manufacturing into the digital economy. To prepare the workforce for this new age, we must not only train in technical skills but also start treating them as human beings full of potential if we want them to not act like machines.

## What Is Coaching?

Coaching was coined and developed as a practice in various places around the world during the 90s, most notably in the UK as led by Sir John Whitmore - Author of Coaching for Performance - and in the US with the Co-Active Training Institute (CTI, then known as Coaches Training Institute) and the International Coaches Federation. The purpose of this nascent practice was to improve the performance and happiness of the coachee, using a process that raises the coachee's awareness to evoke their growth.

It is worth taking a moment to define coaching, as it is often deeply misunderstood and misrepresented. Whilst it is not an issue limited to Cambodia, most "coaches" in the kingdom are neither trained nor accredited but rather spend much of their time giving motivational speeches.

The ICF, the world's largest accrediting body for professional coaching, defines coaching simply as "partnering with clients in a thought-provoking and creative process that inspires them to maximize their personal and professional potential." They also provide a list of coaching competencies that set out the skills and approaches used by coaching professionals around the world. It is a process by which we help clients get better "results" by shifting their beliefs, thoughts and emotions, largely through changing and deepening perception and awareness[3].

1. International Coaching Federation, ICF Global Coaching Client Study (Lexington: International Coaching Federation, 2009).

2. Melissa Harrell and Lauren Barbato, "Great managers still matter: the evolution of Google's Project Oxygen," rework, February 27, 2018, https://rework.withgoogle.com/blog/the-evolution-of-project-oxygen/.

3. Barbara L Fredrickson, "What Good Are Positive Emotions?" Rev Gen Psychol 2, no. 3 (1998): 300-319.

## "Doing Coaching" Vs Coaching Philosophy

When we train leaders in organizations in coaching, we find it helpful to distinguish between coaching as a profession, coaching as an act or a skill, and coaching as a way of being or culture. Monkhood is a profession or vocation. Prayerful chanting is an act or skill. Underlying the act, though, is a way of looking at the world and being in the world, e.g. non-attachment or compassion for all living things.

Likewise, the profession of coaching engages in contracted relationships whereby professional coaches journey with clients to transform themselves, generally facilitated in time-bound sessions of 45-60 minutes. The act or skill of coaching includes things like listening, asking powerful reflective questions, intuition and others, potentially used alongside conversation structures like GROW[4] or CLEAR[5] . The way of being or culture of coaching is curiosity, acceptance, compassion, trust and courageous vulnerability.

Much of the ICF's coaching competencies focus on the "being" aspect of coaching rather than the skillset. "Doing coaching" whilst not paying sufficient attention to the spirit, culture or philosophy that gave birth to the skills will make coaching as effective as Donald Trump's chanting is holy and meaningful.

It is easy for us to fall into the trap of the "form" of something and miss the "spirit" behind the act, especially so in the corporate world. Learning to "do coaching", ask questions and follow a GROW conversation is good and will meet little resistance, but the real benefits for Cambodian companies and wider society will come from the philosophical stance that coaching takes and the cultural and mindset shift required for coaching to be effective.

## The Context the Cambodian Workforce Finds Itself in

Cambodia is in an interesting stage of its development. The country aims to shift its workforce away from manufacturing into a digital economy, alongside its aspiration of becoming an upper-middle economy by 2030. The skills considered crucial for the digital economy include creativity, communication, critical thinking, ability to learn and agility. To address these, the government, companies and employees themselves are rightly investing resources in building up "hard skills" such as coding as well as soft skills. It is, however, even more important to understand how the culture is acting as a barrier to the kingdom's goals. An analogy is installing the latest applications on your phone but the operating system is buggy and outdated.

## Aspects of Cambodian Culture that Hinders Its strategy for Growth

There are specific cultural phenomena that we believe will continue to impede Cambodia's plans for growth, though they are by no means unique to Cambodia. We will highlight some key ones, why we believe this will inhibit Cambodia's desire for progress and propose that the spirit or culture behind coaching provides an antidote.

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**4.** GROW = Goal, Reality, Options, Way.

**5.** CLEAR = Contracting, Listening, Exploring, Action, Review.

## Fear-Based Motivation and Shame Culture

Fear of punishment is a common way used to motivate people. Fear of getting a bad review, being fired or just being told off in public. It's been a tactic used throughout history across the world, based on the principle that human beings will do what they can to avoid pain. Unfortunately, although we may want to avoid the pain of punishment, the fear of it may make us less equipped to perform the given task.

We now know that fear causes the fight or flight circuitry of the brain to be activated and that this, in turn, impairs our cognitive abilities, notably our ability to think creatively and critically as well as communication skills. These are the very skills that are key to succeeding in the digital economy and the fear-based culture we live in will only hinder our progress.

This fear of punishment also has other familiar consequences. How often have you experienced someone not speaking up or taking action whilst saying that they are "afraid of being blamed *[sic]*" (told off)? Many grow up in an environment lacking psychological safety. People are told from a young age to not speak up because if they are wrong, they will be shamed - within the family, in the education system, and at work. There is a common complaint that staff lack accountability and responsibility, but often there has been little investment in creating psychological safety that is crucial to nurturing these traits.

## Saving Face

Similar to other Asian cultures, Cambodia is known for "saving face" - a sign of respect. There is an aspect of this that is linked to shame: we cannot accept any shortcomings because if we did have shortcomings then

we would be unworthy and shameful people. We do whatever we can to avoid "bringing shame" to individuals and groups, as to point out a shortcoming or failure would be to embarrass and cause shame for the person or group in question.

This has harmful consequences. Firstly, mistakes cannot be addressed and corrected, but are rather covered up. Secondly, what underlies this "saving face" culture is really the lack of psychological safety. We don't feel safe to not be perfect. Rather than being a culture of respect, it is in reality one of shame. We need to save face because deep down, if the mask isn't preserved, the person underneath will be ousted as the shameful creature he is, rather than a wonderful human being full of potential.

We recognize that saving face is partially driven by people putting a high value on relationships with the community and building harmony. People learn to maintain relationships by not making people around them feel uncomfortable and believe that trust is built by caring about other people's feelings and themselves. Whilst we commend the intention and the value of harmony, we must recognize the resulting negative impact of such an approach - a lack of transparency and trust, impeding progress and innovation.

## Hierarchy, Deference to Authority and Strongman Leadership

Cambodia traditionally has a culture of not speaking out in disagreement against your superiors. One's rank determines who is right. This is "command and control" leadership that is not equipped for the rapidly changing VUCA world, in which leaders cannot know and control everything. Moreover, we come from a culture of seeking advice from our elders and superiors. 'Advice' is a recommendation regarding a decision or course of conduct. In short, we seek

their solutions to our problems. This is not bad per se, but it can propagate a culture of dependence and deference to authority, reducing accountability, self-authority, creativity and critical thinking.

Much of "traditional culture" also teaches that what means to be "strong" is to show no signs of "weakness". To avoid showing weakness to many means not showing any signs of emotions, doubt or hesitation. Many leaders believe that to be considered a "strong leader" they have to appear larger than life. To appear superhuman or perhaps, more accurately, inhuman.

The above negatively affects everyone involved. The pressure to always be the one providing the answers and the suppression of displaying emotions takes a huge mental and emotional toll on leaders. The leaders themselves suffer from a lack of psychological safety, fearing that they will lose the respect of their team. Many leaders report feeling lonely, misunderstood and unsupported. Their team members, in turn, feel that they cannot show their true feelings either. Furthermore, future leaders will tend to imitate this behavior, perpetuating this negative cycle. The organization's performance suffers due to burnt-out and emotionally fragmented leaders, and a dependent and fearful workforce.

## The Radical Counterculture of Coaching

Coaching, or rather the spirit behind coaching provides a radical counterculture to the one we are familiar with. It is in this spirit of coaching that we find the antidote to the systemic problems that Cambodia faces and will continue to face. Much more can be written on this subject, but we will highlight the key aspects with the greatest potential to impact Cambodian society.

### Radical Acceptance - Safety and Honesty

Effective, transformational coaching can only happen in an environment of acceptance, trust and psychological safety. This is the first thing we set up in our coaching training - we design space of radical acceptance so that every trainee can experience what becomes possible in such a space.

So often in life only our strengths and achievements are celebrated and accepted, whilst weaknesses and "failures" are pointed out and shamed. In coaching, there is no such selectiveness. Everything is accepted, as it is, without judgment. Both the ugly and the beautiful. We allow room for the less than desirable traits and characteristics. It is ok to feel angry. It is ok to feel lazy. It is ok to feel disengaged or discouraged. This safe environment has the opposite effect to that of fear - it boosts creativity, critical thinking, and broadening perspectives, allowing the creative process of coaching to take place.

This culture of radical acceptance also acts as an antidote to the toxic culture of "saving face". Saving face avoids looking at painful things, which are often judged as being "not good" or "shameful". But these things fester away hidden under the surface and infect the body. It is not courageous to pretend these things do not exist and carry on (though we commend the will to carry on). What is truly courageous is to look at the hard things, accept them and move forward.

Foundational to coaching is radical honesty, which is made possible through a culture of permission, trust, and safety. The purpose of radical honesty is one of service and genuine love for the other, which is a stark contrast to the toxic cultures of saving face and shaming. Radical honesty allows neutral, nonpersonal observations, in service of the other person.

Frankness is something that's not uncommon to Cambodian culture - we experience it in daily life and also in historical stories. If psychological safety exists, creative ways can be found to improve the status quo. Without it, "honest" observations will simply result in the continuation of the cycle of shame.

Imagine a workplace where every employee feels accepted and safe. Not only will this directly improve their creativity and critical thinking, but they will also be better equipped to address any desired areas for change, identified through radical honesty.

## The Coachee is the Expert

In coaching, unlike in other disciplines such as consulting or mentoring, we hold the coachee as the expert of their lives. Coaching requires deep and genuine curiosity into the mind and heart of the coachee. If carried out in an environment of psychological safety, this invites the coachee to be creative, become curious in turn about their thoughts, emotions, beliefs and actions, and take responsibility for their lives. Rather than turning to the leaders for the answers and just doing what they're told, people can take responsibility, learn to reflect, change their thoughts and solve their problems.

In addition, being genuinely curious about what really motivates the coachee, and helping them connect the dots as to what this looks like applied to their work roles can greatly increase their intrinsic motivation of the employee (in turn improves job performance). Imagine if you no longer had to pretend to care about the company's bottom line or your team's KPIs. No one cares about those things deep down. However, every good employee has specific reasons why he or she comes to work and performs well - whether they are aware of it or not. Those that are aware will have even greater

satisfaction and performance. Those that are not having their intrinsic motivations met will leave for a better paycheck or another extrinsic motivator.

To be coach-like as a leader is to get curious about what that unique person wants, is really motivated by, and how you can work together to help them use their unique strengths to achieve it. The leader's job is to find ways to align the employee's desires with that of the company's, not the other way around. This is what will generate the greatest mutual success.

## Modeling Vulnerability as Strength

We know through extensive research (Dr. Brene Brown being a recent leading proponent[6] ) that a culture of vulnerability is the antidote to the culture of shame and fear, which inhibits development. Vulnerability builds trust if reciprocated, the foundation to a thriving organization and society.

The avoidance of vulnerability is not something that is limited to Cambodia but there is a shocking lack of leaders exhibiting vulnerability and admitting fault. This is understandable, as there is a lack of psychological safety and society is still in fight or flight mode and living in a culture of fear and shame, arguably made worse by the recent genocide of the Khmer Rouge. However, this is a crucial switch that we need to make to thrive in the next age.

We train our coaches to model courageous, vulnerable leadership for our clients through our behaviors. As coaches we know that problems are not solved on the level it presents itself, and to go deeper requires vulnerability. A coach cannot ask their coachee to be vulnerable when the coach

**6.** Brene Brown, Daring Greatly: How the Courage to Be Vulnerable Transforms the Way We Live, Love, Parent, and Lead (Avery: Reprint edition, 2015),

first does not show vulnerability. This is a radical shift from most professions where the professional is expected to be "the expert" and cannot show uncertainty or admit mistakes.

When vulnerabilities are embraced within organizations and demonstrated by its leaders, it unlocks trust - highlighted by many (including Patrick Lencioni in The Five Dysfunctions of a Team[7]) as the foundational trait required for successful teams. Moreover, by allowing space for the more vulnerable sides of everyone to be present, leaders and employees alike can show up in an integrated and authentic way. Less energy is wasted on suppressing emotions and thoughts, and more resources are instead made available to help each other thrive through challenges.

## Coach the "Chet" not the Mind

In our coaching training sessions, we spend a lot of time helping leaders fundamentally shift how they think of coaching. They come wanting to learn a technique or methodology that will allow them to have an intellectual conversation with their employees to help solve their problems. We spend the entire course teaching them that coaching is not a conversation of the head, but rather a conversation of the heart. It is an intensely human conversation.

This is not an issue that we see as being particularly specific to Cambodian culture, but a trend that has been growing worldwide since the Enlightenment. As coaches, we take a stand against pretending humans are rational versus emotional ones. The Singaporean government, leading a country that takes pride in logic and reason, invests heavily in training their leaders in coaching, through a school that focuses very much on

this "being" of coaching. That, as a core part of their coaching curriculum, reconnects students with "human skills" (often miscalled "soft skills"). Of course, they would not do this merely as a philosophical stance if it was not effective. To be compassionate, vulnerable, curious and open is not "soft". It is fiercely difficult. And very few master it. And when it is mastered, the results are transformational.

As we strive to build a thriving Cambodia of the future, we must not forget the fact that human beings are not cold, logical and rational beings. We believe that Cambodians especially know this to be true. In our training, we ask participants to point to where the "chet" (often translated as "mind") lives in their bodies. The vast majority point towards their hearts and not their heads. This encourages us and we hope this truth is not forgotten as we enter the Fourth Industrial Age and build on the foundations laid by those who came before us.



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7. Patrick Lencioni, The Five Dysfunctions of a Team: A Leadership Fable (Wiley, 2002).

## Concluding Remarks

We celebrate the increasing number of organizations that train their staff with various "models" of coaching (popular ones being variations of CLEAR and GROW) and coaching skills to be used in the workplace. What Cambodia and its organization need though is the "being" of a coach, rather than people "doing coaching" (skills, methodologies, etc).

The "being" of a coach and coaching culture entails mindsets, beliefs and ways of looking at a person: trust, loving, safe, curiosity, open, vulnerability. It is a shift away from looking at human beings and the workforce as parts of a machine (a view that we inherited from the previous industrial age). This shift in how we see people mirrors the Kingdom's longer-term plans to shift the economy away from garment manufacturing into the digital economy.

This is the real change required to serve the needs of the growing country and its workforce. The real benefits for Cambodian society will only be realized when the cultural and mindset shift (which is the foundation of coaching) is put at the center. By adopting this new way of "being", Cambodia and its organizations will reap countless benefits both on a macro (national and organizational) and micro (e.g. teams, families and individuals) level. These things should not be limited to "coaching conversations" but should permeate the corporate culture.

This cultural shift cannot just be limited to forward-thinking organizations. The country is going through a massive transformation plan. To be equipped to meet the plan's demands, all aspects of society need to change. Culture is built from families, friendships, social media chats, schools, governments. This is the goal. We start with companies and their leaders.

# ABOUT THE AUTHOR

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RA Joey is Cambodia's only Certified Professional Co-Active Coach and the Founder of Cambodia Coaching Institute, the country's first professional coaching training program. Joey also holds the role of Chief Happiness Officer for Spark18, a Leadership Coaching Company in Singapore.

Born in Korea and raised in the UK, he now works to nurture and grow coaching in Cambodia and beyond, serving as teacher and mentor to coaches in the region.

He partners with leaders around the globe, aiming for deep inner transformation that leads to lasting improvements in happiness and performance. Combining rigorous scientific research with ancient wisdom, he specialises in helping clients integrate parts of themselves previously ignored (emotions, heart, characteristics) so that they can lead from a more resourceful place. He read Biochemistry at Imperial College London and his understanding of neuroscience informs his coaching.

Prior to coaching, Joey worked in Human Performance and Reward for Deloitte, Prudential and Nomura. He continues to run a small consultancy practice.

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# Wellbeing Hacks
# for the Workplace

**Achieving Performance by Promoting Well-being
with Little Planning and Strong Actions**



HÖR Robert

## Introduction

The idea of being able to design your job sounds tempting. What would it look like, the workplace of your dreams? Green and flooded with light? Adjustable desks in a modern open office that offers places of retreat and exchange at the same time? A manager who is understanding, gives constructive feedback and allows freedom? Healthy food in the cafeteria and opportunities to exercise at work? Two days of home office?

Employees' and managers' expectations of the workplace vary, yet there is a growing consensus that managers are striving for a paradigm shift from traditional and profit-oriented leadership to more personal responsibility of staff, mutual appreciation, freedom and participation to make decisions, and coaching of employees.[1] The reasons for this are manifold. One heavily researched reason is the increase in stress and, in the worst case, burnouts.[2] Psychological stress has been rising continuously for 15 years, which has consequences for companies.[3] Days of incapacity to work are increasing, employees are less efficient, employees quit internally, are demotivated and consequently the innovation and competitiveness of companies decrease.

From this situation arises the potential for managers to increase performance by hacking the wellbeing of employees. With small ideas and steps, which can be implemented straight away, the innovation capacity and the corporate culture can be magnified. One possibility to do so lies in

Positive Psychology and the enhancement of well-being in the workplace. Therefore, the focus of this paper is to develop hacks for promoting well-being in the workplace based on the newest findings and recommendations from Positive Psychology.

## The Challenge for Managers

Managers are the driving forces of change in companies. They have a significant influence on the well-being and performance of employees in the workplace. At the same time, leaders are under pressure from an increasingly volatile, uncertain and complex world that places high demands on both the leaders and the employees.

Health and well-being are essential goods for society as well as for companies and are culturally, scientifically, and individually multifaceted.[4] Health is not a uniformly defined construct but is highly dependent on socially constructed notions of health, scientific subdivisions into physical, social and psychological well-being, and practical applications.[5] A general definition of the World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being and not merely as the absence of disease and infirmity (WHO, 2018).

With this definition, WHO is responding to a scientific paradigm shift in the 21st century.[6] The paradigm shift is based on the criticism

1. Peter Kruse and Andreas Greve, Führungskultur im Wandel. Kulturstudie mit 400 Tiefeninterviews (Berlin: Initiative Neue Qualität der Arbeit, 2019), 11

2. TK, "Gesundheitsstudie," tk.de, 2016, https://www.tk.de/resource/blob/2033594/0a69181d4341efc350dacc72d7da8c10/tk-job--und-gesundheitsstudie-data.pdf .

3. Ibid.

4. Sandra Ursula Rochnowski, Gesundheitsmanagement als personale Ressource der Lebensstilmodifikation: Gesundheitsfördernde Maßnahmen und Nudges für Führungskräfte in Settings (Wiesbaden: Springer, 2018), 25; Peter Franzkowiak and Klaus Hurrelmann, "Gesundheit," BZgA.de, June 13, 2018, https://www.leitbegriffe.bzga.de/alphabetisches-verzeichnis/gesundheit/.

5. Peter Franzkowiak and Klaus Hurrelmann, "Gesundheit," BZgA.de, June 13, 2018, https://www.leitbegriffe.bzga.de/alphabetisches-verzeichnis/gesundheit/.

6. Ricarda Rehwaldt, Glück in Unternehmen: Positive Psychologie für Führung und Organisationsentwicklung (Wiesbaden: Springer, 2019).

that medicine, psychology, and health sciences have been concerned with the construct of disease and its manifestations for too long, and not enough with the global construct of health.[7] Health criteria vary in medicine, psychology, sociology, or economics, however, they have overlapping criteria that are summarized as follows by Udris et al:

- Absence of symptoms, disease, or disability
- Freedom from pain and discomfort
- No functional impairment of life activities
- Positively evaluated psychological experiences
- Adequate assessments of one's own ability to act
- Ability to love and enjoy, ability to grieve
- Resistance to stress
- Capacity and potential to set and pursue independent goals
- Ability to cope with environmental and social demands as well as stresses and crises
- Seeking and finding meaning in life.[8]

The criteria offer already several starting points for self-reflection and broader analysis of social and organizational settings. The figure below is one way to illustrate the relationships between leader Self-Care, StaffCare, and overall health.

*Abbildung 1: Gesundheitsorientierte Führung nach Franke, Ducki und Felfe[9]*
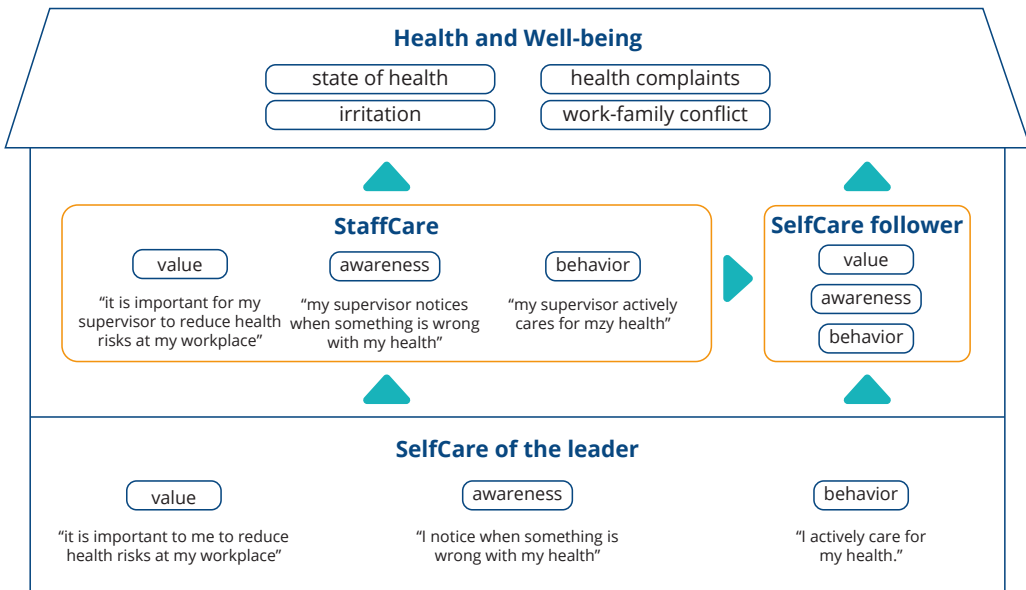
7. Martin Seligman, "The Original Theory: Authentic Happiness," upenn.edu, April, 2011, https://www.authentichappiness.sas.upenn.edu/learn/wellbeing.

8. Ivars Udris, Ueli Kraft, Carin Mussmann, and Martin Rimann, "Arbeiten, gesund sein und gesund bleiben: Theoretische Überlegungen zu einem Ressourcenkonzept" psychosozial 52 (1992): 11.

9. Franziska Franke, Jörg Felfe, and Gwen Elprana, "Führungsspielräume nutzen und erweitern," in Handbuch Mitarbeiterführung: Wirtschaftspsychologisches Praxiswissen für Fach- und Führungskräfte, ed. Franziska Franke and Rolf van Dick (Berlin-Heidelberg: Springer Reference Psychologie, 2016), 144 – 155.

## Overview: Positive Psychology

Influential thinkers, such as Lao-Tse[10] and Aristotle[11] already pondered about the question of personal development and fulfilling life. Great works, such as the Nicoman Ethics or the Tao Te Ching are the result of the realization that well-being and happiness can be influenced by people. This makes happiness shapable and changes a fatalistic worldview to a dynamic humanistic view.

Psychology is concerned with perception, behavior, well-being, and the healing of the psyche. Basic research examines, among other aspects, processes of learning and how personality traits are formed. Since the postwar period, psychology has been increasingly concerned with mental illnesses and how they can be cured.[12] Various authors have criticized the strong pathological focus, including Abraham Maslow, who first coined the term Positive Psychology and describes the orientation of psychology as follows: The science of psychology has been far more successful on the negative than on the positive side. It has revealed to us much about man's shortcomings, his illness, his sins, but little about his potentialities, his virtues, his achievable aspirations, or his full psychological height.[13]

Carl Rogers, Erich Fromm and an increasing number of scientists agree with this criticism of self-limitation and one-sidedness of psychology and developed theoretical approaches and measuring instruments for happiness and flourishing. With the turn to human potentials, virtues, and aspirations, Positive Psychology as a new field in psychology has emerged. Gable and Haidt summarize Positive Psychology as a discipline that is "concerned with research and practice with the conditions and (inter) effects that enable the optimal development of individuals, groups and organizations.[14]

Since the early 2000s, the young research field of Positive Psychology has been shaped by scholars including Martin Seligman, Barbara Fredrickson, Barry Schwartz, Daniel Kahneman, and Fred Luthans. Martin Seligman's inaugural address to the American Psychology Association presidency in 1998 is considered a central milestone.

Accordingly, the premise of Positive Psychology is that the absence of stress and illness is not the same as well-being and happiness.[15] If a person lives stress-free and disease-free, it does not mean that a person is happy and thriving. Seligman defines well-being as a combination of feeling good as well as having meaning, good relationships, and accomplishment.[16] Ryff adds self-acceptance, autonomy, environmental control, and personal growth.[17] Positive Psychology explores these concepts and connections between the concepts. The self-claim of Positive Psychology is to have a strong application orientation, which makes the development and design of intervention for individuals, teams and organizations central.

**10.** Lao Tzu, Tao Te Ching: The Essential Translation oft he Ancient Chinese Book of the Tao (Shambhala, 2007)**.**

**11.** Aristoteles: Nikomanische Ethik. (Reclam)

**12.** Michael Tomhoff, Positive Psychologie in Unternehmen (Wiesbaden: Springer Fachmedien, 2018); Norbert Heining, Glücksprinzipien: Mit dem fundierten Erkenntnisschatz der Positiven Psychologie zu mehr Lebensfreude, Erfolg und einem gelingenden Leben (Wiesbaden: Springer, 2019).

**13.** Abraham H. Maslow, Motivation and personality (New York: Harper & Row Publishers, 1954), 354.

**14.** Shelly L. Gable and Jonathan Haidt, "What (and why) is positive psychology?," Review of general psychology (2005).

**15.** Michael Tomhoff, Positive Psychologie Erfolgsgarant oder Schönmalerei (Wiesbaden: Springer, 2017), 92.

**16.** Martin Seligman, "The Original Theory: Authentic Happiness," upenn.edu, April, 2011, https://www.authentichappiness.sas.upenn.edu/learn/wellbeing.

**17.** Carol D. Ryff, "Psychological Well-Being Revisited: Advances in Science and Practice" Psychother Psychosom. 2014; 83(1) (2015): 10–28.

Positive Psychology logically divides into three scientific areas, the first deals with what positive emotions are, the second deals with positive character traits, and the third area deals with positive institutions and a positive community.[18] Seligman and Csikszentmihalyi continue that Positive Psychology is concerned with the study of positive human functioning and development, which includes biological, personal, relational, institutional, cultural, and global environmental dimensions.[19] Thus, it asks what pleasure and enjoyment are, how strengths can be fostered, and how both are related to relationships and social systems. This includes fostering good and great personal qualities, such as optimism, future orientation, social competence, social responsibility, enjoyment, and meaning. Positive psychologists are rather not concerned with the question of how weaknesses in children and employees can be corrected but how strengths can be discovered and built up.

## The PERMA Model according to Seligman

Psychologist Martin Seligman examines the emergence and promotion of subjective well-being and postulates the PERMA model as a theoretical framework. The premise of the model is Seligman's belief that individuals can increase their well-being through intervention.

The PERMA model consists of five dimensions that Seligman calls building blocks of well-being that contribute to a person's well-being.[20] The five dimensions are positive emotions, engagement, relationships, meaning, and accomplishments. Positive emotions describe what we feel, such as joy, warmth, and comfort. It is a subjective variable defined by feelings and thoughts.[21] Seligman considers positive emotions to be an optimistic and constructive perspective on the past, present, and future. With the help of interventions, e.g. cultivation of gratitude and forgiveness, positive emotions can be developed about the past. In the present, mindfulness interventions and conscious enjoyment of moments, and in the future through hope and optimism.[22]

People perform and experience a variety of activities and gain individual experiences. Engagement describes the perception and experience of activities.[23]  Activities can be experienced as enjoyable or unpleasant. Csikszentmihalyi coins the term flow, which describes an optimal state of enjoyment, involvement in the task, and focus. People often experience a flow state when skills are in harmony with the task or challenge.[24] In the flow state, individuals become completely absorbed in their activity and lose track of time.

From an evolutionary perspective, relationships are essential for ensuring the survival of individuals. Already in the womb, humans build a close relationship with the mother via the bonding hormone oxytocin.[25] This can also be proven neurologically because as soon as the risk of isolation arises, certain pain centers in the brain are

**18.** Martin Seligman, "The Original Theory: Authentic Happiness."

**19.** Martin Seligman, "PERMA and the building blocks of well-being," The Journal of Positive Psychology 13, no.4 (2018): 333-335, https://www.tandfonline.com/doi/abs/10.1080/17439760.2018.1437466.

**20.** Martin Seligman, "The Original Theory: Authentic Happiness,"

upenn.edu, April, 2011, https://www.authentichappiness.sas.upenn.edu/learn/wellbeing.

**21.** Ibid.

**22.** Ibid.

**23.** Ibid.

**24.** Csikszentmihalyi, Mihaly: Flow: The Psychology of Optimal Experience (2008).

**25.** Argang Ghadiri, Andres Habermacher, and Theo Peters, Neuroleaderhsip, A Journey Through the Brain for Business Leaders (Wiesbaden, Springer, 2012).

activated.[26]  Perceptual signals encourage individuals to reconnect with others. For this reason, healthy relationships with fellow human beings are another element for a happy and fulfilling life, because relationships give us security and have a significant impact on the self-esteem of individuals.[27] Relationships are crucial for laughter, meaning, pride of accomplishment, and support systems and positive relationships are demonstrated through compassion, teamwork, cooperation, kindness, and self-renunciation.[28]

The question of the meaning of life engages a variety of disciplines and experts and laypeople alike. This is expressed through the search for meaning in institutions such as religions, families, sciences, and politics. People strive for meaning and purpose in life that goes beyond engagement and positive emotions and represents a shared mindset.[29] The question and search for meaning are characterized by the aspiration to be part of and contribute to something larger than the individual.[30]

The fifth element is achievement through accomplishment. Developing and achieving goals and ambitions contributes to personal growth, the development of competence, and motivation.[31]  As with meaning and commitment, this is an objectively and subjectively measurable component. The dimension also includes professional skill development, success in terms of

work, sports, or hobbies. People pursue achievement even if it does not necessarily contribute to positive emotions, meaning, and healthy relationships.

Each of these five building blocks contributes to a person's well-being and can be pursued to its own end. Those who seek meaning are not necessarily seeking positive emotions. The blocks can improve performance, more cooperation, a stronger immune system, fewer health risks, and higher performance.

## Hacks: With Positive Psychology to Positive Corporate Culture

Hofstede describes a corporate culture as a kind of brain software that is permanently programmed by members, subunits of the company and other influencing factors. So how to positively hack the corporate culture? The step-by-step approach is divided into three areas: Preparation, Exploration and Hacks. Important at this stage is, that the preparation and exploration steps are just needed in case of deeper problems or culture of KPIs exists at the organization. When healthy and just higher potentials shall be realized, feel free to jump straight to the hacks and get creative.

### Preparation: What are Hacks and What do We Want to Hack?

In the preparation phase, the benefits and opportunities of Positive Psychology are presented and applied to the company and its leaders. In addition, the hacking approach is introduced. Hacks are a proven form of intervention from Positive Psychology and similar disciplines that are flexible, need-based, and pragmatic. The goal of a hack (not a cyber hack) is to increase well-being in the workplace and targets actions, habits, norms, and communication.

**26.** Martin Seligman, "PERMA and the building blocks of well-being," The Journal of Positive Psychology 13, no.4 (2018): 333-335, https://www.tandfonline.com/doi/abs/10.1080/17439760.2018.1437466.

**27.** Argang Ghadiri, Andres Habermacher, and Theo Peters, Neuroleaderhsip.

**28.** Martin Seligman, "PERMA and the building blocks of well-being."

**29.** Martin Seligman, "The Original Theory: Authentic Happiness."

**30.** Ibid.

**31.** Ibid.

Unlike large-scale change initiatives that involve comprehensive packages, hacks ensure more freedom and flexibility, as well as the spontaneous and creative, entirely in the spirit of Positive Psychology. It is not the big rollout, but the sum of many small hacks that contributes to the result. Through the hacks, the explicit and implicit rules of the game are transformed into the company.

Hacks can be smart and small ideas to foster the five building blocks, continuing education offerings, short inputs, learning lunches, or online courses. An important component in addition to the development of the measures is communication. Hacks are self-contained processes that deepen knowledge in a particular area and thus strengthen self-efficacy. Hacks need to be transparent to everyone so that the new patterns are perceived. The following hacks are based on the five building block engagement, healthy relationships, meaning, positive emotions, and achievements, which are important variables and key indicators of well-being at work.[32] Hacking can start at every moment and can address the individuals, teams or the organization as a whole. They are often free and do not consume many resources.

## Exploration

Every company has grown uniquely and has different structures, processes, and cultures.[33]  Companies are diverse in their personnel composition. Before the hacks are used, it should be questioned where the company currently stands and how the corporate culture is perceived by different groups and individuals concerning the dimensions of Positive Psychology. At the core are values, norms, informal rules, fears, conflicts, strengths, weaknesses, world views and assumptions. The goal of the exploration is to describe the current culture as accurately as possible and to determine points of connection. For example, if a majority of employees feel a deep sense of purpose in their work, but are not satisfied with the way recognition is communicated, the topic of recognition should be addressed.

For the analysis, a focus can lie on hard factors, such as the corporate vision, internal guidelines, continuing education programs, codes of conduct, slogans, websites, and organizational charts.[34] The documentation is divided into five topics that provide information about corporate identity. The vision, the culture and values, the capabilities of the company, the leadership and leadership behavior, and the environment.

The investigation of soft factors, i.e. values, routines, perceptions, is supplemented by quantitative methods. For this, a standardized questionnaire can be used, which provides information about the well-being of the employees. In addition to standardized measurement tools, shadowing, focus group discussions and one-on-one interviews can provide further insights. Data can be supplemented by other data sources, such as days of absence, insurance costs, health care spending, and employee retention. They are often not included in the holistic assessment but are important clues and function as important indicators. From the quantitative, qualitative and informal analysis, an overall picture of the company emerges concerning the aspects of Positive Psychology. Deficits, initial success stories, management efforts and stakeholder concerns then yield stimuli for hacks and prioritization. Based on the analysis, a target

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**32.** Nils Schnell and Anna Schnell, 50 Inspirationen für modernes und innovatives Arbeiten (Wiesbaden: Springer Gabler, 2019), 19.

**33.** Ricarda Rehwaldt, Glück in Unternehmen: Positive Psychologie für Führung und Organisationsentwicklung (Wiesbaden: Springer, 2019), 26.

**34.** Ibid.

state is developed, which provides a guiding function and legitimizing function for the alignment of the hacks. This target state is based on the exploration results and includes all perspectives. The following guiding questions are suitable for this purpose:

- What kind of values do leaders and employees represent in the organization and toward partners? Do we want to change or align any of these values?

- Do we share credits fairly and recognize achievements?

- How do external stakeholders see us? Are we attractive or repulsive? Why?

- Do we support innovative and creative new ways?

- What are winning and losing routines in our organization?

- What are key factors supporting our value innovation? Do we focus on the right ones?

- What kind of talents do we have and what kind of talents do we need?

- How can we upgrade the talents we have?

- Do we leave enough space for our staff to thrive and be autonomous?

- What are our vision and goal? Is it clearly communicated?

- What are our indicators to measure staff motivation, flow resignation, boredom, absenteeism and productivity?

- Can we reshuffle teams to create better fits?

- How do we promote and retain qualified staff?

The target state includes measurable and realistic goals over specific periods. The goals can be qualitative and quantitative. Exploration serves as the starting point for measurement here. One goal may be to become the top employer in the region. Another quantitative goal may be to reduce turnover and decrease sick days. Qualitative goals can be measured through regular feedback loops (employee-team discussions), observations and surveys. For example, what about employee satisfaction, the quality of relationships in the company, the use of one's skills and the sense of purpose. In addition to the economic figures and surveys, the analysis includes a consideration of the infrastructure.

## Positive Hacks - Small Steps to a Big Goal

The goal of Positive Hacks (ff. Hacks) is little planning, lots of action. The hacks are geared to the well-being of the employees and relate to the agreed goals from the exploration phase. Therefore, they allow for a targeted, tailored effort based on identified needs and problems. Self-determined work, an open process design, flexibility, compassion and personal development are important elements of the hacks.

The hacks are described based on three relevant aspects. First, the target group, which is either the individual employee, the team or the entire organization. Second, the focus of the hack, such as healthy relationships, sense of purpose, communication, and personal development. Third, the type of hack, which describes whether it is a training, workshop, event, or informational material. Leadership has

a critical role in selecting hacks and prioritizing them. Leaders act as role models. If a hack includes regular self-reflection, executives should practice this as well. The special thing about hacks is that they are not accompanied by big announcements, but are integrated into everyday life. Thus, a minimally invasive style is exercised. If they work they can be habitualized, if they don't work the effort was minimal. In addition, employees are intensively involved. The number of hacks chosen depends on the results of the exploration phase. The Positive Hacks described are examples used for illustrative purposes. The exact methodology is not discussed in this context.

| Name | Focus | Target Group | Measurement | Characteristics |
|---|---|---|---|---|
| Speak out! Active and constructive communication | Hope and optimism, positive relations | Team | Focus groups and feedback talks | • Deeper relations<br>• Servant leadership and followership<br>• Motivative and trust-building |
| Agile feedback mechanisms | Engagement, positive relations | Employee | Focus groups and feedback talks | • Success and credits<br>• Prospective feedback |
| Design your day | Engagement | Employee | Focus groups and feedback talks | • Responsibility<br>• Autonomy of employees<br>• Freedom to select task bundles and organize them based on own needs and talents |
| Design your office | Engagement | Team | Focus groups and feedback talks | • Health, team, performance focus |
| Flexible working time and working place design | Purpose, positive relations, engagement, life balance | Employee | Focus groups and feedback talks | • Silent and team working spaces<br>• Self-organized working |
| From time to goal systematics | Engagement, achievements, self-efficacy | Employee | Focus groups and feedback talks | • Result orientation, performance-based |
| Gender training | Positive relations | Company, employee | KPIs, surveys, assessments | • Sensitization for gender-related topics<br>• Project development |
| Goal parties | Achievements | Team, employee | Focus groups and feedback talks | • Celebrate goal achievements |
| Health support | Physical health | Employee | KPIs, Focus groups and feedback talks | • Sport<br>• Health and veggie days |
| Homeoffice | Positive relations, Engagement | Employee | Focus groups and feedback talks | • Own responsibility,<br>• Flexible<br>• Goal-oriented |
| Incentives beyond money | Motivation | Employee | Focus groups and feedback talks, KPIs | • Incentive for bicycles, public transport<br>• Fitness card |
| Job rotation/day in different department | Positive relations, engagement | Team | Focus groups and feedback talks | • Resilience<br>• Skill development<br>• Empathy fort he work of colleagues |
| Learning lunch | Positive relations | Employee | Focus groups and feedback talks | • Team members present self-chosen topics in a casual atmosphere |
| Mindfulness and awareness training | Global | Employee and leadership | Focus groups and feedback talks | • Repetitive<br>• Deeper understanding<br>• Trainer might be needed |
| Participation in decision making | Engagement | Employee | Focus groups and feedback talks, KPIs, | • Pride<br>• Hope<br>• Optimism<br>• Recognition |
| Reflection camps | Positive relations | Team | Focus groups and feedback talks | • Trips, adventures, relaxation |

| Short visits/ field trips | Engagement, meaning | Team | Surveys | • Short trips to partners and companies to extend understanding and context factors |
|---|---|---|---|---|
| Strength focus and development/ weakness acceptance | Engagement | Individuum | Focus groups and feedback talks | • Empathy<br>• Support systems<br>• Global human view |
| Teambuilding adeventures | Positive relations, purpose | Unternehmen | Focus groups and feedback talks | • Teambuilding<br>• Community building |
| Tickets | Engagement | Employee | Focus groups and feedback talks | • Capital for social projects and education |
| Week of learning | Engagement | Organization | Focus groups and feedback talks | • Experimentation<br>• Out of the box week |

*The table can not be seen as exhaustive, rather as inspiration. The ideas are deduced from work, life and academic experiences. The hacks are also partially based on Schnell and Schnell 2019, which offer additional hacks for New Work environments[35]/Own table*

## Outlook

The hacks offer ways for an innovative and timely approach to responding to resistance and other negative stressors that torpedo well-being and have been highlighted in the explanatory models. Employee well-being should be understood as a significant metric in corporate policy. Employees are a valuable resource of the company, which have a significant impact on the corporate culture and the company's results, and should be treated, motivated and cared for accordingly.

For this purpose, it is necessary to equip managers with the appropriate concepts and competencies so that they can succeed in implementing this feeling of well-being among the employees with hacks defined in collaboration with the employees. Employee well-being will have a positive impact on the company's external image and key performance indicators. Motivated, loyal employees who identify with their company and are motivated and committed to their activities have a significant, if not the most significant, share in the company's success.

**35.** Schnell Nils, Schnell Anna, New Works Hacks. 50 Inspirationen für modernes und innovatives Arbeiten (Wiesbaden: Springer, 2019).

# ABOUT THE AUTHOR

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Robert Hör is currently program manager for digitalization at Konrad-Adenauer-Stiftung Cambodia. He is a political scientist by training and is in charge of several research projects and dialog formats between Cambodia, regional and German experts. His current research focus lies on the implementation of digitalization projects within SMEs and organizational development. Having always been fascinated by the social-political impact and potential of a new tecnologies and what they mean for enterprise, he started studying the online M.Sc. program on digital transformation and management. His major fields of study are digital strategy development, political economy and business informatics.

# The Shortening Half-life of Human Capital or How to Build a Learning Ecosystem

HILDEBRANDT Tim        OUM Oudom

In the 2013 bestseller "The Half-Life of Facts: Why Everything We Know Has an Expiration Date," author Samuel Arbesman describes how our collective knowledge is constantly evolving systematically and predictably. The "half-life" in this context, means the time it takes for us to lose our knowledge on a given topic, or for that knowledge to lose relevance. The continuous development of existing methods, as well as the acquisition of new knowledge through the use of scientific methods, would give existing knowledge a kind of expiration date. Corresponding media contributions are often characterized by statements about the period in which existing knowledge loses its value. School knowledge, for example, is said to no longer be relevant after 20 years and IT skills after even just one to two years.[1] For example, technical skills are needed for image and video editing. If new versions of the same editing program or a different program become the industry standard, this will lead to the need for retraining, because the skills for using the new software are lacking. On top, free online and easy-to-use applications offer similar services as professional agencies, which might replace the job photo editor in the long run. In addition, the specialist knowledge acquired in the course of vocational training or university studies is said to lose 50 percent of its current significance after ten to fifteen years. Knowledge, therefore, seems to decay.[2]

*Table 2: Half-lives of knowledge propagated by a management consultancy (Quality in Motion. 2021. Halbwertszeit des Wissens – was ist das und wen betrifft es? Available at: http://www.qualityinmotion.at/halbwertszeit-des-wissens/. Retrieved on: 31.05.21*

| Type of Knowledge | Half-life |
|---|---|
| School knowledge | 20 Years |
| University knowledge | 10 Years |
| Professional knowledge | 5 Years |
| Technical knowledge | 3 Years |
| Electronic data processing knowledge | 1 Year |

With his book, Arbesman took up a debate that continues to enjoy great popularity, namely the debate about the shortening half-life of knowledge and its consequences. The term "half-life", borrowed from physics, is applied to knowledge, often around facts and methods, primarily in popular science contexts and by human resources and management consultancies. In this context, training providers, futurologists, and management magazines like to bring digitalization and Artificial Intelligence into play, which could make numerous qualifications superfluous in the future.[3]

This transfer of a physical concept to a social science concept is not without problems from a scientific point of view, but it can help us to recognize the challenges we face in the context of the enormous gains in scientific knowledge, which are translated into continuously improving technical and methodological know-how. The loss of relevance of skills, especially

1. Möller, T. 2017.Woher stammt das Wissen über die Halbwertszeit von Wissen? In: Theorie, Semantik und Organisation von Wissen. Baden Baden. Nomos. P. 398 – 410. 1

2. Helmrich 2020, 7.

3. Helmrich R./ Leppelmeier, I. 2020. Sinkt die Halberwertszeit von Wissen? Theoretische Annahmen und empirische Befunde. Bundesverband fuer Berufsbildung. 5

in a professional context, threatens individual competitiveness in the labor market, the international competitiveness of organizations, and the basis of the prosperity of nations.

The purpose of this article is, on one hand, to enable the reader to take a critical look at the concept of the half-life of knowledge. To this end, the genesis of the concept is examined and probed. On the other hand, the main purpose of the article is to point out the very real problems that the concept is meant to highlight in the context of accelerating scientific and technological progress for individuals, organizations, and states, and to explore possible solutions.

## Weak Concept, Real Problems

The concept of the half-life of knowledge can be traced back to library science, where it genuinely described the rate of obsolescence of scientific literature.[4] Thus, when we speak in this context of either knowledge losing its validity or knowledge losing its usefulness. It should be noted that methodological knowledge rarely loses its validity, but rather its usefulness. This can be explained particularly easily by software applications. If these are replaced by new applications after some years, the knowledge about the old software programs is obsolete, but only in the sense that it is no longer state of the art.[5]

The search for the empirical basis for the surprisingly exact statements about the half-lives of knowledge or the periods in which it loses its relevance, however, runs into emptiness and reveals that such claims are not based on a solid empirical foundation.[6]

It must be taken into account that knowledge as a resource has many different facets.[7] The physical concept of half-life appears to be completely unsuitable with knowledge and competencies. Knowledge does not lose its significance through the process of generating new knowledge. Rather, it is developed further. The previous knowledge then becomes marginalized or changes, but it remains knowledge. Thus, once acquired, knowledge can be used as a basis for the understanding of new knowledge, or the acquisition of new skills, since new insights, techniques and methods usually build on pre-existing ones.[8]

Even though the "half-life of knowledge" is not a scientific concept in the strict sense, it does illustrate real problems very clearly.

The knowledge, skills and abilities of an employee can be described as human capital.[9] Individuals need human capital to find employment. Organizations need human capital to produce goods and services. Nations are also dependent on a well-educated workforce to compete globally in terms of labor costs and innovation. The main problem is that human capital may lose value for the individual or the collective as a result of various trends. This problem is acute in the context of the future of work since it must be assumed that said trends will tend to intensify in the coming years. The three trends are automation, globalization and collaboration.

Automation describes the trend in which increasingly sophisticated machines take over or replace more and more human jobs and make entire occupational fields redundant.

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4. Möller 2017, 4

5. Möller 2017, 9

6. Helmrich 2020, 7

7. Helmrich 2020, 8

8. Helmrich 2020, 13.

9. Goldin, Claudia, "Human Capital," in Handbook of Clinometrics, ed. Claude Diebolt and Michael Haupert (Luxemburg: Springer S+M Media, 2014).

*Figure 1:* *Future of work (Foundation Young Australians 2017, 7)*



**Future of Work for
Today's 15 Year Olds**

| **AUTOMATION**<br>What work will we do | **GLOBALIZATION**<br>Where will we work | **COLLABORATION**<br>How will we work |
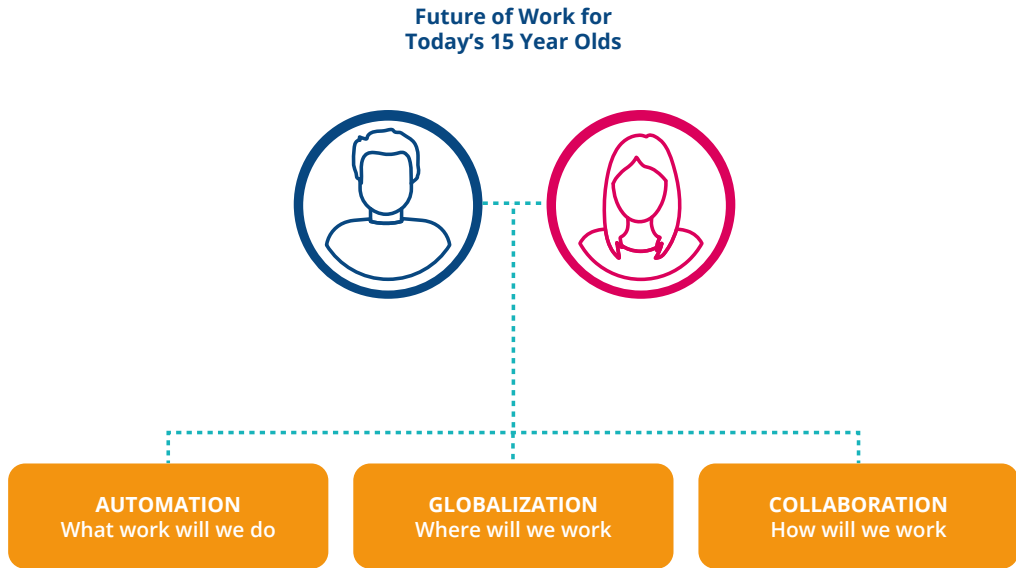
In the past, it was mainly routine and production activities that were affected. In the future, automation will increasingly affect more complex tasks. Globalization here describes the trend that the workforce is looking for work globally, or that labor can be sourced globally. This is by far not a new trend. Especially the labor-intensive industries, such as the textile industry, are continuously moving to locations with the lowest possible labor costs. The increasing digitization of work, however, makes it easier to employ foreign workers for all possible activities without having to move the factory or office abroad. Technology increases the potential for collaboration and cooperation across different platforms. The so-called standard employment relationship, where an employee works for one employer under a single contract, is becoming a thing of the past. Instead, flexibility is increasing, so that employees could work for an employer only in phases, or on a project-by-project basis for several clients at the same time.[10]

According to the International Labor Organization, the ASEAN-Region will be especially affected by Automation. While the region's inhabitants are particularly tech-savvy, the companies are not exactly at the forefront of technological progress.[11] In total, 56 percent of all jobs in the ASEAN-5 countries are at high risk of automation in the next two decades. Particularly affected are the hotel, restaurant, retail, construction and manufacturing sectors.[12] However, there are also considerable differences within the ASEAN-5. For example, Thailand has the lowest proportion of jobs with a high risk of automation (44 percent) and Vietnam the highest (70 percent). In Cambodia, 57 percent of jobs are at high automation risk. This puts Cambodia

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**10.** Foundation Young Australians, The New Work Order: Ensuring young Australians have skills and experience for the jobs of the future, not the past (The Foundation for Young Australians, 2015): 7.

**11.** Jae-Hee Chang and Phu Huynh, ASEAN in Transformation: The Future of Jobs at Risk of Automation, (Geneva: International Labor Organization, 2016), 2.

**12.** Ibid.

*Figure 2:* *Approaches on three levels (own design).*
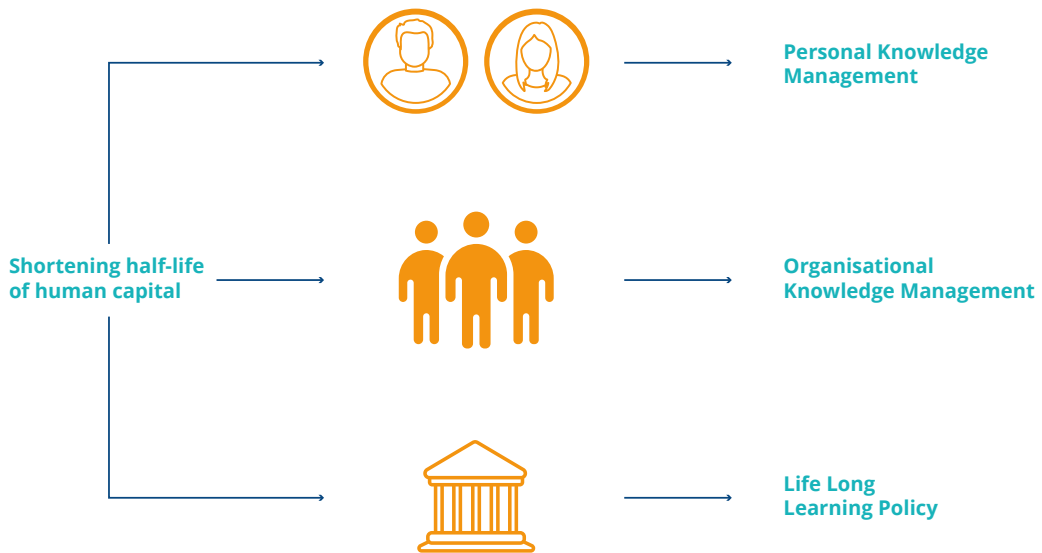


slightly above the ASEAN-5 average of 56 percent.[13] In Vietnam and Cambodia, workers in the textile industry are particularly affected. Jobs in the textile industry are threatened by potentially disruptive innovations in the field of sewing machinery technology.[14]

## Approaches on Three Levels

Since the problems described above affect individuals, organizations, and states, solutions must be developed at all three levels, i.e. for individuals, organizations, and states or policymakers. For this purpose, three solution sets, one for each level, are first introduced and then integrated. Individuals can counter the problem of the dwindling relevance of their knowledge or their concrete skills through personal knowledge management. Organizations can counter the loss of their human capital through organizational knowledge management. Policymakers can implement lifelong learning policies to support individuals and organizations.

Personal knowledge management supports the individual in effectively structuring, linking and formalizing knowledge and in creating and acquiring new knowledge. However, there are no magic remedies, but rather it is a matter of practicing and developing the permanent openness to the learning of new information and techniques.[15] It is difficult to create fixed structures to support personal knowledge management. Instead, high degrees of self-efficacy and meta-skills are needed.

**13.** Ibid.

**14.** Ibid.

**15.** Mittelmann, Angelika, "Personal knowledge management as basis for successful organizational knowledge management in the digital age," International Conference on Knowledge Management, Procedia Computer Science 99 (2016): 117-124. 120.

Today's knowledge workers solve complex, non-standard problems based on their knowledge and experience. The respective workers are successful to a large extent based on their flexibility, creativity and innovation.[16] Therefore, it is not advisable to confront these knowledge workers with rigid structures of a prefabricated system for personal knowledge management. One possibility for a supporting structure is the so-called "Seek, Sense, Share framework".[17] This encourages contact with interesting individuals and filters the newly gained information (Seek), Sense stands for the understanding of the newly gained information, e.g. through visualization or comprehensive presentation. In this way, a deep-thinking process is initiated, which includes perceiving, questioning and experimenting with the new knowledge. The newly acquired knowledge is communicated in the social context (Share).[18] Given the scheme presented, it is already clear how important the organization and its culture and structure are for the functionality of personnel knowledge management.

Organizations not only face the challenge that the human capital of their employees may decrease over time, e.g. due to technological progress, but also the challenge that knowledge workers leave the company due to e.g. age. The internal knowledge built up by said knowledge workers throughout their employment in a said organization is difficult to replace or copy. Organizational knowledge management thus describes the process of creating, organizing and using knowledge to help achieve organizational goals and improve organizational performance.[19] Organizational knowledge

management has a proven positive effect on the outcomes of the organization's work. This can include the organization becoming more innovative, the improvement of products, or the improvement of employee performance.[20] The success of knowledge management depends to a large extent on the organizational and management culture. Above all, it is important to have strong internal trust and to uphold values such as creativity, teamwork and collaboration among colleagues. Pronounced competitive thinking is rather harmful.[21] There is a multitude of techniques and methods of organizational knowledge management, the listing of which would go beyond the scope of this article. Roughly, however, as mentioned above, a distinction can be made between methods such as planning or creativity methods and technology such as information systems.

In the wake of the enormous technological changes after the Second World War, European countries began to implement lifelong learning policies in the 1970s.[22] The concept of lifelong learning (LLL for short) has become the talk of the town, but it often remains very vague. It is a contested, or fuzzy concept. According to ILO, it can be reduced to the fact that it covers all training of life, e.g. school, university and training during the working life or retirement. It is not only "lifelong", but also "lifewide", which means that all areas of learning are covered, not only school and university, but also, for example, learning in the family. If the

**16.** Ibid.

**17.** Ibid.

**18.** Ibid.

**19.** Rasula Jelena, Vuksic Vesna Bosilj Vuksic, and Stemberger

Mojca Indihar, "The Impact of Knowledge Management on Organizational Performance," Economics and Business Review 14, No.2 (2012): 147-168. 147.

**20.** Ibid.

**21.** Ibid.

**22.** Panitsidou Eugenia, Griva Eleni, and Chostelidou Dora, "European Union policies on lifelong learning: in-between competitiveness enhancement and social stability reinforcement," Procedia – Social and Behavior Sciences 46 (2012): 548-553 548.

future of work is to be people-centered, in the context of effective LLL policies, people must be invested in so that they do not lose out in a rapidly changing environment.[23] One of the cornerstones of an LLL policy framework must be universal access to quality education, as this is the only way that subsequent training measures can be effective. Furthermore, the state must ensure that the training measures offered also correspond to the demand for skills in the labor market.[24]

To solve the problem of the "decreasing half-life of knowledge", a lifelong learning ecosystem should ideally be implemented. This is characterized by the fact that the approaches described here are coordinated on three levels and complement each other. Thus maximum effect can be achieved. The ecosystem takes into account the shared responsibility of states, organizations and individuals. However, no state has yet made a serious attempt to implement a lifelong learning ecosystem.[25] Another way to describe the ideal state of a whole society as a lifelong learning ecosystem would be the concept of the learning society.

## Lifelong Learning in East and Southeast Asia

Many East and Southeast Asian countries have introduced national policies to implement lifelong learning in recent years. In China, a national plan for medium and long-term reform of the education system has been in place since 2010. Japan implemented a life-long learning policy with the Basic Act on Education 2006. The Republic of Korea has already adopted more frameworks with the Lifelong Learning Act one to three. In Malaysia, the blueprint of enculturation of lifelong learning was implemented from 2011 onwards. Thailand began in 1999 with the national education act and Vietnam in 2005 with the education law.[26]

In Asia, Japan, the Republic of Korea and Singapore can be considered as regional models for the successful implementation of lifelong learning, i.e. the creation of a lifelong learning society. The study of the LLL policies of these three countries is worthwhile, as it shows how other countries can succeed.[27] The basic takeaway from these three models is that there is no one policy for success. It is much more a matter of analyzing one's situation. The first step is to determine the fundamentals. In other words, it is a matter of determining what socio-economic, political or cultural conditions exist for building a learning society. On this basis, national goals can be set which are designed to achieve the desired learning society. Subsequently, appropriate policies can be adopted, or national policies, strategies and plans can be forged.[28] For Example, Denmark began to streamline its learning programs and allow adults free access to training as early as 1995. From the 2000s onwards, education and training programs began to be aligned with the needs of the industry. The result was a needs-based, transparent and accessible system of adult education.[29]

23. International Labor Office, Lifelong Learning: Conflicts, Issues and Actions (Geneva: International Labor Office, 2019), 6.

24. International Labor Office, A Skilled Workforce for Strong, Sustainable and Balanced Growth (Geneva: International Labor Office, 2011), 1.

25. Ibid.

26. UNESCO, "Lifelong Learning Policies and Strategies," UIL Documentation Centre and Library, 2014. https://uil.unesco.org/fileadmin/keydocuments/LifelongLearning/en/LLPSCollection.pdf.

27. Yang Jin and Yorozu Rika, Building a Learning Society in Japan, the Republic of Korea and Singapore, (Hamburg: UNESCO Institute of Lifelong Learning, 2015), 37.

28. Ibid.

29. OECD. 2001. Lifelong Learning For All Policy Directions. 5.

This can be seen in the example of Japan. Due to demographic change (i.e. the increasing aging of society) and the associated decline in the economic influence of its economy on a global scale, there is a need in Japan to develop into a society with a well-functioning learning ecosystem. Japan's goals are, on one hand, the development of human resources to support society and maintain international competitiveness and, on the other hand, the enhancement of opportunity. The target society should be a well-educated nation that offers all its citizens lifelong opportunities for learning and development so that they can contribute personally, intellectually and participative to society and develop professionally. From the 1990s onwards, Japan began to adopt structured policies to achieve this goal. In addition, the individual measures were coordinated using five- and ten-year plans. This manifests itself in the opening of community and adult education centers, the support of families who take up further education measures, more flexible courses of study and an opening of the education market for private providers.[30] Of course, Japan is already a highly developed country whose problems are more like those of many Western European countries and are not exactly representative of the Asian continent. Therefore, the following is a look at the Kingdom of Cambodia. To achieve this objective, the roles of formal and informal institutions in Japan have been defined at different levels. Thus, the goal of creating a home learning environment was set. This was achieved through financial support to families. In addition, local authorities were encouraged to invest more in education and training facilities to create spaces for families.

Companies have also been put under an obligation to provide training, and most companies now offer training themselves for a fee. Staff development and training are now a normal part of working life.[31]

## Way to Go for the Kingdom of Wonder

The Kingdom of Cambodia has great opportunities in the world of the future of work, but where there is great potential, risks are not far behind. Cambodia's relatively low level of development offers considerable scope for young, dynamic and well-educated Cambodians. It is now up to them to take the reins into their own hands to shape the future of work and thus the economic future of Cambodia. The young nation with an affinity for technology faces national problems that need to be solved.

For example, the rather poor human capital supply is one of the reasons that discourage foreign companies from investing in Cambodia. Thus, the issue of implementing a learning society in Cambodia becomes essential for the smooth continuation of the Kingdom's economic rise. This highlights the socio-economic and political reasons why a learning society needs to be created.

If the young nation can establish a culture of learning and dynamism, the problems described above can be overcome. Cambodia in 2019 has already introduced a national lifelong learning policy. The aim is to address the high dropout rate and low standards in Cambodian schools. In addition, the policy focuses on the limited productivity of businesses and institutions due to the rather low level of education of employees. Objectives include the provision of low-threshold lifelong learning opportunities with

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**30.** Ibid.

**31.** Yang/ Yorozu 2015, 40.

a particular focus on flexible literacy support, capacity building for the development of lifelong learning programs and materials, and the introduction of Cambodian National Qualification Certificates.[32] In addition, a primary objective of the policy is to promote a culture of good citizenship, gender equality, equity and inclusion so that all groups have access to lifelong learning opportunities.[33] The goal is thus much more rudimentary than in Japan and is largely about bringing the population at large up to a basic level of education.

In addition, it might be worthwhile for Cambodia to open a state distance-learning university; Germany, for example, has already had very good experiences with this. Such a state distance learning university has several advantages. Studying becomes independent of location, which could be a relevant plus point for the children of the Cambodian province. There is no longer the need to move to Phnom Penh. Furthermore, the costs of studying can be kept low, as only videos and learning materials are used, not large university buildings. Moreover, distance learning can be easily combined with a career and could work wonders in adult education

## A Story from the Cambodian Learning Society of the Future

If we want to put this into practice, we can use the story of a Cambodian boy who experiences the implementation of a learning society in Cambodia during his lifetime. The following story is fictional and is intended

to illustrate how lifelong learning policies could help Cambodians with some of their contemporary problems.

Meet Touch Mesa, who was born in the north-eastern Ratanakiri province. As a young boy, he easily passes the national exam after secondary school and is allowed to attend the local high school. He dreams of becoming an engineer and works hard. With good results in the national high school exam, he is accepted at a prestigious STEM university in Phnom Penh. As his parents cannot support him financially, he has to work while studying to support himself in Phnom Penh. To pay for his room, he started working as a barista at a local coffee shop chain. Unfortunately, the hours he worked increasingly clashed with his class hours and Mesa's grades deteriorated until he had to drop out of university. After leaving the university, Touch Mesa worked for a few years doing odd jobs.

After some time, he started working in construction. As part of a new government-backed initiative, his employer offered him courses in structural engineering, as he already had some knowledge of the subject from his previous studies. After completing the evening course, Touch Mesa was promoted to supervisor. When a reputable state distance learning university for STEM subjects was opened a few years later, he was able to study civil engineering alongside his job and completed his studies. Touch Mesa's story shows us how a learning society can help people to develop their skills throughout their lives.

## Conclusion: From the Trend Concept to Literacy

The previous article has bridged the gap from a trendy term used by the consulting industry to a concept that is both highly relevant

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**32.** UNESCO, "Cambodia: National Policy on Lifelong Learning," UNESCO, October 21, 2015. https://uil.unesco.org/document/cambodia-national-policy-lifelong-learning-issued-2019.

**33.** UNESCO, "Cambodia launches Lifelong Learning Policy," UNESCO, December 19, 2019. https://en.unesco.org/news/cambodia-launches-lifelong-learning-policy#:~:text=Most%20importantly%2C%20the%20Lifelong%20Learning,access%20to%20lifelong%20learning%20opportunities

for the development of today's low to medium developed economies, but also important for the most developed economies. The learning ecosystem is one of the most central answers to the major challenges we face in the world of work in the coming years, whether it is the demographic change in Japan or Germany, immigration in Sweden and the USA, or the still too high dropout rates in Cambodia. The development of a learning society in which individuals, organizations and the state share responsibility and act together is a promising approach.

# ABOUT THE AUTHOR

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Mr. Tim Hildebrandt (BA.) studies Business Administration and Political Science in Duisburg and Muelheim in Germany. He has profound professional experience in the academic field, both in research and teaching, in the disciplines of economics (especially economic policy and economic geography), country analysis and intercultural communication. His studies and work focus on the economic and political development of East and Southeast Asia. Mr. Hildebrandt is also involved in the promotion of civil society development in Asia.

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Mr. Oudom Oum graduated with High Honors and with a thesis in Political Science and International Relations, concentrating on contemporary Sino-American relations, from Paragon International University, Phnom Penh, Cambodia. He served as a Vice-President of the university's Model United Nations club for a one-year term before being nominated as a Rapporteur of UNESCO Committee in Asia World Model United Nations III in Bali, Indonesia, in November 2019. Before joining KAS Cambodia as a Research Officer, he was doing his internship at UNICEF Cambodia and the US Embassy in Phnom Penh. Oudom is currently working as Program Manager for Digitalization for the Foundation.

# The Future of Work
# Is Based on Innovation, How Can Organizations Promote It?

**Top Tips for Promoting Innovation
in Cambodian Organizations**

**HUM Sophoanvotey**          **HESKETH Thomas**

## Introduction

The success or failure of an organization is increasingly tied to its capacity to innovate – a trait integral to the future of work.[1] In this paper we provide a high-level assessment of the capacity to innovate in Cambodian organizations, and of barriers that can impede innovation. We analyze feedback from 30 leading organizations and posit five practical recommendations for those aiming to promote innovation in their workforce. Our key finding was that promoting innovation capacity is often a HR challenge (correlated to a supportive leadership style & environment) rather than being a cost, time, or technical challenge - and that even in the absence of additional financial resources, building innovation capacity is a task achievable by most organizations. Our paper suggests an organization where the top listens to the bottom, where measured risks are tolerated, and where changemakers are encouraged and promoted is one that will have a greater capacity to innovate.

*"Innovation is the practical implementation of ideas that result in the introduction of new goods or services, or the improvement of current goods or services."[2]*

## Background

The rise of Artificial Intelligence, internet of things, E-commerce, social media, blockchain technology, industry 4.0, and remote working software will fundamentally change how organizations operate. Indeed, the pace of change is rapid, and increasing (Figure 1). Organizations and their employees already require the capacity to adapt to new ideas if they are to remain competitive.

*Figure 1:* *Approximate years for technologies and applications to be taken up by 100 million global users.[3] The number in brackets is the year in which the technology or application was commercially launched.*

**Years to be Taken up by 100 Million Users**
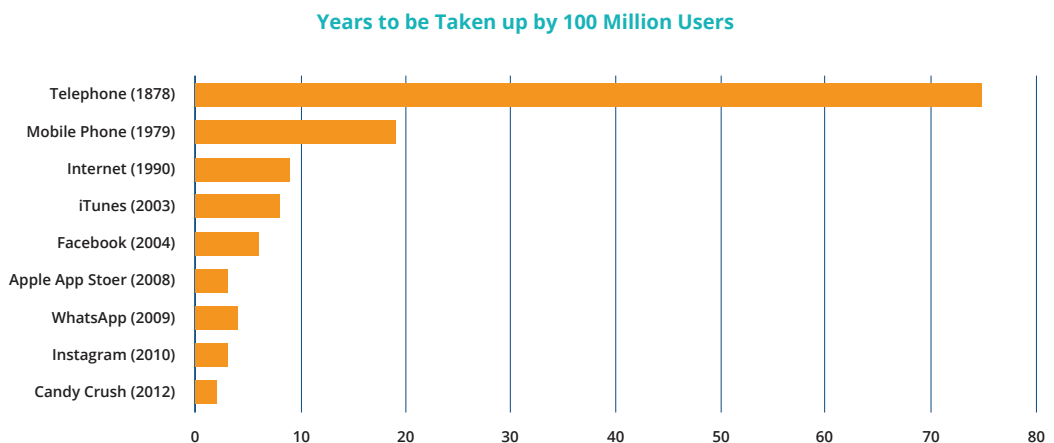
1.  Kark, Briggs, Terzioglu. 2019. The Future of Work in Technology. Deloitte.

2.  Schumpeter. 1983. The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle. Opie, Redvers, Elliott, John E.

3.  Schwab, David. 2018. Shaping the Future of the Fourth Industrial Revolution, A Guide to Building a Better World. Penguin Random House UK.

## Cambodia's Innovation Potential

The above statement is particularly true in Cambodia. Cambodia has great potential to innovate, particularly via technological leapfrogging. This is defined as "the implementation of a new technology in an area in which the previous version of that technology has not been deployed".[4] Cambodia has already achieved this with high social media use, vast mobile internet penetration, and its own nascent blockchain based payment system, Bakong.[5] It has a youthful, and increasingly educated population of 16.9 million people, 47.36% of whom are under the age of 25.[6] Cambodia has the demographic dividend and economic growth potential to be a "blank canvas" for innovation. Such is the pace of change that a millennial worker arriving from Europe, accustomed to email correspondence, may already find themselves surprised in Cambodia, as filesharing apps such as Telegram and WhatsApp become increasingly important for day-to-day business correspondence, both for the public and private sectors.

## Preconceived Barriers to Innovation

The term "innovation" is broad - its interpretation can vary depending on the sector or context in which the organization operates.[7] Innovation may require resources,

knowledge, new technology, and flexibility[8] - or simply a new leadership style.

Openness and tolerance to risk can improve the resilience of an organization[9], yet the structure of an organisation may disrupt innovation if it prevents employees from trying new ideas and implementing new technologies.[10]

Leadership styles and cultural tendencies could also closely link to innovation capacity. For example, three global tendencies thought to impede innovation are: the concept of "losing face", fear-based motivation via a shame-culture, and a strong inclination towards hierarchy & deference to authority.[11]

The subtleties of "losing face" are explained in the 1998 publication Concept and Dynamics of Face: Implications for Organizational Behavior in Asia[12], and further explored by Ra & Chea in their 2021 paper Cambodia Needs Leaders Being Coaches, not Doing Coaching. In general, these tendencies can be valuable, but can have downsides when it comes to innovation:

- "Saving face" can ensure a respectful work environment, but if young workers are reluctant to raise new ideas for fear of "losing face", it can stifle innovation.

**4.** Davison, Vogel, Harris, & Jones. 2000. Technology Leapfrogging in Developing Countries - An Inevitable Luxury? Electronic Journal on Information Systems in Developing Countries.

**5.** PwC. 2021. Central Bank Digital Currency Global Index. 1st ed.

**6.** Central Intelligence Agency. 2021. World Factbook: Cambodia. https://www.cia.gov/the-world-factbook/countries/cambodia/#introduction (Accessed July 2021).

**7.** Stephen J. Kline, and Nathan Rosenberg. 2010. An overview of innovation. Studies on science and the innovation process: Selected works of Nathan Rosenberg.

**8.** André Spithoven, Wim Vanhaverbeke, and Nadine Roijakkers. 2013.Open innovation practices in SMEs and large enterprises. Small business economics 41, no. 3.

**9.** Yuan-Chieh Chang et al. 2012. How do established firms improve radical innovation performance? The organizational capabilities view. Technovation 32, no. 7-8.

**10.** Richard Leifer, Gina Colarelli O'Connor and Mark Rice. 2011. Implementing radical innovation in mature firms: The role of hubs. Academy of Management Perspectives 15, no. 3.

**11.** Ra, Chea. 2021. Cambodia Needs Leaders Being Coaches, not Doing Coaching. Konrad Adenauer-Stiftung.

**12.** Kim, Nam. 1998. The Concept and Dynamics of Face: Implications for Organizational Behavior in Asia. Vol. 9, No. 4 (1998), pp. 522-534 (13 pages). INFORMS.

- Shame culture can ensure employees pay rigid attention to detail & process - avoiding mistakes - but can also prevent them trying new solutions to problems.

- Hierarchical leadership can ensure one clear vision is provided - but can also silence the voices of others, and propagate dependence on one leader.[13]

Overall, our paper seeks to understand the factors that can stifle innovation within a Cambodian organization. Are the primary barriers to innovation related to leadership style, structure, culture – is it a lack of finance, resources, and understanding of technologies – or is it something else entirely?

# Objective

Our paper seeks to provide a snapshot of the capacity of Cambodian organizations to innovate, and to assess preconceptions regarding barriers to innovation. We achieved this via a desk review of general "tips to promote innovation" and then assessed their relevance via primary data collection. Our objective was to translate our findings into five "top tips" that organizations could follow to promote innovation capacity.

## Sample

We obtained 30 respondents, 70% of whom were male. The average respondent was 41 years old. 87% of our respondents held management positions (64% High-Seniority, 23% Mid-Seniority), and represented diverse sectors including development, education, automotive, pharmaceuticals, fintech and retail.

## Limitations

Ideally, we would have obtained a larger sample of junior employees (representing just 13% of our respondents). Our study may be expanded to target this demographic in the future. Our survey was also conducted in English, and findings may be skewed towards the opinions of foreign-owned organizations. Future work would seek to expand our sample size, and test the effectiveness of implementing our Five Top Tips for Promoting Innovation.

# Results

We first assessed preconceptions regarding barriers to innovation within an organization. We analyzed responses (provided in Figure 2) to the following questions:

## Do junior workers feel confident raising their ideas to senior managers?

Our results indicate more could be done to encourage an open environment for junior employees. 43% of respondents disagreed when they were asked "In Cambodia, junior employees feel open and able to raise their ideas to senior managers". This is despite 93% of respondents believing it was important junior employees were able to.

## How much of a barrier to innovation is the "top-down", hierarchical approach?

Our results suggest a strictly top-down approach is often detrimental to its capacity to innovate. 67% of respondents agreed that "a strictly hierarchical structure is a barrier to innovation within an organization".

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**13.** Ra, Chea. 2021. Cambodia Needs Leaders Being Coaches, not Doing Coaching. Konrad Adenauer-Stiftung.

## Are younger employees better able to adapt to new technologies?

Perhaps unsurprisingly, 75% of respondents agreed that younger employees are better able to adapt to new trends and technologies, suggesting efforts should be made to ensure their voices are heard when making strategic decisions.

## Do organizations feel capable adapting to new trends and technologies?

Support to promote innovation-related skills (such as critical thinking) would likely be appreciated by our respondents. Innovation is not easy. Just 43% agreed it was "easy to adapt to new trends and technologies" in their organization, and of this, only 7% strongly agreed.

*Figure 2:* *To what extent do you agree with the following statements?*
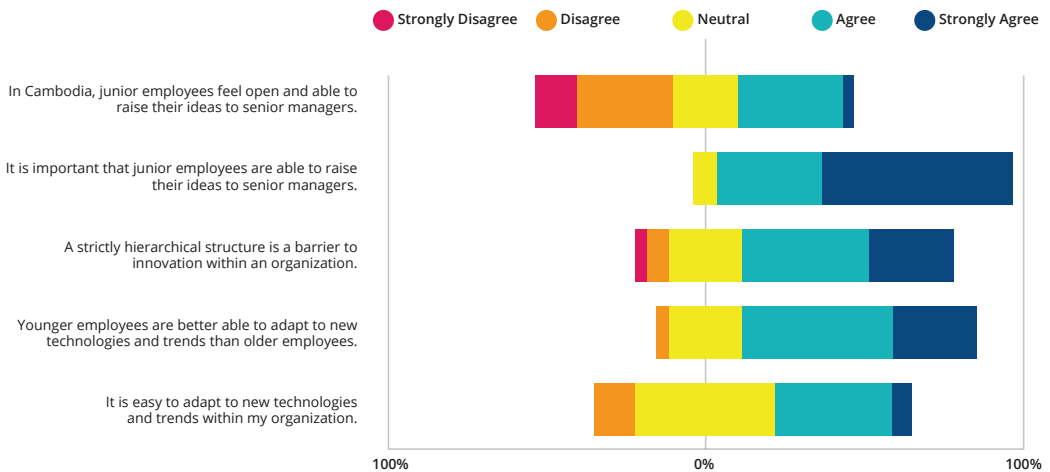


We then tried to understand primary barriers to innovation, and ways it could be promoted:

## What are the most important aspects to promoting innovation in an organization?

Respondents were asked to rank ten options from most to least important in promoting innovation, and our results suggest that the promotion of autonomy is key. Results are shown in Figure 3.

Regardless of sector, the findings were clear that encouraging "employees to operate autonomously and with initiative" was the most important method. This was closely followed by the presence of "motivational and inspirational leaders." Reducing internal bureaucracy and providing training opportunities were also highly ranked.

Of interest, the aspect ranked least important to promoting innovation was hiring a person or team to be responsible for research & development (R&D). This suggests that for our respondents (most of whom represented SMEs), promoting innovation is more effective when it is at a holistic, whole organisation level, rather than when it is the responsibility of a few,

specialist staff. We recognize R&D is critical to innovation worldwide , yet hiring experts for the task is often challenging and not realistic within Cambodia's SME environment.[14]

*Figure 3: Ranking of aspects that can promote innovation within an organization. Question text: Please rank the following in order from most to least important when promoting innovation in your organization (put most important at the top):*
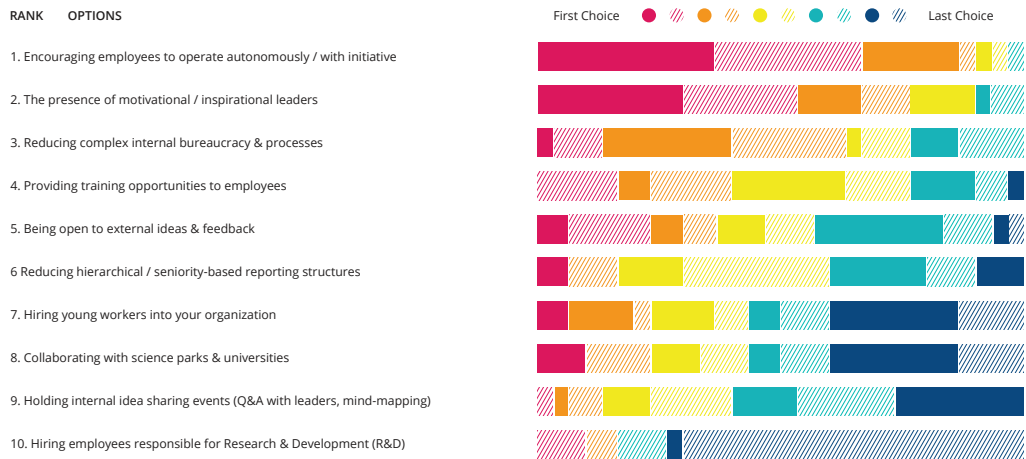


## What are the challenges organizations face when attempting to innovate?

We asked respondents to provide qualitative answers to the question: What are the primary barriers to innovation within your organization?

A promising finding was that most barriers were not related to finance, though of course it remains a factor. Less promising was that many barriers were due to human resources, and leadership styles.

The responses largely provided further evidence to the ranking in Figure 3 – with barriers such as "command and control" leadership, and complex internal processes commonly mentioned. Other important aspects such as "lack of time", "resistance to change", and of course - "lack of cash" were put forward.

A response mentioned by many was that internal complacency, and an attitude of "what will work in the past will work going forward" was a key obstacle. Cases where "rewards are linked to seniority, rather than performance", was mentioned by one respondent, and finally, low employee confidence was a common theme. Several respondents mentioned staff members "afraid to voice their opinion", sometimes due to "controlling managers" who "prefer subservient staff". It was clear from our answers that improvements could be made.

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**14.** Richard Leifer, Gina Colarelli O'Connor and Mark Rice. 2011. Implementing radical innovation in mature firms: The role of hubs. Academy of Management Perspectives 15, no. 3.

# Top 5 Tips for Promoting Innovation in Cambodian Organizations

Despite the challenges above, our respondents mentioned many success stories, and the overall sentiment was positive. By analyzing our data, and corroborating results against the literature, we posit five practical tips to encourage innovation within a Cambodian organization.

## Tip 1: Encourage Employees to Operate Autonomously

Chang et al. (2012) suggested that an organization's openness and tolerance to risk can encourage better idea flow and innovation.[15] Our own results certainly support this. Allowing employees to take ownership of their tasks, creating an environment where they "have the confidence to be wrong", and where they can raise their ideas openly to senior staff was the most-often mentioned method to improve innovation capacity.[16] As one junior respondent stated: "employers should encourage initiative, rather than focus on catching mistakes".

## Tip 2: Implement Motivational Leadership

The "presence of motivational / inspirational leaders" was the second most highly ranked factor in promoting innovation. How to become a motivational and inspirational leader is of course the subject of countless studies. However, applying the research of Parmer et al (2014), and Giles (2016) to our results, motivational leaders continuously

practice decisive communication, demonstrate strong vision[17] and exhibit a strong sense of personal ethics – for one cited example, by "not taking credit for the achievements of team members", and "acknowledging junior staff member efforts". Of greatest relevance, motivational leaders provide goals and objectives that empower others to self organise, rather than simply list instructions.[18]

## Tip 3: Identify & Nurture Innovators

Internal complacency, "resistance to change", and an attitude of "what will work in the past will work going forward" were cited as key barriers to innovation. However, as one Senior Director in the education sector stated, "there are always a few key employees that are champions of innovation", and it is important to "quickly promote them to positions of authority". Our third tip is simply to follow this example. Cambodia is changing rapidly, identifying young changemakers, and nurturing them to become examples for others to follow will be key to achieving wider organizational change. According to Howell (2005), the traits to look out for in your "champions of innovation" are: the ability to convey confidence in their ideas, the ability to enlist the involvement of others, and persisting in the face of setbacks.[19]

## Tip 4: Create a Supportive Environment

Our results suggest that limited innovation is often just as much the fault of the "controlling manager" as it is the employee

**15.** Chang, Y.C., Chang, H.T., Chi, H.R., Chen, M.H. and Deng, L.L. 2012. How do established firms improve radical innovation performance? The organizational capabilities view. Technovation, 32(7-8), pp.441-451.

**16.** Ra, Chea. 2021. Cambodia Needs Leaders Being Coaches, not Doing Coaching. Konrad Adenauer-Stiftung.

**17.** Rashik Parmar et al. 2014. The new patterns of innovation. Harvard Business Review.

**18.** Giles. 2016. The Most Important Leadership Competencies, According to Leaders Around the World. Harvard Business Review.

**19.** Howell. 2005. The right stuff: Identifying and developing effective champions of innovation. Academy of Management Perspectives. ISSN (print): 1558-9080 | ISSN (online): 1943-4529

who "lacks initiative" - and that the role of leaders should be to understand these nuances within their team. Quieter, or more junior employees should be given the fora to speak out, and managers should avoid the "command and control" leadership style, aiming for broader task delegation that allows staff to develop. As one respondent from the development sector claimed: "the top listening to the bottom, instead of the authoritarian way has led to our most effective outcomes". This sentiment was echoed by another digital executive, who stated that the "shift in management perspective to promote collaborative problem solving" had been the most successful initiative implemented in their organization to promote innovation.

## Tip 5: Train and Reward

Our final tip is to train and reward employees. "Providing training opportunities to employees" was ranked fourth out of our ten survey options of methods to promote innovation. Training sessions develop employee skills, reduce turnover, motivate staff, and provide a sense of safety to employees that they are being invested in.[20] Although a common complaint mentioned from employers was that "if we train [employees], they will leave for another company", Nda and Fard (2013) suggests that not training staff is far more damaging.[21]

From the employee perspective, one respondent from the NGO sector stated that "monthly staff learning sessions with external trainers" were key to developing their capacity to innovate.

As our final, perhaps cynical tip, we recommend linking innovation performance to financial benefits where reasonable. The effect of financial incentives on performance is now hotly debated, with some stating they do more harm than good[22], however, the common consensus is that they have a positive effect on employee motivation.[23] Our own survey respondents mentioned that "linking better results to pay and bonus" had been highly successful in promoting innovative practice.

Rewards need not always be financial of course – holding an internal "innovator of the month" competition was suggested to achieve a similar effect. For organizations reporting "passive employees", this could be a way to promote and encourage innovative breakthroughs.

**22.** Kohn. Why Incentive Plans Cannot Work. 1993. Harvard Business Review.

**23.** Novianty. Evita. 2018. Financial Incentives: The Impact on Employee Motivation. Academy of Strategic Management Journal. Research Article: 2018 Vol: 17 Issue: 6

**20.** Kim, W.J., Hoi, T.V., Tuan, L.N. and Trung, N.N., 2019. R&D, training and accessibility to finance for innovation: a case of Vietnam, the country in transition. Asian Journal of Technology Innovation, 27(2), pp.172-193.

**21.** Maimuna., Fard. 2013. The Impact of Employee Training and Development on Employee Productivity. Global Institute for Research & Education.

# Appendix

## Results: How Important are the following to promoting innovation in your organization?

In addition to the ranking of most to least important aspects when promoting innovation in your organization, we also asked a series of questions to provide further evidence to our findings.

*Figure 4:* *How important are the following to promoting innovation in your organization?*
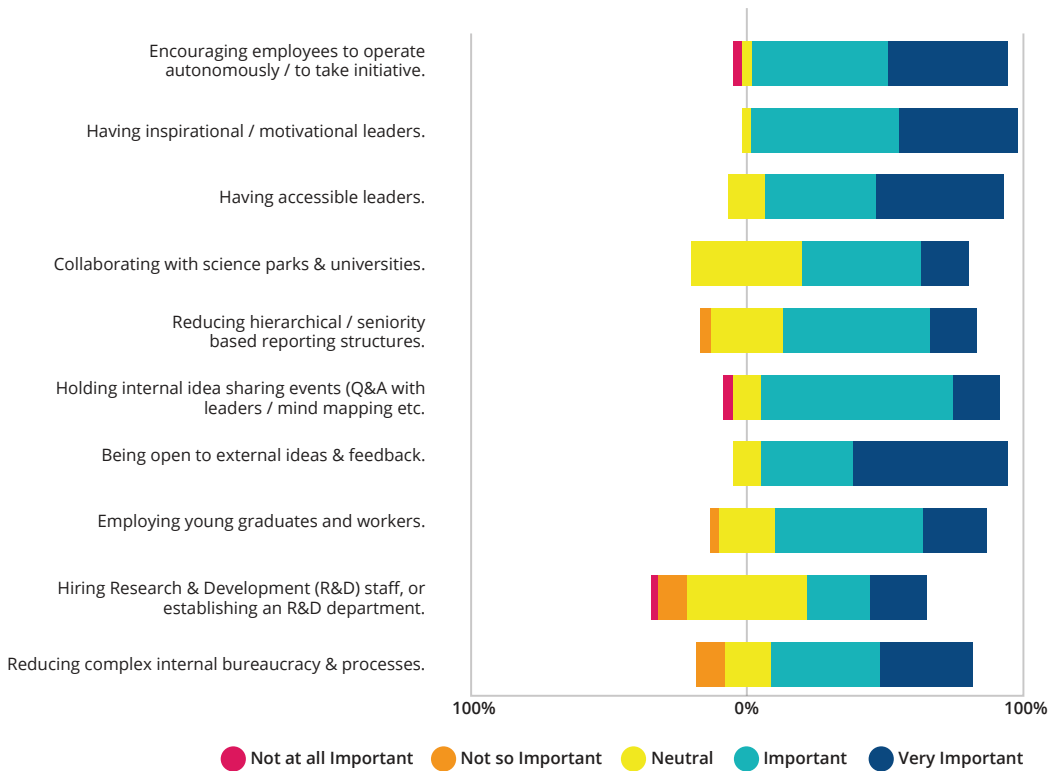
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Thomas is the Deputy Director of the European Chamber of Commerce, where he supports the leadership of the 20 person EuroCham team, and heads the Investment Services Department.

Prior to this, Thomas was manager of the Investment Services Department for 3 years. He managed the implementation of consulting projects across Cambodia and facilitated the entry of European firms interested in the Kingdom. His projects have focused on trade & investment promotion, and private sector development for clients such as Swisscontact, Oxfam, GIZ, as well as several embassies and private corporations.

Prior to joining EuroCham, Thomas was a consultant at Emerging Markets Consulting (EMC), where his work included the development and the implementation of project methodologies for development partners, embassies, and private sector companies, including the UK Embassy to Lao PDR, Save the Children, Plan International, The World Bank, IFC and GIZ.

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# Using Communication and Collaboration Technologies Professionally and Preventing Conflicts

HÖR Robert

During the pandemic, many companies have invested in hardware and software at a breakneck pace, some have written digitization strategies, and developed new training concepts for employees.[1]

Communication and collaboration systems (CaCs) have quickly become must-dos in companies and are contributing to the progress of digitization. The digitization push also has an impact on teamwork[2], which plays a central role in modern organizations.[3] Effective teams promise the ability to act, adaptability, increased commitment, flexibility, and much more.[4]

However, teams are not a conflict-free space, and the question of how CaCs can be used expediently and targeted to prevent conflicts in teams has not been explored in great detail. This paper addresses this gap and develops recommendations for managers, team leaders and team members based on a SWOT analysis. Here are three simple rules of thumb obtained from recommendations:

1. **Call instead of messaging!** This keeps social contact up and avoids miscommunication.

2. **Think clearly about what you digitize before you do it!** Is the message needed? Is the volume justified? For what and whom do I digitize it?

3. **Do not text, share, link etc. out of working hours in digital channels with notifications!** Also turn notifications off when full focus and concentration is needed! Always keep in mind, the world will continue to spin without you.

## The Scenario and Key Concepts

Teams have become increasingly important in organizations. There are two trends converging, firstly that teamwork is a relevant component of organizations and secondly that the digital office is becoming the standard, at least in hybrid forms.[5] As the environment of teams and sociotechnical systems are permanently evolving, new and old challenges come up.

The practical problem in organizations is that CaCs are often implemented without clear rules, without consideration of demographics, and insufficient stringency in task design and role clarity.[6] Simply put, a problem of the analog world is projected into the digital world, as the aforementioned three factors are among the main causes of conflicts in the workplace.[7] In addition to

1. Bitkom, "Bitkom Digital Office Index 2020," Bitkom, 2020, https://www.bitkom.org/doi-2020, 9.

2. Harvard Business Review, "Why Today's Digital Teams Need a New Class of Collaboration Tools and Solutions," hbr.org, September 28, 2016, https://hbr.org/sponsored/2016/09/why-todays-digital-teams-need-a-new-class-of-collaboration-tools-and-solutions.

3. Florian Becker, Teamarbeit, Teampsychologie, Teamentwicklung: So führen Sie Team! (Wiesbaden: Springer, 2016), 1.

4. Ibid.

5. Ibid.; Bitkom, "Bitkom Digital Office Index 2020," Bitkom, 2020, https://www.bitkom.org/doi-2020; Jean-Victor Alipour, Oliver Falck and Simone Schüller, Homeoffice während der Pandemie und die Implikationen für eine Zeit nach der Krise, ifo, July 15, 2020, https://www.ifo.de/DocDL/sd-2020-07-alipour-falck-schueller-homeoffice.pdf; Zukunftsinstitut, "Megatrends," zukunftsinstitut, 2020, https://www.zukunftsinstitut.de/dossier/megatrends/.

6. Jochen Günther, Digital Workplace - Herausforderungen und Implikationen für die Gestaltung (Wiesbaden: Springer, 2017).

7. Steven Appelbaum, Chahrazad Abdallah, and Barbara Shapiro, "The self-directed team: A conflict resolution analysis" Team Performance Management 5 (2) (1999): 60 – 77; Werner Schienle and Andres Steinborn, Psychologisches Konfliktmanagement: Professionelles Handwerkzeug für Fach- und Führungskräfte (Wiesbaden: Springer Fachmedien, 2019); Goparaju P. Suhakar, "A Review of Conflict Management Techniques in Projects" Brazilian Journal of Operations & Production Management (2015): 214-232.

these causes of conflict, new conflicts may also arise due to the idiosyncrasies of CaCs – e.g. ongoing availability, data security and data protection[8] as well as digital stress.[9]

Against this background, the correct application of CaCs is of central importance, because their roll-out and use can not only resolve conflicts in the team, but also shift conflicts from the analog to the digital world and, in the worst case, fuel them. The consequences of conflicts for the company are a loss of productivity, conflicts cost due to a loss of motivation, burnouts, a loss of image, sick leave and so on.[10] For team members consequences are stress, anxiety, frustration, and a decrease in well-being.[11] This leads to two questions:

What are the strengths, weaknesses, opportunities, and threats (SWOT) of CaCs in the context of conflict prevention for teams?

What recommendations for conflict prevention emerge from the SWOT analysis for the professional implementation of CaCs in teams?

## What are Communication and Collaboration Technologies?

An information system consists of people and machines that communicate with each other and exchange information. The goal of information systems is to support operational management processes in the company and its environment. Typical tasks of an information system include the acquisition, processing, storage and transmission of information, consisting of data and signs.[12]

One type of information system are communication and collaboration systems (CaCs), which include technical and management components to support collaboration in teams, groups, networks, and organizations. The application scenarios of CaCs are diverse and pursue different goals depending on the scenario. CaCs enable location - and device -independent collaboration, as in the case of home office and digital office concepts, they ensure transparency concerning work processes and task allocation, encompass synchronous and asynchronous communication, collaborative work on projects and documents, and the storage of project-relevant documents.[13] CaCs include IT communication tools, such as mail services, IT conferencing tools, as well as collaborative IT management tools which enable managing virtual teams and their goals, tasks or deadlines.[14]

## What are Conflicts?

De Dreu and Gelfand define conflict as "that begins when an individual or group perceives differences and opposition between itself and another individual or group about interests and resources, beliefs, values or

8.  Dunja Koelwel, "So (un)sicher sind Teamwork-Apps und Video- Konferenzen von Zoom, Slack, Google & Co.," Versicherungsbetriebe, 2020, https://www.versicherungsbetriebe.de/trends/2020/so--un-sicher-sind-teamwork-apps-und-video--konferenzen-von-zoom.html.

9.  DAK, "Digitalisierung und Homeoffice in der Corona-Krise," dak.de, July 22, 2020, https://www.dak.de/dak/bundesthemen/sonderanalyse-2295276.html.

10. PwC/EUV, "Konfliktmanagement in der deutschen Wirtschaft - Entwicklungen eines Jahrzehnts," pwc.de, 2016, https://www.ikm.europa-uni.de/de/Studie_V.pdf; Michelle Zumsteg, Konfliktmanagement, Team Work Engagement und psychologische Sicherheit in Scrum-Teams: eine quantitative Studie (Wiesbaden: Springer, 2016).

11. Werner Schienle and Andres Steinborn, Psychologisches Konfliktmanagement: Professionelles Handwerkzeug für Fach- und Führungskräfte (Wiesbaden: Springer Fachmedien, 2019); Martin Seligman, "PERMA and the building blocks of well-being" The Journal of Positive Psychology (2018): 333-335.

12. Roland Gabriel, "Informationssystem," GITO Enzyklopädie der Wirtschaftsinformatik, November 22, 2011, https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/uebergreifendes/Kontext-und-Grundlagen/Informationssystem/index.html.

13. Ibid.

14. Stefan Stieglitz, "Kommunikations- und Kollaborationssysteme", GITO Enzyklopädie der Wirtschaftsinformatik, May 15, 2020, https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/uebergreifendes/Kontext-und-Grundlagen/Informationssystem/index.html.

practices that matter to them.[15]  Accordingly, conflicts exist when at least two individuals or groups have perceptual differences about resources, values, practices, or interests. Herrmann et al. emphasize that in addition to this component of a conflict, the need for agreement also plays a role.[16] Not only do impulses of interest and action collide, but the parties are under pressure to reach an agreement either by choice or external pressure.

An important component of conflict is that it can be functional and dysfunctional. A functional conflict is when work performance and group goals are achieved through, for example, innovative counter-designs and constructive feedback. Dysfunctional conflicts, on the other hand, reduce work performance and employee satisfaction.[17] The number conflict types illustrates that conflicts are complex social phenomena that arise from different perceptual and thought structures, ideas about approaches and divisions of tasks, lack of communication, and other aspects of interpersonal exchange.

## SWOT Analyse: Which Contribution Can CaCs Make to Prevent Conflicts in Teams and Organizations?

The SWOT analysis is divided into two sections. In the first section, strengths, weaknesses, opportunities and threats of CaCs are deduced. Following the descriptive

analysis, a synthesis is made which derives recommendations.

## Strengths, Weaknesses, Opportunities and Threats of CaCs

### Strengths of CaCs

The strengths refer to characteristics of CaCs that enable an improvement of communication and collaboration in teams and can be part of conflict prevention measures.[18] With this in mind, the focus is on technical features. Key strengths are listed below:

- CaCs can be used via various end devices and thus ensure location independence via an Internet connection.[19]

- CaCs ensure the definition and visualization of work steps, goals, processes, tasks, accesses and responsibilities via rule-based software functions.[20]

- CaCs ensure simultaneous collaboration on digital documents[21] and synchronous as well as asynchronous communication.[22]

**15.** Carsten K. W. De Dreu and Michele J. Gelfand, "Conflict in the workplace: Sources, functions, and dynamics across multiple levels of analysis," in The psychology of conflict and conflict management in organizations, ed. Carsten K. W. De Dreu and Michele J. Gelfand (New York: Taylor & Francis Group/Lawrence Erlbaum Associates, 2008), 6.

**16.** Dorothea Herrmann, Knut Hüneke, and Andrea Rohrberg, Führung auf Distanz: Mit virtuellen Teams zum Erfolg (Wiesbaden: Springer Gabler, 2012), 8.

**17.** Bruno Rüttinger and Jürgen Sauer, Konflikt und Konfliktlösen: Kritische Situationen erkennen und bewältigen (Wiesbaden: Springer Gabler, 2016).

**18.** BWL, "SWOT-Analyse," BWL-Lexikon, 2020, https://www.bwl-lexikon.de/wiki/swot-analyse

**19.** Roland Gabriel, "Informationssystem,", November 22, 2011, https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/uebergreifendes/Kontext-und-Grundlagen/Informationssystem/index.html

**20.** Stefan Stieglitz, "Kommunikations- und Kollaborationssysteme", GITO Enzyklopädie der Wirtschaftsinformatik, May 15, 2020, https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/uebergreifendes/Kontext-und-Grundlagen/Informationssystem/index.html

**21.** Lena Klaus, "Kollaborationstools: Vorteile & Nachteile von Tools für die Zusammenarbeit," IT-Service.Network, July 1, 2020, https://it-service.network/blog/2020/07/01/kollaborationstools-vorteile-nachteile/.

**22.** Stefan Stieglitz, "Kommunikations- und Kollaborationssysteme", GITO Enzyklopädie der Wirtschaftsinformatik, May 15, 2020, https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/uebergreifendes/Kontext-und-Grundlagen/Informationssystem/index.html.

- CaCs are updated regularly from software providers - new functions in the backend and frontend.

- Automated notifications inform the user about processes.[23]

## Weaknesses of CaCs

The weaknesses of CaCs are features that can lead to a disadvantage of team members or conflicts in teams.[24]

- Manipulating information requires digital capabilities of team members.[25]

- The stored information is located on its own or third-party servers with associated security risks.

- CaCs often have limited application scenarios, for example, messenger, program management, video conferencing tools.

- Input, processing, and output of information require Internet-enabled terminals.

- Without internet and power, CaCs are not functional.

## Opportunities through the use of CaCs

Opportunities are application scenarios and factors regarding CaCs that can be of advantage for conflict prevention in teams.[26]

The opportunities described below are predominantly derived from strengths:

- Operational performance processes can be improved through the use of CaCs. Inputting, storing, and transmitting information in CaCs enables team members to digitize by writing down or recording information, thus enabling traceability of content, sender, time, and location. By writing down and storing information, process errors and inappropriate tasks can be addressed flexibly and quickly. Visualizing steps and the interaction of individual team members can also establish a shift in attention from individual team member positions to goal and success criteria, which can create an organization-wide culture of collaboration.[27] The question of who does what, when, why, and how can be visualized. Task and process conflict potential can be reduced through CaCs.

- Misunderstandings in teams can be quickly discussed and resolved via conferencing tools instead of emails.[28]

- Text-based electronic communication and the development of ideas can be implemented disregard the age, gender, and other social barriers.[29] E.g. digital brainstorming.

- Cross-cultural teams are often more creative and innovative and are

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**23.** Ibid.

**24.** BWL, "SWOT-Analyse," BWL-Lexikon, 2020, https://www.bwl-lexikon.de/wiki/swot-analyse.

**25.** Bitkom, "Bitkom Digital Office Index 2020," Bitkom, 2020, https://www.bitkom.org/doi-2020; DAK, "Digitalisierung und Homeoffice in der Corona-Krise," dak.de, July 22, 2020, https://www.dak.de/dak/bundesthemen/sonderanalyse-2295276.html.

**26.** BWL, "SWOT-Analyse," BWL-Lexikon, 2020, https://www.bwl-lexikon.de/wiki/swot-analyse

**27.** Harvard Business Review, "Why Today's Digital Teams Need a New Class of Collaboration Tools and Solutions," hbr.org, September 28, 2016, https://hbr.org/sponsored/2016/09/why-todays-digital-teams-need-a-new-class-of-collaboration-tools-and-solutions, 7.

**28.** EF, "Virtueller Konflikt: Hindernisse bei der Zusammenarbeit in globalen Teams," EF, 2020, https://docplayer.org/18682281-Virtueller-konflikt-hindernisse-bei-der-zusammenarbeit-in-globalen-teams.html, 6.

**29.** Ibid.

enabled by conferencing tools, digital information flow, and clear task definitions.[30] Using CaCs, collaboration across geographic boundaries is enabled.

● Flexible work location and work time models can reduce business trips and commutes, which saves costs, increases sustainability (business trips, office costs, etc.) and can reduce the amount of time spent by team members.

● Email overload in teams can be significantly reduced. Face-to-face meetings and video conferences provide the most clarity. Emails, on the other hand, often lead to misunderstandings and conflicts.[31]

● The flood of paper in offices and teams can be reduced by CaCs and efficient digital knowledge management systems can be introduced.

● Asynchronous communication allows time-delayed exchange, so team members can flexibly access information regularly.

● Synchronous communication using conferencing tools allows uncomplicated exchange between team members who are in different locations.

**Risks associated with the use of CaCs**

Risks are factors and developments in the application environment of CaCs that can be dangerous or of disadvantage to a team.[32]

● The traceability of digital actions is generally quantifiable (time, place, delivery, etc.) and thus can lead to unhealthy evaluation systems of team members.

● Usage requires digital skills, which can vary widely differ across diversified teams based on demographics and experience, leading to different user behaviors. In particular, practices and interests regarding how tasks are completed by team members can vary. Conflicts of judgment and evaluation can result.

● The lack of social and personal sharing can lead to a reduction in team membership and trigger social conflicts.

● Stored information can be subject to hacking attacks.

● The formalization and standardization of work steps, decision rules, processes can lead to the restriction of autonomy and the creativity of employees.[33]

● Too many CaCs and notifications can overwhelm or frustrate team members because they believe they are not being useful. Constant accessibility and notifications can also trigger digital stress.

## Recommendations for the Use of CaCs in Teams

The previous chapter shows that the use of CaCs brings opportunities and risks for teams. Teams are complex entities, consisting of humans, division-based

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**30.** Ibid.

**31.** Ibid.

**32.** BWL, "SWOT-Analyse," BWL-Lexikon, 2020, https://www.bwl-lexikon.de/wiki/swot-analyse.

**33.** Werner Schienle and Andres Steinborn, Psychologisches Konfliktmanagement: Professionelles Handwerkzeug für Fach- und Führungskräfte (Wiesbaden: Springer Fachmedien, 2019), 19.

tasks, and an environment that requires communication, coordination. It is also obvious that teams, technologies and environments are constantly changing, which is why the recommendations for action serve as a basis for creating framework conditions and provide signposts for potential team alignments. The recommendations for action address team members, team leaders, and executives who influence the playing field of teams.

## Expand: Recommendations to expand CaCs in teams.

The recommendations for action for expanding CaCs in teams translate the strengths and opportunities into concrete recommendations and focus on creating clear rules for virtual collaboration in teams.

### Create flexible location and working time models

With an increase in digital mobility, the boundaries between work and leisure, work in the office and at home, the division of work throughout the day, and the availability and unavailability of team members are becoming blurred. To reduce organization-related conflicts caused by the flow and structure of processes and tasks, clear rules are needed that specify the maximum duration, the timing of working hours, work on weekends, and rest periods.[34] This should take place against the background of legal requirements. Concerning the place of work, clear rules should also apply so that the advantages (working according to one's bio-rhythm, cost savings, etc.) of work location models come into play. The accessibility of team members outside the office should be clearly defined and clear agreements

on alternating home offices should apply - how, where and when team members meet for personal exchanges. The requirements of teams can vary greatly, which is why continuous adjustment and coordination among team members make sense.[35]

### Establish clear rules and approaches for virtual teamwork

Virtual teams consist of modules and networks that can be controlled via CaCs.[36] This means that different people can access different modules (tasks, processes, document sharing, cloud services, calendars, messages), so clear rules regarding rights, communication and tasks are necessary. For example, it can be defined as a rule that only collaboration tools are used for simultaneous editing of documents, that cameras should be turned on in meetings, and that feedback functions should be used. Clear rules for dealing with conflicts, such as resolving conflicts via video or phone call instead of chat functions, can also be established.

### Create clear task packages and design processes flexibly

Teams live by the independence of their team members and yet there is a need for coordination and agreement.[37] This means that different goals and values, different working styles, and experiences of team members should be incorporated into the creation of task packages and processes to avoid conflicts of goals, tasks, and processes.

**34.** Matthias Schmidt, "Die 5 wichtigsten Regeln rund um die Arbeitszeiten," Starting-up, 2020, https://www.starting-up.de/praxis/organisation/die-5-wichtigsten-regeln-rund-um-die-arbeitszeiten.

**35.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf, 11.

**36.** Gerhard Schewe, "virtuelle Organisation," Gabler Wirtschaftslexikon, 2020, https://wirtschaftslexikon.gabler.de/definition/virtuelle-organisation-49441.

**37.** Bruno Rüttinger and Jürgen Sauer, Konflikt und Konfliktlösen: Kritische Situationen erkennen und bewältigen (Wiesbaden: Springer Gabler, 2016), 57.

CaCs visualize and allow virtual interactions, but are dependent on input. Determination and negotiation should be team-based and take into account demographics and experience. Properly aligned and coordinated, CaCs make task packages, deadlines and processes clear and easy to follow. Feedback and experience sharing should continue over time as social and technical aspects adapt and grow.[38]

**Catch-up: Recommendations to transform weaknesses.**

Catching up is about how weaknesses of CaCs can be eliminated so that conflict potentials are reduced. This area is about catching up so that weaknesses do not slow down expansion.

*Providing hardware and software*

A basic prerequisite for the application of CaCs in teams is the provision of appropriate and demand-oriented hardware and software for all team members.[39] Limited access, complicated systems, low-quality endpoints, and software can lead to resistance from team members.[40] Involving teams and employees in the selection process of hardware and software can reduce resistance.[41]

*Creating tailored training offerings and promoting digital competencies*

Providing information technology support for teams through tailored, job-profile-specific and age-appropriate training, continuing education and external experts can increase the efficient use of CaCs. In this context, demographic factors and experience differences among team members should be taken into account.[42] Young employees often adopt chat services and program management tools more intuitively than older colleagues, so training and information materials should be adapted.[43] It should be avoided that young employees sit in long training, although a short introductory video would have been sufficient for this target group.[44] In addition to application-oriented training, complementary training should be offered on topics such as data security, process design, and task design. Teams can also self-organize how to learn about new functions and thus increase the digital skills of other team members. Regular time slots can be created for this exchange.

*Avoiding silo landscapes*

Silo landscapes are triggered by the lack of integration of processes and missing interfaces between softwares and can lead to the failure of CaCs.[45] CaCs can only function as a target-oriented tool if they are adapted to the application scenarios as well as conditions of teams and if they are mobile,

**38.** EF, "Virtueller Konflikt: Hindernisse bei der Zusammenarbeit in globalen Teams," EF, 2020, https://docplayer.org/18682281-Virtueller-konflikt-hindernisse-bei-der-zusammenarbeit-in-globalen-teams.html.

**39.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf, 11.

**40.** Harvard Business Review, "Why Today's Digital Teams Need a New Class of Collaboration Tools and Solutions," hbr.org, September 28, 2016, https://hbr.org/sponsored/2016/09/why-todays-digital-teams-need-a-new-class-of-collaboration-tools-and-solutions, 3.

**41.** Harvard Business Review, "Why Today's Digital Teams Need a New Class of Collaboration Tools and Solutions," hbr.org, September 28, 2016, https://hbr.org/sponsored/2016/09/why-todays-digital-teams-need-a-new-class-of-collaboration-tools-and-solutions.

**42.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf, 11.

**43.** Ibid.

**44.** Ibid.

**45.** Harvard Business Review, "Why Today's Digital Teams Need a New Class of Collaboration Tools and Solutions," hbr.org, September 28, 2016, https://hbr.org/sponsored/2016/09/why-todays-digital-teams-need-a-new-class-of-collaboration-tools-and-solutions, 3.

user-friendly, and consolidated (reduced solutions).[46] In particular, the use of too many CaCs can cause confusion. The most important applications are cloud (sharing and synchronization), video conferencing tools, content management systems, and team management systems.[47] The consideration of additional systems should be well justified. External consultants can also provide advice on creating interfaces and integration.

### Safeguarding: Recommendations for Action to Avoid Risks

In the area of safeguarding, the aim is to reduce and prevent risks arising from the use of CaCs.

### *Trust Instead of Control*

Flexible working time and location models mean that trust and reliability become more important for team members because physical social interaction decreases due to mobile working. For the team, it makes sense to schedule fixed face-to-face meetings. These meetings can be used to share experiences and results. The monitoring of employees via tracking systems and the evaluation of generated data brings significant potential for conflicts of objectives between team members and company management, conflicts of values and social conflicts.

Employers can be harmed, if homework duties are not fulfilled, communication and information systems are used for private purposes, and data manipulation takes place.[48] Clear legal rules, corporate standards, and transparency can prevent risk

on both sides. As CaCs give rise to new forms of work and organization, new evaluation and feedback mechanisms must also be designed. New standards must be clearly communicated.

### *Reduce Digital Stress*

Another risk is digital stress triggered by notifications and information overload.[49] Digital stress can be reduced through clear rules on digital accessibility (see 4.2.1), clear specifications for use cases of tools, and the alignment of flexible working time and work location models with the needs of team members.[50] Training on general and digital stress prevention can additionally be offered.

### Avoid: What Should be Avoided

This area is about what should be avoided so that teams can work securely.

### *Unclear Data Protection and Data Security*

Lack of clarity among team members about how to handle CaCs securely leads to uncertainty and, in the worst cases, negligent behavior. A great deal of confidential information and ideas are exchanged in teams, leading to competitive advantages for the company. Accordingly, when selecting CaCs, emphasis should be placed on data security issues and team member privacy. Tests by app security specialists from Appvisory have shown that vendors such as Cisco, Microsoft, Google and Zoom still need

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**46.** Ibid.

**47.** Ibid.

**48.** Jan Peters and Anja Mengel," Rechtsfragen der Mitarbeiterkontrolle," Haufe, 2020, https://www.haufe.de/personal/haufe-personal-office-platin/rechtsfragen-der-mitarbeiterkontrolle_idesk_PI42323_HI893152.html.

**49.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf ; DAK, "Digitalisierung und Homeoffice in der Corona-Krise," dak.de, July 22, 2020, https://www.dak.de/dak/bundesthemen/sonderanalyse-2295276.html.

**50.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf, 9.

to improve significantly in both areas.[51] For this reason, clear IT security rules should be communicated in writing that includes third-party access in the home office, set clear rules for information outside the company, specify which communication technologies are used for what reason, inform about phishing emails, set password rules, include access and access protection, and explain data backup.[52] Team members should also be clear about reporting channels in the event of endpoint loss.[53] External consultants can provide important recommendations for action, such as the use of mobile threat defense solutions for iOS and Andriod devices. Written rules should be discussed and updated in teams regularly. Companies, team leaders and team members are all responsible for the secure handling of private data and company data as well as the protection of IT systems.

### *Excessive Standardization and Formalization*

Teams are agile units based on autonomy, self-efficacy and based on the division of labor. If too many structures are prescribed via CaCs and freedom is increasingly restricted via the standardization and formalization of processes, tasks, deadlines and working styles, this can lead to a loss of creativity, a decline in commitment and team membership.[54] Freedom for teams to experiment and work in an agile manner should therefore be preserved.

## Outlook

To put the recommendations into three simple thumb rules:

**4.** Call instead of messaging! This keeps social contact up and avoids miscommunication.

**5.** Think clearly about what you digitize before you do it! Is the message needed? Is the volume justified? For what and whom do I digitize it?

**6.** Do not text, share, link etc. out of working hours in digital channels with notifications! Also turn notifications of when full focus and concentration is needed! Always keep in mind, the world will continue to spin without you.

CaCs enable new digital forms of work, synergy effects, efficient planning, modern work location and working time models, fast and flexible communication, as well as precision in terms of task and process design. On the other hand, there are uncertainties caused by data protection, data security, lack of digital skills, excessive standardization and digital stress.

The analysis shows that CaCs can make a significant contribution to conflict prevention in teams. Their use requires a global strategy to prevent conflicts, which existed in the analog world to be transferred and accelerated in the digital world. In addition, there are new conflict potentials that can be reduced by a global approach to CaCs. Success depends on social and technical actions that include training, investment and clear rules. The recommendations in the areas of expanding, catching up, safeguarding and avoiding can only have effects if they are approached in a complementary and holistic way.

**51.** Dunja Koelwel, "So (un)sicher sind Teamwork-Apps und Video- Konferenzen von Zoom, Slack, Google & Co.," Versicherungsbetriebe, 2020, https://www.versicherungsbetriebe.de/trends/2020/so--un-sicher-sind-teamwork-apps-und-video--konferenzen-von-zoom.html.

**52.** BSI, "Tipps für sicheres mobiles Arbeiten," Bundesamt für Sicherheit in der Informationstechnik, 2020, https://www.bsi.bund.de/DE/Themen/Cyber-Sicherheit/Empfehlungen/HomeOffice/homeoffice_node.html.

**53.** Ibid.

**54.** HIRSCHTEC, "Digitale Kommunikation und Zusammenarbeit im Unternehmen: Eine bevölkerungsrepräsentative Umfrage von Kantar im Auftrag von HIRSCHTEC," hirschtec.eu, 2020, https://hirschtec.eu/wp-content/uploads/2020/10/hirschtec.eu-kantar-umfrage-digitale-kommunikation-und-zusammenarbeit-in-unternehmen-2020.pdf, 1.

# ABOUT THE AUTHOR

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Robert Hör is currently program manager for digitalization at Konrad-Adenauer-Stiftung Cambodia. He is a political scientist by training and is in charge of several research projects and dialog formats between Cambodia, regional and German experts. His current research focus lies on the implementation of digitalization projects within SMEs and organizational development. Having always been fascinated by the social-political impact and potential of a new tecnologies and what they mean for enterprise, he started studying the online M.Sc. program on digital transformation and management. His major fields of study are digital strategy development, political economy and business informatics.

# Business Values and Digitalization in Cambodia 4.0

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## Introduction

Cambodia is one of the fastest-growing economies not only in Asia but in the whole world, at least before the pandemic. Along with the economic growth, Cambodia has shown a deep desire in reducing the technological and digital gap with other neighboring countries, while becoming in the shortest time possible an active player in the regional digitalization boom.

The transformation of almost every aspect of our life, from the private sphere to the professional one, is heavily impacting the way we interact with each other, the way we think, and also our priorities. These changes have a great spillover on the management approach, with a shift driven by this digitalization wave, in the values and visions of many managers. It becomes fundamental to understand what is the relationship between technological innovations as well as digitalization and value transformation in the industry 4.0 era[1], targeting the Cambodian context.

In this chapter, we aim to investigate the transformation of processes related to data information and knowledge in the industry sector in Cambodia, investigating the two phases aforementioned, related to the transformation driven by Industry 4.0 that is affecting the management approach in companies. For doing so, we approached the investigation with a reverse approach, beginning from investigating the change of values in the management, for then measuring the digitalization index in the companies who participated in this research. In the specific, as the first step, we measured the corporate values

identified by Blštáková et al.[2] in meaningful work, engagement, passion, cooperation, recognition, communication, support, autonomy, health emphasis, common values, trust, and commitment. Furthermore, we gauged the level of digitalization (and importance given to it) in the businesses that participated in this research work (answering our questionnaire) measuring digitalization indexes identified in digitalization of analog data, digitalization of biometric data, usage of a platform of digital interaction and networking, usage of big data analytics, usage of fast analytics (feedback), usage of predictive analytics, and implementation (and given importance) of General Data Protection Regulation (GDPR) and customer protection.[3]

## The Concept of Industry 4.0

The concept of Industry 4.0 rose with a 2011 German government initiative, when the concept of Industry 4.0, part of the 4th Industrial Revolution, was established as a critical strategy for industrial production, within the idea of an interconnected world, changed by the Information Communication Technology (ICT).[4] Industry 4.0, which is currently the focus of many research works[5], has opened the door to deep changes in both industrial, social and economic fields, disrupting labor relations not only in industrialized countries but also in developing ones, like Cambodia. Developing

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**1.** Jana Blštáková, Zuzana Joniaková, Nadežda Jankelová, Katarína Stachová, and Zdenko Stacho, "Reflection of Digitalization on Business Values: The Results of Examing Value of People Management in a Digital Age," Sustainability 12, no 12 (2020), https://www.mdpi.com/2071-1050/12/12/5202.

**2.** Ibid.

**3.** Ibid.

**4.** Silvia H. Bonilla, Helton R. O. Silva, Marcia Terra da Silva, Rodrigo Franco, Rodrigo Franco Gonçalves, and José B. Sacomano, "Industry 4.0 and Sustainability Implications: A Scenario-Based Analysis of the Impacts and Challenges," Sustainability 10, no. 10 (2018), https://www.mdpi.com/2071-1050/10/10/3740.

**5.** Yongxin Liao, Fernando Deschamps, Eduardo Rocha Loures, and Luiz Felipe Ramos, "Past, present and future of industry 4.0 – a systematic literature review and research agenda proposal," International Journal of Production Research 55, No. 1, https://www.researchgate.net/publication/315670892_Past_present_and_future_of_Industry_40_-_a_systematic_literature_review_and_research_agenda_proposal.

countries are subject to more shocking effects due to not having yet completed their industrial transformation, and with an education system still not prepared for the transition[6], something that Cambodia is experiencing.[7]

With the concept of Industry 4.0 generally, we think of the adoption of new technological solutions in the industrial process. Thus, we find robots involved in industry and production, deployment of three-dimensional printers, Artificial Intelligence and machine learning relying on big data, and in general Internet of Things (IoT).[8] In specific, Bonilla et al.[9] identified in Cyber-Physical Systems, IoT, 3D Printing, BigData, and Cloud the underpinning technologies for Industry 4.0, with a wide array of solutions that these technologies, or even the combination of them, can offer. Ghobakhloo[10] identified an even longer list of principles underpinning Industry 4.0, namely service orientation, smart product, smart factory, interoperability, modularity, decentralization, virtualization, real-time capability, vertical integration, horizontal integration, product personalization, and corporate social interoperability. In addition, several trends were identified in the Internet of Things (IoT), Internet of Service (IoS),

Internet of People (IoP), Internet of Data (IoD), Cloud Computing, Big Data Analytics, Blockchain, Cybersecurity, Augmented Reality, Automation and Industrial Robots, Additive Manufacturing, Simulation and Modelling, Cyber-Physical Systems, and Semantic Technologies.[11] All these principles underpinning the transformation to Industry 4.0, serves the purpose of what Moeuf et al.[12] defined capacities of managerial industrial processes. In specific, Moeuf et al.[13] performed a literature review on Industry 4.0 identifying as capacities of managerial industrial processes four main categories, namely monitoring, control, optimization, and autonomy. Thus, in short, we can consider Industry 4.0 as an umbrella term that refers to the usage of new technologies, relying on specific principles, capable of serving managerial industrial processes, to enhance quality and productivity.

But if the possibilities introduced by technologies are enormous, on the other end, new challenges appear on the horizon, with among them, the necessity of the labor market to adapt to this change[14], with the technological aspect of this transition being one of the major factors likely to influence employment markets, the demand and supply of skills, and the structure of occupations[15]. It is in this transitional time that we are facing a transformation where old work activities are disappearing and being replaced, while entirely new ones are

6. Resul Kurt, "Industry 4.0 in Terms of Industrial Relations and Its Impacts on Labour Life," Procedia Computer Science 158 (2019): 590-610, https://www.sciencedirect.com/science/article/pii/S1877050919312633.

7. Riccardo Corrado, Sereyvuth Khat, and Panha Vattey Nhean, "The Role of Cambodian Universities in Preparing Cambodia for a Digital Economy," in Digital Insights – Sustainability & Digital Innovation, ed. Raimund Weiß and Robert Hör (Phnom Penh: KAS Cambodia, 2021), 76-84.; Riccardo Corrado and Patchanee Tungjan, "How Digital Tech can Help Fix Cambodia's Broken Education and Healthcare Systems," in Digital Insights, ed. Raimund Weiß and Robert Hör (Phnom Penh: KAS Cambodia, 2019), 20-39.

8. ustry 4.0 in Terms of Industrial Relations and Its Impacts on Labour Life."

9. Industry 4.0 and Sustainability Implications."

10. Morteza Ghobakhloo, "The Future of Manufacturing Industry," Journal of Manufacturing Technology Management 29, No.6 (2018), https://www.emerald.com/insight/content/doi/10.1108/JMTM-02-2018-0057/full/html.

11. Ibid.

12. Alexandre Moeuf, Robert Pallerin, Samir Lamouri, and Simon Tamayo Giraldo, "The Industrial Management of SMEs in the Era of Industry 4.0," International Journal of Production Research 56, No. 3 (2017): 1-19, https://www.researchgate.net/publication/319612802_The_industrial_management_of_SMEs_in_the_era_of_Industry_40.

13. Moeuf et al, "The Industrial Management of SMEs in the Era of Industry 4.0".

14. Sandrine Kergroach, "Industry 4.0: New Challenges and Opportunities for the Labour Market," National Research University Higher School of Economics 11, No. 4 (2017): 6-8, https://ideas.repec.org/a/hig/fsight/v11y2017i4p6-8.html.

15. Ibid

being created[16]. In this regard, Liboni et al.[17] wrote that the most in-demand occupations that we see today, did not exist ten or even five years ago and it is in this new paradigm of the job market demands that education cover a fundamental role to prepare the newer Cambodian generations to the new work ecosystem, aiming to tackle the possible undermining issue: Cambodia facing a lack of prepared and skilled workers for the Industry 4.0.

Regarding this, some experts believe that digitization and the rise of labor-saving technologies such as intelligent robots, autonomous vehicles, and cloud solutions, will reduce or even eliminate the need for human workers to cover lower-skilled jobs positions, yet creating new job opportunities in various areas[18]. Considering this, the Cambodian Ministry of Post and Telecommunication (MPTC) has committed itself to increase the digital literacy and the awareness of Cambodians on the importance to study tech-oriented fields, with the collaboration of the Ministry of Education, Youth and Sport (MoEYS). The educational branch of the MPTC itself, the National Institute of Posts, Telecoms & ICT (NIPTICT) has evolved officially in 2021 to the Cambodia Academy of Digital Technology (CADT), defining itself as an arm of the MPTC for elite education, research, and innovation in the field of digital technology.

In summary, Industry 4.0 is just at the very beginning stage and it is changing the way firms create value, gain competitiveness, become successful, formulate strategies

and implement them[19]. It is important to investigate these changes in a specific ecosystem, like Cambodia, aiming to learn about its current stage and thus being prepared for the transition that is investing and disrupting the industrial sector all over the world.

## Evolutionary Management

Industry 4.0 has been identified as a cross-cutting theme of many disciplines that influence each other[20]. One of the spheres of interest is represented by the management sphere. The digital transformation underpinning industry 4.0 has deeply impacted the way organizations manage their whole organizational approach. Regarding this, Saucedo-Martínez et al.[21] wrote that "the reorganization of operations is not intended to mark a radical change in the functioning of the organization, but rather adapt the technology and management to a new level of operating systems, tools which create the potential value of activities". Implementing the Industry 4.0 concept into any company and ecosystem requires continuous innovation and education that not only relies and depend on people's abilities, but also on the organizational culture of that ecosystem[22], with organizational culture intended as

**16.** Lara Bartocci Liboni, Luciana Oranges Cezarino, Charbel José Chiappetta Jabbour, Bruno Garcia Oliveira, and Nelson Oliveira Stefanelli, "Smart Industry and the Pathways to HRM 4.0: Implications for SCM," emerald insight 24, No. 1 (2019), https://www.emerald.com/insight/content/doi/10.1108/SCM-03-2018-0150/full/html.

**17.** Ibid.

**18.** Ghobakhloo, "Industry 4.0, Digitization, and Opportunities for Sustainability."

**19.** Michela Piccarozzi, Barbara Aquilani, and Corrado Gatti, "Industry 4.0 in Management Studies: A Systematic Literature Review," Sustainability 10, no. 10 (2018), https://www.mdpi.com/2071-1050/10/10/3821.

**20.** Ibid.

**21.** Jania Astrid Saucedo-Martínez, Magdiel Pérez-Lara, José Antonio Marmolejo-Saucedo, Tomás Eloy Salais-Fierro and Pandian Vasant, "Industry 4.0 framework for management and operations: a review," Journal of Ambient Intelligence and Humanized Computing 9 (2018): 789-801, https://link.springer.com/article/10.1007/s12652-017-0533-1.

**22.** Hana Mohelska and Marcela Sokolová, "Management approaches for industry 4.0 – The organizational culture perspective," Technological and Economic Development of Economy 24, no. 6 (2018): 2225-2240, https://www.researchgate.net/publication/329122235_Management_approaches_for_industry_40_-_The_organizational_culture_perspective.

the sphere of shared values, beliefs, and norms that drives attitudes and actions of the members of a specific organization. From the management point of view, we can consider many aspects, from the management of data, and the management of people. Regarding the first one, Raptis et al.[23] offered a comprehensive literature review of the current research and trends in data management for Industry 4.0, covering a wide variety of important aspects.

For instance, one of the important concepts regarding the management of data in the Industry 4.0 is represented by data enabling industrial technologies, such as the Industry Internet of Things (IIoT) and the Industry Cyber-Physical System (ICPS), sensor communication, control systems, industrial robots, assembly lines, and direct communication between industrial networked devices (M2M communication).[24] Another important aspect to consider related to data management is the concept of data-centric industrial services, supported by virtual and augmented reality (AR/VR), camera and vision technologies for pattern recognition, fault estimation and template matching, prognostic, anomalies detection, fault diagnosis, multi-agent systems composed of multiple interacting intelligent agents based on AI, decision making, job scheduling, machine learning, big data analytics, security, energy management, and cloud solutions.[25] It is in this ecosystem that Industry 4.0 has a deep impact on Human Resource Management (HRM), the second management point of view. In the specific, it is the HRM that is facing changes in the way people relate to each other (human to human), and also the way

they relate to innovations and technologies emerging in this new manufacturing smart industry (human to an organization and human to technology).[26] Focusing on these changes, and following Blštáková et al.[27], Industry 4.0 transformation is affecting the management approach in companies in two phases. During the first phase, we assist in the transformation of analog and biometric data to their digital version together with an implementation of systems, such as digital platform, networking, and analytics tools. This first phase is followed by a second stage characterized by a re-evaluation process of the content of added value, business model, and also the relationship between employee and employer.

## Core Values

Considering the evolutionary management ecosystem in Industry 4.0, a new set of values has emerged as relevant for the modern management settings. Regarding this, and following the European Foundation for Management Development (EFMD), and with the confirmation of several studies present in the literature body, modern values of people management systems can be summarized in a list of values, including meaningfulness, engagement, cooperation, autonomy, support, trust, commitment, common values, recognition and emphasis on health.[28] Analyzing each of the listed values, the first one is meaningfulness. The meaningfulness of work is an important value playing a significant role in improving an employee's capacity to achieve organizational goals and objectives, and it can be defined as "the positive and significant contributions of the

**23.** Theofanis P. Raptis, Andrea Passarella and Marco Conti, "Data Management in Industry 4.0: State of the Art and Open Challenges," IEEE Access PP 99 (2019).

**24.** Ibid.

**25.** Ibid.

**26.** Liboni et al., "Smart Industry and the Pathways to HRM 4.0."

**27.** Blštáková et al., "Reflection of Digitalization on Business Values."

**28.** Ibid.

job to one's life, and the satisfaction that an individual derives from their job"[29].

Engagement instead, refers to the personal engagement of an employee in the workplace and expressing themselves as physically, cognitively, and emotionally engaged during their work role performances.[30] When engaged, an employee is understood to be "physically involved, cognitively vigilant, and emotionally connected".[31] Furthermore, another important value on the workplace is cooperation, a value capable to make an individual perceive themselves as more promotively interdependent in relation to the other team members, concerning the goal of their roles.[32] Autonomy, which presents three dimensions namely, work method autonomy, work schedule autonomy, and work criteria autonomy, has been found to have a direct positive contribution towards workplace creativity.[33]

Furthermore, studies indicated that social support significantly explains job satisfaction while positively supporting organizational commitment and engagement.[34] Trust is another important component to have in the workplace, and it has been linked to increased firm performance.[35] Another

value listed as a modern value of people management systems is commitment. Specifically, commitment in the workplace is another factor that has been historically heavily investigated in numerous research works over the past decades and it represents an important pivotal element for a firm.[36] In addition, common values in the workplace can guide the teams and their actions and can help create a common project identity, facilitating and boosting operations, mostly in an agile environment[37], common in the new workplace ecosystem. Furthermore, recognition is another value capable to reduce psychological distress in employees[38] and supporting motivation and performance.[39] Finally, between modern values, emphasis on health has increasingly become more important in the business environment, mostly in recent years.[40]

## Methodology

The purpose of this study is to assess the transformation of processes related to data information and knowledge in the industry sector in Cambodia and to rate the importance that Cambodian employees give to the different components of digitalization. We adopted a quantitative method following

**29.** Prabhjot Kaur and Amit Mittal, "Meaningfulness of Work and Employee Engagement," The Open Psychology Journal 13, no. 1 (2020): 115-122.

**30.** Michelle R. Simpson, "Engagement at Work: a review of the literature," International Journal of Nursing Studies 46, no. 7 (2008): 1012-1024.

**31.** Ibid.

**32.** Chen Yue, Patrick Fong, and Teng Li, "Meeting the Challenge of Workplace Change," Social Behavior and Personality An International Journal 47, no.7 (2019).

**33.** Surendra Kumar Sia and Aneesh V. Appu, "Work Autonomy and Workplace Creativity: Moderating Role of Task Complexity," SAGE Journals (2015), https://journals.sagepub.com/doi/10.1177/0972150915591435.

**34.** Leena Mikkola, Elina Suutala, and Heli Parviainen, "Social Support in the Workplace for Physicians in Specialization Training," Medical Education Online 23, no.1 (2018), https://pubmed.ncbi.nlm.nih.gov/29464988/.

**35.** Sarah Brown, Daniel Gray, Jolian McHardy and Karl Taylor, "Employee Trust and Workplace Performance," Journal of

Economic Behavior & Organization 116 (2015): 361-378.

**36.** Rossenberg et al., "The Future of Workplace Commitment," European Journal of Work and Organizational Pyscology 27, no. 2 (2018): 153-167.

**37.** Maria Paasivaara, Outi Väättänen, Minna Hallikainen, and Casper Lassenius, "Supporting a Large-Scale Lean and Agile Transformation by Defining Common Values," (Conference Paper, International Conference on Agile Software Development, May 2014).

**38.** Adele Bergin and Nerina Jimmieson, "The Importance of Supervisor Emotion Recognition for Praise and Recognition for Employees with Psychological Strain," Anxiety Stree Coping 33, no.2 (2020): 148-164.

**39.** Ayomikun Idowu, "Effectiveness of Performance Appraisal System and Its Effect on Employee Motivation," Nile Journal of Business and Economics 3, no.5 (2017).

**40.** Gabriel Chia, See Ming Lim, Gek Khim Judy Sng, Yi-Fu Jeff Hwang, and See Seng Chia, "Need for a New Workplace Safety and Health (WSH) Strategy for the Fourth Industrial Revolution," American Journal of Industrial Medicine 62, no.4 (2019).

the approach of the research work of Blštáková et al.[41], who investigated these aspects in the Slovakian ecosystem. For the data collection, we adopted a questionnaire, relying on the questions in Blštáková et al.[42]. The questionnaire was created using radio buttons and tick boxes following the suggestions of Cohen et al.[43], where the authors suggested using radio buttons and boxes to tick which facilitate the completion of the questionnaire. The questions, in the form of a Likert scale from one to five, are reported in the following table.

**Table 1:** *Components of Digitalization Index, and Values, from Blštáková et al[44]*

| Values | Component of Digitalization Index |
|---|---|
| Meaningfulness of work | Digitalization of Analogue Data |
| Engagement | Digitalization of Biometric Data |
| Passion (enthusiasm and joy of work) | Platforms of Digital Interaction |
| Cooperation | Networking Big Data Analytics |
| Support | Fast Analytics (e.g., feedback) |
| Autonomy | Predictive Analytics (e.g., in marketing) |
| Health emphasis | GDPR (customer protection) |
| Common values | |
| Trust Commitment (internal feeling of responsibility) | |

Additionally, the questionnaire was created bilingual, in English and Khmer, to avoid misunderstanding of the respondents who could be not proficient in English. For distributing the questionnaire we relied on Google Forms following the suggestions from the University of York[45] to use this tool due to its efficacy for gathering responses for research works. The questionnaire was distributed to high-rank managers (mainly CEOs) or Human Resources (HR) offices of companies reachable by direct connections, or indirect connections, following a snowball sampling. In snowball sampling, researchers identify a relatively small number of individuals with the required characteristic, and "these people are then used as informants to identify or put the researchers in touch with, others who qualify for inclusion and these, in turn, identify yet others – hence the term snowball sampling".[46] With this approach, we reached a total number of 102 respondents.

Regarding the phase of data analysis, we used well-known Microsoft Excel software. The collected data was imported from the questionnaire on Google Forms to an Excel spreadsheet, and after a phase of data cleaning for removing inconsistencies or missing or incorrect entries, we performed our data analysis. We explored the changes of values across size, sector, and

**41.** Blštáková et al., "Reflection of Digitalization on Business Values."

**42.** Ibid.

**43.** Louis Cohen, Lawrence Manion, and Keith Morrison, Research Methods in Education (London and New York: Routledge, 2007), https://gtu.ge/Agro-Lib/RESEARCH%20METHOD%20COHEN%20ok.pdf.

**44.** Blštáková et al., "Reflection of Digitalization on Business Values."

**45.** University of York, "Subject Guides."

**46.** Cohen, Manion, and Morrison, Research Methods in Education.

typology of business. The change in value was considered as the difference between the expected one (future) and the current one (present). The same approach was also used for measuring the digitalization level of each company, across the different considered digitalization indexes. For instance, for every index (for example 'digitalization of analog data') we simply calculated the difference between the expected/desired one (for example 'expected digitalization of analog data') and the current one (for example 'current digitalization of analog data').

## Results and Discussions

The first part of the questionnaire focused on profiling the typology of businesses that participated in the research. In total, we had 102 replies. To assure anonymity and foster participation, we didn't collect demographic data. Among the respondents,  the majority of them reported belonging to the services sector (47), followed by education (15), production (10), and retail (2). The remaining (28) didn't specify the field (field: Other). Regarding the size of the company, 25 companies reported to be composed of less than 10 workers, 37 reported to be in the range of 11 to 50 employees, 20 in the range 51 to 250, and 20 companies reported to have more than 250 employees. Furthermore, regarding the sector, the vast majority of the participants reported to be in the private sector (81), 9 in the public sector and 12 reported being non-governmental organizations (NGOs). In figure 1, it is possible to have an overview of the demographics of the participants.

**Figure 1:** *Demographics of the respondents*
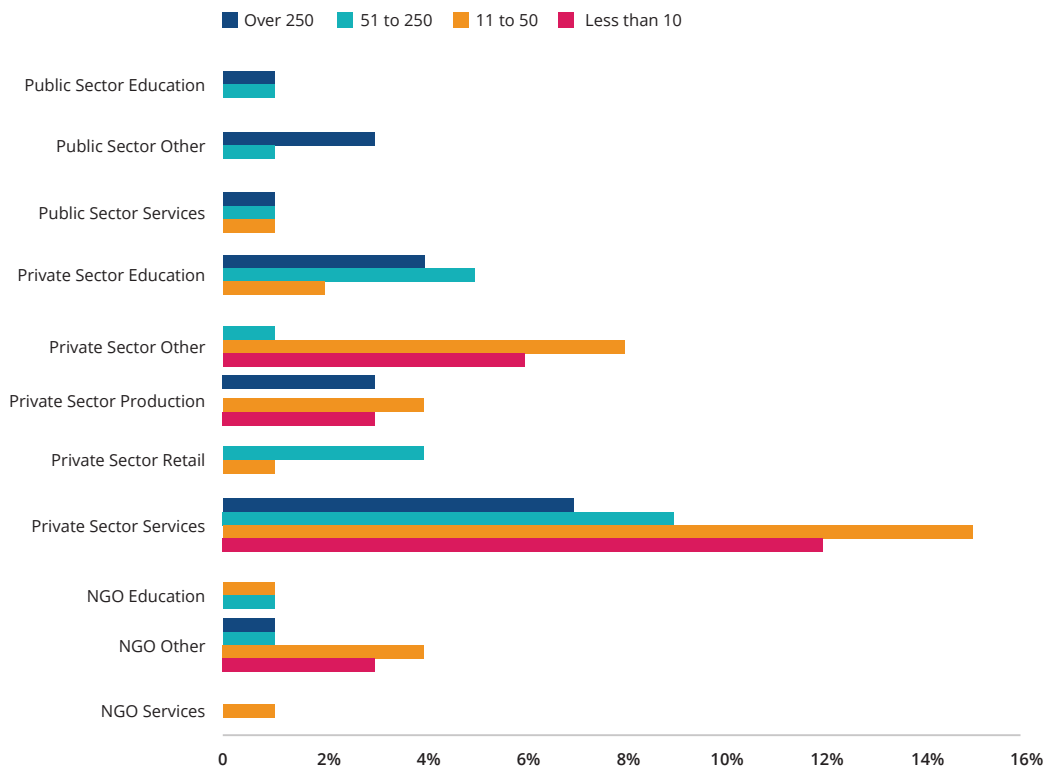
Furthermore, the next section of the questionnaire focused on investigating the values currently present in the companies that participated in our research work. In the specific, the section aimed to profile the culture and values that each participating organization is built on, and uses as a tool for achieving its vision and mission.[47] The list of values is reported in table 1. For each value present in table 1, the responding representative was asked to declare the level of importance given to each value, in the form of a Likert-type scale from one (very low) to five (very high). For each value, the responding representative was asked to rate both the current and the expected level of importance, the latter one considered like the level each company would like to have. The results obtained are reported in the following chart (figure 2).

*Figure 2: Average current and expected values in the participant's businesses*
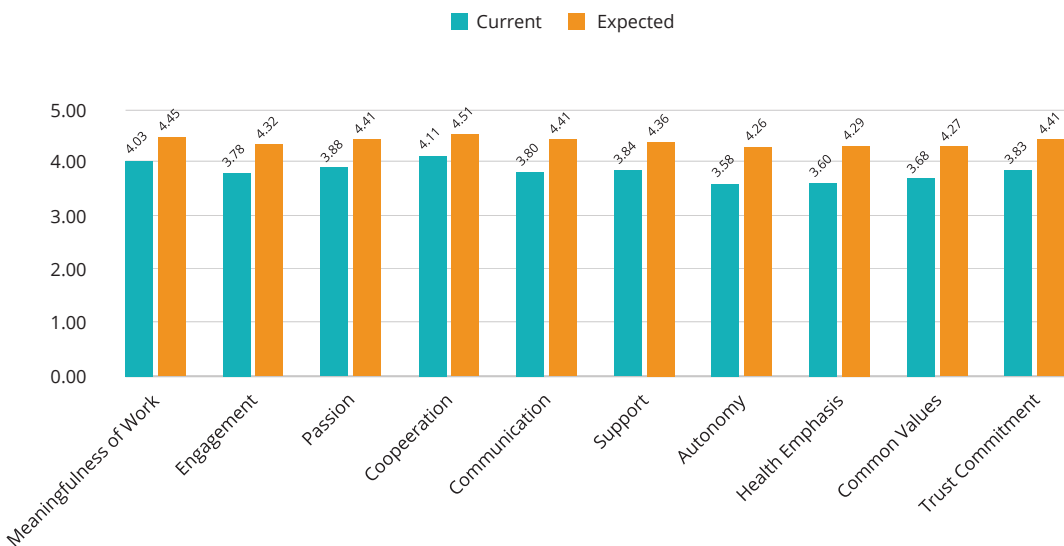


It is possible to see how the current status of importance given to each value is on average lower than the one expected. Analyzing this across the considered business values, no relevant difference is present, with all the values reporting roughly a 0.5 gap between the current and expected level. The scenario changes though when we analyze the results dividing by sector (i.e. public, private, or NGO). In this case, the public sector is the sector that is presenting a wider gap between current and expected values, showing a wider margin of foreseeable change in values. We need to highlight the fact that on average, the public sector seems to show the lowest current status of importance given to the considered values. This lower current point could represent one of the reasons explaining the biggest gap cross-sector between current and expected values.

Additionally, analyzing the correlation between the different current values, we found engagement being moderately correlated (0.5 or above) with all the other values (other than autonomy), and meaningfulness of work being moderately correlated with engagement, passion, health emphasis, and common values. The key takeaways can be summarized in the meaningfulness of work, engagement, and passion being correlated with almost all the other values (at the current level), with autonomy being the value not correlated to any other value.

**47.** Blštáková et al., "Reflection of Digitalization on Business Values."

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**Figure 3:** *Current (C) and Expected (E) values for companies in the NGOs sector*

### NGOs

- 1. Meaningfulness of Work (C)
- 1. Meaningfulness of Work (E)
- 2. Engagement (C)
- 2. Engagement (E)
- 3. Passion (C)
- 3. Passion (E)
- 4. Cooperation (C)
- 4. Cooperation (E)
- 5. Communication (C)
- 5. Communication (E)
- 6. Support (C)
- 6. Support (E)
- 7. Autonomy (C)
- 7. Autonomy (E)
- 8. Health Emphasis (C)
- 8. Health Emphasis (E)
- 9. Common Values (C)
- 9. Common Values (E)
- 10. Trust Commitment (C)
- 10. Trust Commitment (E)

Values: 4.25, 4.25, 3.75, 4.00, 3.75, 3.92, 3.75, 4.08, 3.58, 4.00, 3.25, 3.92, 3.75, 4.17, 3.50, 4.08, 4.00, 4.50, 4.08, 4.42

**Figure 4:** *Current (C) and Expected (E) values for companies in the private sector*

### Private Sector

- 1. Meaningfulness of Work (C)
- 1. Meaningfulness of Work (E)
- 2. Engagement (C)
- 2. Engagement (E)
- 3. Passion (C)
- 3. Passion (E)
- 4. Cooperation (C)
- 4. Cooperation (E)
- 5. Communication (C)
- 5. Communication (E)
- 6. Support (C)
- 6. Support (E)
- 7. Autonomy (C)
- 7. Autonomy (E)
- 8. Health Emphasis (C)
- 8. Health Emphasis (E)
- 9. Common Values (C)
- 9. Common Values (E)
- 10. Trust Commitment (C)
- 10. Trust Commitment (E)

Values: 4.10, 4.49, 3.88, 4.40, 3.99, 4.47, 4.25, 4.58, 3.88, 4.46, 4.00, 4.43, 3.62, 4.33, 3.69, 4.35, 3.70, 4.26, 3.85, 4.43

**Figure 5:** *Current (C) and Expected (E) values for companies in the public sector*



**Public Sector**
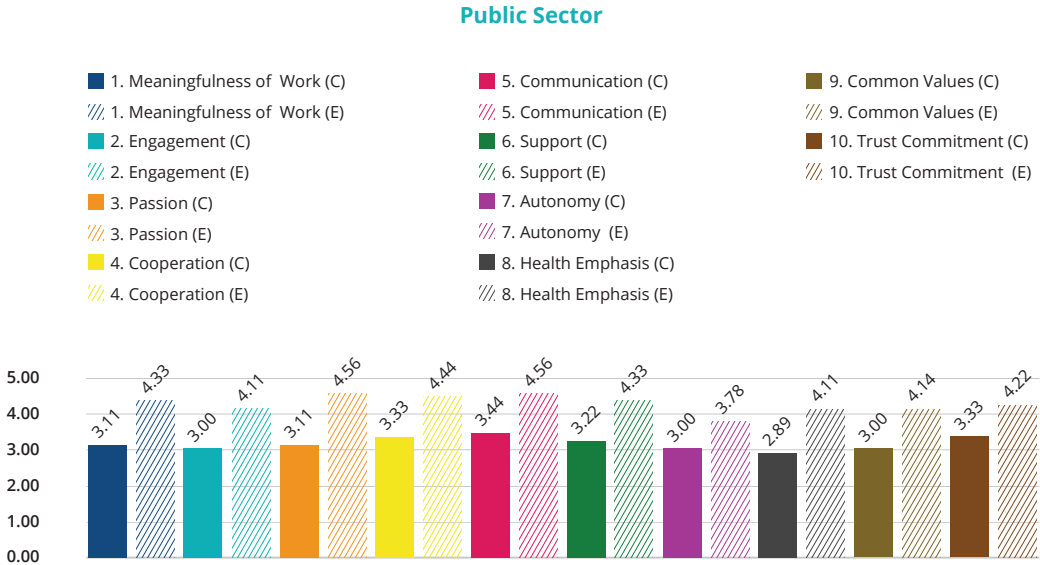
Furthermore, from the data, it seems that retail is the typology of business presenting the highest gap between the current value and the expected value, depicting a scenario where Cambodian businesses involved in the activity of selling goods or services directly to consumers or end-users is presenting the higher space for improvement. Following retail, we find education. In figure 5, the gaps between expected and current are reported, based on the typology of business.

**Figure 6:** *Gap between Expected (E) and Current (C) level for each value, divided by typology of business*
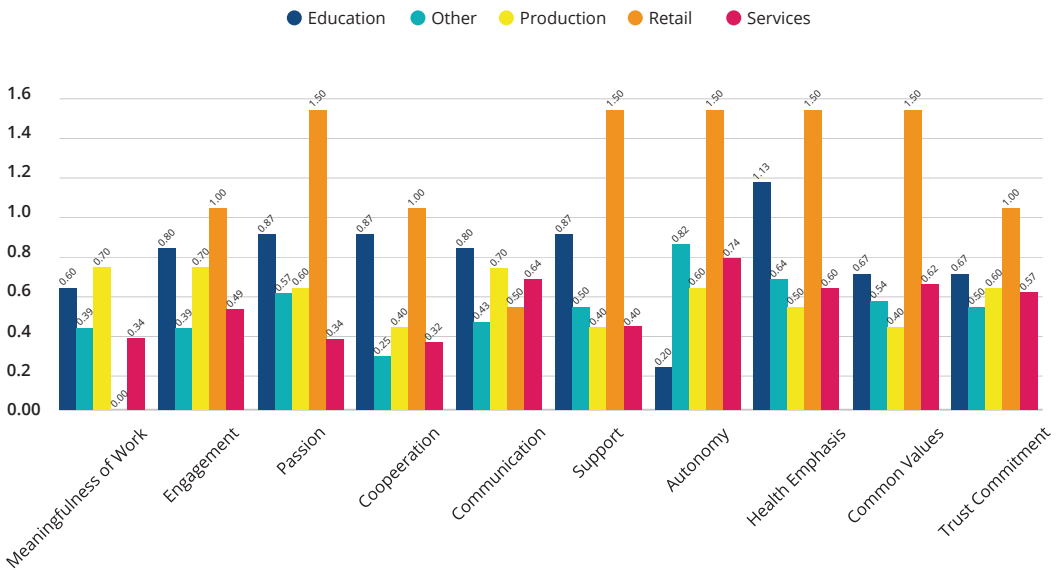
Additionally, when considering the gaps by size, we notice that on average, the higher gap between current and expected values is present in the large size businesses (over 250 employees), with an average of 0.66. This gap is correlated with the size of the business, and in fact, it decreases with the decreasing of the size. In short, this can be expressed with the statement: the bigger the company the higher the gap in changed values.

*Figure 7:* *Gap between Expected (E) and Current (C) for each value, by the size of business*
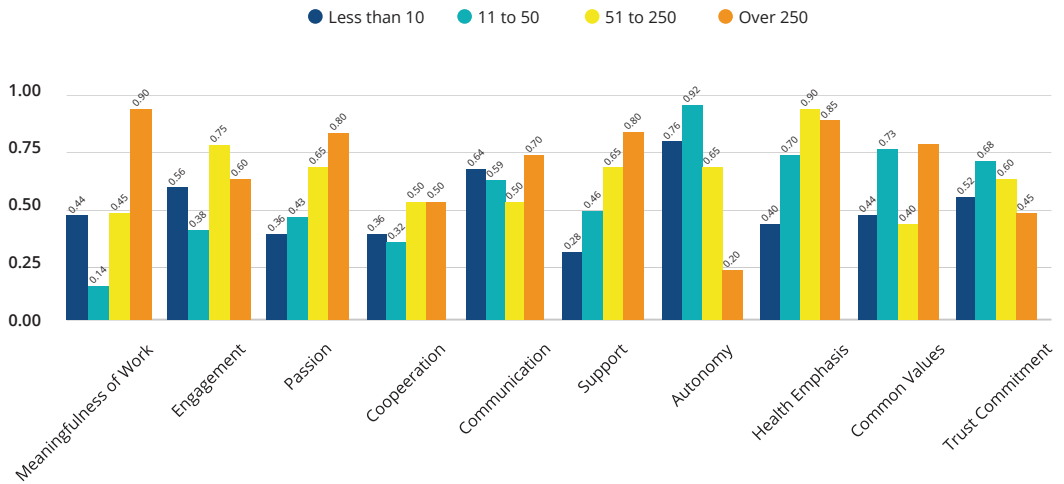


Furthermore, the last section of the questionnaire focused on analyzing the current digitalization status within the businesses that participated in the research. To investigate the current digitalization, we considered six indexes, namely Digitalization of Analogue Data, Digitalization of Biometric Data, Platforms of Digital Interaction, Networking Big Data Analytics, Fast Analytics (e.g., feedback), Predictive Analytics (e.g., in marketing), and GDPR (customer protection), also listed in table 1. From the results, the education sector is the one showing the major lack of digitalization among all the businesses, while services on average, are the one most advanced in terms of digitalization. The results for the current (C) digitalization status are reported in the following chart (figure 8).

*Figure 8:* *Current digitalization*
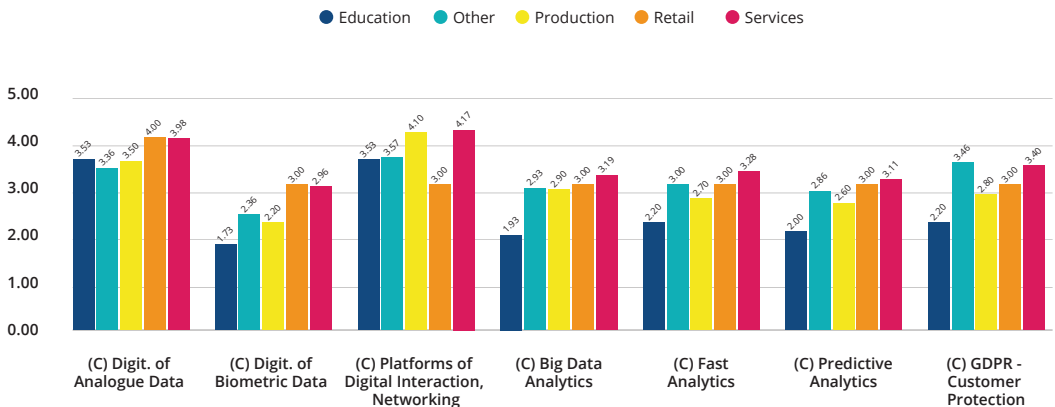
When focusing on the gaps between the current and expected digitalization of a business by typology, we notice that retail is the one presenting the current wider gap between current and expected digitalization. These results could be interpreted as pointing to retail as the most ambitious business typology, foreseeing a higher digital consciousness, but still low digital readiness. To confirm this interpretation, a further investigation should be conducted.

Additionally, when analyzing the correlation between the different digitalization indexes (at the current level) we found the digitalization of analog data being moderately correlated with all the other indexes other than digitalization of biometric data, and GDPR, and customer protection. This is quite understandable since the first step for relying on digital solutions is to digitize yourself, thus convert data into a digital form that can be processed by ICT. The other indexes showed a moderate (or higher) correlation only between the analytics indexes (big data, fast and predictive analytics).

**Figure 9:** *Gap between Current (C) and Expected (E) digitalization*
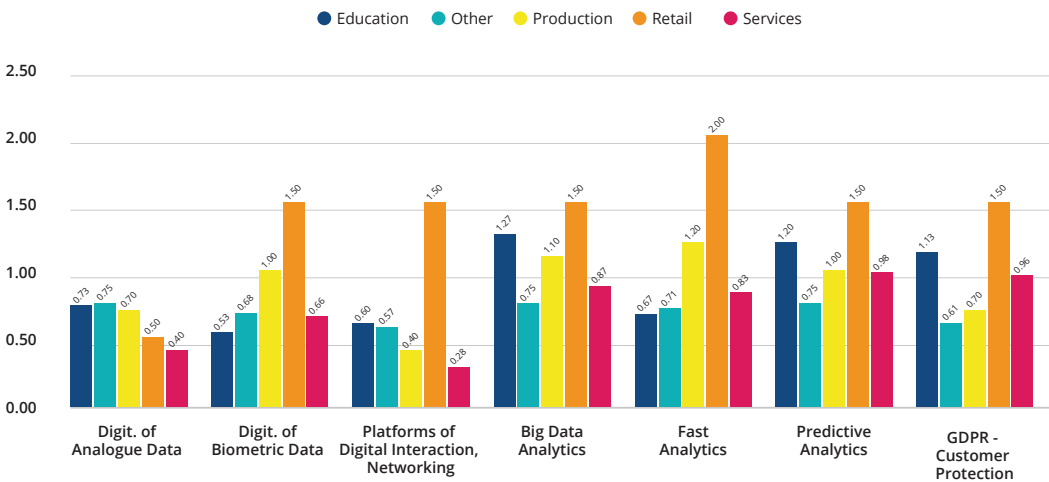


Furthermore, analyzing the digitalization gap between expected and current status by the size of the business, we find an overall similar scenario across size, with a higher gap present for digitalization of data in the large companies. This shows how larger companies are currently prioritizing the transition of their processes to their paperless version while desiring to rely on digital data to use for possible business intelligence operations. In addition, a relatively large gap is present for all the sizes of the company, across all the analytics categories, and also in the GDPR and customer protection category. These results seem to confirm the aforementioned assumption on the importance given to digital data for driving business intelligence operations, mostly for larger-size companies.

*Figure 10: Gap between Current (C) and Expected (E) digitalization, by the size of business*



● Less than 10  ● 11 to 50  ● 51 to 250  ● Over 250
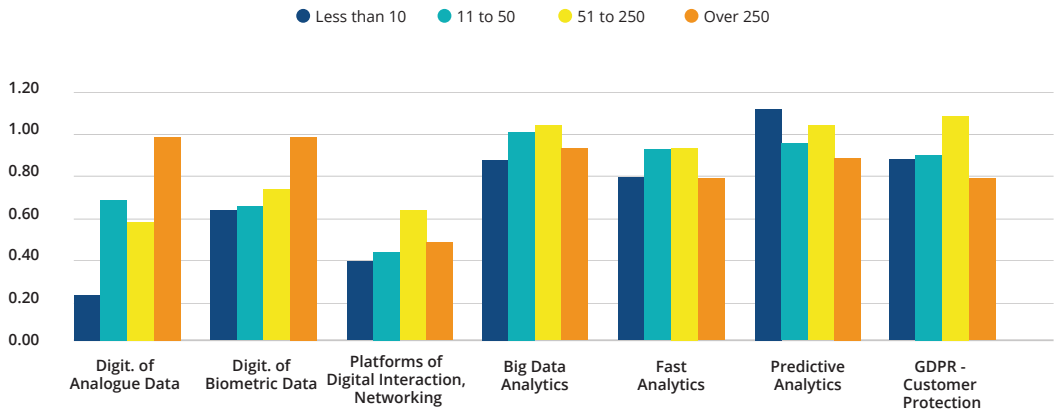
Analyzing the gap between sectors instead, we find that the gap is very evident with the public sector and even lower for the NGOs.

*Figure 11: Gap between Current (C) and Expected (E) digitalization, by sector*



● NGO  ● Private Sector  ● Public Sector
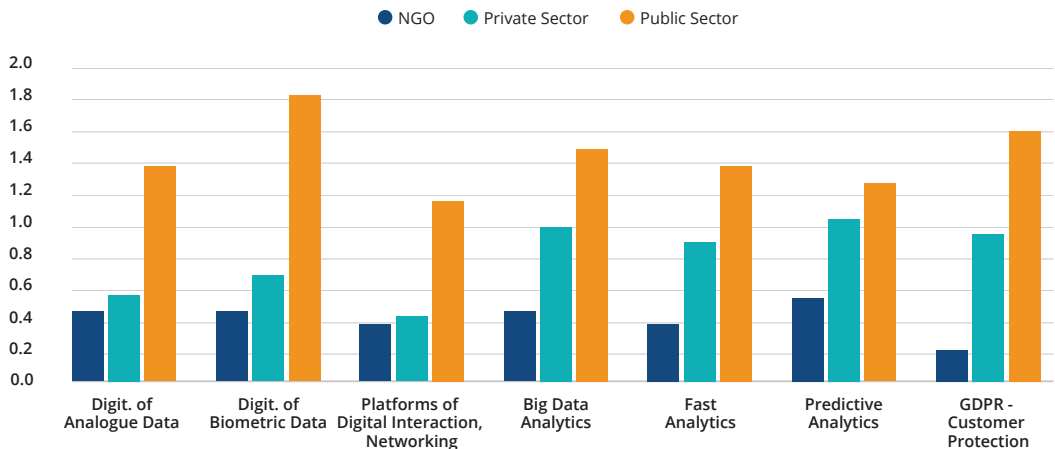
It is important to notice that these gaps are based on the differences between expected and current digitalization, but the expected digitalization is not constant across sectors. Thus, for instance, the public sector could expect a higher digitalization compared to the NGO sector, due to the necessity to serve a greater number of people, and due to the general governmental requirements, or national plans.

Regarding the obtained data, we can see how the retail sector is the one that is showing the biggest gaps in the business values, with passion, support, autonomy, health emphasis, and common values across employees recording the biggest gap between current and expected levels, while large businesses suffer the most (would like to reach a higher level of) in terms of meaningfulness of work, engagement, passion, support, and health emphasis. On the other hand, smaller companies (1-10 employees) tend to lack autonomy. Analyzing across the sector,

the NGO sector is the one with the smallest gap between current and expected values, with the public sector instead of being the one with the largest one. This depicts a scenario where the Cambodian public sector shows the largest gap across all values, and thus the sector that requires a bigger step to fill the discrepancy between current status, and required one.

Finally, when analyzing the digitalization process in Cambodia, the first thing appearing is that big data analytics, fast analytics, and predictive analytics, with GDPR and customer protection, are showing a large margin of improvement, considering the envisioned or required levels (expected). Another important aspect to consider is that education is in the last position in every digitalization index, but one (digitalization of analog data). But when looking at the gap between expected and current levels of digitalization, education remains in the last position. This shows a lack of digitalization in the education sector, and also a relative lack of commitment in digitalizing the sector. Furthermore, for businesses working in the retail field a bigger gap between the current and expected level of digitalization is present.

In summary, relying on this study, these authors focused on analyzing the current situation in the Cambodian context, targeting companies operating in Cambodia. After collecting more than 100 answers, we identified retail as the field of business presenting the larger gap between current and expected values, and thus, the one majorly disrupted by the technological innovations crossing the Cambodian ecosystem. Across sectors instead, the public one is showing the largest space for improvement, reporting the larger gap between current and expected values. Regarding education, the sector should be careful to not fall behind in the digitalization

process, losing the opportunity to take advantage of technological affordances for fostering the preparation of the new Cambodian generations. The obtained results are showing a current lack of commitment to transitioning toward a complete digitalization of the sector. Furthermore, big data analytics, fast analytics, and predictive analytics are all indexes showing a large gap between the current level and expected level, depicting a scenario where Cambodian businesses, even if currently lacking on it, envision a near future where they use data as a pivotal element to improve their business, and thus use data as the new gasoline for their engines.

## Conclusions

With the increasing pervasion of digital technology in our society and across the world, we are experiencing a progressive change within the business ecosystem. Business processes are changing and with them also the values in those companies that are facing a disruptive transition toward Industry 4.0. Industry 4.0 has been identified as a cross-cutting theme of many disciplines that influence each other. Its implementation in each company and ecosystem requires continuous innovation and education that not only relies and depends on people's abilities but also on the organizational culture of that ecosystem. The business culture itself is facing a transition and change in its values, with some new values, before not being prioritized, now rising to the surface of the priority list of many realities. Blštáková et al.[48] considering the reshaping and changing process of the values of management of people in the companies that are approaching or embracing the industry analyzed the relationship between

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**48.** Blštáková et al.

technological innovations and digitalization with value transformation influencing people management in the industry 4.0.

Relying on the research work aforementioned, we investigate the Cambodian ecosystem, and in accordance with the results, these authors identified retail as the area with the major gap to fill between current and expected readiness, with education instead, being the one less disrupted by technological innovation, and thus, once more, the slowest ecosystem to adapt to innovation and societal changes. Finally, the importance of data, defined as the new oil, is prominently rising like the new fuel for Cambodian companies. Even if, at this moment, Cambodia seems not yet ready to fully exploit and benefit from the the power of data, yet it can still envision a near future driven by it.
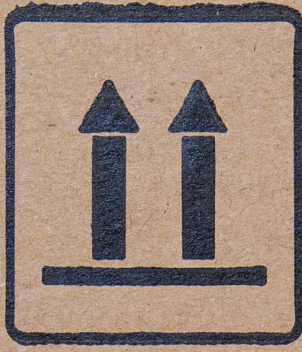
DE IN CAMBODIA
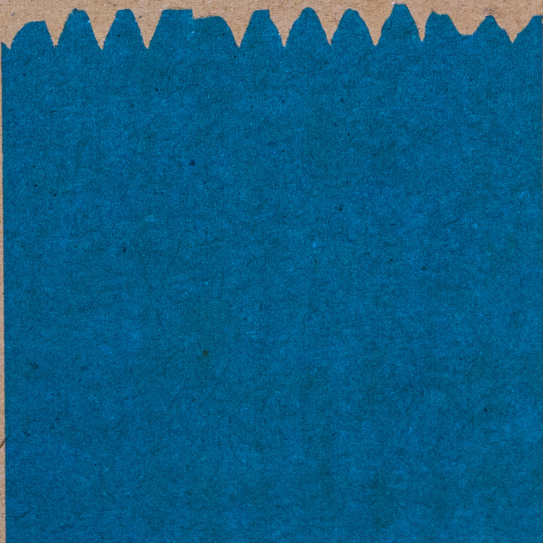
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# Mental Well-Being Interventions in the Future Cambodian Workplace

SOVANN Pichpisey          DOUNG Sovanratana

## Abstract

The mental well-being of employees is vital and linked to an increase in work productivity. In addition to mental well-being, prevention and support of mental well-being should be prioritized and seriously considered by employers to ensure the quality of work performance and work-life balance of their employees. This paper aims to explore measures employers can take to support the well-being of their employees.

Employees need technology-based mental healthcare to cater their needs more than ever before.[1] However, in the Cambodian context, the scarcity of measures dedicated to addressing mental health issues is a growing problem. This paper obtains perspectives from highly experienced professionals by using semi-structured interviews.

The results show that a centralized approach to tackling mental health issues in Cambodia has yet to be developed. This is due to missing financial support and top-down approaches that increase awareness of mental health at the national level through partnerships with employees' and employers' organizations and other stakeholders. Current mental health preventive measures are exclusively done at the organizational level.

There is an absence of strategic planning for mental health awareness-raising in the Department of Mental Health and Substance Abuse of Ministry of Health in Cambodia; however, once emerged as a national priority of the national health policy, the strategic plan should be reinforced by concrete policies to encourage employees' and employers' organizations to allocate effort and resources for the mental well-being of their employees.

In promoting mental well-being and preventing mental health issues to fulfill employees' health and safety at work, much remains to be translated from other countries such as Singapore, Germany, and the United States to Cambodia. Such examples include mental health recovery, guidance to support employees' mental wellness, mental risk prevention programs, psychoeducation programs, extensive fringe benefits, and flexible work environments.

The findings of the paper suggest developing a mental health legislative framework and translating policies into practice through a collaborative effort with local psychological experts and international organizations to raise public awareness about mental health. In turn, this would encourage employees' and employers' organizations to address the mental well-being of their employees.

Finally, psychosocial interventions and initiatives should be contemplated by relevant organizations committed to promoting mental health in Cambodia. These interventions should be towards the objective of making mental well-being a widely discussed topic, and psychological support more accessible. In conclusion, the awareness of the significance of mental health disorders in the workplace is growing, resulting in higher job satisfaction and productivity.

## Background

Cambodia's economic growth depends on its working population. Work has become a core element of contemporary life for most people. People thrive to achieve significant performance, which can cause stress, burnout, and anxiety. Employers

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**1.** Ginger, Workforce Attitudes toward Mental Health (San Francisco, CA: Ginger, 2020).

must be attentive to their employees' mental well-being. As important as increased work productivity, mental well-being should be contemplated to leverage workplace productivity.

A study to examine the impact of the COVID-19 pandemic on global psychological distress yields an interesting finding on the level of stress globally. Over 70% of the respondents in the study had greater than moderate levels of stress, with 59% identified for clinical anxiety and 39% with moderate depressive symptoms.[2] A survey conducted by Ginger[3] in 2020 suggests 59% of U.S. employees are reported to have cried at work.[4] In May 2021, Professor Anthony Klotz of Texas A&M University brought attention to the current habits among the working population driven by the COVID-19.[5] "The Great Resignation", coined by Professor Anthony Klotz forecasts a large number of people resigning from their current jobs after returning to "normal" working habits in a post-pandemic future. The author suggests that this is because people have become more at ease working in their own space during the pandemic.[6] The claim is based on the behavior of people during an uncertain time. It is affirmed that people behave "conservatively" during an uncertain situation[7], in this case, taking advantage of

quarantine. The alternatives people have chosen during COVID-19 exposed how "artificial, unnecessary, and abnormal" the "normal" workday was.[8] This revelation over the abnormality of the normal workday before COVID-19 has led to a reconsideration of previous working habits - Is the normal workday healthy for people? What should be the new norm? When working remotely, people have started to pay closer attention to the way they communicate, and their overall work environment.[9] WHO constitution defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[10]  While being healthy is being physically, mentally, and socially well, one question being proposed for this concern: Is mental well-being in the workplace an essential consideration in the new normal?

Prevention is now a crucial relief mechanism to most modern healthcare systems. Likewise, preventive measures designed to nourish the moral and mental well-being of the working population are core elements of a successful organizational culture. The setting of a workplace plays an important role in preventing work-related risks. The practical benefits of protecting employees from mental health issues should be grasped both at the individual and organizational levels.[11] At the individual level, employees may practice self-care to remedy occupational mental problems. At the organizational level, mental well-being interventions designed to prevent

2. Prerna Varma et al., "Younger People Are More Vulnerable to Stress, Anxiety and Depression during COVID-19 Pandemic: A Global Cross-Sectional Survey," Progress in Neuro-Psychopharmacology and Biological Psychiatry 109, no.3 (July 13, 2021): 110236, https://doi.org/10.1016/j.pnpbp.2020.110236.

3. Ginger is a company based in the U.S. providing a mobile mental health platform to employers. Further information visit https://www.ginger.com

4. Ginger, Workforce Attitudes toward Mental Health (San Francisco, CA: Ginger, 2020).

5. Jonny Thomson, "Great Resignation: COVID Revealed Abnormality of Office Work - Big Think," accessed May 24, 2021, https://bigthink.com/culture-religion/great-resignation-abnormal-modern-workplace.

6. Ibid.

7. Ibid.

8. Ibid.

9. Ibid.

10. WHO, "Constitution of the World Health Organization," World Health Organization, October 9, 2006, https://www.who.int/publications/m/item/constitution-of-the-world-health-organization

11. Ron Z. Goetzel et al., "Mental Health in the Workplace: A Call to Action Proceedings from the Mental Health in the Workplace: Public Health Summit," Journal of Occupational and Environmental Medicine 60, no. 4 (April 2018): 322–30, https://doi.org/10.1097/JOM.0000000000001271.

mental disorders should be more holistic - reviewing mental well-being at work as a person's wellness and not just their illness or condition. As the world recovers from the pandemic and organizations adapt to a "new normal" in working habits, this research paper seeks to answer the question: What measures can employers take to support the well-being of their employees?

## Mental Health in the Cambodian Society and Workplace

A mental health survey conducted by Department of Psychology, Royal University of Phnom Penh in 2012 with 2600 adults aged from 21 in nine provinces of Cambodia reports high prevalence of suicide attempts, post-traumatic stress disorder (PTSD), and anxiety disorder.[12] According to the same study, 27.4% of the total respondents constituted anxiety and 16.7% depression while 2.7% with symptoms of PTSD.[13] In 2014, the mental health team at Chey Chumneas Referral Hospital, Takhmau, provided a total of 5227 consultations to patients with neuropsychiatric symptoms (29%) and mental health problems (11%).[14] Around 200,000 Cambodians have been prescribed mental and psychological support and care from TPO Cambodia[15], suggesting the mental health dimension of employee support should be a serious consideration of employers.

The right working environment and mental well-being is a package deal. Take remote working as an example. Direct communication is a mandatory element at work; although, with technology that enables remote work, people do prefer direct communication with their colleagues. In Finland, effort in promoting mental well-being is embedded with the work environment such as clear communication, independence at work, learning opportunities, and communal healthy lifestyle practices.[16] As stated by the World Health Organization, burnout can be associated with the work-related context, with the exclusion of other perspectives of life experiences.[17] Burnout is stress resulting from chronic work overload which has yet to be resolved. It imposes a negative effect on job performance, resulting in decreased work productivity, lowered job satisfaction and increased absenteeism.[18] Absenteeism is defined as an inability of individuals to appear for work or to accomplish tasks. While Absenteeism causes a great amount of negative impact on the productivity of work of the employees, burnout at the workplace can dangerously exploit employees' mental well-being.

Mental health issues have been increasingly recognized. A study by Ginger in 2019 suggested that employees were more likely to seek help with stress, anxiety, and depression now than they were five years ago.[19] Extraordinarily, 91% of employees

**12.** Schunert Tanya et al., Cambodian Mental Health Survey 2012 (Phnom Penh, Cambodia: Royal University of Phnom Penh, Department of Psychology, 2012).

**13.** Ibid.

**14.** Vikram Patel et al., "Promoting Child and Adolescent Mental Health in Low and Middle Income Countries," Journal of Child Psychology and Psychiatry, and Allied Disciplines 49, no. 3 (March 2008): 313–34, https://doi.org/10.1111/j.1469-7610.2007.01824.x.

**15.** "About Us," TPO Cambodia, accessed June 7, 2021, https://tpocambodia.org/tpo-about/.

**16.** Gabriel Phyllis and Riitta Liimatainen Marjo, "Mental Health in the Workplace," Report, April 1, 2000, http://www.ilo.org/skills/pubs/WCMS_108221/lang--en/index.htm.

**17.** "Mental Health Atlas 2017: Resources for Mental Health in the Eastern Mediterranean Region," World Health Organization, 2019.

**18.** Carl Strömberg, Emmanuel Aboagye, Jan Hagberg, Gunnar Bergström, and Malin Lohela-Karlsson, "Estimating the Effect and Economic Impact of Absenteeism, Presenteeism, and Work Environment–Related Problems on Reductions in Productivity from a Managerial Perspective," Value in Health 20, no. 8 (September 1, 2017): 1058–64. https://doi.org/10.1016/j.jval.2017.05.008.

**19.** Ginger, Workforce Attitudes toward Mental Health (San Francisco, CA: Ginger, 2019).

believed that their employers should care about their emotional health.[20] Mental health policies developed as part of social policy are more substantial because every individual should play a role in addressing mental health issues. Stakeholders representing various sectors in the development and implementation of the policy as well as the society should address the issues in the broader social contexts, for example, workplace.[21] Although the stigma associated with seeking help regarding mental health is decreasing, a third of respondents in Ginger's study had to pay for psychological health services out of their own pocket.[22] There is an awareness of the existence of mental difficulties at work, but the scarcity of measures dedicated to addressing mental health issues is still a growing problem of Cambodia as a whole.

## Psychological Interventions

Mental difficulties have multifactorial causation, usually associated with occupations. While occupational risks can damage both physical and mental health, mental stability should be equally (compared to physical health) and strongly promoted through a considerate point of view. The convention of workplace health and safety is set to minimize or remove risks associated with work[23], manage distress at the workplace, and increase team morale.

Organizational intervention is generally reckoned among the most effective action addressing mental difficulties at work. As of now, the little attention and little evidence to support organizational interventions in Cambodia are crucial to shift the attention of the working populations, specifically employers, in prioritizing the mental well-being of the employees and finding interventions to cope with the issues.

Employees need technology-based mental healthcare to cater to their needs.[24] The emergence of telehealth has shown positive results for mental health prevention and solutions.[25] Telehealth is a delivery method of health services by health care professionals and self-care through digital communications and technologies.[26] Some effective and trending mobile applications for mental health concerns being used nowadays are illness management and supported care, passive symptoms tracking, self-management applications, and improving thinking skill applications.[27]

Amidst the Covid-19, Singaporean government and employers practically respond to the mental health crisis.[28] With government support and committed employers, Singapore has ceased mental health stigma and provided support to those in need even before the pandemic. In 2019, Singapore's president had raised more than USD 13 million to help individuals with mental issues.[29] With support for their employees' mental well-being, Singapore

**20.** Ibid.

**21.** WHO, "Promoting Mental Health: Concepts, Emerging Evidence, Practice: A Report of the World Health Organization, Department of Mental Health and Substance Abuse in Collaboration with the Victorian Health Promotion Foundation and the University of Melbourne," Report, 2005, https://apps.who.int/iris/handle/10665/43286.

**22.** Workforce Attitudes toward Mental Health, 2019.

**23.** Richard Graveling, Joanne Osbourne Crawford, and Harry Cowie Chiara Amati, "A Review of Workplace Interventions That Promote Mental Wellbeing in the Workplace," Draft Report, Edinburgh: Institute of Occupational Medicine, February 13, 2008, https://www.researchgate.net/publication/239615077_A_Review_of_Workplace_Interventions_that_Promote_Mental_Wellbeing_in_the_Workplace.

**24.** Ginger, Workforce Attitudes toward Mental Health (San Francisco, CA: Ginger, 2019).

**25.** Ibid.

**26.** Ibid.

**27.** Ibid.

**28.** Garen Staglin, "Singapore: An International Model For Mental Health," Forbes, accessed July 28, 2021, https://www.forbes.com/sites/onemind/2021/04/06/singapore-an-international-model-for-mental-health/.

**29.** Ibid.

Tripartite Advisory on Mental Well-Being at Workplace is determined to provide practical guidance and resources to committed employers.[30] A year later, the Covid-19 Mental Wellness Taskforce was assembled to address the mental health needs of the citizens amidst the Covid-19.[31] The Taskforce serves as a cross-agency platform to help the nation develop a post-pandemic mental health strategy.[32] Furthermore, the Jardine MINDSET Singapore was established in 2011 to provide mental health assistance to Singaporeans.[33] Five years after the establishment and the acknowledgment of the relationship between work and mental health with the Singapore Association of Mental Health, it established the MINDSET Learning Hub that prepares and trains individuals to recover from mental issues and be brought back into the community and labor market.[34]

In Germany, a systematic health procedure called "health circle" is a great example of organizational interventions. The procedure emphasizes identifying issues and finding solutions to hazards in the work environment, and has been implemented with high efficacy and acceptance from the public.[35] Health circle gathers related stakeholders of firms to pin down the related hazardous working environment and establish solutions to the problems. Moreover, German workplaces have successfully implemented stress prevention and reduction programs that include relaxation, play-acting, and behavioral training. In the United States, employers acknowledge the importance of mental

health in association with work productivity. They implemented supportive strategies for their employees including flexible working hours, part-time schedules, child-care benefits, family counseling, personal leave, and mental well-being programs.[36] Measures taken by employers in Singapore, Germany and the United States including mental health recovery, guidance to support employees' mental wellness, mental risk prevention programs, psychoeducation programs, extensive fringe benefits, and flexible work environment are contextually appropriate for Cambodia.

## Legislation and Compliance

The 2016–2020 Health Strategic Plan by the Ministry of Health acknowledges the need to develop services for mental health problems in Cambodia. The Department of Mental Health and Substance Abuse in Cambodia was established to reinforce this strategic plan through building more than 400 mental health centers.[37] . NSSF[38] leverages two key mechanisms, prevention of work-related and non-work-related diseases and injuries.[39] The scheme includes health benefits, risk prevention, medical care services, daily allowance for the absence from work due to sickness or other accidents in the exemption of work injury, and maternity leave.[40]

**30.** Ibid.

**31.** Ibid.

**32.** Ibid.

**33.** Ibid.

**34.** Ibid.

**35.** Phyllis and Marjo, "Mental Health in the Workplace."

**36.** Ibid.

**37.** Sen David, "Ministry Ups Mental Health Centres - Khmer Times," Khmer Times, February 3, 2019, https://www. khmertimeskh.com/575069/ministry-ups-mental-health-centres-2/.

**38.** The National Social Security Fund (NSSF) is an implementation body under Occupational Risk and Health Care to ensure income stability and promote social stability.

**39.** Roeun Setharun, "National Social Security Fund (NSSF) Disseminated Policy Implementation of Social Security Schemes To Estimated 180 Civil Servants And Contract Officials In Siem Reap Province," National Social Security Fund (blog), February 15, 2019, http://www.nssf.gov.kh/default/2019/02/15/national-social-security-fund-nssf-disseminated-policy-implementation-of-social-security-schemes-to-estimated-180-civil-servants-and-contract-officials-in-siem-reap-province/.

**40.** Ibid.

Asymmetrically, mental health resources in Cambodia are still scarce; only 0.02% of the total government health expenditure (which itself is already low) is allocated to the mental health sector.[41] Employees in Cambodia are entitled to fringe benefits including health and life insurance, NSSF scheme, and many others.[42] On the contrary, major mental disorders such as psychosis, bipolar and depression treatment are not found in the required health insurance plans.[43] In addition to the lack of emphasis on mental health in employees' fringe benefits, a legislative framework concerning the mental well-being of the public is yet to be developed and enacted.

On the contrary, the Malaysian Ministry of Health's report showed around 7% among 273,203 individuals who undergo health checkup diagnosed with a history of depression in 2017[44] even though the Malaysian Mental Health Framework and the National Operational Plan of Action for Comprehensive Integrated Community Mental Health Services (CMHS) was formulated in 2002.[45] The Occupational Safety and Health (OSHA) law, providing a legislative framework for both employers and employees to collaborate to cultivate a secure, safe, and healthy workplace, was enacted in 1994 and has been enforced since then.[46]

It is also noteworthy to acknowledge 12% of people in the UK diagnosed with mental health problems are in the working population. In the early 1990s the Department of Health brought attention to address mental health issues in the workplace to employees' and employers' organizations.[47] This results in a 1999 White Paper, "Saving Lives: Our Healthier Nation," to raise awareness of mental health problems as an indicator of illness and disability in the UK.[48] The Ministries for Public Health and for Safety and Health of the UK launched "Healthy Workplace Initiative" that comes with guidelines on mental problem prevention and management at work to be practiced by organizations.[49] Therefore, employers are bound to comply with appropriate work environment arrangements for employees.

Meanwhile, in Cambodia, three non-governmental organizations are key players in tackling mental health issues. The organizations, supported by international NGOs and organizations, advocate for mental health prevention, promotion, treatment, and rehabilitation. The Transcultural Psychosocial Organization (TPO) and the Social Service du Cambodge (SSC) train people at community level to be able to develop self-help groups and aid.[50] TPO provides a large variety of mental health services with an emphasis on the cultural context of Cambodia, while SSC aims to dismantle the stigmas associated with mental health in Cambodia with help from the Municipality Government.[51] The Centre for Child Mental Health (CCMH) is

**41.** "Ministry Ups Mental Health Centres - Khmer Times."

**42.** PwC Cambodia, Cambodian 2018 Tax Booklet (PwC, 2018), https://www.pwc.com/kh/en/tax/cambodian-2018-tax-booklet1.pdf.

**43.** WHO, "WHO | Mental Health ATLAS 2017," WHO (World Health Organization), accessed June 7, 2021, http://www.who.int/mental_health/evidence/atlas/mental_health_atlas_2017/en/.

**44.** Azura Abas and Siti A'isyah Sukaimi, "Dr Wan Azizah: Time to Review Malaysia's Mental Health Policy," NST Online, October 11, 2018, https://www.nst.com.my/news/nation/2018/10/420119/dr-wan-azizah-time-review-malaysias-mental-health-policy.

**45.** Marhani Midin et al., "Mental Health Services in Malaysia," Taiwanese Journal of Psychiatry 32, no. 4 (2018): 281–93.

**46.** Ibid.

**47.** Phyllis and Marjo, "Mental Health in the Workplace."

**48.** Ibid.

**49.** Ibid.

**50.** Daya J. Somasundaram, W A van de Put, M Eisenbruch, and J T de Jong, "Starting Mental Health Services in Cambodia," Social Science & Medicine 48, no. 8 (April 1999): 1029–46, https://doi.org/10.1016/S0277-9536(98)00415-8.

**51.** Tanya et al., Cambodian Mental Health Survey 2012.

a child and adolescent assessment and treatment center in Phnom Penh that helps children in the community, at school and their center by providing counseling and awareness-building services.[52]

# Research Methodology

Due to the exploratory nature of this paper, it allowed the exploration and comprehension[53] of mental health at work and the roles of workplace interventions through practices reported in past studies and recommendations from experts. The paper employed a qualitative method to obtain perspectives from highly experienced professionals. To assimilate the current state of mental well-being among the working population in Cambodia, interviews with leading experts were conducted. Representatives from the United Nations Development Programmer (UNDP)[54] and the Director of Khmer Counseling and Psycho-Education in Cambodia (KCPS)[55] were selected to participate.

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**52.** Somasundaram et al., "Starting Mental Health Services in Cambodia."

**53.** John W. Creswell, Research Design: Qualitative, Quantitative and Mixed Methods Approaches, 4th edition (Thousand Oaks: SAGE Publications, Inc, 2014).

**54.** UNDP Cambodia has been around for more than 50 years with an aim to support the government in catering public services to the population through participatory democracy by creating a responsible civil society and an enabling environment for inclusive growth. Their recent focus is to promote decent employment among youths and to prepare them for the 4th industrial revolution. Further information can be found here: https://www.kh.undp.org/content/cambodia/en/home/about-us.html.

**55.** KCPS is established by a group of professional and reliable psychiatrists in Cambodia with a commitment to promote positive mental well-being of the population and "well-rounded" human resources in Cambodia. Further information can be found here: http://www.khmer-cps.com/en/2020/05/13/%e1%9e%a2%e1%9e%b6%e1%9e%98%e1%9f%81%e1%9e%9a%e1%9e%b7%e1%9e%80%e1%9e%93%e1%9f%85%e1%9e%8f%e1%9f%82%e1%9e%94%e1%9e%93%e1%9f%92%e1%9e%8a%e1%9e%85%e1%9f%84%e1%9e%91%e1%9e%94%e1%9f%92%e1%9e%9a%e1%9e%80-4/

# Findings and Discussion

## Mental Health in Cambodian Society and Workplace

Mental health problems in Cambodia are not a well-comprehended or elaborated issue. A respondent uttered that mental health is comparable to a contagious disease, not for it is a transmissible disease, but influenced by an individual's distress or mental problems. Most young people are to be impacted by psychological distress or have experienced distress. COVID-19 is viewed as a wake-up call for the abnormality of normal working behavior. It alarms the working population to reconsider their working behavior from working at a corner office or cubicle to working at home office or being an ultimate working nomad.

However, this sudden shift of their daily routine may contribute to the impact of their psychological state since working from home means less communication, long hours in front of a screen, inappropriate work environment setting, and poor time management. Employees with children find it challenging to manage their work-life balance, with their children studying from home and requiring their constant support. The effectiveness of the presented alternative work shifts is still questionable because people end up working in a confined space at home, with unpleasant background noise and ineffective time management. Children studying at home resulting from the closure of schools is an additional challenge. Lockdowns cease or slow down business operations, which directly impact the economy, at the same time, put burdens on people's mental state. Businesses are faced with revenue plummets. Employees are faced with salary cuts, and their expenses seem to skyrocket from stocking up food and necessities at home.

Our participants deem mental well-being as a sensitive topic. Social stigma of mental health still exists due to lack of mental health awareness. One of the participants explains that individuals with mental issues who seek psychological support are often perceived as emotionally weak. This perception could lead to a barrier to individuals suffering from mental health difficulties and in need of support. People seeking psychological help are often perceived as visiting doctors that consult severe mental disorders patients such as schizophrenia, a participant mentioned. The International Labour Organization (ILO) defines mental health difficulties or problems as a situation in which an individual experiences mild, though distressing; these problems can be prevented from developing into disorders when appropriately addressed or supported by professionals.[56] Considering Cambodian culture, an expert from our interviews anticipates that men are not encouraged to express their emotions or problems to preserve their perceived masculinity. The survey on mental health in Cambodia in 2019 of 2689 respondents in which women constitute more than 67% examine the needs of mental health services.[57] Only 7.6% of the respondents are aware of psychological programs or NGOs that provide support near them and 97.2% would like to have a psychological service at a health care center or clinic in their areas.[58] However, there are no major distinctions for gender in seeking psychological support.[59]

*When a person seeks psychological support, their peers would ask "Why are you going to a psychiatrist? Do you have a mental disorder?"*

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**56.** Phyllis and Marjo, "Mental Health in the Workplace."

**57.** Tanya et al., Cambodian Mental Health Survey 2012.

**58.** Ibid.

**59.** Ibid.

*"They often refer psychiatrists as Pet Chkout (ពេទ្យឆ្កួត)."*

## Mental Health Interventions

Workplace is a favorable environment in which individuals are able to get psychological education and raise their awareness about mental health difficulties to prevent them from developing. As a psychological counselor for multinational companies to provide psychological programs to corporations, a participant from our interviews voiced that only around 10% of companies in Cambodia, mostly multinational companies, and joint-venture companies, can provide mental health schemes for their employees voluntarily. Corporations that prioritizes their employees' well-being implement a large variety of interventions, ranging from non-technology-dependent to technology-dependent forms. Examples raised by the participants include advance salary, psychological webinars, confidential surveys, staff association, and quick friendly meetings. Many international companies competitively provide psychological support through psychotherapy, psychoeducation, psychosocial interventions, and psychological first aid, specifically to employees in giant corporations, which is in line with Dennis' and Hodnett's categories of mental well-being interventions.

*"It is a voluntary action of an organization to provide mental wellness support."*

*"Communities should play a role in creating support groups that are accessible and inclusive, especially for disadvantaged groups."*

Good mental health preventive and promotional practices can be included in human resource management policy to

play a role in early identification of mental health problems in the workplace.[60] Dennis and Hodnett (2007) categorize mental well-being interventions into psychosocial and psychological interventions.[61] Fallen under the psychological type, psychotherapy refers to consulting mental issues with a psychiatrist, psychologist[62], or psychological first aid provider, useful during pandemic time, aims to reduce symptoms of mental problems and assist individuals in a healthy recovery following a crisis.[63] A good example of psychotherapy can be counselling or consultations. While psychosocial is a combination of psychology and society, psychosocial interventions are actions that involve the community to alleviate the mental instability of an individual.[64] For example, psychoeducation is a systematic and structured intervention aiming to transfer knowledge for mental health problems and motivational aspects to enable individuals to cope with the issues.[65]

Both participants believe that technology can improve identification of mental health difficulties and provision of psychological support. Using technology as a means of delivering psychological support is always a case for international organizations in which employees from various countries

collaborate and communicate on a regular basis. For instance, organizations can invite specialists to host a webinar or online training on stress management or working with diverse groups.

*"Webinars are not new to some organizations because they work with their colleagues overseas every day."*

Not to mention, to ensure the work-life balance, surveys are conducted within organizations with confidential response. These confidential surveys are regularly conducted to identify employees' needs and to provide tailor-made psychological support through an in-house association or team dedicated to the well-being of their employees. From one of our participants' experience, the "Buddy System" is a system to assist new employees during their onboarding period. How the Buddy System works is to assign an existing employee to provide emotional support to new employees. Likewise, a referral system, recommended by another participant, was also mentioned. The referral system provides a certain direction to receiving proper psychological support from experts.

*"We have a system called Buddy System to provide support to new staff upon their onboarding."*

## Legislation and Compliance

While current trends of mental health preventive measures are being done at the organizational level, a centralized governmental approach to tackling mental health issues in Cambodia is yet to be developed due to the inadequate financial support and top-down approach to partnership. There is an absence of strategic plan for mental health awareness-raising in the Department of Mental Health

**60.** Satish Pandey, Workplace Stress and Mental Health: Issues and Concerns for HR Managers, 2006.

**61.** Cindy-Lee Dennis and Ellen D. Hodnett, "Psychosocial and Psychological Interventions for Treating Postpartum Depression," Cochrane Database of Systematic Reviews, no. 4 (October 17, 2007), https://doi.org/10.1002/14651858.CD006116.pub2.

**62.** Katarzyna Cieślak, "Professional Psychological Support and Psychotherapy Methods for Oncology Patients. Basic Concepts and Issues," Reports of Practical Oncology and Radiotherapy 18, no. 3 (May 23, 2013): 121–26, https://doi.org/10.1016/j.rpor.2012.08.002.

**63.** Guthrie S. Birkhead and Karla Vermeulen, "Sustainability of Psychological First Aid Training for the Disaster Response Workforce," American Journal of Public Health 108, no. Suppl 5 (June 27, 2018): S381–82, https://doi.org/10.2105/AJPH.2018.304643.

**64.** Dennis and Hodnett, "Psychosocial and Psychological Interventions for Treating Postpartum Depression."

**65.** Ibid.

and Substance Abuse of Ministry of Health Cambodia; however, once emerged as a national priority of the national health policy, the strategic plan should be reinforced by concrete policies to encourage organizations to allocate effort and resources in account of the mental well-being of their employees.[66] National Social Security Fund (NSSF) is a success story of nation-wide mental well-being intervention, which includes physical insurance and partially mental insurance. Moreover, international companies in Cambodia are complying with their corporal standards by allocating funds to provide mental health care and psychological support to their employees. The providers' benchmark on local counselors to provide recreational programs, counseling and therapy, and emergent interventions to their customers.

> *"Giant international corporations work with local psychological experts, usually hired by international organizations that provide psychological support, to support their employees' wellness."*

> *"The Department of Mental Health and Substance Abuse of the Ministry of Health Cambodia only has a strategic plan, but we need a policy to promote the mental well-being of the public."*

# Conclusion and Recommendations

## Limitations

The paper has three limitations within which our findings must be carefully interpreted. First, the availability of literature concerning the mental wellbeing in Cambodian workplace and its intervention are not available at our convenience. Such information often concerns publicity and reputation of an organization. Second, the sample selected for this paper was specifically highly experienced individuals representing relevant organizations. This paper did not explore the issues from the perspectives of the working population. The findings may not be completely generalizable. Third, the sample size of this paper is relatively small. However, the participants have profound understanding on the mental wellbeing at Cambodian workplace and society and have shared insightful information on the topic.

## Further Studies

The results of the present paper provide several possible avenues of future research. Further studies should explore:

- The differences between reinforcing the mental well-being of employees in large organizations and MSMEs.

- The kinds of support needed to enhance mental stability from employees' perspective.

- Effective psychological support is endorsed by both employees and employers.

- How mental disability or instability influences the operations of a business and the economy of Cambodia.

## Recommendations

Based on the findings and conclusion presented, the following recommendations are suggested:

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**66.** Phyllis and Marjo, "Mental Health in the Workplace."

## Government

- Mental health legislative frameworks should be developed to raise public awareness about mental health and to encourage the private sector to prioritize mental well-being of their employees.

- Government agencies, employers' and employees' organizations should work collaboratively in developing policy and enterprise-specific programs to address the prevention of mental health problems and the promotion of mental stability.

- A broad, coordinated approach concerning prevention and promotion still needs to be developed. There are rooms to move from policy to concrete practices in promoting mental health in the workplace.

- The government in Cambodia should translate policies into actions in partnership with local psychological experts and international organizations.

- Legislative initiatives that mandate working conditions to promote mental stability and prevent mental problems should be developed.

## Relevant Organizations

- Social partners, the government, advocates from the relevant organization, and employees' organizations, should seek partnerships to prioritize and address mental health concerns, and particularly, the impact of work or workplace on mental health.

- Organizations that are committed to promoting mental health in Cambodia should implement programs that involve the society in mental health discussion, known as psychosocial interventions.

- Organizations that are committed to promoting mental health in Cambodia should seek partnership with local psychological experts and the government to leverage the mental well-being of Cambodia as a whole.

- Impact investment to psychological solutions providers, to make the solutions more diverse and affordable, is needed to encourage both big organizations and MSMEs to prioritize their employees' mental stability.

- Incorporating a mental well-being plan in an annual strategic and action plan at organizational level is necessary to promote mental health in Cambodia.

## Conclusion

The paper addresses the need for a legislative framework to meet the needs of people with mental health problems in the workplace. In promoting mental well-being and preventing mental health issues to fulfill employees' health and safety at work, much remains to be done to translate examples into practice. Given the results of the current paper, the awareness of the significance of mental health disorders in the workplace is growing, which may result in higher job satisfaction and productivity in the future.

# ABOUT THE AUTHOR

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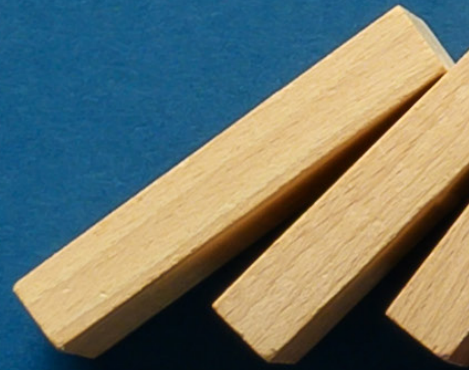
# SECTION 02.
# INDUSTRY DISRUPTION

**DIGITAL INSIGHT:** FUTURE OF WORK

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# Cyber Threats During COVID-19 Pandemic: The Risk at Your Fingertip

OU Phannarith      CHEA Vatana

# Background

As we are aware, COVID-19 has separated many people from one another physically. Most gatherings have to be conducted remotely. This includes daily work, meetings, training, etc. But as more and more people from all spheres of society, namely government, enterprise, education, go online and interact more frequently through digital technologies, their cyber vulnerability is also exacerbated - especially for end-users, who are less aware of the potential cyber threats that threaten them. In such a time of exponential growth of internet connectivity, there is also higher probability for monetary gain for cyber-criminals. The activity of cyber-criminals generally comes in the form of stealing data or ransomware, and so far, they are doing very well. Consequently, the variety and frequency of cyber-attacks has been growing in size, and on a variety of devices and equipment. This problem is only expected to grow. As technology adoption, especially internet penetration in Cambodia will continue to increase for the foreseeable future, it is expected that many more Cambodians may find themselves the targets for hackers and cybercriminals.

Besides briefly showing how the COVID-19 pandemic has changed the way we work and communicate, this paper attempts to answer three crucial questions: (1) What are the technological risks around online communication in Cambodia during the pandemic? (2) How can users adapt their digital workplaces? (3) What policy options can the government consider to manage the growing cybersecurity challenge? To answer these questions, the study used secondary research methods such as data requests from government and non-government agencies, as well as literature review of existing academic sources. In terms of research significance, the paper contributes to raising Cambodian users' fundamental knowledge of cyber threats and security, and the ways they can protect themselves from black-hat hackers.

# Cyber Threats

## Fraud / Scam

Throughout this pandemic, online money transfers or E-payment is mostly and popularly used to settle financial obligations to reduce face-to-face interaction, and hence reduce Covid-19 transmission possibilities. As a result, the number of online financial transactions has skyrocketed and online payment has become very convenient. However, the increasing volume of online financial transactions also provides fraudsters ample opportunities to take advantage of users who have little knowledge about common online scams, and thus are susceptible to them. These online scams usually begin with the fraudsters hijacking an email to impersonate suppliers. They then communicate with the victims who are told to make a money transfer to a new bank account of a sister company in another country because the suppliers' current account is not working or facing an issue prohibiting them to use it. Unaware of the email hijacking, the customers would often follow the impersonator's instructions believing that they were genuinely from their supplier. In some cases, the customers are tricked into sending millions of dollars to an unknown person, and the financial payment due to the real supplier remains unsettled, causing further issues.

## Business Email Compromised (BEC)

Another infamous fraudulent case is the Business Email Compromised (BEC). BEC is a type of high-level online scam that predominantly targets companies with a

number of overseas suppliers and who, as a result, make frequent wire transfers to them. While typical fraud generally involves deceiving customers, BEC mainly targets high-ranking employees in the companies or corporations who are responsible for such wire transfers. To make the attack work, hackers would attempt to hack the employees' email account using keyloggers, or via a phishing scam to obtain relevant information which can be used for future fraudulent transfers. Next, the hackers would try different strategies, a few of which are notable. First, one strategy is "CEO fraud", in which the cybercriminal attempts to impersonate the CEO of the company using the CEOs compromised email account – they then send an order to the responsible employees in the financial department to make large financial fund transfers to the hackers' account. Sometimes, the hackers' end goal is confidential business or financial information which can be sold on the black market. Because such a directive is from the CEO's real email account, the employees do not normally question such unauthorized transfers. According to the official account of the Federal Bureau of Investigation (FBI), BEC scams costs businesses in the United States two billion dollars between January 2014 and October 2019.[1] The global figure is most certainly higher, as the two billion does not consider any loss outside the United States, for which there is limited data. Third, a false invoice scheme, in which the personnel that works at the financial department will be targeted. In such an attack, the hackers, who control the network system and thereby have the ability to alter the original invoice, would change only the bank account number to which financial transfers should be made and keep everything else unchanged to make it look like a fully legitimate invoice from

suppliers and then send it to buyers who would find it very difficult to detect if it is fraudulent.

## Phishing Attack

Earlier, we have mentioned the phishing attack – a type of scam in which the attackers would send a spoofed message purporting to be from reputable companies to trick victims into revealing sensitive information such as personal data, account passwords, or credit card numbers. It should be highlighted that such information is sometimes also sold on the black market or underground forums. As a result, the attackers are not necessarily the stealers of personal credentials. Having said that, the phishing scam is on the rise due to its efficiency and effectiveness not only in acquiring individual information but also in getting into many companies' internal networks (through the acquired password and other personal information) even though most of them especially the big corporations have been protected by modern defense technical solution namely cloud technology and Artificial Intelligence (AI).

In Cambodia, recent phishing attacks were conducted using a social media network and cross-platform cloud-based instant messenger known as Telegram. Apart from sending text messages, Telegram can also be used for video calling and Voice over Internet Protocol (VoIP) services, and therefore it is one of the most, if not the most, popular messengers in the country. To put it into perspective, Telegram is used by not only typical Cambodian users but also government officials ranging from lower-ranking civil servants to the top leadership due to its alleged high security. However, even Telegram has security flaws. By creating a fake account with a real name and profile photo on Telegram, attackers would impersonate high-ranking

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1. "Scams and Safety," FBI, accessed on June 09, 2021, https://www.fbi.gov/scams-and-safety/common-scams-and-crimes/business-email-compromise.

government officials and ask other victims to click on a link which would lead to an automatic download of malicious software. This software is then installed on the victims' computer or smartphone. If done successfully, the attackers will then gain complete control over such devices remotely and can copy out any data, listen to any conversation, record all keystrokes, and even turn on the webcam attached to the devices.

## Ransomware

Ransomware, such as WannaCry, CryptoLocker, and Petya, causes millions of dollars in damages each year and is one of the most profitable tools for hackers. A ransomware attach is typically carried out using Trojans (legitimate looking files that contain malicious code). Trojans are named after the famous "Trojan Horse" – a gift of surrender from the Greeks who were besieging the city of Troy. What the Trojans did not know was that the horse was filled with hidden Greek soldiers. At night, the soldiers escaped, and opened the city gates from the inside, leading to the fall of Troy. Users are often deceived to download and open these Trojans, which would then initiate the strike. The WannaCry ransomware could even travel from computer to computer within the network automatically without users' interaction, and attack all of them after infecting the initial device.[2] The main objective of a ransomware attack is to prevent users from using their computers or encrypt their important files or folders denying their access until the victims agree to pay a ransom. Sometimes the victims are locked out of their computer or smartphone completely unless they pay a large amount

of money ranging from a few hundred to a few million US dollars.[3] Since early 2020, ransomware attacks have no longer just been encrypting users' files and asking them for ransom, but also using their confidential or sensitive data or information to blackmail the victim. In case the victims do not pay; such data would be released to the public and reputation would be lost in the process.

In recent years, the use of ransomware as a cyber-attack or scam method has grown exponentially and internationally because today one does not need to be a professional computer programmer or hacker to deploy such attacks. There is a Ransomware-as-a Service (RaaS), which is a business model used by professional ransomware developers who would lease out their ransomware to anyone at an agreed price. The buyers are not required to have any technical knowledge to develop the ransomware or to program it, all they have to do to launch a ransomware attack is to sign up for RaaS (and pay the money). Nevertheless, it is worth noting that ransomware attacks are not new and have been found since the early days of computer development during which diskette was used to transfer files. However, the scam was not as successful as it currently is due to the lack of means to transfer ransom. But with the creation of digital currencies, such as Bitcoin, the ransom can be paid and received quickly and anonymously. It is extremely difficult, if not impossible, to trace back to the Bitcoin account user's real identity – and it is this anonymity that has reinvigorated ransomware attacks, and led to rising cases of cybercrime.

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2. Jon Hoeksma, "NHS Cyberattack May Prove to Be a Valuable Wake up Call," BMJ: British Medical Journal 357 (June 8, 2017), https://www.jstor.org/stable/26940548.

3. Krishna Chinthapalli, "The Hackers Holding Hospitals to Ransom," BMJ: British Medical Journal 357 (June 8, 2017), https://www.jstor.org/stable/26944485.

## Challenges of Remote Working

Remote working is very likely to become a new normal - even after the Covid-19 pandemic is under control. Therefore, both employees and firms should be aware of the challenges they might encounter and understand the potential security breaches that could stem from unmonitored devices both at home and in the workplace. It is worth noting that such new cyber-attacks might not only target firms or organizations, but also technological devices in your living room, bedroom, or even kitchen.

Usually, a home network or coffee shop internet connection has less security protection compared to that of a professional firm – both in terms of hardware and software. A home router that sometimes connects more than 10 devices ranging from desktop computers to laptops, to smartphones, to smart TVs, to tablets and even to smartwatches, is not updated and/or monitored regularly - leaving hackers adequate opportunities to strike. Moreover, typical users rarely perform, if not at all, safety assessments for their laptops or civilian cameras (CCTVs) which can ultimately be used by cybercriminals as a stepping stone to attack the users themselves and their associates. It is also common to find personal computers that are full of unrestricted software or applications that can expose users to a higher level of vulnerability, which hackers can then take advantage of to penetrate the personal computer, and in some cases compromise the entire company system. Why? Because that software and applications might contain unexpected bugs and vulnerabilities that can be exploited. If such exploitation happens, both individual and firms' confidential and proprietary data will be extracted or encrypted for ransom or sale at the black market. Firms' reputations

will be damaged, and clients' trust will also be lost in the process. In addition, there is significant monetary loss from spending time and energy to deal with customers' complaints, and in reactively fixing the vulnerability. With that said, it is generally futile to have state-of-the-art technology or infrastructure that is highly capable of protecting against cybersecurity breaches when the employees still use "password123" as a password to log into companies' user accounts. The persons behind the keyboard need always to be kept vigilant and alert. As a result, firms need to enforce internal cybersecurity rules and guidelines including back-up/restore, remote access and incident reporting framework, and guidance on what an appropriate password should look like. It is expected that all personnel follow the rules set and apply them whenever applicable.

## Government Effort

The sudden shift from working physically at the office to remote working from home not only happens in the private sector, but also within government institutions. In the beginning, it was quite a challenge for public officials to promptly adapt to a new working environment. It was more difficult for the public sector to do so compared to private firms or organizations, for many government officials (especially those living in rural areas) tend to have limited access to the internet, let alone knowledge and expertise on using and managing online communication tools. But after a period of trial and error and a series of government-provided training sessions, most civil officials at the national level now possess technical know-how to properly keep pace with their routine work.

In addition, to ensure high quality of mobile connectivity and access to internet services, the Ministry of Post and Telecommunications

issued in late March 2021 a guideline entitled "Instruction on Measures to Improve Efficiency and Telecoms Quality of Service for Telecoms Operators, Owners of Townships and High-Rise Buildings, and the General Public". Moreover, to stay alert and up-to-date on cybersecurity threats during the Covid-19 pandemic, the Cambodia Computer Emergency Response Team (CAMCERT), under the Department of ICT Security, Ministry of Post and Telecommunication, regularly published advisory notices and security guidelines and tips. Such information is intended to protect individuals and firms from being scammed, or from falling victim to cyber-attacks. Additionally, the Department of Information Technology and the Anti Cyber-Crime Department, both of which are under the Ministry of Interior, are playing key important roles in keeping internet users in Cambodia safe by enforcing the law against offenders. They have also continuously provided cybersecurity-related information and step-by-step instructions on how to secure end-user devices, or to stay safe while using communication platforms such as WhatsApp or Telegram.

## Conclusion and Suggestions

COVID-19 has played a crucial role in accelerating digital transformation for both the public and private sectors in Cambodia. But alongside such changes are the increasing number and variety of cybercrimes and online scams. Cambodians should be vigilant, as hackers are always looking for the weak link in a security system, to penetrate and exploit. It should be highlighted that the public sector has already made tremendous efforts to secure the safety of internet users in Cambodia - but to minimize the risk of cyber-attack on individuals and firms, the study would like to propose some suggestions as follows:

**For Government:**

- The government should work closely with telecom and ISP operators to ensure that the internet service is stable and of high quality during the pandemic, especially during the lock-down period.

- Public institutions should conduct more frequent cybersecurity awareness training programs for their officials using technology (such as Telegram) for their daily communications. Knowledge about cyber threats and the way to prevent them should be disseminated properly to all officials who are working behind the keyboard - without any exception.

- The government should strengthen the cybersecurity risk management framework, especially in the financial sector during this pandemic because there has been a large increase in the number of online payments. Therefore, it can also be a potential venue for cyber-attackers to exploit any loopholes arising from system vulnerabilities, or inadequate security controls in place.

**For Firms/Organizations:**

- Double-check or verify with the suppliers if there is an unexpected change in banking information. One of the best ways is to do it through phone calls, as email communication might potentially be compromised by hackers.

- Use a double or triple financial authorization process. Responsible personnel at the finance department should also verify directly through phone calls with the top management

who have authorized any unusual financial transaction via online communication tools.

- User awareness is the main key to combat cybercrime besides technical control. Therefore, cyber-attack simulation should be enforced and practiced within firms to better prepare, prevent, and respond to any attempt to penetrate or breach security.

- Firms need to make sure that their employees or users have sufficient knowledge about cybersecurity by providing regular training. This will, in turn, increase their level of cybersecurity defense.

- Firms should consider reconfiguring their information technology (IT) infrastructure to accommodate suddenly increasing remote access by their employees. Restricted access, user behavior monitoring, encrypted communication, and data are all technical measures that should be considered and taken seriously.

- Firms are also advised to have a Business Continuity Plan (BCP) including cybersecurity incident handling and response in place. Firms need to operate under the assumption that a breach will occur at some point in the future and know what to do if it happens.

- All systems, software, and applications that the firms are using should be purchased officially from trusted vendors who can provide a genuine license and an update which should be patched whenever available.

## For Individual Users

- Home users should start to update their home router, mobile or technological devices, and Internet of Things (IoTs) to the latest versions as soon as available.

- Stay alert and be vigilant by practicing cyber hygiene including using a strong and unique password and licensed software, installing antivirus and updating it regularly, backing up your data and keeping it offline. More importantly, users should not click on any link or download any attachment provided inside suspicious emails.

- Follow experts' instructions on cybersecurity best practices.

- Finally, users should reach and report cybercrime to relevant authorities in case they encounter one. In Cambodia, the relevant authority is the Anti Cyber-Crime Department within the Ministry of Interior.

There is a saying: "security is only as strong as the weakest link". And it means that when just a single weak spot within a system is inevitably found, the entire system starting from personal data to national security could be compromised. Therefore, let's be strong together – let's avoid being the weakest link.

# ABOUT THE AUTHOR

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Mr. OU Phannarith is one of the well-known cybersecurity experts in Cambodia and the region. He was awarded as TOP 100 Global CISO 2020 by Forcepoint, Information Security Leadership Achievements (ISLA) in 2016 by (ISC)2 and in 2012 as one of the top 10 Chief Information Security Officers (CISO) in ASEAN by the International Data Group (IDG) and has been invited to present in global conferences, forums, and seminars.

Mr. OU has been the research fellow at the Center for Inclusive Digital Economy, Asian Vision Institution (AVI), Professor of Cybersecurity at RULE and the visiting professor at Kirirom Institute of Technology (KIT). He is the founder of cybersecurity think-tank known as Cyber Studies Network (CSN) which contributes to improve policy for strategic decision making through research, dialogue, public debate, policy engagement, forum and training on cyber-related issues, emerging and critical technologies.

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# Beyond Conventional Business: Applications of Blockchain in Cambodia's World of Travel

CHEY Nalin

BORA Bormeysophoan

# Introduction

The tourism sector plays an important role in the development of Cambodia's economy. It has contributed significantly to Cambodia's GDP and generated large employment for the local people. However, the arrival of the COVID-19 pandemic posed severe economic consequences to the nation, especially on the tourism sector; which received the hardest impact. In 2019, the number of international tourists traveling to Cambodia was around 6.6 million. The contribution of Travel and tourism to GDP was 12.1%. However, the growth trend dipped sharply by 80.2%, reaching only around 1.3 million in 2020. In line with the widespread of the pandemic, the world has entered the era of the Fourth Industrial Revolution in which many new cutting-edge technologies have emerged and this requires the country to put extra effort into catching up with the current trend. To stabilize and accelerate the competitiveness of the tourism sector, the paper will propose blockchain technology as a solution. The paper provides an overview of two major blockchain-led technologies such as cryptocurrency and smart contracts and describes their application within the blockchain technology to the tourism sector. Challenges of blockchain technology will be discussed and policy recommendations will be proposed to ensure their efficiency.

# A Brief Overview of Blockchain Technology

## Blockchain

This section briefly describes the fundamental technology underpinning blockchain. Blockchain is a distributed software network that serves as both a mechanism that facilitates the digital exchange of units of value and a shared digital ledger to store transaction records.[1] A blockchain composes of two components as transaction and block. Transaction; in a block; symbolizes exchange or interaction initiated between the participants of the blockchain; which could be financial agreement, contract, exchange, understanding, or transfer or cash or property.[2] A block; in a blockchain; comprises a collection of data recording the cryptographic hash of the previous block, a timestamp, and transaction data.

One of the features of blockchain is its public implementation technology. A blockchain acts as a shared digital ledger with a public implementation technology; in which the digital data is synchronized, and shared anywhere throughout the blockchain network. Each participant in the blockchain network (nodes) possesses an updated complete record of the transactions.[3] Hence, allowing the data to be transparent and undeletable.

Blockchain also comes with data transfer security despite it is publicly accessible to every participant in the blockchain network. All transaction records are time-stamped and encrypted in digital code using cryptography.

Another feature of blockchain is decentralization. It is decentralized in a way that the data is not controlled by a central authority, but is distributed among participating entities within the nodes. In addition, the transactions are not subjected to the approval of a single authority but are approved by a majority of all nodes using

1.  "An Intro to Blockchain and Nfts," Blockchain Research Institute, 2021, https://www.blockchainresearchinstitute.org/an-intro-to-blockchain-and-nfts/.

2.  Kizza and Joseph Migga, Guide to Computer Network Security, (Switzerland: Springer NatureSwitzerland AG, 2020).

3.  Mahdi H. Miraz, and Maaruf Ali, "Applications of Blockchain Technology Beyond Cryptocurrency," Annals of Emerging Technologies in Computing (AETiC) 2, no. 1 (2018), https://doi.org/10.33166/AETiC.2018.01.001.

efficiently verifiable protocols.[4] Blockchain technology applies a consensus algorithm that consists of pre-set rules and consensus requirements from the nodes for a new data entry to be permitted and aggregated into blocks.[5] Several consensus algorithms are in existence including Proof-of-Work (PoW), Proof-of-Stake (PoS), Delegated Proof-of-Stake (DPoS), Proof-of-Authority (PoA), Proof-of-Weight (PoWeight), Proof-of-Collaboration (PoC), and Byzantine Fault Tolerance (BFT), and different blockchain technology applies different consensus algorithm. Within the blockchain network, all data is controlled by the nodes whose roles are to maintain the data and approve transactions within a blockchain network.

## Cryptocurrency

A cryptocurrency is a decentralized unit of exchange that uses cryptography to perform financial transactions. Cryptocurrency system relies on the existence of blockchains, which it utilizes to gain decentralization, transparency, and immutability.[6] Cryptocurrency has the important feature of not being controlled by a central authority due to the decentralized nature of blockchain.[7] The attributable ability of blockchains as a shared public ledger also allows participants to view all transaction records subject to any given coin. In addition,

as blockchain applied cryptography, the security of cryptocurrencies is established.

Participants in a cryptocurrency system exchange with one another by using cryptographic units known as coins. A coin comprises an extensive length of digital code made up of a combination of digital signatures between parties. Within blockchain technology, every coin transaction requires a digital signature of the party that previously held that coin in their cryptocurrency wallet. Meanwhile, signatures can only be inserted with the aid of a unique and highly confidential private key. Upon the transaction, confirmation of transactions is a critical concept in cryptocurrencies and blockchain. In the validating process, nodes perform calculations to validate whether the transactions are accompanied by a technically valid electronic signature and the blockchain of the coins is uninterrupted. After the nodes marked that the transactions are legitimate, transactions are broadcasted into the network and placed into the memory pool or transaction pool. The pool contains transactions that are ready to be added into a block by specialized nodes known as miners as they mine a block. The confirmed block is then broadcasted back to all nodes for validation. Once validated, nodes add the block to the previous blocks, creating a blockchain.[8]

## Smart Contract

With the advancement of cutting-edge technologies, the transaction process is being modernized with the emergence of smart contracts – a new era of contract use. The idea of smart contracts was proposed in 1994 by Nick Szabo, an American computer scientist. Szabo defined a smart contract

4.  A U Mentsiev, E R Guzueva, S M Yunaeva, M V Engel, and M V Abubakarov. "Blockchain as a Technology for the Transition to a New Digital Economy," Journal of Physics: Conference Series 1399, no. 3 (2019), https://doi.org/https://iopscience.iop.org/article/10.1088/1742-6596/1399/3/033113. IOP Publishing Ltd.

5.  Brian Harley and Laura Nixon, "Blockchain What It Is and Why It's Important." TALKING TECH, 17 Nov 2017, https://talkingtech.cliffordchance.com/en/emerging-technologies/blockchain---distributed-ledger-technology/blockchain---what-it-is-and-why-it-s-important.html.

6.  Geiregat Simon, "Cryptocurrencies Are (Smart) Contracts." Elsevier Ltd 34, no. 5 (2018): 1144-49, https://doi.org/https://doi.org/10.1016/j.clsr.2018.05.030.

7.  Fan Fang, Carmine Ventre, Michail Basios, Hoiliong Kong, Leslie Kanthan, David Martinez-Rego, Fan Wu, and Lingbo Li, "Cryptocurrency Trading: A Comprehensive Surve," Cornell University 1 (2021), https://doi.org/https://arxiv.org/abs/2003.11352.

8.  "Bitcoin Nodes Vs. Miners: Demystified," Bitcoins Mining Insights, Braiins, May 14, 2021, https://braiins.com/blog/bitcoin-nodes-vs-miners-demystified.

as "a computerized transaction protocol that executes the terms of a contract."[9] The creation of smart contracts is associated with the use of program code and blockchain technology. It is written in code and deployed into a network by using smart contract languages such as Solidity or Vyper.[10] This self-executing contract is created with terms and conditions included in which they are written in code, stored inside the blockchain, and operated on a blockchain decentralized platform where transactions are made and facilitated transparently without involving an intermediary. When a smart contract is created, it cannot access data from the real world. Therefore, it has to access real-world information that is relevant to contractual terms through Oracle, a bridge between blockchain and the outside world.[11] After the terms and conditions have been met and confirmed by the algorithm, the contract is then autonomously executed.[12] Smart contracts can be deployed in various industries, ranging from financial, healthcare, to tourism. The benefits brought by this new technology include accuracy, lower cost, lower execution risks, and minimizing intermediaries.

## Existing ICT Adoption in Cambodia Tourism

Cambodia's tourism sector has made progress over time with the efforts of the government in developing infrastructures,

facilities, and issuing essential policies in promoting and developing tourism. With the acknowledgment of the potentials of ICT, ICT has been integrated into the tourism sector in a few ways in hope of attaining additional benefits and opportunities for the country. An official website of the Ministry of Tourism and an app called 'Visit Cambodia' was created to provide tourist-related information and to promote tourist destinations in Cambodia. Moreover, hotel and business owners, and local tourism agencies also step up with the use of the internet and social media to promote their businesses and attract tourists as well. Still, there are some business owners in offline mode. The most noticeable adoption of ICT in Cambodia's tourism sector is the introduction of Cambodia E-Visa in 2006 which enables foreign nationals to complete the Cambodia E-Visa application form online to get an electronic tourist visa via email. This Cambodia E-Visa fastens up the visa application process which is deemed to be an attractive transformation. Nevertheless, despite the existing integration of ICT in Cambodia's tourism sector, it appears that the ICT adoption is still in a mostly conventional style with the use of social media as a way of attracting tourists, which is not competitive when compared to neighboring ASEAN countries. According to the WEF, in terms of the Travel and Tourism Competitiveness Index (TTCI), Cambodia was ranked 98th out of 140 countries around the world while Laos PDR, Vietnam, and Thailand were ranked 97th, 63rd, 31st respectively. In addition to this, one pillar among the 14 pillars of TTCI is ICT readiness in tourism, in which Cambodia was ranked 101st while Vietnam was ranked 83rd, Thailand 49th, and Laos 112th.[13] The ranking of TTCI of

9. Bhabendu Kumar Mohanta, Soumyashree S Panda, and Debasish Jena, "An Overview of Smart Contract and Use Cases in Blockchain Technology" (IEEE, 2018), 2, https://doi.org/10.1109/ICCCNT.2018.8494045.

10. Kevin Ziechmann, "Introduction to Smart Contracts," Ethereum, 2021, https://ethereum.org/en/developers/docs/smart-contracts/.

11. Pierre Grimaud, "Oracles," Ethereum, 2021. https://ethereum.org/en/developers/docs/oracles/.

12. Dorota Benduch, "Risks and Opportunities for Tourism Using Smart Contracts," 2019, 12, https://www.researchgate.net/publication/344340600_RISKS_AND_OPPORTUNITIES_FOR_TOURISM_USING_SMART_CONTRACTS.

13. WEF, "The Travel & Tourism Competitiveness Report 2019," Report, 2019, 65,74, http://www3.weforum.org/docs/WEF_TTCR_2019.pdf.

Cambodia illustrated that Cambodia is still lacking behind neighboring countries. Therefore, to be attractive, Cambodia shall further invest in developing or digitalizing the tourism sector to harness the benefits and attract more tourists.

# A Blockchain-led Transformation in Tourism Sector

## Cryptocurrency

### Minimizing Credit Card Fraud and Cash Loss

One of the changes brought by cryptocurrency is credit card fraud and cash loss minimization. While payment cards such as credit cards or debit cards are accepted in several countries, a few tourists are reluctant to use credit cards in fear of fraud. Fraudulent credit card incidents via remote and other digital payment channels were reported to increase by 29% in the Philippines during the COVID-19 pandemic.[14] Similarly, losses of cash by the disappearance in terms of theft loss is also another common incident. In this case, cryptocurrency provides a safer alternative to payment cards and cash. Both payment card and cryptocurrency transactions occur via mobile devices. Cryptocurrency transactions contrast to payment card transactions; which later only require entering security codes before transactions. Before transactions are sent to another party, transactions are encrypted with a hashing encryption algorithm, coin holders are required to enter bitcoin addresses and a unique digital signature, and a consensus mechanism is required to be performed by nodes to validate the transaction. The transaction process of

cryptocurrency protects the unique private key of the coin holders and prevents tampering with transactions.

As cryptocurrency is not yet widely accepted in Cambodia, Cambodia can look into the experiences of other countries for cryptocurrency market growth. Thailand has become an engine of growth for the cryptocurrency market. Before the legalization of bitcoin, Thailand travelers were worried about credit card fraud and were looking for bitcoin traders.[15] After the legalization of bitcoin in 2014 by the Central Bank of Thailand, Thai citizens began to openly adapt themselves to the cryptocurrency transaction. One of the early adopters was a dining area known as Pattaya Beer Garden, which started to accept bitcoin in early 2014 after the easing in Bitcoin's legality. Bitcoin acceptance has resulted in several foreign visitors. As mentioned by the manager of the dining area, most of the visitors visited the dining area specifically to spend their bitcoin and the dining area was now patronized by customers from diverse demographics where bitcoin transactions occurred daily.[16] Therefore, Cambodia can utilize cryptocurrency in tourism to enhance traveling satisfaction and experiences.

### Blockchain-based Donation for Cultural Heritage Conservation

Cryptocurrency can also be used with the purpose to donate for heritage conservation. While cryptocurrency is commonly known for its usage as a decentralized medium of exchange to trade for another value, it was also seen to be used as a donation

**14.** Doris Dumlao-Abadilla, "Credit Card Fraud Cases Surge 29%," Inquirer, February 03, 2021, https://business.inquirer.net/316906/credit-card-fraud-cases-surge-29.

**15.** Waleed Rashideh, "Blockchain Technology Framework: Current and Future Perspectives for the Tourism Industry," Elsevier Ltd, (2020), https://doi.org/https://doi.org/10.1016/j.tourman.2020.104125.

**16.** Kevin Helms, "Bitcoin Adoption in Thailand Led by Tourism Industry," Bitcoin, April 18, 2017, https://news.bitcoin.com/bitcoin-adoption-thailand-tourism-industry-scaling-debate/.

to preserve antiquities or objects of cultural heritage around the world.[17] Cambodia's tourism researchers and heritage practitioners have been focusing on the importance of the preservation and expansion of the heritage sites and the cultural promotion to attract tourists. By looking at other countries, Cambodia can apply blockchain-based donations to assist Cambodia in the ongoing quest to preserve historical documents, historic sites, and monuments while also enhancing the awareness of cryptocurrency and the tourism sector.

In the case of Japan, bitcoin donation was launched on a heritage conservation project of cherry blossoms.[18] The famous cherry blossoms of Japan are well known around the world for their beauty and every year, they never fail to attract visitors and locals to watch the Sakura bloom and fall throughout the season. In addition, they also symbolize the nation's history, culture, and identity.[19] In 2017, on the occasion of the Cherry Blossom Festival, donors sent funds to their preferred organizations to celebrate the 100th year in the preservation of cherry trees throughout Hirosaki Castle. Specifically, the structural properties of the cryptocurrency system allowed donors to make transactions through a QR code while avoiding the transaction fees related to international bank transfers. Donors were also able to donate without providing their name or email address as every donation was traceable and transparent throughout the blockchain

network. A blockchain-based donation has been shown as a fun way for countries to not only receive cryptocurrencies but also promote the cultural heritage of the nation to the world and enhance people-to-people connections. Cambodia, as a country rich with cultural heritage and antiquities, can learn from the case of Japan and launch a blockchain-based donation on any special occasion.

## Smart Contract

In tourism, smart contracts are implemented to book hotels or restaurants, make reservations, and payments with no intermediaries involved.[20] Terms and conditions of the smart contract are in the form of payment date, information of participants, deposit refund, cancellation fee, and room rate which are written in code. The contract is then executed on a blockchain decentralized platform where the transaction is made and facilitated transparently without the involvement of intermediaries; therefore, eliminates costs for travelers. With its capability in expeditiously and transparently executing the transaction, the smart contract has the potential to transform Cambodia's tourism landscape into a world-class destination by improving service quality and facilitating transactions in two ways.

### Minimizing Intermediaries

The first transformation brought by smart contracts is to minimize intermediaries to have a cost-efficient traveling experience. In contemporary Cambodian tourism, foreign nationals who want to visit Cambodia often have to surf online traveling sites for their accommodation or restaurant reservation.

17. Amy Whitaker, Anne Bracegirdle, Susan de Menil, Michelle Ann Gitlitz, and Lena Saltos. "Art, Antiquities, and Blockchain: New Approaches to the Restitution of Cultural Heritage," Taylor & Francis Online 27, No 3 (2020), https://doi.org/https://doi.org/10.1080/10286632.2020.1765163.

18. Marc Pilkington, "Can Blockchain Technology Help Promote New Tourism Destinations? The Example of Medical Tourism in Moldova," SSRN (2017): 12, https://doi.org/https://dx.doi.org/10.2139/ssrn.2984479.

19. "Cherry Blossoms," Japan Endless Discovery, https://www.japan.travel/en/au/experience/cherry-blossoms/.

20. Benduch, "Risks and Opportunities for Tourism Using Smart Contracts," Conference Proceedings, 26th Geographic Information Systems Conference and Exhibition (September 2019): 12, https://www.researchgate.net/publication/344340600_RISKS_AND_OPPORTUNITIES_FOR_TOURISM_USING_SMART_CONTRACTS

Therefore, local business owners have to advertise their businesses on online traveling sites to attract tourists. In this case, the commission fee has to be paid for the promotional activities. For example, hotel establishments have to pay a commission fee of 15-30% depending on the type of property to websites like Booking.com.[21] By this, the final cost imposed by the intermediation is paid by the final consumers who are the tourists. However, the high cost of accommodations and restaurants is one of the key determinations making tourist destinations becoming unattractive. To overcome this, the adoption of the smart contract is a smarter way in lowering the traveling cost by minimizing intermediaries. Cambodia tourism can adopt the technology of smart contracts by looking at the current adoption of the technology in global tourism.

Cambodia tourism can learn from the creation of a tourist platform called 'LockTrip' which utilizes a smart contract with zero percent commission fee on the retail booking model. LockTrip is a decentralized and open-source online platform for traveling enabling owners to communicate directly with consumers with no commission fee charged on booking. It employed smart contracts as a way to regulate and record all transactions being made on the blockchain.[22] When tourists want to make room reservations with their credit card in EURO, the algorithm will exchange the EURO payment into a LOC token – the utility token used in the transaction process. Subsequently, the booking is carried out with LOC at 0% commission and the smart contract handles the transaction by releasing the payment to the hotel. In this case, the transaction process is less time-consuming and cost-efficient for travelers to go to tourist destinations.[23] Learning from this model, Cambodia's tourism sector can find an open-source blockchain platform that supports the use of smart contracts and employs the smart contract to automate the transaction process without involving an intermediary. It is where tourists are provided with greater visibility in terms of hotel and restaurant reservations in Cambodian tourist destinations where 0% commission is charged – a time-saving and cost-efficient way for travelers into Cambodia.

Furthermore, Cambodia can learn from another platform, namely 'Trippki', a hotel booking platform with a customer rewarding system. It is a platform that utilizes Ethereum blockchain as a backbone of the system, and it uses a smart contract as a portion holding 40% of TRIP tokens with the purpose to provide liquidity during the bootstrapping process. Under Trippki, intermediaries are eliminated and the direct contact between customers and hotel owners is facilitated with the provision of additional rewards. The customers will be rewarded with TRIP tokens as loyalty rewards and build their reputation with the hotels which afterwards, they will be offered the best deals and the best services from the hotel.[24] This customer incentivized blockchain-based platform could enhance Cambodia's competitiveness in attracting more tourists and creating a cost-efficient traveling destination with the utilization of the technology.

**21.** LockTrip, "LockTrip Blockchain Manifest v.09," September 29, 2018.

**22.** Kichan Nam et al., "Blockchain Technology for Smart City and Smart Tourism: Latest Trends and Challenges," Asia Pacific Journal of Tourism Research 26, no. 4 (2021): 461, https://doi.org/https://doi.org/10.1080/10941665.2019.1585376.

**23.** LockTrip, "LockTrip Terms & Conditions," 2018, https://locktrip.com/terms.html.

**24.** Trippki, "Trippki," 2018, https://trippki.com/wp-content/uploads/2018/05/Trippki_White_Paper_V1.7.pdf.

## Transparent and Responsive Flight Insurance Transaction

The second change brought by smart contracts in Cambodian tourism is responsive, and transparent transactions for flight and insurance processes, especially in the event of a delay or cancellation. With the adoption of a smart contract, once travelers purchase flight tickets, the payment is processed promptly based on the contractual terms. Their payment transaction process is then recorded on a blockchain with the facilitation of a smart contract which therefore the travelers will obtain their tickets. Moreover, the smart contract obtains information related to flight data or flight delays from an Oracle.[25] In this case, after purchasing, if the flight is delayed or canceled, the compensation will be executed automatically following the coded terms and conditions of a smart contract. The smart contract will help automate the claim process timely and transparently without a third party or complicated procedures, like filling out the form requesting compensation and waiting for the company to process the request. Therefore, service quality will be improved and it will enhance traveling satisfaction. To be well-navigated in a time of fierce competition, the airline and insurance companies in Cambodia's world of travel can take this opportunity to leverage this new cutting-edge technology to harness promising benefits and opportunities and further make the tourism industry more competitive regionally and globally.

On that account, airline or insurance companies in Cambodia can learn about the real-life use of a smart contract from the case of Fizzy flight insurance by AXA which was launched in 2017. Fizzy operated on Ethereum blockchain and employed a smart contract to automate the flight insurance transaction process. Under Fizzy, when customers want to purchase flight insurance, they have to enter their information online then proceed to choose the desired damage coverage. After the selection, the system shows the price which can be paid on a credit card. The transaction is created and stored on blockchain following the successful payment and it is immutable. Since a smart contract obtains flight data or flight delay information from an Oracle, when the flight is delayed for more than two hours, compensation then proceeds automatically. The customers will be notified minutes after the plane lands. This is the basic idea of how a smart contract in Fizzy works. In addition to this, Cambodia should also take into account the reasons behind Fizzy's cease operation as well for the better adoption of the technology in the tourism industry. After two years of operation, AXA announced the cease of operation of this blockchain insurance. It is said that AXA could have had insufficient marketing because it did not make enough cooperation with the third parties to find sale channels for Fizzy, one of the first blockchain insurance in the market. Therefore, the potential benefits of Fizzy were not communicated well enough to the targeted customers. Another reason was technology. It could be very costly to acquire essential knowledge to build blockchain architecture in an insurance company that tries to build up blockchain expertise by itself. In this case, it was hard to reach a commercial target which made the Fizzy platform becoming an unprofitable business for the company.[26] Cambodia could learn from the case of Fizzy

**25.** Christian Hugo Hoffmann, "A Double Design-Science Perspective of Entrepreneurship – the Example of Smart Contracts in the Insurance Market," Journal of Work-Applied Management 13, no. 1 (2021): 73, https://doi.org/10.1108/JWAM-08-2020-0037.

**26.** Christian Hugo Hoffmann, "A Double Design-Science Perspective of Entrepreneurship – the Example of Smart Contracts in the Insurance Market", Journal of Work-Applied Management 13, no.1 (2020): 73 – 75, https://www.emerald.com/insight/content/doi/10.1108/JWAM-08-2020-0037/full/html.

and carefully leverage this new disruptive technology to enhance competitiveness and attain additional benefits to Cambodia tourism.

## Possible Challenges of Adopting Cryptocurrency and Smart Contract in Tourism:

### Lack of Expertise

Despite several promising benefits, the adoption of blockchain technology in tourism could face several challenges. Blockchain technology's conceptual complexity can be a challenge.[27] For example, the coding language of smart contracts, and the linkage of smart contracts with an Oracle; all are complicated and highly technical to be implemented. 4IR technologies relevant to the tourism industry, including Big Data, Blockchain, and IoT are still new to Cambodia's tourism industry. According to ADB, only 35% of employers in the industry are said to have a good understanding of the 4IR technologies.[28] On that account, not many tourism organizations or tourism service providers have a sufficient understanding or expertise in adopting this new cutting-edge technology. On top of this, not all Cambodian local business owners are tech-savvy enough to navigate through blockchain technology since there are still some owners not able to operate an online platform, like establishing and managing a webpage for their businesses. In this case, the implementation of blockchain technologies, including cryptocurrency and a smart contract, is deemed to be quite challenging for Cambodia. More workshops,

seminars, and lectures related to blockchain technology shall be frequently held to make targeted tourism professionals and Cambodian youths more familiarize with the technology. If Cambodia can step up and invest more in nurturing youths and professionals for the use of blockchain, a lack of expertise will not become a big challenge for blockchain implementation in the field.

### High Energy Consumption

The application of blockchain technology, especially cryptocurrency, requires a huge amount of electrical energy to function. The procedure of mining for cryptocurrency involves computer calculation to verify transactions; therefore, it needs a huge amount of energy consumption. For instance, according to Cambridge Centre for Alternative Finance, it is estimated that Bitcoin represents 0.59% of the total global energy consumption and it consumes around 128 terawatt-hours annually.[29] Due to this fact, it poses a challenge for Cambodia to implement this new technology, because Cambodia's electrical energy capacity is still limited. The total electricity generation in Cambodia was around 8,476 gigawatt-hours in 2018, an increase from 998 gigawatt-hours in 2010.[30] Not all households have access to electricity supply; only 81% of them were electrified.[31] In addition to this, there are still some energy shortages which can be seen in the 400 megawatts electricity shortage during the dry season in 2019. From this point, with Cambodia's limited capacity in

**27.** Inessa Tyan, Mariemma I. Yagüe, and Antonio Guevara-Plaza, "Blockchain Technology for Smart Tourism Destinations," *Sustainability* 12, no. 22 (2020): 8, https://doi.org/https://doi.org/10.3390/su12229715.

**28.** ADB, "Reaping the Benefits of Industry 4.0 through Skills Development in Cambodia," report, 2021: 23, https://www.adb.org/publications/benefits-industry-skills-development-cambodia.

**29.** Daniel Will, "Bitcoin Energy Use Has Jumped 80% since the Beginning of 2020, According to a New Study," *Business Insider South Africa*, 2021, https://www.businessinsider.co.za/bitcoin-energy-consumption-cambridge-study-cryptocurrencies-bitcoin-mining-climate-change-2021-3.

**30.** ERIA, "Energy Demand and Supply of Cambodia 2010-2018," Report, 2020, https://www.eria.org/uploads/media/Research-Project-Report/Energy-Demand-and-Supply-of-Cambodia-2010-2018.pdf.

**31.** ERIA, "Cambodia Basic Energy Plan," Report, 2019, https://www.eria.org/uploads/media/CAMBODIA_BEP_Fullreport_1.pdf.

electric power supplying and generating, the implementation of blockchain technology is challenging. Moreover, the paradox of blockchain technology is a dilemma as it allows the nation to utilize technologies that enhance the process of transaction, but in return steering the wheel away from SDG Goal 12 on responsible consumption and production.[32] In line with this, the subsequent section will suggest renewable ways to overcome the challenge.

## Conclusion and Policy Recommendation

Tourism, one of the main contributors to Cambodia's economy, is still lagging compared to other countries in the region. To accelerate the competitiveness and to be relevant in the era of the digital age, Cambodia tourism could move forward with the adoption of blockchain technology, known as cryptocurrency and smart contracts. Cryptocurrency and smart contracts in tourism will bring tourists visiting Cambodia a variety of promising benefits and will transform Cambodia's travel industry into a world-class destination because of its capability in securing transaction processes, minimizing intermediaries, and facilitating flight and insurance transactions transparently and responsively. Despite those potential benefits, the integration of such technology into the tourism sector does not come without challenges. The lack of expertise and the high energy consumption are seen to be possible challenges for Cambodia in terms of implementing blockchain technology in the sector.

Due to this fact, adopting such technology has to start from a relatively low baseline

which requires cooperation and collaboration from the government, tourism, and educational sector so that Cambodia can prepare for the future adoption of this new technology in the tourism industry. In response to the high energy consumption from blockchain technology adoption, enhancing the resilience of the nation's energy system is required. Government can make investments in hydropower, and high-quality smart grid technologies and infrastructure investment to enhance renewable power and hydroelectricity generation. A strategic plan is needed to select an area that is capable of generating large amounts of hydropower while local demand is lower. Moreover, the government shall work together with relevant stakeholders like foreign investors for technology transfer which will pave the way for the adoption of blockchain technology in the future.

Furthermore, it is significant that Cambodia's tourism sector shall provide inclusive and up-to-date digital skill training, especially related to blockchain technology to tourism professionals or tourism service providers to align with the future of work. In addition, to upskill training, Cambodia's tourism sector shall also cooperate with relevant partners to hold frequent seminars on digital literacy as well as blockchain-related technology for the professionals working in the field, business owners, and tourism service providers to further improve their knowledge and understanding about the technologies used in tourism.

Educational institutions must integrate blockchain courses, including its mandatory blockchain-related foundation courses, including cryptography, Web Development, and Data Structure, etc, into the curriculum so that youths will have background knowledge of blockchain. At the moment,

**32.** Tham, Aaron, Sigala, and Marianna, "Road Block(Chain): Bit(Coin)S for Tourism Sustainable Development Goals?" Journal of Hospitality and Tourism Technology (2019), https://doi.org/https://doi.org/10.1108/JHTT-05-2019-0069.

there are very few professors who could teach blockchain in Cambodia; therefore, educational institutions should partner up with foreign universities and hold frequent professor exchanges to deliver blockchain-related courses and seminars. Building up human resources is undeniably a significant investment for Cambodia to be ready for the adoption of the new disruptive technology of blockchain.

# ABOUT THE AUTHOR

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Ms. CHEY Nalin is currently an instructor's assistant for a classroom on DataCamp, a massive and interactive online learning platform for Python, R, and SQL etc., and a research fellow at VOHAR-Strategic Sight Center. Prior to that, she was a junior researcher at the Cambodia Development Resource Institute (CDRI). She graduated her Bachelor of Arts in International Studies with Honors from the Department of International Studies, Royal University of Phnom Penh. She was also one of the winners in 2020 ASEAN-Korea Academic Essay Contest. Her research interests revolve around digital economy, Cambodia's foreign policy, education (particularly secondary education improvement), and technology and innovation.

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# Startup and Performance Success Factors. The Implementation Competence as a Psychological Factor Influencing the Founding Success of Start-Ups

HÖR Robert

# Abstract

Startup founders face a variety of challenges and tasks daily. At the same time, startups play an important role in the development of economies, and the innovation process of societies. This study aims to investigate the influence of the implementation competence of founders on founders' task-related performance and to examine whether founders in advanced development phases, especially the early stage and expansion phase, or serial founders are more implementation competent than first-time founders. A quantitative research design was used to answer the research questions, using an internet-based questionnaire to survey 44 startup founders in Cambodia. The Gießener Inventory of Implementation Competence (GIUK) was used to measure the implementation competence (independent variable) and a newly operationalized scale was used to measure the founder's task performance (dependent variable).

The results of the study show that the implementation competence has a significant influence on the founder's performance (β = 0.593, p = 0.001). Interestingly, the dimensions of goal-related self-discipline through the deeper meaning of tasks (β = 0.483, p = 0.001) as well as forward planning and creative problem solving (β = 0.357, p = 0.007) show the highest significance in the multivariate analysis. Contrary to assumptions, the implementation competence of founders in the early stage phase does not differ from founders in the expansion phase. The number of founded companies has no significant influence on implementation competences as well. The determinant freedom and autonomy motive shows the largest effect on implementation competence and founder performance (β = 0.408, p = 007)

# Introduction

Start-ups are moving further into the spotlight both for policy-makers and the private sector.[1] They are seen as key drivers of well-functioning economies, and are considered to be innovative, technology-oriented and scalable. They are seen as job generators and guarantors to increase competitiveness through creative products and services for new markets.[2] Start-ups are created by founders, whose personality traits and motives are the basis of numerous economic, psychological, and social studies. With their drive to implement their business ideas, founders contribute to social change and economic success.[3] Nevertheless, there is a very high mortality rate of startups.[4] According to Hyder and Lussier, up to 80% of startups fail in their first year.[5] The high mortality is often due to a lack of cash flow, strife within the founding team, no market for the product, insufficient quality of the product, or psychological factors, such as personality traits, motivation or volition.[6]

1.  Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015); Günter Faltin, Handbuch Entrepreneurship. (Wiesbaden: Springer Gabler, 2018).

2.  Ibid.; Trevor Blake, Secrets to a successful startup: A recession-proof to starting, surviving & thriving in your own venture. (Novato: New World Library, 2020).

3.  Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 2

4.  Maura McAdam and Rodney McAdam, "High tech start-ups in University Science Park incubators: The relationship between the start-up's lifecycle progression and use of the incubator's resources", technovation 28 (2008): 277–290.

5.  Shabir Hyder and Robert N. Lussier, "Why businesses succeed or fail: a study on small businesses in Pakistan", Journal of Entrepreneurship in Emerging Economies, Vol. 8 No. 1 (2016): 82-100.

6.  Marco Cantamessa, Valentina Gatteschi, Guido Perboli, and Mariangela Rosano, "Startups' Roads to Failure.", Sustainability 10, no. 7 (2018): 1-19; CBinsights, "The Top 20 Reasons Startups Fail", cbinsights.com, November 6, 2019, https://www.cbinsights.com/research/startup-failure-reasons-top/

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Whether the startup fails or succeeds, founders must manage a variety of tasks. They are often innovators, leaders, inventors, marketing experts, promoters, and organizational developers all at once. This variety of tasks requires a high level of commitment, an understanding of the environment, focus, planning and implementation skills.

Implementation competence, which is also referred to in the literature as willpower, self-control, self-regulation, action orientation, or volition, is conceptualized as the central control instance which coordinates mental processes and subsystems in a way that the implementation of intentions is optimized.[7] The basic understanding of implementation competence is the conscious and volitional regulation of a person. The goal is the optimization of psychological functions and mental processes, such as emotions, motivation, attention, and behavior.[8]

Understanding the implementation competence of founders provides a new perspective - and is closely linked to a founder's psychological competencies. So far, the holistic concept of implementation competencies as an explanatory factor has received little attention in entrepreneurship research.[9] Entrepreneurship psychology currently focuses on the study of personality traits[10], demographics, founder motives,[11] founder cognitive and social conditions[12], founder experience[13], and action characteristics (Brinckmann et al. 2010). However, several studies address aspects of implementation competencies, such as goal setting[14], positive emotions[15], and action orientation.[16]

According to Pelz, the concept of implementation competence includes five skills: Attention control and focus (ACF), emotion and mood management (EMM), self-confidence and assertiveness (SCA), forward planning and creative problem solving (FPP), and goal-related self-discipline through the deeper meaning of tasks (GSM).[17] The range

**7.** Simon Forstmeier and Heinz Rüddel, "Measuring Volitional Competences: Psychometric properties of  Short Form of the Volitional Components Questionnaire (VCQ) in a Clinical Sample", The Open Psychology Journal (2008): 66.

**8.** Ibid.

**9.** Anja Achtziger and Peter M. Gollwitzer, „Motivation und Volition im Handlungsverlauf", in Motivation und Handeln, ed. Heinz Heckhausen and Jutta Heckhausen (Wiesbaden: Springer, 2018), 355 – 380.; Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 103-123.

**10.** Albert Bandura, Self-Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997).

**11.** Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 413-438; Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020). Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 413-438; Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020).

**12.** Randi Kailashinie Thiranagama and Edirisinghe, "Factors affecting small business start-up of engineers and accountants in Sri Lanka", NSBM Business & Management Journal, 6(1) (2015): 84-107.

**13.** Roberto Pugliese, Guido Bortoluzzi, and Ivan Zupic, „Putting process on track: empirical research on start-ups' growth drivers", Management Decision 54 (2016): 1633-1648; Nancy Bocken, "Sustainable venture capital - Catalyst for sustainable start-up success?", Journal of Cleaner Production 97 (2015).

**14.** STIE Trisna Negara Garaika, Sumatera Selatan, and Helisia Margahana, "Self Efficacy, Self Personality and Self Confidence on Entrepreneurial Intention: Study of Young Enterprises." Journal of Entrepreneurship Education (2019).

**15.** Keith M. Hmieleski and Robert A. Baron, "Entrepreneur´s Optimism and New Venture Performance: A Social Cognitive Perspective", Academy of Management Journa (2009): 473-488.; Barbara L. Fredrickson, "The broaden-and-build theory of positive emotions", The Royal Society (2004): 1367-1377.

**16.** Julius Kuhl, "Action versus state orientation: Psychometrics properties of the Action Control Scale (ACS-90)," in Volition and Personality: Action versus state orientation, ed. Julius Kuhl and Beckmann Klaus (Göttingen: Hogrefe, 1994).

**17.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 103-123.

of tasks performed by founders suggests that these skills play a significant role and can thus be used as an explanatory factor for a founder's success. These skills are also trainable, which means that in practice, offering training and behavioral change opportunities to founders and other actors should increase their chances of succeeding as a startup. The study addresses the following three research questions:

**RQ1:** Is there a correlation between the founder's implementation competence and the founder's performance in the start-up process?

**RQ2:** What are the correlations between the five dimensions of the implementation competence and the founder's performance?

**RQ3:** Is there a difference in the implementation competence of founders in the seed phase, the startup phase, the expansion phase, and between serial and first-time founders?

## Concepts: From the Startup Idea to Companies and Implementation Competencies

The term entrepreneurship is derived from French and was already described in the 17th century by economist Jean-Baptiste Say.[18] He describes an entrepreneur as an agent who takes on uncertainty and risk, links resources, and acts with swift judgment.[19] Young, dynamic, and creative founders are often associated with entrepreneurship, generating growth through the intelligent

use of resources rather than the additional use of capital or labor.[20] Joseph Alois Schumpeter sees entrepreneurs as the essential triggers for creative destruction, the further development of the economy and the replacement of conventional forms of production by creating new combinations.[21] The combination of market understanding and the invention is the essence for competent founders. They can identify market gaps and bring creative inventions to customers in a targeted way, thus offering solutions to problems. Entrepreneurship is an intentional and action-based process that leads to specific activities, such as identifying business ideas, prototyping, networking and evaluating commercial opportunities.[22]

In the research field of entrepreneurship psychology, the founder is the core object of investigation. The founder develops motives and the willingness to tackle and implement tasks. It is assumed that psychological factors have an impact on why some individuals start, and others do not start a business. It is also assumed that the psychological characteristics of a founder are key determinants of a business's success or failure.[23] Motives, such as a strong need for achievement or for autonomy[24], as well as personality traits such as the founders'

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18. Michael Fritsch, Entrepreneurship: Theorie, Empirie, Politik (Wiesbaden: Springer Gabler, 2019), 2

19. Ibid.

20. Ibid.

21. Joseph Alois Schumpeter, Sozialismus, Kapitalismus und Demokratie (1942), 215

22. Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 414

23. Ibid.; Namrata Chatterjee, "Key psychological factors ad predictors of entrepreneurial success: A conceptual framework". Academy of Entrepreneurship Journal (2015): 102-114. Aneta M. Przepiorka, "Psychological Determinants of Entrepreneurial Success", Current Psychology (2016): 304-315; Joseph Alois Schumpeter, Sozialismus, Kapitalismus und Demokratie (1942), 215

24. Michael Frese and Andreas Rauch, Born to be an entrepreneur?: Revisting the personality approach to entrepreneurship (2007), 41-65

self-efficacy[25], optimism and hope[26], tolerance of ambiguity and risks[27], and individual control beliefs[28], influence the willingness to start a business and the entire business lifecycle.

## Startups

Business creation is the starting point of entrepreneurship research. It involves individuals who identify a business opportunity and take actions to realize it. The term startup has become established in common language and academia over the past two decades (Reh 2020, 19).[29] In a broad sense, young companies are referred to as startups. In a narrow sense, startups are young companies that are not yet established on the market, pursue scalable business models and are technology-oriented.[30] It is often not possible to make a clear distinction between startups and other types of new businesses because mixed forms exist and the scalability and technology orientation is often hard to define and measure. Against this backdrop, it is no surprise that startups claim to be startups for marketing reasons and easier access to funding even if they do not fit the definition. For this study, a startup is defined as a company that is technology-oriented, growth-oriented, and offers innovative products or services.

As mentioned before, the starting point of a startup is highly dependent on product and service innovation, whereas new businesses often take place in already established markets and are based on the strategy of predatory competition. Innovation combines the invention and production of a product or service and its successful diffusion in new markets.[31] The needs of customers and the markets are at this stage oftentimes unclear for startups because the disruptive business ideas are based on market gaps in blue or white oceans, which need to be developed and shaped.[32] This is different for new businesses. The markets exist and the products are known to customers.

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**25.** Albert Bandura, Self-Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997).

**26.** Petra Gibcus and Elissaveta Ivanova, "The decision-making entrepreneur; Literature review", Business and Policy Research (2003).

**27.** Thomas M. Begley and David P. Boyd, "Psychological characteristics associated with performence in entrepreneurial firms and smaller businesses", Journal of Business Venturing, vol. 2, issue 1 (1987): 79-93.

**28.** Michael Frese and Andreas Rauch, Born to be an entrepreneur?: Revisting the personality approach to entrepreneurship (2007), 41-65.

**29.** Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020), 19

**30.** Ibid.

**31.** Siegfried von Känel, Betriebswirtschaftslehre: eine Einführung (Wiesbaden: Gabler Verlag, 2018), 178.

**32.** Jörg Freiling and Jan Harima, Entrepreneurship: Gründung und Skalierung von Startups (Wiesbaden: Springer Gabler, 2019), 80.

*Table 1:* *Conceptual distinction between new businesses and startups following Pott and Pott 2015*

| | New Business (General) | Startup |
|---|---|---|
| Starting Point | Imitation of existing products | Stand-alone product and market combination |
| Type of Competition | Predatory competition | Competition based on innovation |
| Examples | Fashion, craftsmanship | Health Tech, Fintech |
| Time Perspective of the Business Idea | No product life cycle | The product life cycle is often short |
| Growth and Employment Potential | Significantly limited | No limits: Growth and scalability is the goal |

## Life Cycle Models and Startups

Life cycle models are analytical tools for observing the emergence of companies and their evolution. The models assume that a company goes through different stages in its emergence, which are characterized by common features. Different indicators are used in describing the development stages, such as the size of the company, age, decision crises[33], growth, the way tasks are assigned and managed, the way information is processed, ownership relationships, or customer relationships.[34] A common life cycle model to describe the evolutionary process of startups are financial models. Common phases are the pre-founding, seed, startup, and expansion phase, which are described below. It is important to understand that life cycle models may vary from the real-world experiences of founders and startup evolutions. Nevertheless, they provide an important tool to understand the status quo of startups.

### Pre-founding Phase

In all phases, the founder is the cornerstone of all entrepreneurial actions.[35] The pre-founding phase is considered an orientation phase. In this phase, the founder determines the problems to be solved and examines the added value of his solution for the target group, as well as the feasibility of his idea.[36] Especially in the first phases, founders are exposed to enormous

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**33.** The development of a company is an ongoing process of change that shows a specific pattern of progression. The problems and related crises of companies are often caused by past decisions instead of current market conditions. Based on psychology and the insight that people predominantly determine their actions through past decisions and experiences, Greiner developed a growth model for organizations. The model consists of five phases, each of which begins with a phase of evolution, then shows steady growth, and finally ends with a revolutionary period (Ibenda). In the last period changes and turbulence arise. The essential dimension according to Greiner is time, because specific managerial challenges arise at certain points in time or as Greiner puts it, managerial problems and practices are rooted in time. An example for the change of management challenges is the transformation of leadership styles and/or the successful implementation of technological change management projects.(Greiner, 1998)

**34.** Clay Dibrell, Justin Craig, and Eric Hansen, "Natural Environment, Market Orientation, and firm Innovativeness: An Organizational Life Cycle Perspective", Journal of Small Business Management (2011): 471.

**35.** Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 28

**36.** Jana Strueve, "Von der Idee bis zur Börse – Die 6 Phasen eines Startups", startup-mitteldeutschland.de, May 1, 2020, https://startup-mitteldeutschland.de/von-der-idee-bis-zur-boerse-die-6-phasen-eines-startups/.

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uncertainty and a high degree of task complexity.

For this reason, the founder combines skills and personality traits that are necessary for the pre-founding phase. The founder identifies the entrepreneurial opportunity and refines further his or her business idea.[37] Innovation is a key skill in this phase because the economic environment is changing rapidly. The founder acts as an innovator, adapts to the environmental conditions, and combines his or her available resources to realize the business idea.[38] An essential prerequisite for founders in this phase is goal-oriented and performance-driven work.[39] The analysis of the economic risks and opportunities of the business idea in the entrepreneurial environment requires the focus and concentration of the founder, who must consciously control the uncertain and complex field of action.[40] A crucial difference between founders and employees is that founders do not receive instructions, orientation, and guidance from superiors and are thus left to their own devices and can/ must make decisions freely.

### Foundation phase – the seed and Startup Phase

The startup phase initiates the first financing phase. It is often based on a feasibility study and a business plan that provides information on the business idea, the business concept and the founding team.[41]

Founders in this phase are inventors, investors, accountants, change experts, promoters, managers, and salespeople at the same time.[42] The startup phase is divided into the seed phase and the startup phase.

In the seed phase, financing through cash flow is not yet possible, which is why the company is dependent on external investors.[43] Since investors are reluctant at this stage due to high investment risks, founders mobilize funding from family and friends.[44] The majority of the capital goes into the research and development of the prototype or a minimum viable product. Usually, a more advanced market analysis takes place.[45] Furthermore, the start-up phase includes actions to develop a concrete solution concept, the design of different business models and the testing of technical applications.[46] The founders' experimentation with the business ideas to reduce market uncertainties, and to flexibly deal with contingencies is one of, if not the, most crucial challenge in this phase.[47]

In the startup phase, the formal establishment of the company takes place based on a developed product and a sound understanding of the market.[48] Sales and operations mature during this phase and

37. Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020), 22

38. Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 29

39. Ibid.

40. Günter Faltin, Handbuch Entrepreneurship. (Wiesbaden: Springer Gabler, 2018), 79

41. Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung,

Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 237

42. Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 422.

43. Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 237

44. Ibid.

45. Ibid.

46. Günter Faltin, Handbuch Entrepreneurship. (Wiesbaden: Springer Gabler, 2018), 79

47. Ibid.

48. Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 237

certain predictability emerges.[49] Legal, financial, administrative, and organizational tasks emerge as well.[50] The market continues to be further researched and the product is adapted accordingly until it is finally ready for launch. The team is consolidated and the capital needed to cover increasing costs, such as premises, design of distribution and production capacity, is covered through angel and venture capital investors.[51] A convincing business plan is essential for acquiring capital from external investors.

## Expansion Phase

In the expansion phase, the company reaches the break-even point. The break-even point describes the state in which the cumulative revenues surpass the cumulative expenses of the start-up for the first time.[52] In the expansion phase, the cash flow alone is not sufficient to independently cover the costs of further investments in the company. However, the company has more collateral, through a proof of concept and a convincing business plan, which makes debt financing options available.[53] For investors, the investment risk decreases in this phase.[54]  The expansion phase is divided into the growth phase and the bridging phase. A startup reaches the growth phase when it has established itself in the

market and realizes continuous growth. Product innovations and the national and international expansion of sales take on an important role and require further capital flow. The business model is questioned again in this phase and, if necessary, adapted to new conditions.[55] Depending on the situation, additional employees are hired and personnel responsibilities grow.[56]

In the bridging phase, competition becomes stronger and capital becomes necessary to ensure sufficient differentiation.[57] One way to increase equity is to go public, via an IPO - Initial Public Offering.[58] By selling shares, the company secures capital to invest in product innovation and new markets.[59] The IPO is prepared in the bridging phase. In some cases, bridge financing can be achieved through cash flow or debt financing.

**49.** Günter Faltin, Handbuch Entrepreneurship. (Wiesbaden: Springer Gabler, 2018), 80

**50.**  Jana Strueve, "Von der Idee bis zur Börse – Die 6 Phasen eines Startups", startup-mitteldeutschland.de, May 1, 2020, https://startup-mitteldeutschland.de/von-der-idee-bis-zur-boerse-die-6-phasen-eines-startups/.

**51.** Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 238

**52.** Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020), 23

**53.** Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 238

**54.** Ibid.

**55.** Jana Strueve, "Von der Idee bis zur Börse – Die 6 Phasen eines Startups", startup-mitteldeutschland.de, May 1, 2020, https://startup-mitteldeutschland.de/von-der-idee-bis-zur-boerse-die-6-phasen-eines-startups/.

**56.** Ibid.

**57.** Oliver Pott and André Pott, Entrepreneurship. Unternehmensgründung, Businessplan und Finanzierung, Rechtsformen und gewerblicher Rechtsschutz. (Heidelberg: Springer Gabler, 2015), 238.

**58.** Ibid.

**59.** Ibid.

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**Table 2:** *Relevant phases for the research design and deduced tasks of founders/Own table*

| | Founding phase (Early Stage) | | Expansion phase |
|---|---|---|---|
| | Seed-phase | Startup-phase | |
| **Characteristics** | - High uncertainty<br>- Low market knowledge<br>- Development of the<br>  business idea | - Formal registration and<br>  market maturity<br>- Capital acquisition<br>- Beginning of production | - Scalability<br>- Logistics<br>- Break-Even-Point |
| **Tasks of founders** | - Identification of<br>  business opportunities<br>- Experimentation and<br>  exploration<br>- Prototyping and MVP<br>- Business plan creation<br>- Market and<br>  environment analysis<br>- Teambuilding | - Organizational and<br>  administrative tasks<br>- Product optimization<br>  and market adaptation<br>- Consolidation of the<br>  business plan<br>- Marketing concepts<br>- Personal management | - Continuous market<br>  and environment<br>  analysis<br>- Business model<br>  diversification<br>- Innovation and<br>  creativity management<br>- Personal management<br>- Exploration and R&D |

## Implementation Competencies in the Founding Process

People permanently face challenges in their professional and everyday lives and must
overcome internal and external resistance. Research shows that overcoming obstacles
and achieving results is easier for some people than for others.[60] The answers can often
be found in personality traits, motivation, psychological skills and other factors. This also
applies to founders and the described factors can influence the individual goal achievement
and implementation strength.[61] Implementation competence, which is also referred to in
the literature as willpower, self-control, self-regulation, action orientation, or volition, is
conceptualized as the central control instance, which coordinates mental processes and
subsystems in a way that the implementation of intentions is optimized.[62] In other words,
motives and intentions help us to get out of bed in the morning, implementation skills help us
to realize and materialize these motives, wishes and intentions throughout the day.

The basic understanding of implementation competence is the conscious and volitional
regulation of a person. The goal is the optimization of psychological functions and mental
processes, such as emotions, motivation, attention, and behavior.[63] In this respect, the
focus is on the realization of intentions and the optimization of processes to realize them.
The theoretical framework of the concept of implementation competence is based on
motivation theory studies by Julius Kuhl, Alfred Bandura, and Heinz Heckhausen.[64]  From their

60. Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische
Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au
(Wiesbaden: Springer, 2017), 103-123; Anja Achtziger and Peter M. Gollwitzer, „Motivation und Volition im Handlungsverlauf", in
Motivation und Handeln, ed. Heinz Heckhausen and Jutta Heckhausen (Wiesbaden: Springer, 2018), 355 – 380; Albert Bandura, Self-
Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997); Namrata Chatterjee, "Key psychological factors ad
predictors of entrepreneurial success: A conceptual framework". Academy of Entrepreneurship Journal (2015): 102-114.

61. Aneta M. Przepiorka, "Psychological Determinants of Entrepreneurial Success", Current Psychology (2016): 304-315, 306

62. Simon Forstmeier and Heinz Rüddel, "Measuring Volitional Competences: Psychometric properties of  Short Form of the Volitional
Components Questionnaire (VCQ) in a Clinical Sample", The Open Psychology Journal (2008): 66

63. Ibid.

64. Albert Bandura, Self-Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997); Julius Kuhl and Virginia

preliminary work, other theories have developed that relate to the concept of implementation competence directly or indirectly, either examining individual dimensions or forming new constructs. In the first step, a conscious decision is made about the motives and needs relevant to an individual (e.g. conscious decision making, intention formation, and prioritization) to which goals and intentions are aligned. In the second step, the planning and selection of actions to pursue formulated goals take place (e.g. intention initiating, creativity, systematic planning, option evaluation). In the third phase, the planned actions are carried out and adapted to the circumstances (e.g. intention realization, discipline, attention, focus, mood management). Afterward, success control takes place which ends with a learning process for future decisions and planning (e.g. post-action intention deactivation and reflection, openness). For the successful pursuit of explorative ideas, an individual's implementation competence plays an essential role. The four stages can be summarized in assessing, planning, implementing and evaluating.[65]

### Attention Control and Focusing (ACF)

Attention control and focus describes the ability to concentrate on clearly formulated goals, even when interfering influences occur and involves clear priority setting.[66] Clear and tangible goals, values, and standards are important for motivational power as well as for sustained and concerted actions. Goal-oriented behavior supports the implementation of tasks, processes, and resilience to external distractions.[67] The ability includes consciously setting challenging goals, priorities, and standards, and aligning actions with goals. Each (sub-) goal is a means to achieving the overall goal.[68] Therefore, the alignment of actions with goals is crucial for progress.

### Emotion and Mood Management (EMM)

Emotion and mood management involves a person's ability to put themselves into the shoes of others and themselves – empathy and self-empathy.[69] Understanding motivations, feelings, and actions is important for managing conflicts, setbacks, and stressful situations. Stress and conflicts can consume much of one's energy and jeopardize the realization of goals.[70] Negative emotions narrow the view of options and possibilities, whereas positive emotions broaden the horizon for individuals and can build social, psychological and physical resources.[71] Emotion and mood management also has a motivational function, through the creation of positive emotional states in groups and at the individual level. This competence includes the recognition of motivations and feelings as well as the ability to create a positive mood - putting fellow human beings in a positive emotional state.[72]

Blankenship, "Behavioral Change in a Constant Environment: Shift to More Difficult Tasks with Constant Probability of Success", Journal of Personality and Social Psychology (1979): 551-563; Julius Kuhl, "Motivational and Functional Helplessness: The Moderating Effect of State Versus Action Orientation", Journal of Personality and Social Psychology (1981): 155-170.

**65.** Anja Achtziger and Peter M. Gollwitzer, „Motivation und Volition im Handlungsverlauf", in Motivation und Handeln, ed. Heinz Heckhausen and Jutta Heckhausen (Wiesbaden: Springer, 2018), 79 - 81

**66.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 109.

**67.** Aneta M. Przepiorka, "Psychological Determinants of Entrepreneurial Success", Current Psychology (2016): 304.

**68.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 110.

**69.** Ibid.

**70.** Ibid.

**71.** Barbara L. Fredrickson, "The broaden-and-build theory of positive emotions", The Royal Society (2004): 1367-1377.

**72.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine

## Self-confidence and Assertiveness (SCA)

The self-confidence and assertiveness of a person offers the ability to implement goals confidently and against resistance.[73] Self-confidence is based on experience and an individual's belief in his or her strengths. People with high self-confidence are more likely to resist outside influences and can live their lives in a more self-determined manner.[74] Self-confidence has high predictive power for a healthy and successful life.[75] An important aspect is also the self-efficacy of people, which was studied by Albert Bandura. Self-efficacy is a person's belief that they can focus on difficult tasks, use resources, and accomplish the tasks at hand.[76]

## Forward Planning and Creative Problem Solving (FPP)

Forward planning and creative problem solving describes a person's ability to be forward-looking, solution-oriented, and proactive rather than reactive.[77] This includes preparing for problems and considering risks. The ability to effectively solve problems is considered one of the most important management competencies for achieving goals.[78] Planning forward enables the long-term alignment of actions with goals and priorities.[79] Goals have in common that they direct planned behavior toward something desirable in the form of outcomes, processes, or events in the future, which is and will be experienced positively.[80] They can be defined as internal representations of desired states (Austin and Vancouver 1996).[81]

## Goal-related Self-discipline through Deeper Meaning of Tasks (GSM)

Goal-related self-discipline through the deeper meaning of tasks is a person's competence to continuously work on specific tasks until results are achieved.[82] Perseverance is linked to the deeper meaning of tasks; when the deeper meaning is recognized, negative feedback, for example, can be better endured.[83] When discipline results from coercion or the exercise of power, avoidance reactions and resistance result.[84] More effective than discipline by external influence is self-discipline by conviction and determination. Studies show that goal commitment, the determination of a person to achieve the goal, is related to the difficulty of the task.[85] Thus, when the determination is pronounced, the performance also increases.[86]

theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 110.

**73.** Ibid.

**74.** Namrata Chatterjee, "Key psychological factors ad predictors of entrepreneurial success: A conceptual framework". Academy of Entrepreneurship Journal (2015): 110.

**75.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 110.

**76.** Namrata Chatterjee, "Key psychological factors ad predictors of entrepreneurial success: A conceptual framework". Academy of Entrepreneurship Journal (2015): 106.

**77.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 109.

**78.** Ibid.

**79.** Ibid.

**80.** James T. Austin and Jeffrey B. Vancouver, "Goal Constructs in Psychology: Structure, Process, and Content", Psychological Bulletin 120 (1996): 338.

**81.** Ibid.

**82.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 109.

**83.** Ibid.

**84.** Ibid.

**85.** Klein et al., "Goal Commitment and the Goal-Setting Process: Conceptual Clarification and Empirical Synthesis", Journal of Applied Psychology 84 (2000): 886.; James T. Austin and Jeffrey B. Vancouver, "Goal Constructs in Psychology: Structure, Process, and Content", Psychological Bulletin 120 (1996): 338.

**86.** Ibid.

*Table 3: Description of the five dimensions of the concept of implementation competence following Pelz 2017. ACF = attention control and focus, EMM = emotion and mood management, SCA = self-confidence and assertiveness, FPP = forward planning and creative problem solving, GSM = goal-related self-discipline through the deeper meaning of tasks. Own table.*

| Dimension | Characteristics |
|---|---|
| ACF | - Focus on clear priorities and goals<br>- Targeted dealing with distraction<br>- Important for sustained and concerted actions |
| EMM | - Empathy and self-empathy<br>- Skill to create positive moods and emotions<br>- Important to create positive emotions, which lead to creativity and innovation |
| SCA | - Confident dealing with setbacks and criticism<br>- Conviction of own skills and potentials<br>- Important to build up trust in own skills and solutions |
| FPP | - Proactive solution orientation<br>- Long term view and strategic alignments<br>- Important to visualize long term visions and new ways to get there |
| GSM | - Continuous working on clearly defined and selected tasks<br>- Deep understanding of the meaning of the tasks<br>- Important to be determined and high task performance |

## The Conceptual Framework

The active and purposeful actions of the founders are crucial for the emergence of the company, the success as well as the adaptation to change of the business environment.[87] The actions are aligned with the founder's goals, the founder's understanding of his or her environment, the founder's planning skills, the actual execution of actions, and the utilization of feedback. To quantitatively measure the correlation between the five dimensions of the implementation competence, and the task performance, a conceptual framework is created. The basic assumption is that the volitional and conscious control of thoughts, feelings and actions has an influence on the founder's task performance in the different phases and that implementation competence increases along with the phases.

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**87.** Michael Frese, The Psychological Actions and Entrepreneurial Success: An Action Theory Approach (2007), 151-188; Joseph Alois Schumpeter, Sozialismus, Kapitalismus und Demokratie (1942).

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*Figure 1: Conceptual framework/Own graphic*
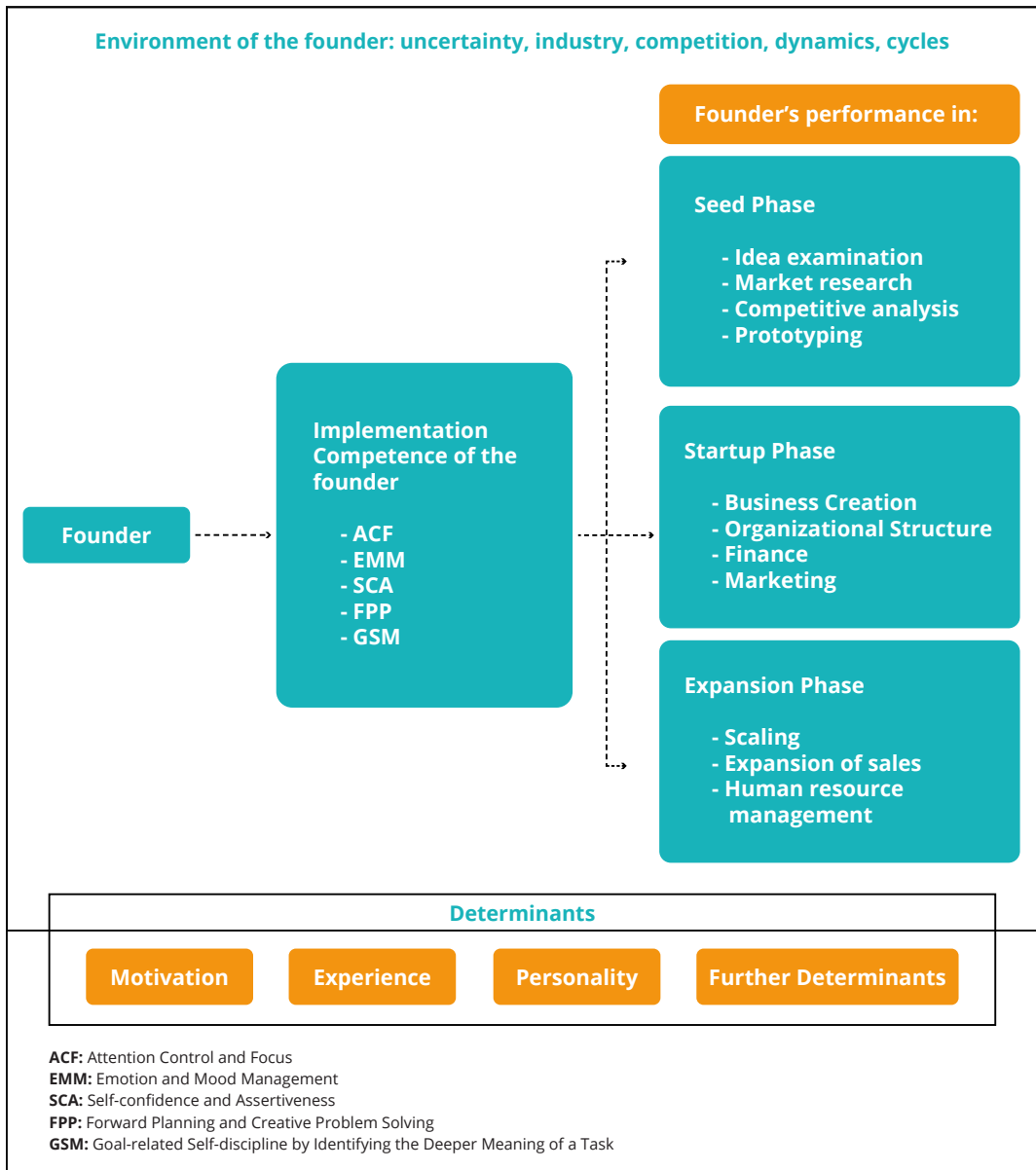


Based on the conceptual framework the following hypotheses for testing are derived:

*Table 4:* *Hypothesis framework/Own table*

| Nr. | Hypothesis |
|-----|------------|
| **Hypothesis Framework** | |
| H1 | There is a positive relationship between the founders' task performance and the founders' implementation competence. |
| H1a | There is a positive relationship between the founders' task performance and the founders' attention control and focus. |
| H1b | There is a positive relationship between the founders' task performance and the founders' emotion and mood management. |
| H1c | There is a positive relationship between the founders' task performance and the founders' self-confidence and assertiveness. |
| H1d | There is a positive relationship between the founders' task performance and the founders' forward planning and creative problem solving. |
| H1e | There is a positive relationship between the founders' task performance and the founders' goal-related self-discipline through the deeper meaning of tasks. |
| H2 | There is a positive correlation between the experience of founders and their implementation competence. |
| H2a | Serial founders are more implementation competent than novice founders. |
| H2b | Founders in advanced stages are more implementation competent. |
| H3 | There is a positive correlation between the founders' motivation and the founders' task performance. |
| H4 | There is a positive correlation between founders' loyalty towards the business idea and founders' task performance. |

## Method

An empirical study aims to enable conclusions about a defined population – in this context startup founders.[88] A full survey was not possible, as the target group is difficult to reach, and time and cost aspects were limited. In Cambodia, and during the COVID-19 pandemic, an online survey was deemed suitable for surveying startup founders. Telephone and face-to-face verbal surveys were also less suitable due to the additional time, cost and human resources they would require. Thus, an Internet-based questionnaire was used for the present study. The advantages of internet-based surveys are a relatively short return time as well as the electronic storage and processing options for the data.[89] The questionnaire was tested in a pretest to check its functionality and the quality of its items. Among the test persons, care was taken to represent both founders from the startup and expansion phases, different age groups, and genders.

At the time of the study, it could be assumed that the targeted population - founders who match the relevant characteristics (start-up and growth-stage), numbers between 120 and

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**88.** Rüdiger Reinhardt and Frederik Ornau, Grundlagen der empirischen Sozialforschung (Riedlingen: SRH Fernhochschule, 2016), 66

**89.** Klaus Backhaus, Bernd Erichson, Wulff Plinke, and Rolf Weiber, Multivariate Analyseverfahren. Eine anwendungsorientierte Einführung (Berlin: Springer Verlag, 2018); Jan Goldenstein, Michael Hunoldt, and Peter Walgenbach, Wissenschaftliche (s) Arbeiten in den Wirtschaftswissenschaften. Themenfindung - Recherche - Konzeption - Methodik – Argumentation (Wiesbaden: Springer Gabler, 2018).

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300 individuals in Cambodia.[90] The characteristics to determine whether a startup founder fits the definition were asked through a general information query in the online instrument. From calculation variables, an optimal sample size of 95-130 participants was calculated.[91] Two non-probabilistic sampling procedures were utilized. First, a quota procedure was used that takes into account the most important characteristics of the population. Second, a snowball procedure was used, which facilitates the finding of the small, hard-to-reach study subjects via recommendations and referrals.

In psychology, various scales are used to study implementation competence. In the context of this study, the Giessen Inventory of Implementation Competence was used.[92] In the research field of entrepreneurship psychology, entrepreneurial success is predominantly measured with indicators such as profitability, growth, and the number of employees.[93] These indicators do not provide a direct scale of the task performance of founders. For this reason, key tasks were derived using the life cycle model. In the next step, these tasks were operationalized to measure the task performance of founders (TPF). The table below shows the reliability values of the scales:

*Table 5: Reliability test results. SCA = self-confidence and assertiveness, FPP = forward planning and creative problem solving, ACF = attention control and focus, TPF = task performance of the founder, EMM = emotion and mood management, GSM = goal-related self-discipline through the deeper meaning of tasks/Own table*

| Constructs | Orig. variables | Cronbach's α after elimination | New amount of items | Eliminated items |
|---|---|---|---|---|
| SCA | SCD001 - SCD006 | .581 | 6 | - |
| FPP | FPP001 - FPP007 | .658 | 7 | - |
| ACF | ACF001 - ACF006 | .570 | 6 | - |
| EMM | EMM001 - EMM006 | .523 | 5 | EMM004 (Prestest), EMM003 |
| GSM | GSM001 - GSM006 | .564 | 4 | GSM001, GSM002 |
| TPF | TPF001 – TPF012 | .854 | 12 | - |
| Motive: *Freedom and Autonomy* | FRE001 - FRE005 | .669 | 5 | - |
| Motive: *Monetary* | MON001 - MON005 | .720 | 4 | MON001 |
| Motive: *Social* | SOZ001 - SOZ005 | .619 | 3 | SOZ003 - SOZ005 |
| Entrepreneurial Experience | EX001 - EX003 | .724 | 3 | - |
| Loyalty towards the business idea | LOY001 - LOY003 | .463 | 3 | - |

**90.** Chan, Penhleak, Tech Innovation Sector of Phnom Penh: Landscape Scoping and Narratives of Change 2013-2018 (Phnom Penh: USAID, 2018).

**91.** Qualtrics, „Online-Stichproben: die richtige Stichprobengröße bestimmen", qualtrics.com, April 12, 2021, https://www.qualtrics.com/au/experience-management/research/determine-sample-size/?rid=ip&prevsite=de&newsite=au&geo=KH&geomatch=au

**92.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 103-123.

**93.** Jan Brinckmann, Dietmar Grichnik, and Diana Kapsa, „Should entrepreneurs plan or just storm the castle?: A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms", Journal of Business Venturing (2010): 24-40; Namrata Chatterjee, "Key psychological factors ad predictors of entrepreneurial success: A conceptual framework". Academy of Entrepreneurship Journal (2015): 102-114; Jean-Michel Sahut, "The entrepreneurship process and the model of volition", Journal of Business Research (2016): 1-27.

# Results

## Descriptive Statistics

During the data collection phase in March and April 2021, the questionnaire was fully completed by 44 founders. Control questions were used to determine whether the participants were startups according to the definition in chapter 2.1.1. 90% of the participants fit the definition. Three of the subjects did not meet the definition and were removed from the sample, which left the final data set as N = 41.

The surveyed founders are active in different sectors. With six founders active in the information technology sector, this sector takes the largest share. Bundled together, 4.9% of the founders work in agriculture, 4.8% in the industrial sector, and 90.3% in the service sector. This high share of startups in the service sector is striking because the GDP contribution in Cambodia in the manufacturing sector occupies 34.2% and in the agricultural sector at 20.7%. The service sector is thus disproportionately represented in terms of GDP production (WKO, 2021).

Most of the enterprises were founded between one and three years ago (56.1%) and for most of the founders, it is their first company (53.7% first time and 31.7% second-time founders). Only two of the founders surveyed have founded more than three companies. In addition, 46.4% of the surveyed founders employ more than five people and the majority of the companies are in the seed capital phase (36.6%).

Another important factor in determining which phase the founders are in was the question about the breakeven point. For 48.8% of the founders, the breakeven point has not yet been reached and is not achievable shortly, which means that the remaining number of startups are in the expansion phase. In addition, 80.5% stated that they founded at least in teams of two people.

The age range of the participants is between 19 and 59 years. Nineteen surveyed founders are between 19 and 29 years old, which corresponds to 46.3%. The second-largest age group is between 30 and 39 years with 39%. Six participants are older than 40 years. The gender distribution of male and female participants is 41.5% female and 58.5% male. A majority of the founders hold a bachelor's or master's degree (95.1%). The table below shows the mean values of the measured variables and the correlations.

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*Table 6:* *Means, standard deviations, and correlations between study variables (N = 44). IC = implementation competence, TPF = task performance of the founder, FPP = forward planning and creative problem solving, GSM = goal-related self-discipline through the deeper meaning of tasks, EMM = emotion and mood management, SCA = self-confidence and assertiveness, ACF = attention control and focus, FRE = freedom and autonomy, SOZ = social, MON = monetary, EX = entrepreneurial experience, LOY = loyalty towards the business/Own table*

| Variables | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1 IC** | 3.9686 | .41238 | 1 | .696** | .832** | .826** | .633** | .481** | .636** | .483** | .536** | .339* | .290 | .282 |
| **2 TPF** | 3.9614 | .40786 | .696** | 1 | .538** | .617** | .461** | .468** | .498** | .514** | .301 | .332* | .529** | .313* |
| **3 FPP** | 3.8397 | .50122 | .832** | .538** | 1 | .375* | .693** | .301 | .537** | .481** | .308 | .278 | .142 | .300 |
| **4 GSM** | 4.0976 | .49332 | .826** | .617** | .375* | 1 | .353* | .498** | .517** | .319* | .584** | .284 | .340* | .167 |
| **5 EMM** | 3.6951 | .49146 | .633** | .461** | .693** | .353* | 1 | .492** | .425** | .394* | .159 | .102 | .076 | .358* |
| **6 SCD** | 3.7764 | .50636 | .481** | .468** | .301 | .498** | .492** | 1 | .414** | .404** | .293 | .225 | .223 | .248 |
| **7 ACF** | 3.6220 | .42168 | .636** | .498** | .537** | .517** | .425** | .414** | 1 | .337* | .293 | .400** | .211 | .189 |
| **8 Motive FRE** | 4.4439 | .48890 | .483** | .514** | .481** | .319* | .394* | .404** | .337* | 1 | .388* | .570** | .304 | .512** |
| **9 Motive SOZ** | 4.5122 | .53799 | .536** | .301 | .308 | .584** | .159 | .293 | .293 | .388* | 1 | .219 | .238 | .316* |
| **10 Motive MON** | 4.4695 | .57878 | .339* | .332* | .278 | .284 | .102 | .225 | .400** | .570** | .219 | 1 | .344* | .226 |
| **11 EX** | 3.3740 | .89503 | .290 | .529** | .142 | .340* | .076 | .223 | .211 | .304 | .238 | .344* | 1 | .237 |
| **12 LOY** | 4.5772 | .48890 | .282 | .313* | .300 | .167 | .358* | .248 | .189 | .512** | .316* | .226 | .237 | 1 |

*\*\*. The correlation is significant at a level of 0,01 (2-sided) significant.*
*\*. The correlation is significant at a level of 0,05 (2-sided) significant.*

The surveyed founders can be summarized as a homogenous group considering that the majority has at least a bachelor's degree, the age range is close and that the majority is active in the service sector. Also, the small variances of the measured constructs support a high similarity of founders, when it comes to their motivation, implementation competence and loyalty towards their business idea.

## Results of the Bivariate and Multivariate Hypothesis Testing

The hypotheses were tested using bivariate and multivariate analysis procedures. The individual hypotheses are discussed below.

### H1: There is a positive relationship between the founders' task performance and founders' implementation competence.

The statistical analysis shows that there is a significant relationship between the founders' task performance and the founder's implementation competence (β = 0.593, p = 0.001). The next step was to examine the different dimensions of implementation competence as an influencing factor on the founders' task performance. The bivariate analysis shows that the five dimensions have a significant influence on the founders' task performance. In particular, the dimension of goal-related self-discipline through the deeper meaning of tasks shows a high correlation coefficient (β = 0.617, p = 0.001), as well as the dimension of forward planning and creative problem solving (β = 0.538, p = 0.001).

*Table 7: Results of the bivariate analysis/Own table*

| | | TPF | GSM | EMM | FPP | ACF | SCA |
|---|---|---|---|---|---|---|---|
| **TPF** | Pearson Correlation | 1 | .617** | .461** | .538** | .498** | .468** |
| | Significance (2-sided) | | .000 | .002 | .000 | .001 | .002 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 |

The multivariate analysis was used to measure the significance and strength of influence of the five predictors. The results show that the dimension of goal-related self-discipline through the deeper meaning of tasks and planning are the two significant predictors and thus have the strongest influence on the founders' task performance.

*Table 8: Results of the multivariate analysis (backward). Dependent variable: TPF = task performance of the founder. Independent variables: EMM = emotion and mood management, GSM = goal-related self-discipline through the deeper meaning of tasks, ACF = attention control and focus, SCA = self-confidence and assertiveness, FPP = forward planning and creative problem solving/Own table*

| Model | | Standardized Beta | Sig. |
|---|---|---|---|
| **1** | **(constant)** | | 0.67 |
| | **EMM** | .011 | .951 |
| | **GSM** | .390 | .013 |
| | **ACF** | .067 | .666 |
| | **SCA** | .149 | .332 |
| | **FPP** | .303 | .102 |
| **2** | **(constant)** | | .060 |
| | **GSM** | .390 | .012 |
| | **ACF** | .067 | .663 |
| | **SCA** | .153 | .273 |
| | **FPP** | .310 | .033 |
| **3** | **(constant)** | | .038 |
| | **GSM** | .410 | .005 |
| | **SCA** | .163 | .232 |
| | **FPP** | .335 | .011 |
| **4** | **(constant)** | | .012 |
| | **GSM** | .483 | .000 |
| | **FPP** | .357 | .007 |

In addition to the question of whether implementation competence has an influence on the founders' task performance and which of the dimensions has the highest correlation value, it was examined whether the implementation competence differs in the seed, startup and expansion phases. In the descriptive statistics, it has already been pointed out that the classification was established by control questions and that the ratio is balanced.

### H2: There is a positive correlation between the experience of founders and their implementation competence.

Hypothesis H2 was tested by performing a correlation analysis of the variable implementation competence and the variable entrepreneurial experience. The correlation coefficient is 0.263. and the p-value of 0.097 is greater than the alpha value of 0.05. The alternative hypothesis is rejected and shows no significant relationship. There was no significant relationship between the experience of founders and their implementation competence.

### H2a: Serial founders are more implementation competent than novice founders.

It is tested whether different groups of persons, in this case, persons who are founding for the first time or have already founded, differ significantly in their mean values of implementation competence. The question to be investigated is whether the implementation competence of multiple founders is more developed than the one of novice founders. The null hypothesis is confirmed if the mean scores of the different groups are equal. From the test of homogeneity, the significance can be taken, indicating that the probability of error is 44% and well above 5%. This speaks in favor of maintaining the null hypothesis since the variances are equal. The single factor

analysis of variance confirms the retention with a significance value of 0.577. The null hypothesis is consequently retained.

### H2b: Founders in advanced stages are more implementation competent.

Hypothesis H2b investigates the relationship between the implementation competence of founders in the seed, startup, expansion phases. Based on the test of homogeneity, the significance can be taken, indicating that the probability of error is 15.9%, well above 5%. This speaks in favor of maintaining the null hypothesis since the variances are equal. The single factor analysis of variance confirms the retention with a significance value of 0.082. The null hypothesis is consequently retained, which means that founders in advanced stages were generally not more implementation competent.

### H3: There is a positive correlation between the founders' motivation and the founders' task performance.

Hypothesis H3 was tested by performing a linear regression of the variable founders' task performance and the variable founder motivation. The scale founder motivation is composed of the three dimensions' freedom and autonomy, social and monetary motives. The correlation coefficient is 0.552 and the p-value of 0.001. The alternative hypothesis can be accepted.

### H4: There is a positive correlation between founders' loyalty towards the business idea and founders' task performance.

Due to the low reliability of the founder's loyalty scale, the latent construct was already excluded from further analysis after the reliability test. The bivariate correlation analysis confirms the exclusion by the Pearson correlation of 0.324. The null hypothesis is accepted for the time being. The results of the statistical test are summarized in the table below:

*Table 9:* *Results of the hypothesis testing/Own table*

| Results of the Hypothesis Testing | | | |
|---|---|---|---|
| **Nr.** | **Hypothesis** | **Result** | |
| H1 | There is a positive relationship between the founders' task performance and the founders' implementation competence. | ✔ | Alternative hypothesis accepted |
| H1a | There is a positive relationship between the founders' task performance and the founders' attention control and focus. | ✖ | Null hypothesis accepted |
| H1b | There is a positive relationship between the founders' task performance and the founders' emotion and mood management. | ✖ | Null hypothesis accepted |
| H1c | There is a positive relationship between the founders' task performance and the founders' self-confidence and assertiveness. | ✖ | Null hypothesis accepted |
| H1d | There is a positive relationship between the founders' task performance and the founders' forward planning and creative problem solving. | ✔ | Alternative hypothesis accepted |
| H1e | There is a positive relationship between the founders' task performance and the founders' goal-related self-discipline through the deeper meaning of tasks. | ✔ | Alternative hypothesis accepted |
| H2 | There is a positive correlation between the experience of founders and their implementation competence. | ✖ | Null hypothesis accepted |
| H2a | Serial founders are more implementation competent than novice founders. | ✖ | Null hypothesis accepted |
| H2b | Founders in advanced stages are more implementation competent. | ✖ | Null hypothesis accepted |
| H3 | There is a positive correlation between the founders' motivation and the founders' task performance. | ✔ | Alternative hypothesis accepted |

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| H4 | There is a positive correlation between founders' loyalty towards the business idea and founders' task performance. | ✖ | Null hypothesis accepted |
|---|---|---|---|

## Additional Tests

In addition to the calculations necessary to answer the research questions, additional calculations were performed that promise interesting findings. For the variable founder motivation, a multivariate regression analysis was conducted with the dependent variable founders' task performance. The motive freedom and autonomy reaches a beta value of 0.514 and a p-value of 0.001. Accordingly, there is a strong correlation between the motive freedom and autonomy and founders' task performance.

Furthermore, it was tested whether there is a difference between female and male founders concerning their implementation competence. Levene's test shows that the significance is greater than the alpha value of 0.05 with a p-value of 0.312. The mean values show no significant differences (see table). This means that there are no effects and the female and male founders do not differ significantly.

*Table 10: Comparison of means between female and male founders and their implementation competence/Own table*

| Gender | | N | Mean | SD |
|---|---|---|---|---|
| **IC** | Female | 24 | 3.7503 | 30879 |
| | Male | 17 | 3.8850 | 42743 |

The same procedure was used to test whether there was a difference between female and male subjects in terms of founders' task performance. Levene's test shows that the significance with a p-value of 0.883 is greater than the alpha value of 0.05. The mean values show no significant differences. This means that there are no effects and the female and male subjects do not differ significantly.

In addition, it was tested whether the level of education has a significant effect on the implementation competence of the founders. For this purpose, a one-factor analysis of variance was performed. The majority of the founders (25) hold a bachelor's degree, 14 of the founders hold a master's degree, one founder holds a doctorate, and one respondent holds a high school diploma. Based on the test of homogeneity, significance can be taken, indicating that the probability of error is 97.4%, well above 5% (see Appendix 3). This argues for maintaining the null hypothesis since the variances are equal. The single factor analysis of variance confirms the retention with a significance value of 0.62. Consequently, the null hypothesis is retained, which means that a higher level of education did not have a positive effect on a founder's implementation competence.

# Discussion

## Interpretation of the Results

Of particular interest is the falsification of hypotheses H2, H2a, and H2b, which postulated a correlation between the implementation competence of founders and their current phase as well as if they are serial or novice founders. The empirical data shows that this correlation does not exist and that the implementation competence does not vary. The mean values of implementation competence in the seed, startup, expansion and mezzanine phases do not show significant differences. Accordingly, the implementation competence does not depend on the different phases. The same applies to the assumption that multiple founders are more competent than novice founders. Here, the mean values show no significant differences too. In this measurement, implementation competence is not influenced by the number of founded companies. This finding is also reflected in the studies of Pelz, who was able to prove that managers with similar experience and factual competences show significant differences in terms of implementation competence.[94]

Another basic assumption of the measurement model is that the implementation competence has an impact on the founders' task performance. This relationship was demonstrated by conducting bivariate and multivariate analysis methods. Implementation competence has a highly significant effect on founder performance ($\beta = 0.593$, $p = 0.001$). It is interesting to note that the dimensions of goal-related self-discipline through the deeper meaning of tasks ($\beta = 0.483$, $p = 0.001$) and forward planning and creative problem solving ($\beta = 0.357$, $p = 0.007$) in the multivariate analysis, are the two remaining significant dimensions of implementation competence. It can be inferred that discipline and perseverance towards tasks until they are completed, a systematic approach with clear goals and priorities, and a deeper sense of purpose have a positive impact on the founders' task performance. This finding confirms previous findings and theories, which postulate active, planned and purposeful actions of the founders are crucial for the emergence of the company, its success as well as the change in its environment.[95]

In this context, the influence of the determinants on implementation competence is informative, because only the motive freedom and autonomy showed a significant effect on implementation competence in the multivariate analysis ($\beta = 0.408$, $p = 007$). The construct measures a person's striving for independence, the realization of one's dream, and aspiration to be one's, own boss. Studies show that founders tend to be more proactive, risk-taking, optimistic, and autonomous.[96] In a study, Frese and Gielnik find that passion, which evolves from the pursuit of autonomy and high self-efficacy, also influences the commitment to tasks and actions in the founding process as well as the effort of the founder.[97] The data confirm this finding and

**94.** Waldemar Pelz, „Umsetzungskompetenz als Schlüsselkompetenz für Führungspersönlichkeiten: Eine theoretische und empirische Analyse." In Führung im Zeitalter von Veränderung und Diversity, Leadership und Angewandte Psychologie, ed. Corinna von Au (Wiesbaden: Springer, 2017), 103-123.

**95.** Michael Frese, The Psychological Actions and Entrepreneurial Success: An Action Theory Approach (2007), 151-188; Joseph Alois Schumpeter, Sozialismus, Kapitalismus und Demokratie (1942).

**96.** Michael Frese and Andreas Rauch, Born to be an entrepreneur?: Revisting the personality approach to entrepreneurship (2007), 41-65; Barbara L. Fredrickson, "The broaden-and-build theory of positive emotions", The Royal Society (2004): 1367-1377; Aneta M. Przepiorka, "Psychological Determinants of Entrepreneurial Success", Current Psychology (2016): 304-315.

**97.** Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 426.

**Startup and Performance Success Factors. The Implementation Competence as a Psychological Factor Influencing the Founding Success of Start-Ups**

*HÖR Robert*

show that founders with a strong motive for freedom and autonomy are disciplined because they see a deeper meaning in performing the tasks.

The meaningfulness of tasks is derived from goals and forward planning. This finding reinforces the theoretical assumptions that clear goals and desires influence founders' self-control and self-regulation and are related to planning behavior.[98] This relationship is also shown by Klein et al. who investigate whether there is a relationship between goal commitment, the goal-setting process, and task performance.[99] The authors emphasize that when the determination is pronounced, performance increases.[100] The theoretical assumptions are consistent with the measured cases and show that persistence, discipline, willingness to exert effort is related to determination and deeper meaning.

The determinant founding motivation has a significant effect on founder performance ($\beta = 0.491$, $p = 0.001$) and on the implementation competence ($\beta = 0.584$, $p = 0.001$) especially the motive freedom and autonomy ($\beta = 0.408$, $p = 007$) shows a strong relationship with the implementation competence. The strong significant influence of motivation on implementation competence confirms the criticism of Pelz (chapter 2.3), who sees implementation competence as a further development of motivation theories. The findings rather show that motivation, implementation competence, and performance are intertwined as the result of a mental process. Founders' strongly expressed motivation

correlates significantly with strongly expressed implementation competence and performance. The results are echoed in theory. Kuhl and Quirin emphasize that motives are a crucial stimulus for the decision to found and actively implement a company.[101]

Bandura describes motivation as a general construct that has a directional and activating effect and determines a person's effort.[102] The motive of freedom and autonomy plays a decisive role, which in the multivariate analysis is the only variable that has a significant effect on implementation competence ($\beta = 0.408$, $p = 0.007$). For the interviewed founders, the pursuit of freedom and autonomy is decisive and of greater importance than the social and monetary motives. That the financial incentive no longer acts as the sole motivator is shown by Su et al. in a study (2020).[103] A study by PWC also shows that pursuing one's interests, being self-reliant, and implementing a business opportunity come before the pursuit of wealth and money.[104] It can be concluded that motivation influences performance and implementation competence and that the motives of freedom and autonomy are particularly relevant for founders.

Additional tests and calculations of the data set were performed, which are listed in chapter 4.2.4. Performing t-tests and

**98.** Veronika Brandstätter and Marie Hennecke, „Ziele", In Motivation und Handeln, ed. Heinz Heckhausen and Jutta Heckhausen (Wiesbaden: Springer, 2018), 332

**99.** Klein et al., "Goal Commitment and the Goal-Setting Process: Conceptual Clarification and Empirical Synthesis", Journal of Applied Psychology 84 (2000): 885-96.

**100.** Ibid.

**101.** Julius Kuhl and Markus Quirin, "Seven Steps Toward Freedom and Two Ways to Lose It. Overcoming Limitations of Intentionality Through Self-Confrontational Coping with Stress", Social Psychology (2011): 76.

**102.** Albert Bandura, Self-Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997), 69.

**103.** Xiaohua Su, Shengmei Liu, Shujun Zhang, and Lingling Liu, "To Be Happy: A Case Study of Entrepreneurial Motivation and Entrepreneurial Process from the Perspective of Positive Psychology", Sustainability (2020).

**104.** PWC, "European Startup Survey", www.pwc.com, 2018, https://www.pwc.com/gx/en/services/entrepreneurial-private-business/small-business-solutions/european-start-up-survey.html.

unifactorial analyses of variance showed that the gender of the founders, the educational attainment and the age of the founders do not have a significant influence on implementation competence and founder performance (see statistics in the appendix). One explanation for the non-significant correlation between educational attainment and founder performance and implementation competence may be that a large proportion of the subjects (exceptions: one subject high school, one subject Ph.D.) have at least a bachelor's degree and thus the educational level of the founders does not differ greatly. The figures thus confirm that a majority of startup founders in Cambodia have an academic degree, similar to Western countries. According to the German Startup Monitor, over 80% of founders in Germany have a diploma, master's degree, or doctorate.

The high number of female founders (41%) is equally interesting and suggests that there are proportionally more female founders in Cambodia than in Germany. This is interesting given the patriarchal and hierarchical power structures in Cambodian society. The German Startup Monitor confirms that in Germany, the number of female founders has slowly increased since 2013 to 15.9% in 2020, but is still far from the measured 40% in Cambodia. In summary, startup founders in Cambodia are a very homogeneous group of people who, according to the data, are between 20 and 40 years old, hold an academic degree, and have a high proportion of women by international standards. This may be one explanation for the non-significant differences in terms of implementation skills and founder performance.

## Scientific Limitations

An important limitation of the research design is that it is a cross-sectional study, which only provides a snapshot of the measurement of founder performance and implementation skills among founders in Cambodia. Accordingly, the measurement results do not provide insights into development trends in the implementation competence of founders over a measurement period or allow comparisons of implementation competence across measurement periods, socio-demographic groups, or generations.

A lack of representativeness for the population arose from the procedure because the subjects were not randomly selected and the targeted sample size of N ≥ 90 was not realized. The determination of the sample has further limitations. In the Cambodian context, there are varying statements about the number of active startups, depending on the institution. In addition, access to databases that provide information on the number of active startups is limited. For example, the Ministry of Economy has registrations of startups. However, it is unclear how many of the startups are active. In addition, startups in the pre-startup and seed phases are not recorded because startups usually register at the end of the startup phase. As a result, the expert estimates varied between 50 and 150 active startups, resulting in an approximate mean of 80 startups. It is therefore not possible to generalize the results without further ado. Nevertheless, the results allow conclusions to be drawn about young startup founders in Cambodia. In particular, the composition of the sample and verification of the subjects through control questions allows conclusions to be drawn about the startup scene. Important control questions were the use of technologies, the scalability of business models, the question about financing stages, and the gender and age distribution. The descriptive statistics show a representative cross-section of participants according to relevant quotas. Only the

mezzanine and bridge financing phases were underrepresented, partly because the startup scene has only been developing for about ten years. A further limitation is that the survey was conducted in the English language only, which might have quenched Khmer entrepreneurs with limited English proficiency. Similar future research projects can be implemented in language tandems to guarantee unlimited access.

The participants participated voluntarily in the survey and the question mode is based on self-reflection and self-assessment of their abilities, which creates another limitation of the results. This fact may lead to the positive self-presentation of the participants and social desirability. The effects of social desirability and positive self-portrayal, which can lead to judgment bias, were attempted to be limited by the research model. The fact that the founders are actively working on their startups' rules out response bias due to recall bias. It can be assumed that the formulated items apply to the current situation of the founders and that the founders have answered authentically.

Another limitation concerns the use of the measurement scales. This concerns in particular the newly formulated items of the founders' task performance scale, which were used for the first time. All scales were subjected to an exploratory factor analysis, which must be viewed critically due to the small number of datasets generated, even though the reliability for the new scale turned out to be very good. However, several items had to be eliminated to achieve good reliability. To make a final statement about the reliability of the different items, the scales have to be subjected to several measurements, which is not possible within a cross-sectional study. Furthermore, the scale attachment towards the business idea had to be removed on the bivariate and multivariate

analysis, although it has high mean values. In this case, it is recommended to develop a new scale for the determinant or to use other validated scales.

## Implications

### Implications for Founders and Individuals

Simplified, the main implication on the individual level can be expressed with the formula that implementation-strong founders equal high-performing everyday performers. Implementation competence should therefore be consciously promoted and trained. The following approaches are suitable for this:

- Founders can perform self-analysis and reflections of current strengths and weaknesses regarding their implementation competence. Online self-diagnosis tests or professional psychological tests can be used for this step. For example, a founder may have strong implementation competence in the dimensions of emotion and mood management and self-confidence, but have development potential in the dimension of self-discipline through deeper meaning of the task. The targeted identification of skills serves as a benchmark for training. Websites input and support groups can help to exchange experiences, developing implementation skills and tracking progress. As implementation skills have a direct impact on the founder's performance in everyday life and are intertwined with the founder's tasks, there should be a high situational focus in the training sessions.

- Mentoring: Mentors from the startup ecosystem and other spheres, who have had similar experiences in their careers

can play an important role. Mentors can bring in an important outside-in view and help founders to control their focus, attention, emotions and relevant factors. Mentors can also share relevant experiences and methods regarding forward planning and problem solving skills.

**Implications for Science**

Implications arise firstly from the study limitations and secondly from the opportunities that arise from the findings.

- A key implication for entrepreneurship research is that the behavior and specific actions of founders should become more central to studies. Moreover, the increased combination of motivation-theoretic, volitional, and performance-based models of inquiry may provide new global insights. So far, the focus has been on disciplinary characteristics, such as personality traits[105], demographics, founders' motives[106], founders' cognitive and social conditions.[107]

- The research model used shows that implementation competence significantly influences behaviors such as disciplined action, planning activities, and founder performance in the start-up and expansion phases. It also shows

there is a link between motivation and performance. The study does not provide any insights into how decidedly and in which cycles founders plan and how meaningfulness arises and what it consists of. In this context, the current scientific debate on the planning logic of founders can be linked. Aspects of both causation or effectuation schools[108] can be integrated into the research design and provide insights on correlations with implementation competence in specific phases.[109]

- The same relates to founders' sense of purpose and meaning, some of whose expression is found in motives such as striving for autonomy, but which may evolve or change throughout the phases.

- This research demonstrated that implementation competence influences founders, but not how implementation competence emerges. Longitudinal studies with selected founders could provide important insights into how founders' implementation competence evolves and also look more closely at the pre-founding period.

- The research design can be extended to CEOs, intrapreneurs, teams, and neighboring countries.

**105.** Albert Bandura, Self-Efficacy: The Exercise of Control, (New York: W.H. Freeman and Company, 1997).

**106.** Michael Frese and Michael M. Gielnik, "The Psychology of Entrepreneurship", The Annual Review of Organizational Psychology and Organizational Behavior (2014): 413-438; Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020).

**107.** Roberto Pugliese, Guido Bortoluzzi, and Ivan Zupic, „Putting process on track: empirical research on start-ups' growth drivers", Management Decision 54 (2016): 1633-1648; Nancy Bocken, "Sustainable venture capital - Catalyst for sustainable start-up success?", Journal of Cleaner Production 97 (2015).

**108.** The current scientific debate is characterized by two planning concepts. The causation planning school assumes that systematic, forecast-oriented and formal planning lead to better business performance. This approach is challenged by the causation school which emphasizes a focus on learning, flexibility, resource control and dealing with uncertainty.

**109.** Sebastian Reh, Effectuation als Startup-Entscheidungslogik: Einflussfaktoren auf die Entscheidungsfindung in jungen Unternehmen. (Wiesbaden: Springer Gabler, 2020); Jean-Michel Sahut, "The entrepreneurship process and the model of volition", Journal of Business Research (2016): 1-27.

**Implications for the Ecosystem**

Implementation competence is not only relevant for startup founders but offers a range of potentials for companies and other organizations. By being more productive and stress-free, implementation-savvy individuals make an important contribution to the success of teams and companies. Accordingly, targeted support pays off for financial, psychological, social and public welfare reasons.

- The findings also provide practical implications for actors in the startup ecosystem, such as innovation centers, competence centers, business associations, incubators or investors. In general, it can be stated that the number of startup supporters in Cambodia is increasing because the significance of startups is also increasing in the face of digital development. For funders and investors, the findings suggest the possibility of expanding their activities for targeted support of founders and analysis of the strengths and weaknesses of startups. The focus on implementation competence can provide important additional parameters for investment analyses. This is especially true given the high mortality rate of startups and the frequent focus on factors such as lack of cash flow, disputes in the founding team, no market for the product or quality. The analyses can be used for decision-making but also for the promotion of the founders through coaching and information campaigns to create awareness for the concept of implementation competence. Currently, it can be assumed that the concept receives little attention.

- Psychological influencing factors can be included in analysis tools. The results show that implementation competence has an important influence on founder performance and entrepreneurial experience, but that it does not change significantly in the financing stages. However, entrepreneurial experience and the previous business success of founders play a much larger role in investment decisions. By looking specifically at implementation competence using diagnostic instruments, the classic selection criteria for investors can be extended to include psychological factors.

## Conclusion

Young founders play an important role in the development of an economy through their openness to technology and innovation, and startups are increasingly shaping economic landscapes. They create new and innovative products and services, are considered as job generators and independent organizational units, which are often based on the strong will of their founders. The theory chapter illustrates that founders and their behaviors, motives and personality traits are increasingly becoming the focus of business administration and entrepreneurship research. In particular, modern approaches that enter into interdisciplinary synergies with research approaches and theories from psychology are gaining momentum, and are providing new insights into the research field.

This study aimed to investigate the influence of the implementation competence of founders on their task-related performance and to investigate whether founders in advanced development phases, especially the early stage and expansion phase, or multiple founders are more implementation competent than first-time

founders. To achieve the objective, a quantitative research design was used that evaluated 41 data sets of founders. To this end, three research questions were posed, first, is there a relationship between the founder's implementation competence and founder performance throughout founding? Second, what are the correlations between the dimensions of founder implementation competence and founder performance, and third, is there a difference in the expression of founder implementation competence in the seed phase, the startup phase, the expansion phase, and among multiple founders?

The research questions could be answered clearly, even if the new findings contradicted expectations in parts. The findings confirm that implementation skills are relevant for practice and research and that the combination of implementation skills, the startup process and the most important tasks of a founder complement the current scientific debate. Planning skills and self-discipline through a deeper sense of the founder's tasks, and in relation to the completion of daily founding tasks seem particularly relevant based on the data. For researchers, this creates numerous opportunities for further investigation and combinations with other disciplines. For investors and entrepreneurs, implementation competence can extend classic training and investment approaches. For founders, implementation competence offers the targeted and systematic opportunity to develop their situationally required meta-competencies. For this reason, the integration of psychological factors both into training programs and the everyday life of founders is central. First and foremost, an awareness of the concept must be created, which can then lead to conscious actions and promotion of the implementation competence in practice.

## ABOUT THE AUTHOR

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Robert Hör is currently program manager for digitalization at Konrad-Adenauer-Stiftung Cambodia. He is a political scientist by training and is in charge of several research projects and dialog formats between Cambodia, regional and German experts. His current research focus lies on the implementation of digitalization projects within SMEs and organizational development. Having always been fascinated by the social-political impact and potential of a new tecnologies and what they mean for enterprise, he started studying the online M.Sc. program on digital transformation and management. His major fields of study are digital strategy development, political economy and business informatics.

# i-Farmers@Cambodia
# Digital Innovation for
# Farmers in Cambodia

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# Background

Agriculture is playing a pivotal role in Cambodia's economic growth. In 2019 agriculture represented 20.71% of Cambodia's GDP[1], but saw a resurgence to 32% of GDP in 2020 due to the Covid-19 pandemic, and the dramatic slowdown of Cambodia's service (mostly tourism) sector. However, alongside the growing population and limited cultivable land, Small-Scale Producers (SSPs) in a developing country like Cambodia face many challenges and barriers to becoming sustainable farming entrepreneurs. The main challenges: are (i) a lack of timely and relevant advisory information (ii) little or no access to capital and insurance, (iii) a lack of decision support systems for seed selection, fertilizer optimization, and crop monitoring and finally, (iv) limited reliable market access for their products.[2] Due to these challenges and barriers, the productivity of the agricultural sector is not growing as expected. Agricultural exports are relatively low, and mostly in the form of raw, unprocessed products. Recognizing the challenges faced by the agriculture sector, the Minister of Agriculture, Forestry and Fisheries, Veng Sakhon stated that the government aspires to increase agricultural labour productivity (in terms of output per worker) from $1,839 in 2018 to $4,625 by 2030.[3]

Some 11 million people, or 65% of the 16.9 million Cambodian population are young (under 30 years). Despite this young population, and Cambodia's rich agricultural heritage, very few young Cambodian's are engaged in developing their career in the agricultural sector. This is thought to be due to a lack of empowerment, or encouragement of this young population to get involved in agriculture. As the elderly population is declining in agriculture (because of the competitive market, lack of technological skills, retirement due to age, etc.), this could cause a detrimental effect on the long-term growth of the sector. To ensure the agricultural sector develops in line with the rest of the Cambodian economy, young Cambodians should be empowered and encouraged to engage with the country's rich agricultural heritage

Although 35% of the workforce in the country depends on agriculture for employment[4], the productivity of the sector is not at the expected level due to limited use of modern technology (fertilisers, threshers, tractors etc.). Young people in the country are now growing up with new, widely accessible mobile technologies. Theoretically, this should offer an opportunity to engage and empower a young agricultural workforce via innovation and new business models powers by advanced technology (e.g., Artificial Intelligence (AI), IoTs, drones, and visual gamified mobile apps). This engagement could contribute to addressing the efficiency and productivity challenges faced by the agricultural sector today - thus ensuring food security for everyone and sustainable economic growth.[5]

This paper presents an investigation to explore the potential growth opportunities, as well as the challenges that farmers in

1. "Cambodia GDP Share of Agriculture - Data, Chart | TheGlobalEconomy.Com," The GlobalEconomy.com, 2021, https://www.theglobaleconomy.com/Cambodia/share_of_agriculture/.

2. Road T O Recovery, "Cambodia Economic Update," 2021.

3. Thou Vireak, "Agriculture Share of Kingdom's GDP on Track to Hit 32 per Cent | Phnom Penh Post," The Phnom Penh Post, 2020, https://www.phnompenhpost.com/business/agriculture-share-kingdoms-gdp-track-hit-32-cent.

4. "FAO in Cambodia: Cambodia at a Glance," Food and Agriculture Organization of United Nation, 2021, http://www.fao.org/cambodia/fao-in-cambodia/cambodia-at-a-glance/en/.

5. Debra P.C. Peters et al., "Harnessing AI to Transform Agriculture and Inform Agricultural Research," IT Professional 22, no. 3 (2020): 16–21, https://doi.org/10.1109/MITP.2020.2986124.

rural villages have faced. This is in part to understand whether a younger, digitally savvy workforce can support Cambodia reach its agricultural potential. The research question we considered to achieve this goal was: How can digital technology-enabled human-centered design help in growing innovation and talent for the sustainable growth of agriculture in Cambodia?

We conducted an ethnographic study with the rural farmers through a set of questionnaires that explored their knowledge and understanding of agricultural technology. The outcomes of the study are presented in this paper, with detailed discussions to demonstrate the challenges faced when attempting to modernize agriculture in Cambodia. It is our firm belief that digitization and modernization of the sector can improve efficiency, profitability, and equity for all of Cambodia.[6]

## Methodology and Questionnaire

Several digital technology initiatives have been launched in many areas in Cambodia. However, these are still in the early stages and are not currently embracing the opportunities issuing from inter alia, AI, internet of things (IoT), drones, mobile-enabled empowerment, and intelligent decision support systems.[7] This research was conducted in the form of an ethnographic study with 24 small scale producers to explore the challenges (awareness, innovation, digital transformation, and human-centered system design issue) and opportunities (mobile/smart TV-based empowerment, engagement, innovation,

communication, etc.). It also explored the potential use of AI-enabled mobile applications for guidance, high-value crops selection, seed selection, pesticide control, sensor/image-based diagnosis, soil test and weather prediction. An incentive-based questionnaire was used to extract knowledge from the farmers to know their current awareness, facilities and access to finance.

The in-depth interviews were conducted in several Cambodian provinces known for their agricultural activities, including agroindustry. Data collection occurred between May and June 2021, and 24 individual farmers participated. These farmers were holding different sizes of arable lands ranging from as small as 0.01 to as large as 24 hectares – they used this land to grow different rice varieties, mangoes, corn and other types of vegetables used for daily consumption. Data was collected by 3 enumerators (2 from Phnom Penh and 1 from Battambang province). Out of the sample of 24, 22 interviews were face-to-face and 2 were conducted over the phone. Of our interviewees, 15 were from Battambang Province, 7 were from Kandal province, and 2 each were from Kampong Thom and Kampong Speu provinces. Before the interview, each of the interviewees was explained the purpose of the research study and consent was obtained to record the conversation. A token of appreciation of USD 5 was presented to the participants to show our gratitude for their engagement. To all extents possible, it was ensured there were no biases in our data collection.

## Findings and Discussions

The summary of the findings is presented in table 1. When asked if they knew about the potential high-value products for their land? The predominant answer from the interviewees was simply a "no". Most people are growing the crop they have traditionally

**6.** Raj Kumar Goel et al., "Smart Agriculture – Urgent Need of the Day in Developing Countries," Sustainable Computing: Informatics and Systems 30 (June 1, 2021): 100512, https://doi.org/10.1016/j.suscom.2021.100512.

**7.** Shanmuga Vivekananda Nadarajan and Roslan Ismail, "E-Commerce Framework to Improve Rural Agriculture Sector in Cambodia," Management 25 (2011): 287–91.

grown over years or generations without knowing if their lands can potentially be used to grow other types of crops. Assumingly, they only know how to grow certain types of crops, the growing method which has been passed from generation to generation or among the circle of close relatives. Having said that, a few participants revealed that they had tried growing other kinds of crops as recommended by brokers or middlemen – these brokers would go household by household negotiating prices for a certain amount of output with individual farmers. The offered payment for identical products is generally similar to all farmers within the neighbourhood or village. In addition, our respondents stated that according to them, the price offered by the different brokers or mill owners who maintain a large barn as storehouse or a small rice processing factory, is almost the same considering transportation cost. With this belief, participants believed that the price offered was truly the market price for such commodities, when in reality this might not always be the case due to the presence of a local oligopoly. The concept means that price might be manipulated by a small group of producers or sellers known in economic term as cartels, which are cooperating to limit market competition and thereby are able to control the price. In developing countries such as Cambodia, oligopolies are largely possible due to imperfect information which is a form of market failure. And since most farmers operated at a small scale without proper knowledge and capital to preserve their harvest, they have to sell it at any given price before their produce becomes rotten, or otherwise they will earn no revenue at all.

Another characteristic of developing countries is that the banking and insurance system is largely underdeveloped.[8]

Therefore, it comes as no surprise that the Cambodian rural population we interviewed had completely no access to agricultural insurance which would insure against future loss of crops, a new technology backfire, and/or an unexpected drop of market price for certain commodities. In addition, not all the participants could access a banking system, instead often taking loans from informal local money lenders who charge a usury rate. From the perspective of those who can take a loan using formal channels, the bank or microfinance institutes (MFIs) also impose a limit on the amount they can borrow, and such credit is normally much less than the amount of capital they need to make a decent agricultural investment. However, a few people did mention they did not face such liquidity constraints meaning that they were lent the amount of money they desired, yet we are not sure if such amount was large enough to reach ceiling or limitation. It should also be highlighted that those banks or MFIs are typical commercial banks and not specialized in agriculture. In general access to finance remains a problem. For some respondents, borrowing money through a formal channel was not an option, either because they do not have any form of collateral, or they do not consider taking a loan because there would be social stigma attached to taking the loan.

Participants were also questioned about the methods they used to select their seeds and fertilizer, and the amount of fertilizer used, and whether the methods were based on their soil quality. As we expected, none of the respondents had tested their soil before and were therefor completely unaware of their soil quality, and whether their soil was suitable for the types of crops they were currently, planning on growing. As mentioned before, many farmers also simply grew the crops suggested by the brokers, who claimed that they are currently in high demand. Furthermore, it is surely of little surprise

8.   Vatana Chea, "Effects of Remittances on Household Poverty and Inequality in Cambodia," Journal of the Asia Pacific Economy, 2021, https://doi.org/10.1080/13547860.2021.1905200.

now to learn that the decision to use certain amounts of fertilizer and seeds relies almost entirely on conventional perception, what has been practiced by other people in the village, or by asking seed & fertilizer retailers, who often have little to no knowledge in agronomics. On top of that, the retailers are of course actively incentivised to sell as much of their product as possible, and therefore would generally advise farmers to use as much fertilizers as they could afford, promising higher yields during the harvest season. The strategy of "the more fertilizer the better" is clearly not always true. Scientific evidence has proven that misuse of fertilizer leads to a decline in soil quality and severe environmental pollution.[9] Besides, it is likely to affect individual health, for all participants indicated that had never used a spreader to spread fertilizer. This is troubling, as simply using bare hands to disseminate fertilizer could lead to disastrous skin infections.

The agricultural product broker or middleman plays an important role in agricultural trading in Cambodia. They bridge the gap between rural farmers and the potential markets for the commodities, and often advise or dictate which crops should be grown. However, unscrupulous brokers also have ample opportunities to exploit those agricultural workers who have almost no market information about the real value of their products - a problem we identified during our in-depth interviews. Despite most interviewees owning a mobile phone, none of the farmers we questioned had ever used their mobile phone or any other technology for agricultural activities – they never used their phone to look for the market price of their crops, or to search for prospective customers. Therefore, it was not clear how

much technological knowledge they had, or what their smart phone was normally used for. Without sufficient information that would guide their own decisions, farmers would simply sell their yields to brokers for the price determined by the broker, who would go to several villages during harvesting season and buy the crops in bulk at the farmer's barn. Despite the risks of price exploitation, overall, the rural population found this farmer-broker arrangement very convenient. They asserted that it meant they did not have to transport their products to the market and find potential buyers themselves who would purchase their harvests in amounts as large as the brokers do. This is also a primary reason why brokers can direct the type of crops farmers should grow. The broker would not buy any crops other than those they wanted, and ultimately the farmer cannot sell it to any buyer other than the broker who agreed to purchase in bulk in advance. They agree to the brokers price, because otherwise the farmers will face excessive leftover and earn no profit. With that said, there is also some competition between brokers, some of whom would make slightly higher offers in order to draw sellers of specific agricultural products, as a few interviewees have pointed out.

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**9.** Yang Liu et al., "Potential for High Yield with Increased Seedling Density and Decreased N Fertilizer Application under Seedling-Throwing Rice Cultivation," Scientific Reports 9, no. 1 (December 1, 2019): 1–8, https://doi.org/10.1038/s41598-018-36978-w.

*Table 1:* *Outcomes based on the collected data*

| Questions | Yes, fully aware of | No, not known | Partly aware of the use of technology | Comments |
|---|---|---|---|---|
| Q1 | 6 | 18 | 0 | All the Yes were not confident to their answers. |
| Q2 | 5 | 19 | 0 | Mostly, they go for general loan, not specific to agriculture. |
| Q3 | 0 | 24 | 0 | No one knows how to test the quality of the soil for seed selection. |
| Q4 | 0 | 24 | 0 | Follow traditional method only. |
| Q5 | 1 | 23 | 0 | Generally, the farmers sell their products to the brokers without exploration of different markets. Sometimes brokers have asked for specific crops, in that case, the farmers have to sell these crops through these brokers. |
| Q6 | 0 | 24 | 0 | No one knows how to use, but some of them used to hear of it. |
| Q7 | 0 | 24 | 0 | Some farmers try to predict the best time and crops, but the results are still quite unexpected. |

**Outcomes as a whole:** The farmers do not know how to use technology even though some of them are aware of its advantages. In addition, they rely on using the traditional farming techniques and sometimes recklessly follow brokers' recommendations.

*(The questionnaire used in this study is below: Q1: Do you know (or how to obtain information to know) about the potential high-value products for your land? Q2: Do you have any easy access to finance or insurance for your farming? Is there any regional financial company that offers these services? If yes, are these enough to meet your expectation? Q3: How do decide on seed and fertilizer selection / amount? Have you ever tested your soil quality for seed selection or fertilizers? Q4: Do you use technology for monitoring, predicting and spreading fertilizers? Q5: Do you sell your product to a middle-man or in the nearest market? Do you know which one of the nearest markets has a high price for your products? Q6: Do you use a smartphone for any of the above activities? If yes, will it help if you have a mobile app to know the high-value product, seed and right amount of fertiliser selection? Q7: Do you monitor, diagnose and predict your crops for the best time and best market?)*

## Concluding Remarks

This paper has presented an investigation to explore the awareness and skills of rural farmers to use technology for efficient farming. We have conducted an ethnographic study with 24 farmers using an open-ended questionnaire. The objective was to identify the understanding

of the farmers for high-value product selection based on soil testing, market awareness, loan facilities for farming, insurance opportunity to minimize risk, and potential challenges in achieving a fair value of their products from middleman brokers. We also explored the ability of farmers to use digital technology to address some of challenges they are facing.

We found that most farmers are not aware of these issues. Most of them just follow the traditional model of farming passed from generation to generation, they produce crops based on the demands of the broker or middleman and frequently they are not receiving a fair price for their crops and are often not choosing the most suitable type or quantity of fertilizer. Most farmers are not aware of high-value products, soil testing-based seed selection and real-time market information. We also identified that most of them are not aware of bank loans or insurance for farming. It is noted that the small producers cannot have proper bank loans due to various constraints, including guarantors/equity. These challenges force the farmers to borrow money from informal private loan providers at higher interest rates.

Our study suggests that digital technology-based skills and support for rural farmers would be highly valuable, enhance their services and increase their productivity via reduced costs and improved market intelligence. A mobile, user friendly app in Khmer language could support farmers with their crop selection, soil quality testing for seed selection, plant diagnosis and care advice, provide real-time market information, and information for a comparative bank loan and insurance facilities for farming. In the future, this app could even be AI-powered. A co-creating approach to develop an innovative digital platform with rural farmers to empower and enable them may address many of these challenges. The outcomes of this digital platform could help them to improve their return on time and investment and thus, in turn, their quality of life.

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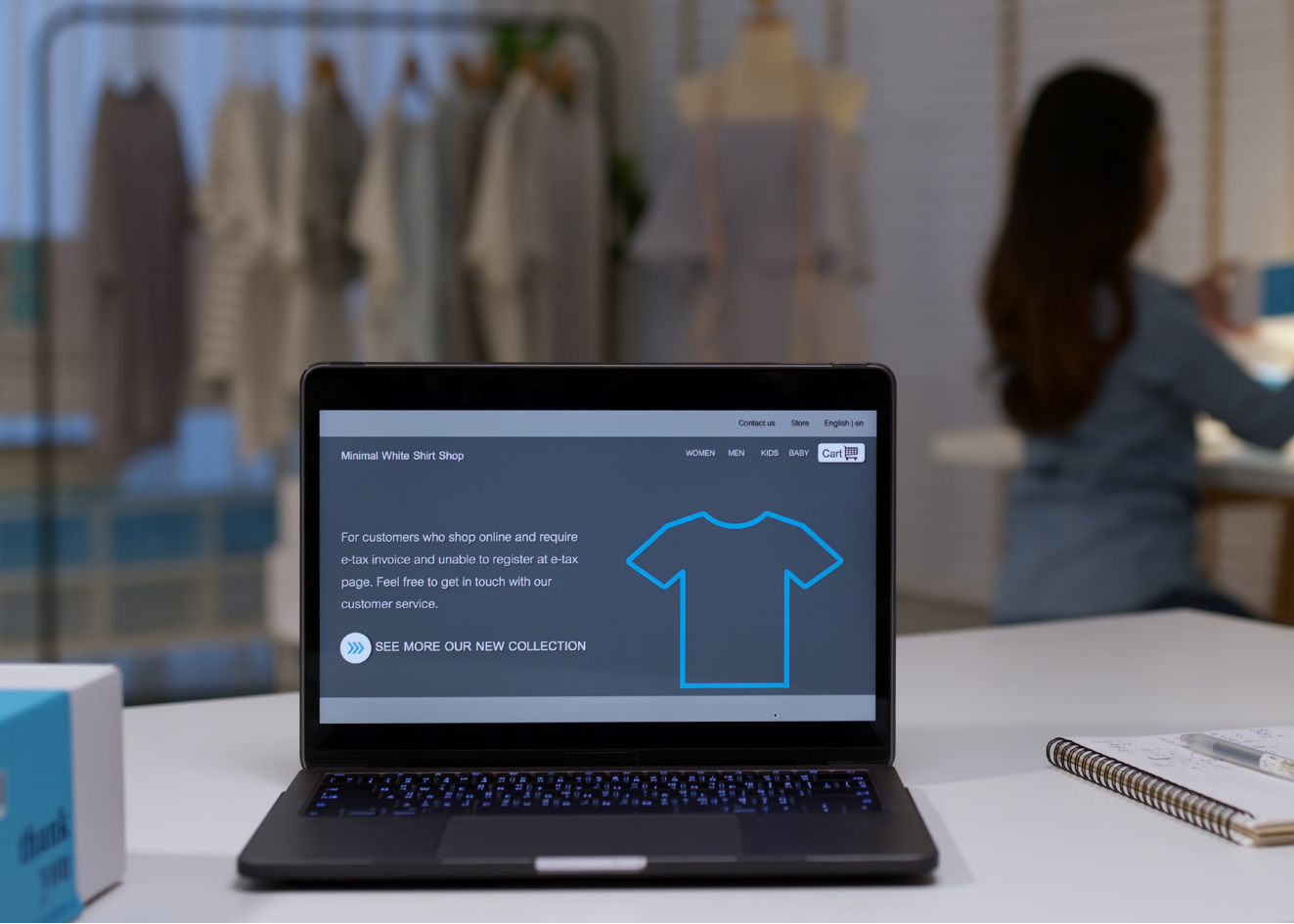
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# The Growing E-commerce Sector - Future Jobs and Opportunities



YANG Maria

## Introduction

Digital technologies possess great potential to accelerate growth and the competitiveness of national economies. They also have an impact on how goods and services are delivered and linked to other sectors. Growing digital adoption is witnessed in the public and private sectors as well as in civil society. Digital adoption is most prevalent in business, which is commonly called electronic commerce or E-commerce.

Cambodia's digital economy, in particular the E-commerce segment, has experienced rapid growth within the past decade. It is growing even faster during the COVID-19 pandemic. Internet access, affordability, and uptake have ramped up significantly, and the consumer base is becoming increasingly sophisticated in terms of absorbing social media, local content, and increasingly smart-phone based value-added services. During the global pandemic, E-commerce has been playing an even more important role in the continuation of daily business and personal activities. As countries deploy full or partial lockdown measures to contain the disease, in-person interaction is restricted, resulting in a contracted flow of trade and investment and the disruption of business activities. As the pandemic prolongs, businesses and people must adapt to a new-normal context, such as online business / E-commerce, online learning, online work, etc. Consequently, there has been a rise in demand for digital technology as a means to continue business activities and people interaction.

The rise of E-commerce is almost certain to continue in the post-pandemic world. In Cambodia, we have seen a rise in E-commerce in some sectors, such as grocery, food, fashions, real estate, delivery/logistics, e-payment, entertainment, marketplaces, etc. As the rise of E-commerce affects how goods and services are delivered, this paper mainly aims to examine how E-commerce shapes employment – and the demand for skills in particular. The paper is relevant to the current national policy agenda of Cambodia which is to prepare Cambodia for Industrial Revolution 4.0 and the digital economy, as mentioned in the Rectangular Strategy Phase IV, the Digital Economy and Society Policy Framework 2021-2035, and the Cambodia National E-commerce Strategy (2020). The paper will contribute to preparing Cambodia's young labor force for participating in the fast-growing E-commerce sector, and support local business leverage the benefits of digital technology through E-commerce.

This paper will be divided into 4 sections. The first section provides a background on E-commerce, the second provides an overview of E-commerce development in Cambodia, and the third provides an analysis on skills in demand and opportunities in the E-commerce sector. Lastly, the paper will provide a conclusion with some recommendations.

## What Is E-commerce?

There are various definitions of E-commerce. Some are broadly and some are narrowly defined. OECD defines "an E-commerce transaction as the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing to receive or place to receive or place of orders."[1] In Cambodia, the Law on E-commerce defines "E-commerce as activities involving purchase, sale, rental, exchange of goods and services, including business activities and civil as well as

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**1.** "Electronic Commerce," Glossary of Statiscial Terms, OECD, last modified June 15, 2021, https://stats.oecd.org/glossary/detail.asp?ID=4721

activities and various transactions by the state through electronic systems" (Cambodia Law on E-commerce).[2]

Value chain, fulfillment or process of E-commerce can be varied depending on types of E-commerce. Generally, a basic value chain of E-commerce starts from warehousing referring to receiving and storing inventory to order processing including picking, packing/labeling and shipping to delivery logistics focusing on first, middle and last-mile delivery. The ITC (2017) classifies the processes of an E-commerce transaction into three stages, including product/service ordering, payment, and delivery. According to the definition of E-commerce provided by OECD, for a transaction to be considered as an E-commerce transaction, the product/service can be either digital or physical; ordering must be digital; payment can be either digital or physical (cash on delivery); and delivery can be either digital or physical.

Since an integral part of E-commerce is the deployment of digital technology, particularly computer networks or electronic systems (Cambodia's Law on E-commerce), E-commerce can promote productivity. E-commerce is positively correlated with economic development as it helps reduce cost and increase efficiency for businesses. Business are able to reach out to more customers and are better integrated into global value chains. E-commerce can also promote productivity through entrepreneurship, innovation and job creation; reduce barriers of business expansion by improving peer-to-peer collaboration, and providing more options for access to finance like crowdfunding, and business records.[3] The OECD also analyzes

the economic and social impacts of E-commerce. According to the OECD, E-commerce significantly contributes to the reduction of transaction costs of the whole business process, including but not limited to owning and operating a physical establishment, carrying an inventory, conducting a sale, placing an order, customer support and after-sale service, simple purchase orders and product distribution.

The Covid-19 pandemic accelerated the importance of E-commerce through the deployment of digital technology in determining who stays and who leaves the market. Undoubtedly, we have seen many business closures, but also some business expansion in certain areas during this challenging time. The pandemic has slowed overall economic growth, causing a decline in demand in general. The tourism and hospitality sector is most affected, resulting in the closure of many businesses and job losses in this sector. In other sectors, businesses, particularly SMEs experienced a large drop in sales as the traditional supply chain has been disrupted by various restriction measures. During this critical time, productive or innovative firms have survived, but many of those reliant on traditional business models have closed. While sales have dropped in general, we have seen an increase in sales in sectors where technology is widely adopted to deliver goods and services to consumers. These include E-commerce businesses deploying digital technology to provide goods and services in sectors such as fashion, groceries, food, logistics, transportation, entertainment, news, real estate, and e-payment.

There are different ways to understand E-commerce models. Commonly,

**2.**   Royal Government of Cambodia. Law on E-commerce

**3.**   UNCTAD, E-trade for All. 2021. Covid-19 and E-commerce: A Global Review Reth Soeng, Ludo Cuyver and Morarith Soeung,

"E-commerce Development and Internet Banking Adoption in Cambodia," ERIA Research Project "Digital Economy, Innovation, and East Asia's Competitiveness in GVC: Impriving e-commre enabling/supporting connectivity in Asia" (FY2017 to FY2018)

E-commerce models are classified in two ways: (i). as a relationship between parties that are involved in E-commerce and (ii) the types of business that facilitate the E-commerce transaction. For the first classification, E-commerce models can be Business to Business (B2B), Business to Consumer (B2C), Consumer to Consumer (C2C), Government to Business (G2B), and Government to Consumer (G2C), etc.[4] For the second classification, the E-commerce segment includes pure E-commerce players that sell only over the internet or online platform and omnichannel players that combine physical stores and online platforms to sell products. Online sales channels used by E-commerce are social commerce (Facebook, Instagram, Youtube, Twitter, Whatsapp, other social media), own E-commerce websites, third-party online marketplace, and others.[5] There is a variety of goods and services sold on E-commerce platforms categorized by market segments, such as food and beverages; personal care; furniture and homeware; household appliances; toys and baby; sports and outdoor; hobby and stationery; DIY, garden and pets; consumer electronics; books, movies, music and games; apparel; footwear; and bags and accessories (Uni Global Commerce Union, 2019). According to the UNCTAD business survey (2020), the top three goods and services sold online by E-commerce in developing countries and LDCs before the Covid-19 are fashion and accessories, agro-good and beverages as well as electronics and IT equipment.[6]

**Figure 1:** *Types of goods and services sold online by E-commerce companies before Covid-19 (in percent)*
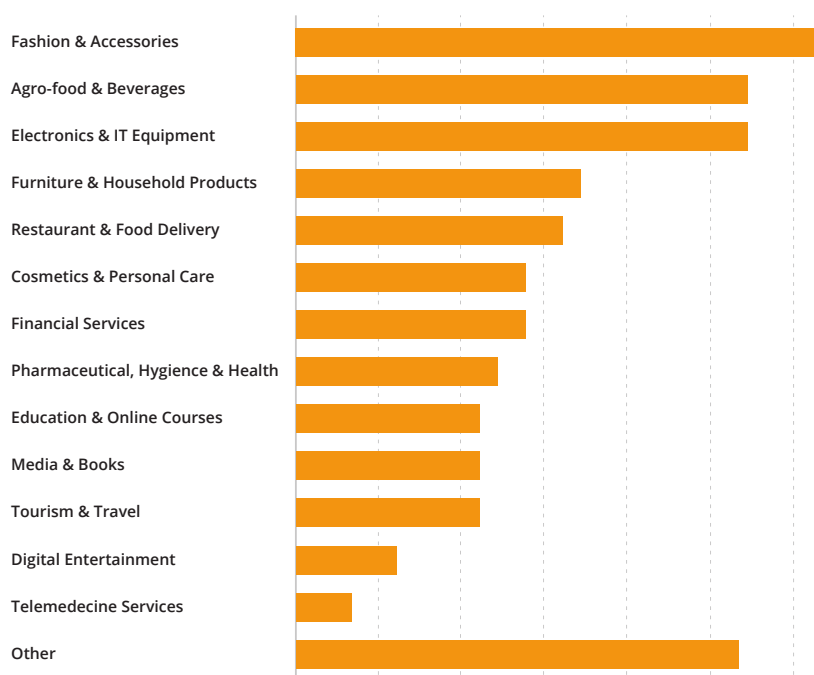


*Note: 180 responses from the e-commerce company track. Based on the question "What kind of goods or services do you sell via e-commerce?" (multiple choices allowed)*

**Source:** *Covid-19 and E-commerce Impact on Business and Policy Response, UNCTAD (2020)*

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4. "The role of transport and logistics in promoting E-commerce in developing countries," UNCTAD, last modified on June 21, 2021, https://unctad.org/news/role-transport-and-logistics-promoting-E-commerce-developing-countries

5. Uni Commerce Global Union. 2019. E-commerce: Recent Trends and Impact on Labour: 5

6. UNCTAD. 2019. Covid-19 and E-commerce: Impact on Business and Policy Response

# E-commerce Development in Cambodia

There are different approaches to assess the development of E-commerce. UNCTAD developed an analytical framework to assess e-Trade Readiness Assessment in developing countries, including Cambodia.[7] Thus, Cambodia's E-commerce development can be assessed based on the analytical framework of E-commerce developed by UNCTAD.

First, in regards to the legal and regulatory framework, Cambodia has developed a legal and policy framework to build trust and provide clear policy direction for stakeholders, especially the business community. The Law on E-commerce has been promulgated in late 2019, followed by relevant regulations to enforce the implementation of the law. The Law on E-commerce provides legal certainty in civil and commercial transactions and confidence to the public in usage of electronic communication.[8] In addition, aligned with the Law on E-commerce and recommendations in Cambodia E-trade Readiness Assessment studied by UNCTAD in 2017, the Ministry of Commerce developed an E-commerce Strategy addressing 10 areas of the E-commerce ecosystem, including strategy and policy focus and institution coordination, legal and regulatory framework, SME regulations, ICT infrastructure, digital skills infrastructure, payment systems, domestic trade logistics, cross-border trade, access to financing, and trade information and in-market support.[9] In regards to the policy framework, the RGC has recently launched its Digital Economy and Society Policy Framework 2021-2035, in which E-commerce is mainstreamed in the digital business pillar. This is just one of three pillars of Cambodia's digital economy - the other two being creating digital citizens, and building the digital government. E-commerce is set to be developed through the promotion of digital transformation, the digital business ecosystem and integration into global value chains.

Second, ICT infrastructure and services which are crucial for processing E-commerce transactions have been developed significantly. The E-commerce sector is closely related to the growth of the internet. The Internet penetration rate in Cambodia has exponentially increased from only 0.53% in 2009 to 40% in 2018.[10]

 As shown in table 3 and 4 below, the mobile phone network has expanded to a large share of the total population; however, the digital divide remains an issue of concern because mobile network coverage has not yet been expanded to all rural areas.[11] For instance, the 4G mobile phone network coverage is only 60.5% of Cambodia's total area. As internet service is a core of E-commerce transactions, a high percentage of mobile internet users generally leads to E-commerce growth in the kingdom. Developing broadband internet or fixed internet service should therefor be a priority to accelerate E-commerce transactions and narrow the digital divide gap.

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7.   UNCTAD. 2017. Cambodia Rapid e-Trade Readiness Assessment

8.   Royal Government of Cambodia. Law on E-commerce

9.   Royal Government of Cambodia. Ministry of Commerce. 2020. E-commerce Strategy

10.  Statista. Internet Penetration Rate in Cambodia 2009-2018. https://www.statista.com/statistics/766013/internet-penetration-rate-cambodia/

11.  Royal Government of Cambodia. 2021. Digital Economy and Society Policy Framework 2021-2030

*Table 3: Mobile Phone Network Coverage in Cambodia, as of July 2020*

| Description | Coverage share of the total population | Coverage share of the total area |
|---|---|---|
| **2G mobile phone network coverage** | 92.3% | 79.5% |
| **3G mobile phone network coverage** | 85.2% | 66.2% |
| **4G mobile phone network coverage** | 82.5% | 60.4% |

*Source: General Department of Telecoms, Ministry of Posts and Telecommunication, Cambodia (2020)*

*Table 4: Supply and Usage of Internet Service in Cambodia, as of July 2020*

| Operator | Number of Users | Percentage per 100 People | Market Share |
|---|---|---|---|
| **Mobile internet service** | 15,127,031 | 91.65% | 98.36% |
| **Fixed internet service** | 252,216 | 1.53% | 1.64% |
| **Total** | 15,379,247 | 93,15% | 100% |

*Source: TRC, Cambodia (2020)*

Third, new financial technologies have been integrated to build trust and improve user experience with payment solutions, such as e-payment, e-wallet, e-banking, mobile banking, FAST payment system, Cambodian Shared Switch-CSS, national clearance system, Bakong system, etc. While financial technologies have been increasingly adopted, Cash on Delivery (COD) is still a popular payment option for online shopping.

Fourth, logistics services, especially last-mile delivery is one of the most important parts of E-commerce fulfillment. Logistics services, especially last-mile delivery service have been rapidly growing in Cambodia due to increasingly online consumption through E-commerce. The covid-19 pandemic has created a higher demand for logistics services, especially in the retail and grocery business. However, delivery time and cost are still a challenge for Cambodia's E-commerce competitiveness even though hard infrastructure has developed.

Fifth, in terms of access to finance, there are not many financing instruments or options available for E-commerce in particular. The banking system is still dominant in the financial sector in Cambodia, which does not provide loans with favorable terms (interest, collateral, and other requirements) for E-commerce. Although E-commerce is clearly defined in the Law on E-commerce, regulations and incentives for E-commerce target SMEs in general, not E-commerce specifically. For instance, the SME Bank was established in 2020 by Ministry of Economy and Finance with a core mission to expand financial access to SMEs based on SMEs criteria, in which E-commerce is not specified.[12] In addition, since E-commerce is a new model of business, specific credit criteria for E-commerce have not yet been acknowledged or adopted by financial institutions. Besides less favorable credit terms for E-commerce, there

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**12.** Small and Medium Enterprise Bank of Cambodia Plc. https://smebankcambodia.com.kh/about/

are also limited financing options on the basis of investment, such as venture capital, equity financing, investmen agel, etc.[13]

Lastly, regarding skills development, E-commerce requires higher-tech skills, which are currently lacking in Cambodia. Although Cambodia is enjoying a demographic dividend in which more than 60% of the total population are under 30, the Cambodian young population needs tech skills to be able to participate in the labor market of the digital economy, particularly the E-commerce sector. This issue will be discussed further in the next section.

Given the current evolving growth of E-commerce, a number of E-commerce businesses have been able to expand their businesses significantly. One of the most successful E-commerce business, built from a digital start-up by an apspired Cambodian entreprendure, is BookMeBus.[14] BookMeBus provides an E-commerce platform for booking bus tickets online, enabling time and cost efficiency for both ticket sellers and buyers. BookMeBus deploys digital technogy, including financial technogy to enable and secure online payment by integrating with financial service providers. BookMeBus was able to expand business rapidly and attract a huge amount of investment as the new online ticket booking platform has been trusted and adopted by Cambodian young techsavvy population. Due to the Covid19 pandemic, tourism and travel sector is severly afftected. Then, BookMeBus collaborated with VirakBunTham, one of the leading trasporation companies in Cambodia, to form a join-venture E-commerce marketplace called V-tenh that sells a variety of products ranging from groceries to electronic goods online.[15] The success story of BookMeBus that is started from a digital startup and developed into joint-venture E-commerce marketplace reflects a good E-commerce business model that is suitable in the context of digital economy, especially during the Covid19 pandemic.

As digital technology alters how goods and services are delivered more productively, digital technology inevitably affects the allocation of labor. There have been several studies on the impacts of the fourth industrial revolution, a digital economy, or the rise of E-commerce on jobs. ICT or dgitial technology is at the core of each of these. Some studies found positive impacts on employment while some suggsted negative impacts. Some also argued that there are both positive and negative impacts despite different implications on jobs, it is commonly agreed that the future of work in the context of IR4.0 or digital will bring a high demand for tech, highly-skilled, cognitive, and non-routine work.[16] E-commerce is a potential and fast-growing sector in the digital economy, the future of work in E-commerce is indifferent. The paper discusses employment opportunities of E-commerce by annalyzing employment based on necessary skills for occupations in E-commerce and key players or stakeholders in E-commerce.

## In Demand Skills for E-commerce

Regarding to E-commerce skills, Uni Global Commerce studied the employment impacts of E-commerce by classifications of occupation, such as routine, non-routine,

13. Royal Government of Cambodia. Ministry of Commerce. 2020. E-commerce Strategy

14. USAID. Cambodian Start Up That Centralizes Bus Booking Makes Traveling Easier. https://www.development-innovations.org/success-stories/cambodian-start-centralizes-bus-booking-makes-traveling-easier/

15. Vtenh. https://www.vtenh.com/en

16. Asian Development Bank. 2021. Reaping the benefits of industry 4.0 through skills development in Cambodia Klaus Schwab, "The fourth industrial revolution: what is means, how to response," World Economic Forum, last modified July 15, 2021, https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

cognitive, manual, and mixed.[17] The study argued that E-commerce tends to create more jobs for non-routine work (cognitive and manual) while leaving negative impacts on routine work. E-commerce is more sophisticated than traditional business because E-commerce transactions involve the usage of ICT networks or services, meaning that E-commerce growth drives higher demand for ICT-related skills. Studies also showed that E-commerce will create more jobs that deal with information-related goods and services and digital products, while causing certain jobs (with potential for automation) to lose relevance.[18] As routine work is more likely to be automated, it is interesting to know what non-routine work will be increasingly in demand as E-commerce grows. By looking at the E-commerce supply chain and E-commerce ecosystem, we can understand that ICT is an instrument integrated into each process of the supply chain, and each niche of the ecosystem. Therefore, tech-related or digital skills are one of the in-demand skillsets for the E-commerce sector. As can be seen in table 5 below, the recently launched Cambodian E-commerce Strategy identified four categories of skills with respective sub-categories which are in demand and crucial for development to E-commerce.[19]

**Table 5:** *Necessary Skills for the Growth of the E-commerce Sector*

| ICT Specific | E-commerce Supply Chain | Soft Skills |
|---|---|---|
| • IT project managers<br>• IT directors<br>• Software architects<br>• Scrum masters<br>• Web and multimedia developers<br>• Database and network professionals<br>• Computer network and systems technicians<br>• Graphic and multimedia designers<br>• System analysts and IT architects<br>• Software and system developers<br>• ICT user support technicians<br>• Web technicians<br>• Network security, program development security and cyber security | • Sourcing management<br>• Merchandising management<br>• Warehousing and operations (including domestic and cross-border logistics)<br>• Marketplace management<br>• Customer service operations management and after-sales support (including returns)<br>• Supply chain planning and forecasting | • Higher order cognitive skills<br>• Self-control<br>• Client-facing and coordination<br>• Sensitization to computers, peripherals, internet (digital literacy perspective among students and population) |
| **Hybrid** | | |
| • Digital entrepreneurship | | |

**Source:** *Cambodia E-commerce Strategy, 2019*

Employment opportunies in E-commerce can also be assessed by job creation for E-commerce stakeholders. UNCTAD identified seven major areas of the whole E-commerce ecosystem in which each area has its own stakeholders. As shown in figure 2 below, UNCTAD policy areas for E-commerce development include policy and strategy formulation, ICT infrastructure and services, trade logistics and trade facilitation, payment solutions, legal and regulatory frameworks, E-commerce skills development, and access to financing for E-commerce.[20]

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17. Uni Commerce Global Union. 2019. E-commerce: Recent Trends and Impact on Labour

18. Nuray Terzia, "The impact of E-commerce on international trade and employment," Prodedia Social and Behavioral Science 24 (2011): 750 World Bank Group. 2016. World Development Report: Digital Dividends. Washigton, D.C.: 108

19. Royal Government of Cambodia, Ministry of Commerce. 2020. E-commerce Strategy: 38

20. UNCTAD. Harnessing E-commerce for sustainable development

Based on the policy areas for ensuring E-commerce growth, stakeholders from each policy area are identified to have roles in supporting the E-commerce ecosystem., and thus we should expect employment opportunities to be created in these seven areas.

*Figure 2: The E-Trade for All analytical framework for E-commerce*



*Source: UNCTAD (2016)*

Moreover, E-commerce can promote entrepreneurship and innovation, especially the empowerment of women entrepreneurs.[21] There are approximately 500,000 enterprises, out of which 97.6% are micro-enterprises and 2.2% are small-and-medium enterprises (SMEs) in Cambodia. 62% of micro-enterprises and 26% of SMEs are women-owned. E-commerce allows women entrepreneurs to adopt digital technology to transform their business from offline to online and tackle challenges that they face in traditional business. In traditional business, women often find it difficult to devote sufficient time for their business as they have to allocate a large proportion of their time to housework. With the online presence of their business through E-commerce, women can partly or entirely operate their business online from home. They can communicate with their employees, customers, business partners, financial service providers, logistics service providers, etc. effectively via online platforms. In Cambodia, there has been a boom in social commerce in which retail businesses, mostly women-owned sell their products on social media, such as Facebook, Instagram, YouTube, etc. Those who run social commerce businesses (informal or formal) become self-employed and can generate extra income in addition to their primary work.

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**21.**  World Bank Group. 2019. Exploring the Opportunities for Women-owned SMEs in Cambodia. Washington, D.C.

# Conclusion and Recommendations

The E-commerce sector in Cambodia has been rapidly growing given the dynamic E-commerce ecosystem. In the context of the fourth industrial revolution or the digital economy, E-commerce will be a potential new source of Cambodia's economic growth in terms of driving efficiency of doing business and job creation for the young tech-savvy population. There are some recommended ways forward to prepare businesses and people for leveraging digital opportunities in the growing E-commerce sector.

First, for Cambodia as a country where digital technologies are emerging, it is important to support foundation skill training and basic ICT literacy.[22] Foundation skills and basic ICT literacy can be integrated into the curriculum of early-year education. According to the Cambodia Digital Economy and Society Policy Framework 2021-2035, Cambodia is preparing itself to become a digital economy over the next decade. It is necessary to start equipping the young generation with basic skills and ICT literacy. Singapore, ranking in the top 4 of Global E-commerce Index 2019[23], has adopted Digital Readiness Blueprint to build digital readiness of every Singaporean through promotion of digital access, digital literacy, and digital participation. Under the digital literacay approach, the Blueprint suggests adoption of basic digital skills curriculum that covers digital aspects related to managing information and communication (internet surfing), transactioning digitally (online shopping), accessing governement services (governement digital services and apps), and staying safe online (cybersecurity). In additional to basic ICT literacy, the World Development Report 2016 identifies three types of skills that are needed in a modern or digital economy, including cognitive, social and behavioral, and technical skills. As discussed, the E-commerce sector requires ICT-related or technical skills which can be trained or developed at a higher level of education, cognitive skills which have to be developed since early education, and soft skills which are necessary the whole time. World Bank suggested formulation of a comprehensive ICT skills framework as a roadmap for specific ICT skill development.[24] Singapore also has developed Skills Framework (SF) for ICT, providing comprehensive and clear guidelines on specific ICT skills and job opportunities in ICT-related or tech sector, including but not limited to the E-commerce sector.[25] Therefore, it is crucial for Cambodia to formulate skills framework for ICT, E-commerce supply chains, and soft skills through consultations with relevant stakeholders in the industires in order to provide roadmaps for education or training providers as well as the young labor force to be prepared for the job opportunities in the digital economy.

Second, at the emerging stage of the digital economy, there should be laws and regulations, and policies to promote the adoption of digital technology so that businesses can move from traditional business to E-commerce. The government should lower barriers to digital adoption through laws and regulations and policies to ensure fair competition and entry and provide incentives to invest in technology among businesses, especially MSMEs

22. World Bank Group. 2016. World Development Report: Digital Dividends. Washington, D.C.

23. UNCTAD. B2C E-commerce Index 2019.

24. World Bank. 2018. Preparing Skills for Digital Economy: Indonesia within the ASEAN Context

25. Open Gov. Skills Framework for ICT lauched in Singapore to guide and develop ICT professionals in the dighital economy. https://opengovasia.com/skills-framework-for-ict-launched-in-singapore-to-guide-and-develop-ict-professionals-in-the-digital-economy/

and SMEs. Although Cambodia has developed a number of laws and regulations for the E-commerce sector, effective enforcement and policies offering specific incentives for E-commerce are still required. An E-commerce ecosystem should also be promoted to build entrepreneurship, mentorship, innovation, incubation, start-ups, networking, funding, etc. in the E-commerce sector.

Third, as E-commerce has a great potential to accelerate sales or business growth, it is highly recommended that businesses - especially women-owned businesses - should transform from doing business in a traditional way to an online one by taking advantage of digital technology and the existing supporting ecosystem of E-commerce. Digital technology is an instrument helping businesses delivering goods and services effectively and efficiently, leading to significantly increased productivity and cost reduction. Traditional businesses in the agriculture sector, tourism, education, and other retail sectors should leverage digital technology to find consumers and get connected to relevant service providers or business partners, such as payment and logistics services conveniently. Since E-commerce is a new way of doing business, business moving to online presence has to possess necessary online skills for operating their business, such as digital marketing, creative and innovative solutions, managing online store or marketplace. There are many initiatives in Cambodia that assist businesses with E-commerce or online business skills.

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# Cambodia's Higher Education: Educating the Next Generation for the Age of Artificial Intelligence



VEUNG Naron

# Abstract

Cambodia needs to transform its labor-intensive economy into high-tech industry as it plans to upgrade the country's status to an upper-middle-income country by 2030, and a high-income country by 2050. Building a skilled workforce in technical and technological skills and competencies is crucial to realize this ambition. As Artificial Intelligence (AI) is accelerating relentlessly and changing all aspects of human society, Cambodia needs to adopt a fully AI-integrated education system to equip young Cambodians with knowledge of AI and its related technologies. Ideally, this must be achieved in alignment with a national AI plan that mobilizes multiple resources and stakeholders into one national task force.

This paper aims to amplify the important role and direction of the higher education sector in preparing the next generation for the age of AI, while raising public concern over the current higher education system, and its current lack of investment into initiatives that could encourage AI and AI related technologies. The paper presents the importance and effects of AI on industrial and economic development as well as higher education. Some typical models of advanced economies are included as examples – they exemplify how higher education institutions in developed countries can balance, support and nurture rapid AI advancements. The paper also describes where Cambodia's higher education is now, and how it can move forward to better promote adoption of AI technologies in the future.

Based on the review of AI and higher education experiences and lessons from advanced countries, the paper suggests how Cambodia's higher education and relevant government bodies could prepare the next generations for the AI age. It provides policymakers, academics, researchers, practitioners, and relevant stakeholders with possible clues in developing an AI framework.

# Introduction

The world has witnessed the rapid development of Artificial Intelligence (AI), which is increasingly integrated into fast-growing technologies like computers, smartphones, smartwatches, robots, and even our social media platforms. Such AI-integrated platforms can even perform tasks that once required human cognition, due to their built-in learning systems. These machine learning technologies are now growing exponentially, being adopted globally in sectors including finance, transportation, education, and tourism.[1] Moreover, uptake of these technologies is occurring even faster because of the COVID-19 pandemic.[2]

Like many countries, Cambodia is adopting a wide range of technologies in response to the COVID-19 pandemic. This is even though many Cambodians are unfamiliar with advanced technologies, and access to the Internet is still somewhat limited. As Cambodia aims to benefit from Industry 4.0 (I4.0), preparing young Cambodians for this I4.0 adoption is a must, and requires the incorporation of AI and its related technologies into the higher education curriculum.

With a review of AI and higher education, this paper investigates the role and direction of higher education in preparing young Cambodians for the AI age. It explores how

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1. Sachin Chitturu et al., "Artificial Intelligence and Southeast Asia's Future," Discussion Paper (Singapore: The McKinsey Global Institute (MGI), September 2017).

2. "Thriving in an AI World," KPMG, April 2021, https://info. kpmg.us/content/dam/info/en/news-perspectives/pdf/2021/ Updated%204.15.21%20-%20Thriving%20in%20an%20AI%20 world.pdf.

higher education could contribute to Cambodia's uptake of AI technology, and help to solve the new challenges posed by an increasingly digital, and AI driven economy.

# AI in Demand for Industrial Transformation and Economic Development

Over 60 years of evolution, since the term was first coined by John McCarthy in 1956[3], AI has reached a new stage of software and hardware development. It is now highly capable of extracting a valuable range of real-time information on demand, using technologies such as machine learning, complex algorithms, deep learning, and so forth, all towards an overall aim of creating machines that can perform tasks with intelligence.[4] With the rapid growth of AI use cases, it has understandably grown in demand as a means to achieve economic and social development. Many countries see its potential in helping them achieve the fourth industrial revolution - or I4.0 – as they attempt to digitize manufacturing processes and decrease human or manual interventions.[5] AI is seen as an optimal solution to meet changing market demands, face competition, and reduce manufacturing costs.[6] Thus, it is thought that AI technologies will be a key determinant of the economic success of a country or firm. Employed correctly, AI can provide manufacturers and employers flexible, profitable, and efficient production or services, and enable them to keep ahead (or at least match the pace) of their competitors.[7]

*Table 1: National AI strategies of some advanced economies[8,9,10]*

| No | Country | Strategy | Goals | Main AI Initiatives | Start Year | End Year |
|----|---------|----------|-------|---------------------|------------|----------|
| 1 | USA | The American AI Initiative | - Prioritizes the need for the federal government to invest in AI R&D, reduce barriers to federal resources, and ensure technical standards for the safe development, testing, and deployment of AI technologies.<br><br>- Develops an AI-ready workforce and signals a commitment to collaborating with foreign partners and promoting U.S. leadership in AI. | 47 | 2019 | NA |

3.   Richard E. Neapolitan and Xia Jiang, Artificial Intelligence: With an Introduction to Machine Learning, 2nd ed., Artificial Intelligence and Robotics Series (New York, NY: Chapman & Hall/CRC, 2018).

4.   Aditi Sharma and Deepak Kumar Jain, "Development of Industry 4.0," in A Roadmap to Industry 4.0: Smart Production, Sharp Business and Sustainable Development, ed. Anand Nayyar and Akshi Kumar, Advances in Science, Technology & Innovation (Springer International Publishing, 2020), 29.

5.   Akshi Kumar and Anand Nayyar, "Si3-Industry: A Sustainable, Intelligent, Innovative, Internet-of-Things Industry," in A Roadmap to Industry 4.0: Smart Production, Sharp Business and Sustainable Development, ed. Anand Nayyar and Akshi Kumar, Advances in Science, Technology & Innovation (Springer International Publishing, 2020), 1–21.

6.   Christoph Jan Bartodziej, The Concept Industry 4.0: An Empirical Analysis of Technologies and Applications in Production Logistics, BestMasters (Gabler Verlag, 2017), https://doi.org/10.1007/978-3-658-16502-4.

7.   Anand Nayyar and Akshi Kumar, eds., A Roadmap to Industry 4.0: Smart Production, Sharp Business and Sustainable Development, Advances in Science, Technology & Innovation (Springer International Publishing, 2020), https://doi.org/10.1007/978-3-030-14544-6.

8.   "Artificial Intelligence Index Report 2021," Report, Stanford University, March 2021, https://aiindex.stanford.edu/wp-content/uploads/2021/03/2021-AI-Index-Report_Master.pdf.

9.   "National and International AI Strategies," Future of Life Institute, accessed July 5, 2021, https://futureoflife.org/national-international-ai-strategies/.

10.   "OECD AI's Live Repository of over 260 AI Strategies & Policies," accessed July 5, 2021, https://www.oecd.ai/dashboards.

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| 2 | Germany | Artificial Intelligence Strategy | - Cements Germany as a research powerhouse and strengthens the value of its industries.<br><br>- Emphasizes the public interest and working to better the lives of people and the environment. | 31 | 2018 | 2015 |
| 3 | Japan | Artificial Intelligence Technology Strategy | - Focuses on the utilization of data and AI in related service industries,<br><br>- Concentrates on the public use of AI and the expansion of service industries,<br><br>- Focuses on creating an overarching ecosystem where the various domains are merged. | 14 | 2019 | 2030 |
| 4 | Russia | National Strategy for Artificial Intelligence Development | - Places a strong emphasis on its national interests and lays down guidelines for the development of an "information society" between 2017 and 2030.<br><br>- Includes a national technology initiative, departmental projects for federal executive bodies, and programs such as the Digital Economy of the Russian Federation, designed to implement the AI framework across sectors. | 11 | 2019 | 2030 |
| 5 | China | New Generation Artificial Intelligence Development Plan | - Building a domestic AI industry worth nearly USD 150 billion in the next few years and to become the leading AI power by 2030 | 9 | 2017 | 2030 |

Moving towards high-tech development, many advanced economies have focused on an AI strategy in line with their national strategic development plans, as Table 1 shows.

For instance, the USA prioritizes AI and invests enormously in its American AI Initiative 2019. It has since developed a series of sub-initiatives to support AI development. Similarly, Germany adopted its AI strategy in 2018, with a large investment in AI research and development. This strategy set a framework for a holistic policy on the future development and application of AI, whilst also supporting the German National High-Tech Strategy 2025.[11,12]

Like Germany, China introduced the New Generation AI Development Plan, aimed at building a domestic AI industry and becoming a leading AI power by 2030. This initiative supports the "Made in China 2025" initiative which aims to comprehensively upgrade its low-cost industry to a high-quality industry, and to support China to become the leading industrial world superpower in the long run.[13]

As one of the leading AI countries, Japan adopted its AI Technology Strategy in 2017 which specifies the environment and measures conducive to effective future utilization of AI. Its

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11. Kumar and Nayyar, "Si3-Industry: A Sustainable, Intelligent, Innovative, Internet-of-Things Industry."

12. "The High-Tech Strategy 2025 Progress Report," Report, The German Federal Ministry of Education and Research, 2019, https://www.bmbf.de/upload_filestore/pub/The_High_Tech_Strategy_2025.pdf.

13. Ma Huimin et al., "Strategic Plan of 'Made in China 2025' and Its Implementation," in Analyzing the Impacts of Industry 4.0 in Modern Business Environments, 2018, 1–23. https://doi.org/10.4018/978-1-5225-3468-6.ch001.

objective was to contribute to the solution of global issues through realization of Society 5.0 and overcome certain issues facing Japanese society. Toyota provides an example of successful innovation from this strategy – the company is attempting to develop Human Support Robots (HSR) to provide services for the elderly at home and in health care settings – these HSR could eventually prove crucial in Japan, which faces an aging population and tight labor market. Recently, Japan also released its New Robot Strategy to revolutionize its manufacturing industry, improving Japan's international competitiveness.[14]

Like other developed countries, Russia formulated the National Strategy for Artificial Intelligence Development, placing a strong emphasis on its national interests and laying down guidelines for the development of an "information society" between 2017 and 2030. It also developed its Digital Economic Development Program to build information infrastructure, information security, regulatory control, personnel and education, and the formation of research competencies and technological reserves.[15] This digital economic plan is a base for the Russian government to catch up with its counterpart countries like the USA, Japan, China, and European countries, leading to fully AI-integrated manufacturing.

As illustrated above, the development of all high-tech manufacturing industries needs advanced AI and innovative technologies. Therefore, AI, machine learning, deep learning, and other relevant technologies are the key components of the manufacturing

processes to make a smart factory, or enable smart manufacturing.[16] However, a gargantuan investment in technical, technological, financial, and human resources is often needed to realize this high-tech manufacturing concept.

AI has influenced how the labor markets are operated in Asia, and Asian economies have adopted AI technologies at a faster rate than ever before during the time of COVID-19. A study by the McKinsey Global Institute (MGI) estimated that AI technologies could hold the potential to automate about half of the work activities in the four biggest ASEAN economies: Indonesia, Malaysia, the Philippines, and Thailand - and the value of these tasks is currently over USD 900 billion annually in wages. Another study by Cisco and Oxford Economics estimated that the next decade could see around 28 million jobs lost in the ASEAN region due to innovative AI technologies with a high adoption rate.[17] Therefore, the adoption of these AI technologies and automation can dramatically boost manufacturing productivity, disruptively impacting economies, changing the nature of many jobs, and requiring greater interaction with machines.[18]

The trend of AI adoption and development will introduce new types of workforce skills across the region, while the skills and competencies of the existing workforce could become obsolete if action is not taken. For instance, the 2020 World Economic Forum report estimated that by 2025, about 85 million jobs in 26 advanced and emerging economies will become less relevant or

**14.** Ibid.

**15.** E. B. Razuvaeva, N. V. Starun, and L. G. Elkina, "Digital Economy as a Way to Ensure Economic Growth," in Digital Age: Chances, Challenges and Future, ed. Svetlana Igorevna Ashmarina, Marek Vochozka, and Valentina Mantulenko, Lecture Notes in Networks and Systems (Springer International Publishing, 2020), 116–27, https://doi.org/10.1007/978-3-030-27015-5.

**16.** Sharma and Jain, "Development of Industry 4.0," 28.

**17.** "Artificial Intelligence Could Mean 28 Million Jobs Lost," The Phnom Penh Post, September 13, 2018, https://www. phnompenhpost.com/business/artificial-intelligence-could-mean-28-million-jobs-lost.

**18.** Chitturu et al., "Artificial Intelligence and Southeast Asia's Future."

no longer applicable to the shifting labor division, while roughly 97 million new work roles may appear due to innovation and automation technologies. However, these new jobs will not be created immediately[19], and there are several possible short-term downsides. For example, the shifting division of labor between employees, machines and algorithms seems could negatively impact a large portion of the existing ASEAN workforce. Those with limited education and training, and who currently work in low-value-added industries in many developing economies could be particularly hard hit. These fast-rising AI technologies have therefore become a worrisome burden on the governments of the developing world. Do they preserve their economies and low-cost labor force – or drive to catch up with the regional and global developments towards an AI epoch?

## Higher Education And Technological Developments

Education and training systems have undoubtedly been affected by digital technologies. They are increasingly adopted into current teaching practices, and new methods of learning in the 21st century. This increasing technology integration has posed questions to higher education institutes: could traditional practices of higher education, and the roles of instructors disappear? Could they be replaced by new disruptive technologies? This is particularly relevant given that in general, learning methodologies change & develop alongside the socio-techno development of a country.[20]

Growing digital platforms like Coursera, edX, Khan Academy, and Udemy, provide learners with great borderless learning programs, in many cases replacing classroom education. However, moving higher education completely online in the time of COVID-19 is unrealistic in many developing countries, as even advanced countries have not had time to adapt to a completely remote learning environment. In addition, the remote learning technology itself needs time to catch up – nobody could have anticipated the speed in which remote learning needed to develop as a result of the pandemic.

The 21st century is one of constant changes, and the skills and knowledge of the current workforce can become outdated quickly due to the rapid development of technologies and innovative manufacturing processes.[21] Therefore, even recent university graduates could find themselves victims as advanced AI technologies are adopted across economic sectors, in some cases replacing the roles those graduates would apply for. This is worrying in a country such as Cambodia, where we already hear often of a "skills gap" between graduate skills and employer needs. It is expected that new and complex skills and knowledge will be required by graduates to adapt to new technological changes.

To address the skills challenges posed by expected AI developments, upskilling and reskilling the current workforce and young people is a key instrument for a nation to remain competitive.[22] However, there are major challenges. First, it is usually harder for developing countries to upgrade and adopt new (often foreign) technologies because

19. "The Future of Jobs Report," Report, the World Economic Forum, October 2020, http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf.

20. Ildikó Horváth, "Disruptive Technologies in Higher Education," in 2016 7th IEEE International Conference on Cognitive Infocommunications (CogInfoCom), 2016, 000347–52, https://doi.org/10.1109/CogInfoCom.2016.7804574.

21. Jinyoung Kim and Cyn-Young Park, "Education, Skill Training, and Lifelong Learning in the Era of Technological Revolution" (Asian Development Bank, January 23, 2020), http://dx.doi.org/10.22617/WPS200008-2.

22. Seyhah Ven and Naron Veung, "The Contribution of Vocational Skills Development to Cambodia's Economy," Working Paper, Cambodia Development Resource Institute, 2020.

they lack the skilled workers to implement the new technologies. It is hard to prepare a university student to work with a technology that may not have existed at the time they enrolled. In comparison to the Silicon Valley education sector, developing countries often lack programming and AI teachers, curriculum, and facilities to train new batches of graduates.[23]

The workforce of the future must be trained in or equipped with highly technical and technological skills and knowledge. Otherwise, their potential will be wasted, and less competitive in the future of work. Thus, enhancing the capabilities and skills of the workforce with essential skills and competence plays a crucial role in a country's industrial transformation.

In demand skills include:

- Machine learning
- Deep neural networks
- Robotic process automation
- Intelligent applications
- Smart robots
- Chatbot development
- Virtual reality
- Natural language processing
- Speech recognition
- Virtual assistant,
- Generative adversarial network.[24]

It is estimated that by 2024 the market value of AI will break its record of 500 billion US dollars, while the global revenue of the sector is said to grow 16.4% every year, reaching 327.5 billion US dollars in 2021.[25] As digital technologies have become pronounced around the world, this tendency will be relentless, reflecting a prominent role of AI in all sectors, not just in the education sector. More importantly, humans and technologies will be strongly attached to and inseparable from each other in education and other sectors.[26] Thus, this technological expansion also signals that academics, staff, and instructors in higher education need to adapt to new technologies – they need to see it as a lifelong learning experience as much as possible.[27] The risk is that if they do not, their skill set becomes redundant, as more and more of their students become netizens and users of technologies.

# The Role and Direction of Higher Education in the AI Epoch

As AI and innovative technologies are skyrocketing, disrupting the world drastically, and changing the nature of work around the globe, advanced and even developing economies are now embarking on concrete AI initiatives to counteract the intended and unitended consequences of AI advancements.

As shown in Table 1 above, Germany, China, Japan, and Russia have already developed AI strategies as part of their national strategic development plans. All these national AI initiatives are closely connected with human resources development plans in building competent workforces for the

**23.** Qaisar Abbas and James S. Foreman-Peck, "Human Capital and Economic Growth: Pakistan 1960-2003," Lahore Journal of Economics 13, no. 1 (January 2008): 1–27.

**24.** EDBI and Kearney, Nikolai Dobberstein, and Kaushik Sriram, "Racing toward the Future: Artificial Intelligence in Southeast Asia" (Singapore: EDBI and Kearney, 2020), https://www.kearney.com/digital/article/?/a/racing-toward-the-future-artificial-intelligence-in-southeast-asia.

**25.** Gecheng Liu, "Is a Luxury for Some or a Must for All? The Role of Education," Webinar, Higher education with AI:

Global perspectives and local challengesIs AI, April 23, 2021, https://iioe-files-cdn.iioe.org/pdf/42cc4944-28dc-437d-a01c-cc72fc5ae472.pdf.

**26.** Horváth, "Disruptive Technologies in Higher Education."

**27.** Agnes Kukulska-Hulme, "How Should the Higher Education Workforce Adapt to Advancements in Technology for Teaching and Learning?" The Internet and Higher Education, Designing teaching and learning in technology enhanced learning environments - Nordic interdisciplinary perspectives, 15, no. 4 (October 1, 2012): 247–54, https://doi.org/10.1016/j.iheduc.2011.12.002.

world of work.[28] Different models of human resources framework have been suggested as countermeasures against the future of AI uncertainty and I4.0 development in the digital world. For instance, the "triple helix model" or "TH-model", developed by Henry Etzkowitz and Loet Leydesdorff, represents "a set of interactions between academia, industry and governments that offers opportunities for administrations to provide the digitalization of the regional economy with innovative initiatives".[29] The TH-model proposes a balanced collaboration between three key players working towards the same interests of innovation and human resources development:

1. Higher education bodies (basically universities)
2. Industry (or businesses)
3. Government institutions

A good example of the TH-model is found in the practice of the Massachusetts Institute of Technology (MIT), in the United States of America (USA). MIT used the TH-model to develop its academic programs to shape competencies in fundamental issues and to build competence in translating digital economic ideas into real products. This was achieved through building the professionalism of its graduates via a deep theoretical knowledge framework of education, research, and innovation.

Another example is in French higher education where universities, businesses and local governments work together to ensure the digitalization of France's economy through the distribution of graduates across the country and with relevance to industrial needs.[30] These two examples corroborate the triple helix model that would be applicable in many other countries to move towards increased digitalization, and also illuminates the important role of higher education in building a country's innovation culture.

Japan has also built an ecosystem, called the cloning Silicon Valley model of university-industry collaboration, focusing on technology transfer, patent revenues and sourcing of funding. This ecosystem has fostered Japan's strong human resource development in all fields. For instance, at the University of Tokyo, the Matsuo Lab proposed its best education model called the "Hongo Valley Initiative" of industry-academia collaboration. This initiative aimed at building technology startup clusters. It educates students to be entrepreneurs and forms a support network for alumni working in financial institutions, major corporations, and central government offices. Furthermore, this model trains students to understand start-ups, even if not starting a business themselves, while educating and developing human resources that can function throughout society.[31]

AI is now a core part of highly developed economies' strategies and competitiveness; for example, the USA and China, where AI talents are highly distributed[32], are the two global AI development hubs competing for

28. Stanford University, "Artificial Intelligence Index Report 2021" (Stanford: Stanford University, March 2021), https://aiindex.stanford.edu/wp-content/uploads/2021/03/2021-AI-Index-Report_Master.pdf.

29. E. V. Bolgova, G. N. Grodskaya, and M. V. Kurnikova, "The Model for Meeting Digital Economy Needs for Higher Education Programs," in Digital Transformation of the Economy: Challenges, Trends and New Opportunities, ed. Svetlana Igorevna Ashmarina, Anabela Mesquita, and Marek Vochozka, vol. 908, Advances in Intelligent Systems and Computing (Springer International Publishing, 2020), 545, https://doi.org/10.1007/978-3-030-11367-4.

30. Ibid.

31. Koji Nakano, "Support System That Foster Human Resources for University Start-Ups in Japan," Annals of Business Administrative Science 20 (June 15, 2021): 93–106, https://doi.org/10.7880/abas.0210322a.

32. Liu, "Is a Luxury for Some or a Must for All? The Role of Education."

top-notch technological advancements.[33] Thus, the role and direction of higher education in cultivating young generations for the AI era must be clearly aligned with national socio-economic development initiatives. Higher education around the world needs to envisage what and how knowledge, skills, competencies, and other key attributes should be developed and inculcated into learners. For instance, Figure 1 below illustrates a holistic curriculum framework for higher education that aims to provide students with academic excellence and extraordinary learning experiences.[34] This framework incorporates major features such as disciplinary mastery, R&D skills, local and global engagement, as well multicultural awareness and self-effectiveness to educate learners for the AI age.

**Figure 1:** *Holistic curriculum framework for higher education*



**Source:** *University of Reading*

**Figure 2:** *Constructive approach to the whole person education in the AI age*
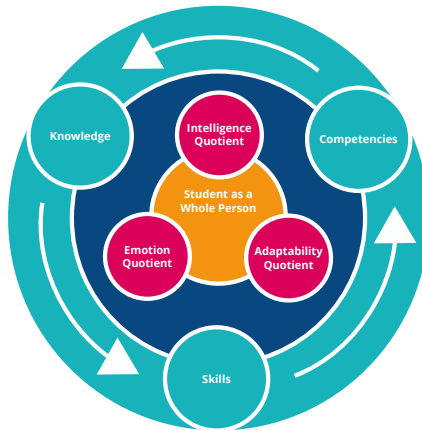


**Source:** *Liu (2021)*

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33. Chitturu et al., "Artificial Intelligence and Southeast Asia's Future."

34. The University of Reading, "Curriculum Framework," Education, University of Reading, accessed May 24, 2021, http://www.reading.ac.uk.

In the time of AI with its accelerating pace, higher education needs to develop learners through a whole person learning approach that responds to the current and future of AI advancements. This approach arises as responses to the increasing interrelatedness of personal, social and wider planetary concerns, which express themselves in a variety of ways at an individual, collective, and global level."[35] Higher education needs to make university graduates master or govern all the necessary knowledge, skills and competencies for the world of work and AI as shown in Figure 2 above.[36]

The core concept of this framework is to develop learners to have intelligence, emotion, and adaptability quotients as a whole person, while also equipping them with crucial knowledge, skills and competencies for the AI labor market. Into the future world of uncertainty, a holistic learning approach that transforms students into social agents with whole-person qualities in the forms of knowledge, skills, creativity, adaptability, and the ability to learn is of great importance.[37] This learning model reflects a lifelong learning approach for which students are prepared during and after their higher education, which involves deeper learning that enhances students' readiness for the changing world. As part of the constructivist learning approach, students will witness a journey of self-development and growth throughout their life through unique learning experiences, a collaboration between students and instructors, and by

solving real-life problems.[38] This is the true professional development of university students that will shape their lives.

It is also crucially important to integrate technologies into a university learning environment. A technology-enabled learning and teaching (TELT) model is now adopted and believed to provide students with flexible learning environments, effective learning methods, collaborative learning contents of real-world problems, and open learning opportunities across a wide array of rich curriculum contents beyond classroom and university limits.[39] With this TELT model, students are well equipped with digital literacy and readiness for the digital world. Therefore, higher education bodies need to constantly take necessary steps that prepare graduates well for the changing information age and allow them to adapt effectively to those unpredicted changes through teaching and learning programs that support digital literacy.[40]

## Cambodia's Readiness for Integrating AI into Higher Education

Cambodia has achieved an impressive annual GDP growth rate of around 7

35. Bryce Taylor, Whole Person Learning (Brussels, Belgium: The GRLI Press, 2010). https://grli.org/resources/whole-person-learning-bryce-taylor/.

36. Liu, "Is a Luxury for Some or a Must for All? The Role of Education."

37. Joseph W. Harder, Peter J. Robertson, and Stephen E. Maiden, "A Holistic Framework for Transformational Learning," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, February 19, 2019), https://papers.ssrn.com/abstract=3335540.

38. Rania Ibrahim and Akila Sarirete, "Student Development in Higher Education: A Constructivist Approach," in Technology Enhanced Learning. Quality of Teaching and Educational Reform, ed. Miltiadis D. Lytras et al., Communications in Computer and Information Science (Berlin, Heidelberg: Springer, 2010), 467–73, https://doi.org/10.1007/978-3-642-13166-0_66.

39. Elizabeth Sherly and Md. Meraj Uddin, "A Technology Enhanced Learning Model for Quality Education," in Technology Enhanced Learning. Quality of Teaching and Educational Reform, ed. Miltiadis D. Lytras et al., Communications in Computer and Information Science (Berlin, Heidelberg: Springer, 2010), 446–51, https://doi.org/10.1007/978-3-642-13166-0_63.

40. I. Kmecová, "Digitization, Digital Technology, and Importance of Digital Technology in Teaching," in Digital Age: Chances, Challenges and Future, ed. Svetlana Igorevna Ashmarina, Marek Vochozka, and Valentina Mantulenko, Lecture Notes in Networks and Systems (Springer International Publishing, 2020), 526–37, https://doi.org/10.1007/978-3-030-27015-5.

percent for over a decade.[41]  However, it still has an unsustainable, somewhat shallow economic foundation for its socio-economic development. It has a large number of unskilled and low-skilled workers employed in low value-added, labor-intensive industries.[42] Therefore, transforming its manufacturing to the high-tech industry would need skilled human resources, and large investments in its education system.[43] As previously mentioned, the growing trend towards the adoption of AI or advanced technologies into manufacturing and business is another challenge for Cambodia in preparing young Cambodians for the future of work.

The ICT Masterplan 2020[44] and the Policy and Strategy on ICT in Education[45] have been adopted in response to changing labor market requirements, but the adoption of AI or advanced technologies for education is overall low. In the time of COVID-19, Cambodia has witnessed chaotic disruptions to its education and training system, suddenly demanding new modalities for teaching. and reflecting a lack of AI and

technologies in education as a whole.

After about two years, noticeable strides have been made in adopting educational technologies, for example, the MoEYS E-Learning applications, MoEYS YouTube channels, and MoEYS websites, for general education, but the full potential of digital infrastructure or technology adoption has yet to come. In higher education, disruptive technologies have been adopted seemingly on an ad hoc basis to adapt to the COVID-19 pandemic in Cambodia. Since there is no such good preparation for technology adoption, teaching and learning activities have faced significant problems adapting, while the quality is constantly questioned by students, parents, and teachers.

Only a few higher education institutions (HEIs) like Kirirom Institute of Technology (KIT) and the National Institute of Posts, Telecoms, and ICT (NIPTICT) have been well equipped with advanced technologies, and have prepared their teachers and students for technology or AI adoption in teaching and learning. For instance, KIT provides students with the best local AI or software engineering program allowing students to experience real-life work and projects with technology companies, exemplifying a university-industry collaboration.[46] The Royal University of Phnom Penh (RUPP) developed its own ICT Masterplan 2017-2020, aimed at integrating ICT into all aspects of university life for students, staff, and faculty members, but the full implementation and success of the plan is still in doubt, despite a large investment into facilities and human resource development.[47]

41.  Seyhah Ven and Naron Veung, "The Contribution of Vocational Skills Development to Cambodia's Economy," Working Paper, Cambodia Development Resource Institute, 2020.

42.  ADB, "Asian Development Outlook 2015: Financing Asia's Future Growth," Report, Metro Manila, Philippines: Asian Development Bank, 2015, http://www.adb.org/publications/asian-development-outlook-2015-financing-asias-future-growth.

43.  RGC, "The Rectangular Strategy for Growth, Employment, Equity and Efficiency: Building the Foundation toward Realizing the Cambodia Vision 2050 (Phase IV)"; RGC, "Cambodia Industrial Development Policy 2015–2025," 2015, http://eurocham-cambodia.org/uploads/97dae-idp_19may15_com_official.pdf.

44.  KOICA, "A Summary on Cambodian ICT Masterplan 2020," Korea International Cooperation Agency, 2014, https://www.trc.gov.kh/wp-content/uploads/2016/10/Cambodian-ICT-Masterplan-2020-%E1%84%8B%E1%85%AD%E1%84%8B%E1%85%A3%E1%86%A8%E1%84%87%E1%85%A9%E1%86%AB%E1%84%8B%E1%85%A7%E1%86%BC%E1%84%86%E1%85%-AE%E1%86%AB.pdf.

45.  Policy and Strategy on Information and Communication Technology in Education, prepared by Ministry of Education, Youth and Sport (Phnom Penh: Ministry of Education, Youth and Sport, 2018), http://www.moeys.gov.kh/index.php/en/policies-and-strategies/3018.html#.YKzxDWYzZPY.

46.  "Software Engineering," Kirirom Institute of Technology, https://kit.edu.kh/kit-academics-research/under-graduate/software-engineering/.

47.  RUPP, "Information and Communication Technology Master Plan 2017-2020" (RUPP, March 2017), http://www.rupp.edu.kh/document/Master_Plan_with_Executive_Summary.pdf.

The Techo Startup Center (TSC), located on RUPP's campus, nurtures startups to grow into successful businesses through well-supported capacity building programs, with a focus on technology and innovation.[48] Although in its early stage, TSC could be a stepping-stone for young talent to experience and develop their innovative ideas into business. Another new establishment of Cambodia University of Technology and Science (CamTech) also shows a positive move into science, technology, engineering, and mathematics (STEM) education.[49] In general, Cambodia needs more STEM universities, especially those specializing in AI and related technologies, ideally with a strong AI industry linkage. If AI businesses cannot be found in Cambodia, then linkages could be formed with international businesses wanting to support AI development in developing countries.

The recently renaming of the former Ministry of Industry and Handicraft to the new Ministry of Industry, Science, Technology, and Innovation also reflects the efforts of the government to generate improvements in STEM subjects.[50] However, there is a lot more that this Ministry needs to develop in its functional areas, especially related to AI.

The Cambodian government just adopted its new Digital Economy and Social Policy Framework 2021-2035, with the vision to build a thriving digital economy and society by laying out the foundations for accelerating digital adoption and transformation for all stakeholders -including the government, citizens and businesses, to boost economic growth and promote social welfare under the new normal context.[51] This framework provides Cambodia with a new impetus for its socio-economic development through key priorities such as digital infrastructure development, digital trust building, digital citizen formation, digital governance, and digital business promotion. This vibrant framework clearly indicates how Cambodia intends to take a serious step towards a digital economy and transformation within 15 years, while also emphasizing an enabling ecosystem for the adoption and development of AI and digital technologies within all economic sectors. With this sound roadmap, Cambodia now needs to mobilize all resources and stakeholders for the implementation of this holistic framework.

## Suggestions for AI Development in Cambodia's Higher Education

The following points, based on the AI and higher education literature so far, are suggested for policy consideration, and for further exploration and discussion among academics, researchers, practitioners, and other relevant stakeholders.

- National AI development plan: Cambodia needs to develop a national AI development plan and mobilize all resources and stakeholders to form one national task force. This national task force should be responsible for the whole AI plan in terms of development, implementation, monitoring, and evaluation.

48. "Techo Startup Center," accessed May 25, 2021, https://www.techostartup.center/.

49. "Skills Shortages and Skills Gaps in the Cambodian Labour Market: Evidence from Employer Survey 2017," Report, National Employment Agency, 2018, http://www.nea.gov.kh/images/survay/ESNS%202017--Final--05282018.pdf.

50. "Ministry of Industry, Science, Technology and Innovation Archives," Policy Pulse (blog), accessed May 25, 2021, https://policypulse.org/policy-inventory/ministry-of-industry-and-handicraft/.

51. Digital Economy and Social Policy Framework of Cambodia 2021-2035, Prepared by Ministry of Civil Service (Phnom Penh: Royal Government of Cambodia, May 10, 2021), http://www.mcs.gov.kh/?p=34022.

- AI talent pool: Pooling talented people in AI, through either building professorships and/or hiring more trainers and experts in AI, is of utmost importance for the national AI plan.

- Digital learning platforms: Higher education needs to adopt AI platforms or digital technologies for teaching and learning activities, while AI fields of study and AI professorships should be expanded in higher education. The AI training programs must be aligned with the national AI plan.

- Industry linkage: A university-industry linkage in AI R&D is needed to allow faculty and students to jointly implement AI research with AI companies through private or state grants. The government should coordinate and/or finance such AI collaboration. Perhaps, national AI project competitions among universities, companies and other enterprises could be the first step.

- Regional cooperation: Regional AI cooperation is needed so that AI skills and knowledge could be transferred among partners. Thus, building an ASEAN-wide AI cluster could be a promising venture for ASEAN countries. Mobilizing regional technical and human resources in AI is a joint force to build an AI repository where country members can benefit from and could ensure no ASEAN member state is left behind when it comes to AI developments.

- Collective efforts: AI-related associations and consortia should be formed so that AI skills and knowledge developments are learnt and shared among members. It should be a collection of talents and practitioners in AI and technologies, allowing debates about and exchange for information on the future of AI development.

- AI centers for excellence: Several AI centers for excellence should be set up widely across the country so that young talents and students can learn and experience from AI talents and experts, while companies benefit from a group of AI experts in their respective industries.

- AI incubation and startup centers: To support AI incubation/startups, innovation and entrepreneurship centers should be developed with innovative services and support for faculty members and students who wish to involve and develop their entrepreneurial ideas into business.

## Conclusion

As Cambodia plans to transform its low-value-added, labor-intensive industry into a high-tech industry incorporating the concepts of I4.0, building a skilled workforce in technical and technological knowledge, skills and competencies is crucial. More importantly, AI advancement is growing quickly, and changing all aspects of business and the very nature of work itself. Therefore, to achieve its digital economy and transformation objectives, Cambodia needs to expedite its education and training reform to fully integrate AI curriculums, training programs, and courses. The aim should be to build a stock of young Cambodians with a skillset in AI and related technologies, and likely these trained students will become changemakers in enabling Cambodia's digital future. Cambodia also needs to develop an ecosystem for AI research, development, and

innovation through collaboration between HEIs and the private sector, and with support from the government.

The above are all valuable objectives, however, it is also clear that Cambodia's digital transformation is a complex process that will not succeed overnight. Although Cambodia is still in the very early stages of AI and innovative technological adoption today, it should not wait for other countries to learn these techniques first. Cambodia can grasp the opportunity to build a highly skilled workforce for the future – and this must start with the higher education institutions.

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# General Trends:
# Future of Work in Cambodia
# Post Pandemic

EDIRI Anderson          HO Varaboth          LONG Phalin

# Introduction

The future of work has constantly evolved. Technological or economic forces were the initial drivers. However, something distinct from the previous factors will change the way we work. The COVID-19 pandemic is unlike any other because it has brought very sharply into focus the notion of physical proximity. It has made physical proximity a factor that determines how we will reshape work, and the new kinds of roles that will grow in demand or decline in need in the future.[1] There are many perspectives on the future of work. Still, it is an understatement for the pending wave of disruption to job markets courtesy of a range of complex forces such as advanced technology, the internet, A.I., and the advent of industrial automation.[2] Throughout the COVID-19 pandemic, "a lot about the way we know work has been emphasized: It is uniquely complex, quickly changing or shifting, and increasingly technology-driven."[3] Work has long been acknowledged as necessary for the livelihood, dignity, and happiness of humankind. Work helps us meet our basic and complex needs. It also provides a path towards financial security, mental and physical health, dignity, and in some cases, a purpose in life.[4] Work and workplaces have come a long way, from when work was shaped by shifting demographic trends, the pace of technological advances, and economic globalization. Besides, the formulation of sound labor policy requires an understanding of how work-related trends evolve and affect the size and composition of the labor force, the features of the workplace, and the compensation structures provided by the employers.

Moreover, we will see more occupational transitions required in the future as an impact of these. According to Tonby et al., "there are about 100 million more occupational transitions across the countries we have looked at".[5] These transitions will require changes in the composition and skillset in the future workforce of both developed and developing countries. Tonby et al. argue that we could experience global labor displacements, especially in developing countries where we could experience a shift towards new and different jobs and skillsets. However, while we find different studies that show various changes in the dynamics of the future of work in a global or regional setting, there are very few that focus specifically on developing countries like Cambodia.

Our research will focus primarily on remote work as a more present trend driven by the pandemic and how it affects Cambodian service sector businesses. We investigate how the workforce (business owners, workers, and policymakers) in Cambodia respond to it. Furthermore, our research sheds light on three main trends: remote work, digital channels, and automation.

## Three Trends: Remote Work, Digital Channels, and Automation

COVID-19 has accelerated the three trends: remote work, digital channels, and automation. Similarly, they are shaping the future of work around the globe, including Cambodia. If there was one trend we have

1. Tonby et al., Mckinsey & Company (Future of Asia Podcast), April 8, 2021.

2. Disparte Dante, and Tomicah Tillemann, "The Great Correction," Research Report of Future of Work, New America, 2020. 37-39, accessed June 5, 2021, http://www.jstor.org/stable/resrep26365.14.

3. Jamie Teevan, "Virtual Chairing – the Future? The next Normal?," Making Meetings Work, May 13, 2021, pp. 81-94, https://doi.org/10.4324/9781003157038-10.

4. Cairnduff, Annette, Kelly Fawcett, and Nina Roxburgh, "Young Australians and the Disrupted Economy," in The Wages Crisis in Australia: What It Is and What to Do About It, ed. Stewart Andrew, Stanford Jim, and Hardy Tess, (South Australia: University of Adelaide Press, 2018), 251-262, http://www.jstor.org/stable/j.ctvb4bt9f.22.

5. Tonby et al., Mckinsey & Company, 2.

experienced the most already, it would be remote work or virtual meetings. For example, countries like Japan have been promoting remote work for decades, making slow progress. Nevertheless, the pandemic has enabled years of progress in just a few months, something they could not achieve in the previous decade.[6]

Remote work spiked during the pandemic across the globe. While it was of sheer necessity, what it has revealed to all workers and businesses is that there are longer-term benefits that include flexibility and greater ease of work in some ways. Teaching, medicine, mental health, and other professions previously thought to be near impossible to do remotely have abruptly moved to online and hybrid mediums. All kinds of workers have needed to find new and creative ways to do their jobs. For many, the boundary between office and home has become a thin, blurred line. These changes have not been small, and they have not been without pain.[7]

The second trend is the increase in the use of digital channels. Before elaborating on this trend, it is worth stepping back to explain this phenomenon. According to Urbach and Roglinger, "digitization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business."[8] So a digital channel is a sales or business channel that is electronic as opposed to physical channels. The following are common types of digital channels - web - websites including social media and video

sharing sites, search - search engine results, and communication - communication tools such as email or messaging apps. App - mobile apps including apps launched by brands or E-commerce sites to drive sales, online events - events that allow users to participate such as a webinar, digital media - digital media such as streaming video and music services.

Digital channels have proliferated and surged worldwide during the pandemic. Tonby et al. stated that Asian economies are top in E-commerce growth in the years during the pandemic – with E-commerce growth two to five times what people would expect when compared to average E-commerce growth in the years before the pandemic.[9] Furthermore, this is not just with shopping. There are hordes of new users, first-time adapters, and businesses figuring out how to manage the whole delivery economy as part of E-commerce. There is also an increase in online food delivery, online grocery shopping, telemedicine, and, of course, remote learning. Further, the concept of a cashless economy or the availability of data and new businesses or new startups taking advantage of those data flows.

The third trend is automation and Artificial Intelligence (A.I.). Automation describes a wide range of technologies that reduce human intervention in processes. At the same time, A.I. refers to intelligence demonstrated by machines, unlike the natural intelligence displayed by humans and animals, which involves consciousness and emotionality. As the pandemic continues, businesses are almost forced to embrace automation in selected areas. They do so because many manufacturing plants must keep stay open - but do so with a lower workforce density. As such, the meatpacking industry, for example, experienced a slow

6. Eiji YAMAMURA Department of Economics, Seinan Gakuin University/ 6-2-92 Nishijin Sawaraku Fukuoka, 814-8511.

7. Jamie Teevan, "Virtual Chairing – the Future? The next Normal?" 3.

8. Nils Urbach and Maximilian Röglinger, "Introduction to Digitalization Cases: How Organizations Rethink Their Business for the Digital Age," in Digitalization Cases, Management for Professionals (Springer, September 21, 2018), https://doi.org/10.1007/978-3-319-95273-4_1

9. Tonby et al., Mckinsey & Company , 4.

adoption of automation because of the nature of the work but suddenly saw a surge because workplace density became a very real issue. In other cases, there were spikes in demand for various goods during COVID-19, and a key tool that companies could respond with was automation. Automation levels will rise, and we already see plenty of signals of that in things like automatic shipments worldwide, and the rise in stock prices of companies who produce automation-related products. There is an anticipation that this will be a more remarkable shift or trend going forward globally.

## Relevant Literature

Take the U.S. for an example. According to a 2004 publication - the 21st Century at work - 'Forces shaping the workforce and workplaces in the United States,[10]  They posed two key questions then; first, what are the significant factors that will shape the future of work in the current century, and how will those factors likely evolve over the next 10 to 15 years? Secondly, the implications of these future trends for crucial aspects of the future workforce and workplace, including the workforce's size, composition, and workforce skills, the nature of work and workplace agreements, and worker compensation. The answer was that the authors expected continued growth as they shifted toward a more balanced distribution by age, sex, and race or ethnicity. Moreover, the pace of technological change, through advances in information technology (I.T.), biotechnology or such emerging fields as nanotechnology and, of course, the synergies across technologies and disciplines

accelerated advances in research and development (R&D), production processes, and the nature of product and services. Finally, the new era of globalization marked by the growing trade in intermediate and final goods and services, expanding capital flows, more rapid transfer of knowledge and technologies, and mobile populations is partly the result of inexpensive, fast communications and information transmission enabled by the I.T. revolution. As a result, globalization will continue its record to date of contributing economic benefits in aggregate. Although market share and jobs are lost in some economic sectors with short-term and long-term consequences for affected workers, the job losses will be counterbalanced by employment gains in other sectors.

In his paper 'Valuing the work of the future,' Guy Rider stated that several accounts of the Future of Work predict that technology will replace people and bring an "end to work."[11]   He says that changes in business models, technology, and the global integration of economies profoundly impact an essential aspect of society known as work. He claims that the evolving temporal and spatial organization of work where more people work at anytime from anywhere, raises questions about how this affects our individual lives and societies. Adding these changes can widen our choices, improve our working lives' quality, alienate us from each other, and purposive and meaningful activity. He then concludes by saying that "the outcome depends on the choices we make and the policies we adopt to shape the Future of Work."[12]

10.  LYNN A. KAROLY and CONSTANTIJN W. A. PANIS, "SHIFTING DEMOGRAPHIC PARAMETERS SHAPING THE FUTURE WORKFORCE," in The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States (Santa Monica, CA; Arlington, VA; Pittsburgh, PA: RAND Corporation, 2004): 15-78, accessed June 6, 2021, http://www.jstor.org/stable/10.7249/mg164dol.11.

11.  Ryder Guy, "CORRECTLY VALUING THE WORK OF THE FUTURE," Journal of International Affairs 72, no. 1 (2018): 23-36, accessed June 5, 2021, https://www.jstor.org/stable/26588340.

12.  Ibid.

Widespread interest in the future of work often centers around how this one major external force, technological change, has affected the types of jobs we do. We will look at prior studies to learn more about trends in employment and how they are affected by this 'mega-driver of change.' Knut H. Sørensen, in his review essay 'Of Men and Machines - Technology and Working Life Discourses,' talked about how skills are likely to become more specialized with the development of the latest generation of technology. To begin with, one should note a few features of the traditional discourse on technology and work. Its main features can be traced to 19th-century political economy, particularly volume 1 of Karl Marx's Da Kapital. If we look at the significant contributions to this discourse in the 1950s and 1960s, e.g., Walker & Guest, Friedman, Blauner, and the Tavistock school, they were conversant with the Marxist concern for the conditions of the working class and the ambiguous nature of modern technology. Sorensen argued that a sustained worry of new technology in the shape of automation would lead to a degradation of working conditions and undermine workers' ability to act collectively, but also hoped for a more positive outcome.[13]  That explains why the impact of technology has long been a concern to the future of work. Fast track to today's arguments relating to work and the fourth industrial revolution, digitalization, automation, and A.I. The arguments are regurgitated.

'Gig Work and the Fourth Industrial Revolution,' Ruyter et al. explain several distinguishing features of the predictions associated with the work revolution. Their first claim is that there will be changes in the skillsets of today's workers and therefore job displacements because of the shift towards new and different jobs. Secondly, there will be a change in the very nature of work and workplaces. The point of their claim is that there will be more work located away from designated workplaces. Furthermore, more work involves interaction with information and communication technologies that will give rise to regulatory challenges for governments on employment, as work will become "invisible and geographically dispersed through online and subcontracting arrangements."[14]

Technology, the emergence of industrial automation, and varying degrees of workforce readiness for the so-called jobs of the future came at us fast during the pandemic. "When COVID struck in March 2020, several million Australians were retrenched or had their working hours reduced. At the same time, 4.3 million people or 32% of working Australians began working from home digitally."[15] We expect to see a significant change in pace on how work will be viewed from now on. The COVID-19 pandemic has been like no previous episode of transformation in the way work is done, especially in the notion of physical proximity. Research by the McKinsey Asia chapter suggests that 20% to 25% of the workforce could work remotely in the long term. While this is not the entire workforce, it is four to five times the level before the pandemic.

Our research wants to investigate a similar trend in Cambodia.[16] This rise in the percentage of the workforce working

**13.** Knut H. Sørensen, "Of Men and Machines: Technology and Working Life Discourses," Acta Sociologica 39, no. 1 (1996): 99-108, accessed June 7, 2021, http://www.jstor.org/stable/4194808.

**14.** De Ruyter Alex, Martyn Brown, and John Burgess, "GIG WORK AND THE FOURTH INDUSTRIAL REVOLUTION: CONCEPTUAL AND REGULATORY CHALLENGES." Journal of International Affairs 72, no. 1 (2018): 37-50, accessed June 5, 2021, https://www.jstor.org/stable/26588341.

**15.** BESSANT, JUDITH, and ROB WATTS, "COVID, Capital, and the Future of Work in Australia," A.Q.: Australian Quarterly 92, no. 1 (2021): 20-28, accessed June 25, 2021, https://www.jstor.org/stable/26965317.

**16.** Tonby et al., 3.

remotely will have significant implications both for the workforce and company workspaces. Moreover, an RSA journal in 2020 on 'Transforming the future of work - Who is at Risk?' states that changing consumer trends, public health measures, and labor costs in the pandemic are all aiding the rise of robots and increased automation. The report also explored how the pandemic might accelerate technological change and forever alter the future of work.[17]

As the pandemic continues and we hear terms like lockdown, social distancing, stay at home policy and so on, new technologies thus have the potential to transform work and workplaces, displace jobs, create new jobs, and generally impact living standards. The pandemic has exposed the long-standing tension between traditionalists or the old guards for whom productivity must be seen as requiring a physical presence at an office or work location. The new generation or the modernists have been clamoring for broader acceptance of remote work and workplace flexibility. With social distancing norms required in the workplaces, video conferencing services such as the nine-year-old upstart, ZOOM, succeeded in doing in months what other platforms have taken decades to achieve. They gain ubiquity as a utility for remote workers, learners, and many others who turned to these services for a semblance of normalcy. "Indeed, the onset of the future of work was so rapid that habitually itinerant business travelers turned to ZOOM, making the platform more valuable than all U.S. airlines combined."[18] Indo-Pacific and the whole of Asia are trending in the same direction as the U.S. and Europe. Specific to Cambodia, more recently, the country has seen a steady rise in the distribution of employment from the agricultural sector to a more services-based sector in the last ten years. Hence, remote work will test workers in this sector on their resilience and adaptability to the new normal in Cambodia.

**Figure 1:** *Distribution of employment by economic sector from 2010 to 2020 in Cambodia*
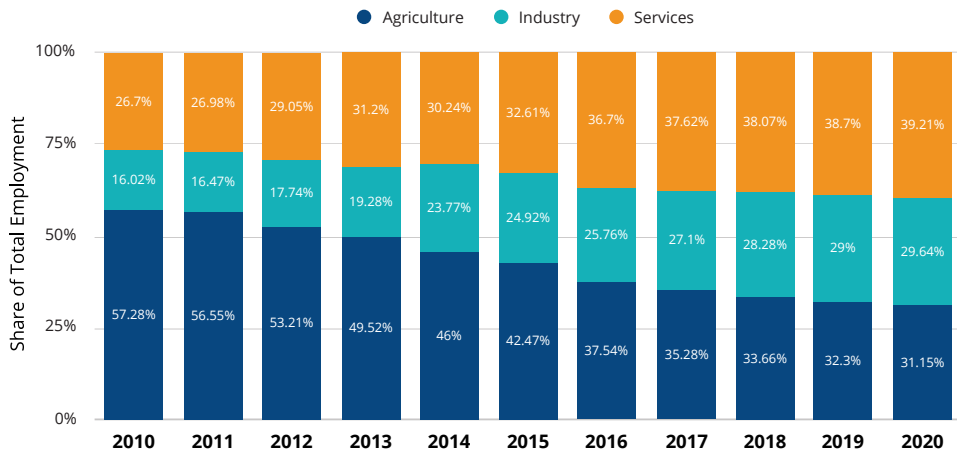


*Source: World Bank (October 2020)[19]*

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17. "Transforming the Future of Work," RSA Journal 166, no. 3 (5583) (2020): 6-9, accessed June 5, 2021, https://www.jstor.org/stable/27008591.

18. Dante Disparte, and Tomicah Tillemann, "The Great Correction."

19. Aaron O'Neill, "Employment by economic sector in Cambodia 2020," World Bank, Statista 2021.
The statistics show the distribution of employment in Cambodia by economic sector from 2010 to 2020. In 2020, 31.15 percent of the employees in Cambodia were active in the agriculture sector, 29.64 percent industry and 39.21 percent in the service sector, accessed June 24, 2021, https://www.statista.com/statistics/438733/employment-by-economic-sector-in-cambodia/

# Methodology

The actual number of workers in the different sectors of the economy is easily accessible in developed countries where government or private corporations' databases provide this information. However, information on the number of employers and employees in the different sectors, especially in the service sector, is not available in developing countries such as Cambodia. We therefore collected data as part of a comprehensive survey from mostly private sector company owners, employers, and employees on the primary trend (remote work) regarding the future of work in Cambodia.

## Sample

The sample consisted of 219 responses from CEOs/business owners, managers, and staff members from the private sector businesses in Cambodia. The majority (40%) of the responses were from company managers, 27% companies staff members, 23% CEOs/business owners, and 10% others that include student interns, teachers, and NGO workers.

# Data Analysis

The aim of the survey questionnaire was to identify the effects of remote work as a future trend in Cambodia post pandemic. Below are the results of our findings:

## Workplace as a Community

More than a year into the pandemic, remote work and physical separation have prevented employers and employees from feeling closer to their co-workers.

Fifty-eight percent (58.4%) of workers in Cambodia feel less connected with their co-workers than before versus 16% who feel more connected.

*Figure 2: The portion of workers showing how connected they felt to their co-workers and community while working remotely during the pandemic in Cambodia*



**58.4%** Less Connected

**16.9%** More Connected

**24.7%** Same as before the pandemic
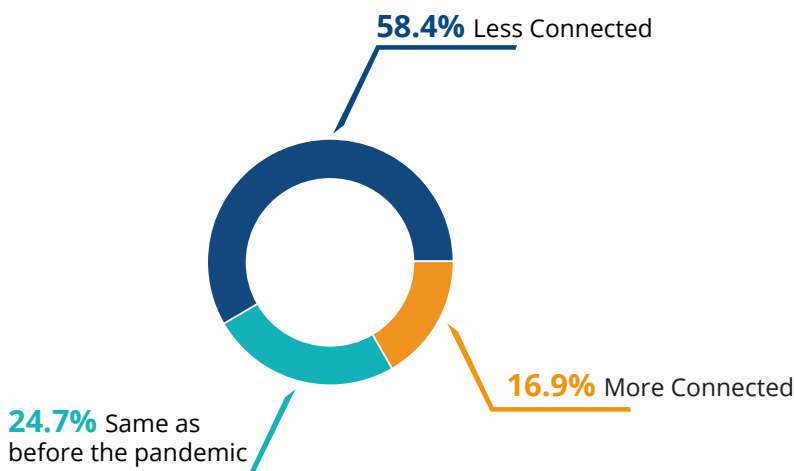
## Finding Meaning

Most employees (56%) say circumstances surrounding the pandemic negatively influenced their productivity. The organization's purpose resonated with them before the pandemic than it has now in the pandemic. Besides, the in-person office experience still appeals to employees. Any future work plans in Cambodia must help employees gain access to diverse perspectives and ideas. Here are the top things employees say they missed while working remotely during the lockdowns:

**a.** Simply being around other people.

**b.** Exposure to a diversity of perspectives and ideas

**c.** Spontaneous interactions with colleagues

**d.** Others, like - ease of communicating ideas with sketches, monitoring what staff does and checking off what has been accomplished, and managing workflow and so on).

*Figure 3: The pie chart shows the top things employees say they miss while working remotely 4.2 Productivity and well-being loss*



7% Others
23% Spontaneous interactions with Colleagues
23% Exposure to a diversity of perspectives and ideas
47% Simply being around other people
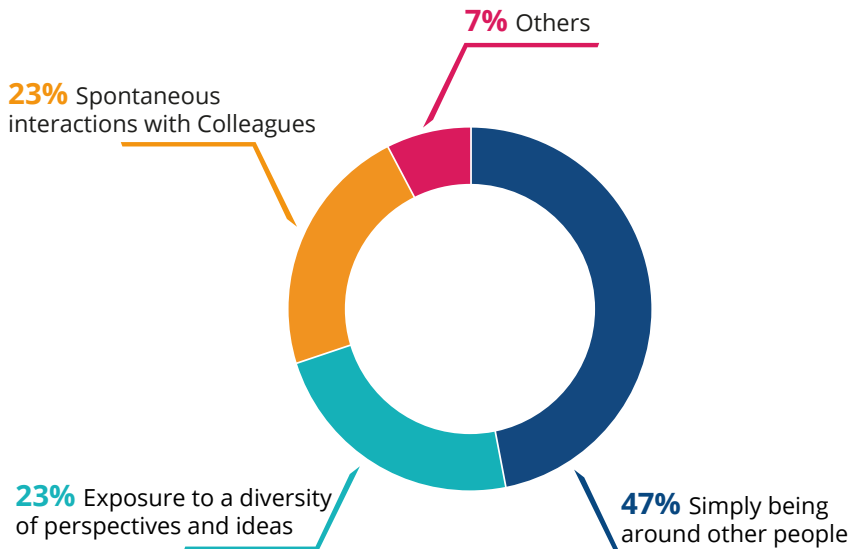
## Productivity and Well-being Loss

**Productivity Loss**

Fifty-one percent (51%) of workers believe they are less productive working remotely, and 27% believe they have been more productive working remotely. In contrast, the remaining 28% say nothing has changed.

**Figure 4:** *A pie chart showing the percentage of productivity gains or loss of employees working remotely*

**50.7%**
Less Productive

**21.9%**
Same as in Office

**27.4%**
More Productive
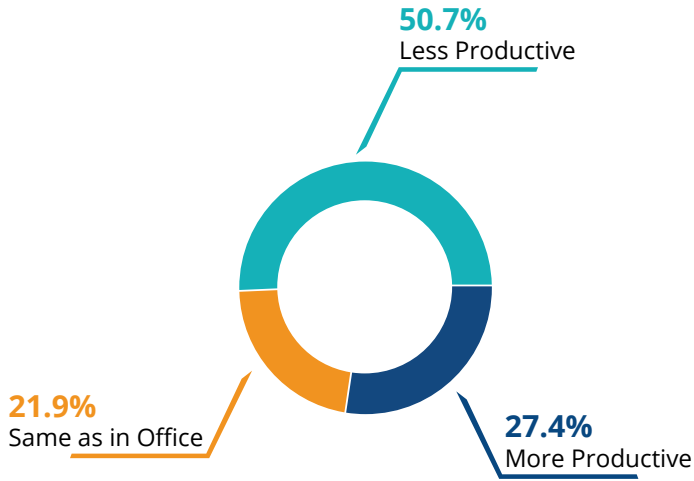
**Well-being Boost**

For every worker who says their well-being has declined, two say it has gotten better (2X). We see this phenomenon in the comparison between younger and older workers' productivity. Millennials (people with dates of birth from 1981 - 1996) and Generation Z (people with dates of birth from 1997 - 2015) are both more likely than older generations (Generation X) to say they have been more productive since working remotely. However, the graph also suggests that millennials, who make up most of the Cambodian workforce, are less productive working remotely. Poor Information technology skills and not being supported by their organizations could explain why. The other two age ranges used in the survey are not represented in the graph - Baby boomers (1946 - 1964) and the Silent generation (1930 - 1945) because there were no respondents from these groups. Another great point here is that Cambodia currently has a younger working generation, born between 1997 and 2015, who are probably technologically savvy and can work well remotely.
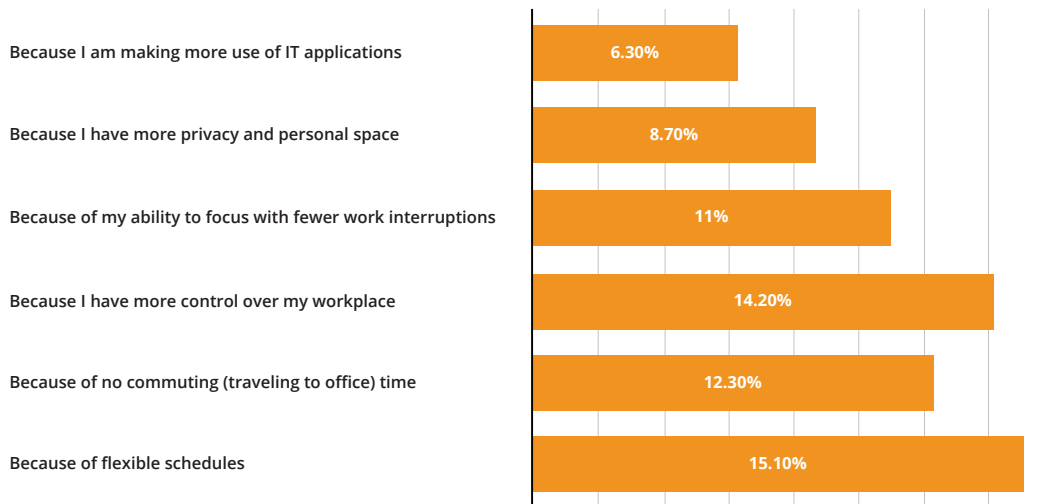
**Figure 5:** *This graph shows the portion of each generation reporting higher productivity since working remotely*
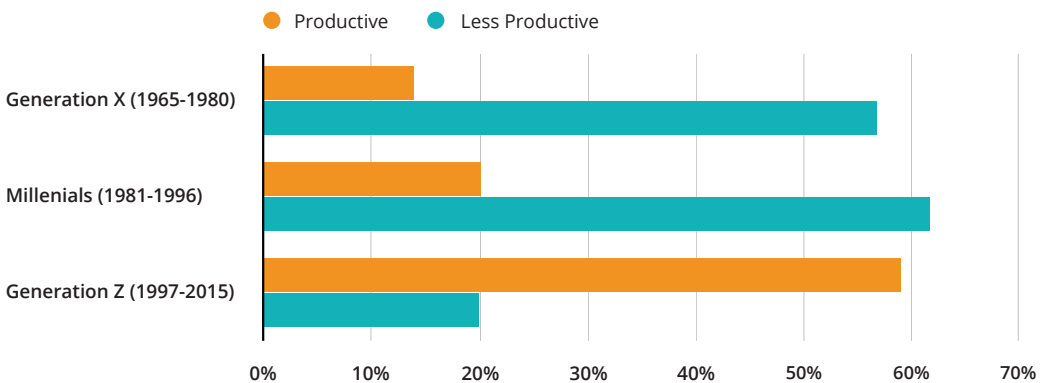
**Reasons for Being More Productive Working Remotely**

Cambodian workers, the majority of whom are young, said they are more likely to work remotely. The reasons they gave explain why they are productive. Therefore, leaders, stakeholders, and policymakers who want to maintain high productivity should note what employees themselves say is helping them do better work.

*Figure 6: Workers say productivity is better because of the reasons on the chart*



| Reason | Percentage |
|---|---|
| Because I am making more use of IT applications | 6.30% |
| Because I have more privacy and personal space | 8.70% |
| Because of my ability to focus with fewer work interruptions | 11% |
| Because I have more control over my workplace | 14.20% |
| Because of no commuting (traveling to office) time | 12.30% |
| Because of flexible schedules | 15.10% |

## Ease of Working Remotely

The ability to travel, move, and live away from the office while still working gave many a greater flexibility that they might likely give up after the pandemic is over. Fifty-six percent of respondents said remote work was essential to them, but then 84% of the same respondents reported that the flexibility of getting back to the office is equally important to them post COVID-19. What this means is that most of the Cambodian workforce are not quite ready to work remotely all the time. Our earlier analysis stated that 51% of workers in Cambodia believe they are less productive working remotely. The workers we surveyed are almost twice as likely to work from the office compared to working from home.

**Pandemic Migration**

The pandemic migration may be permanent for large swatches of global employment. Nevertheless, for Cambodian services sector workers, who moved during the lockdowns placed by the government at the peak of the pandemic, more than half plan on moving back to the office one way or the other (65% hybrid and 33% fully working from the office). Compare this to the 6% who would ultimately work remotely. Moreover, mobility among the younger workers was especially pronounced. Younger workers (Millennials) workers born between 1980 to 1996 and Generation Z workers born between 1997 to 2015 at 44% and 29% respectively were much more likely to work from home during the pandemic.

*Figure 7:* *This bar chart shows each generation that left their offices during the lockdown and worked from home at the height of the pandemic*
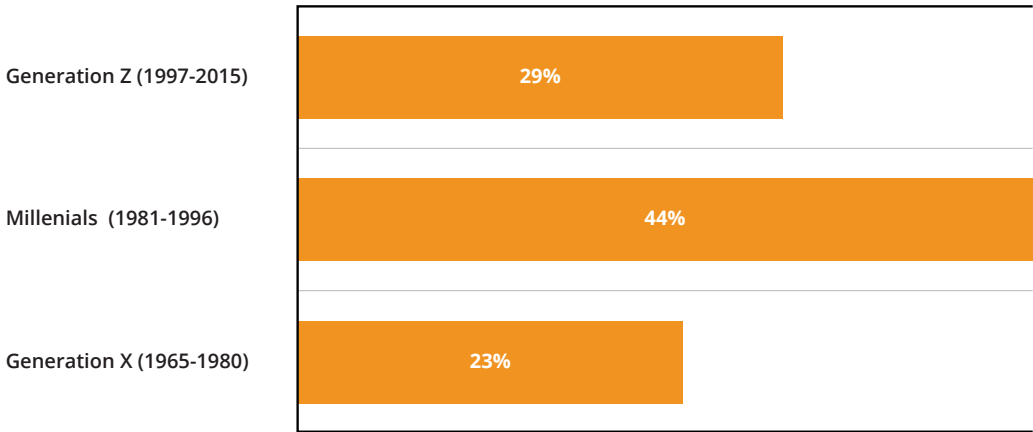


For the 72% of workers who left at the height of the pandemic and lockdowns, here are the top 5 reasons why they left:

- **a.** "To be closer to family and friends."
- **b.** "I just felt ready for a change."
- **c.** "To be somewhere with more space."
- **d.** "I want to upsize my residence."
- **e.** "I am not held there by work anymore."

## The Changing Role of the Office

From our survey responses, most of the Cambodian service sector workers want to work from the office but not make the office their home. While the pandemic intensified with lockdowns, many workers (many for the first time) enjoyed malleable work schedules, private and personal "office" space, more time with family, and time back that they usually would have spent commuting. While most workers do not want to work from home exclusively, the consensus is clear: they also do not want to give that up completely. Many believe offices with hybrid schedules will perform better than those without, mainly if business owners cater to the individual needs of their workers.

*Figure 8:* The pie chart shows the response to the question "How much do you want to work from the office post pandemic?"



**61.2%** Hybrid

**5.9%** Never

**32.9%** Always
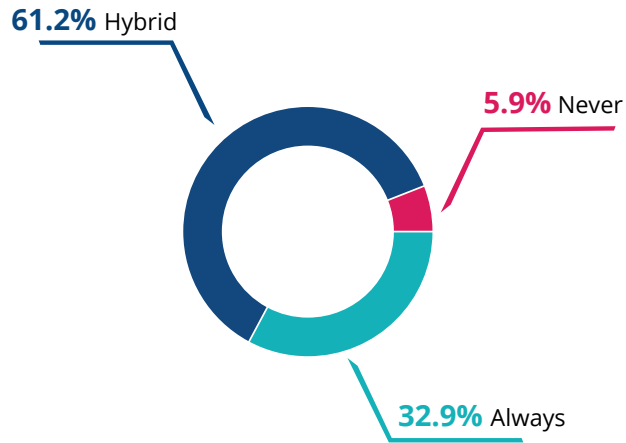
**The Status Quo**

Generally, workers want to be in the office some or most of the time after the pandemic. Only 19% want to work from the office full-time, but the fewest of all (3%) want to work from home full-time. The vast majority (37%) want to work remotely sometimes. For at least 1- 2 days a week.

*Figure 9:* Shows the work setups workers would prefer after the pandemic
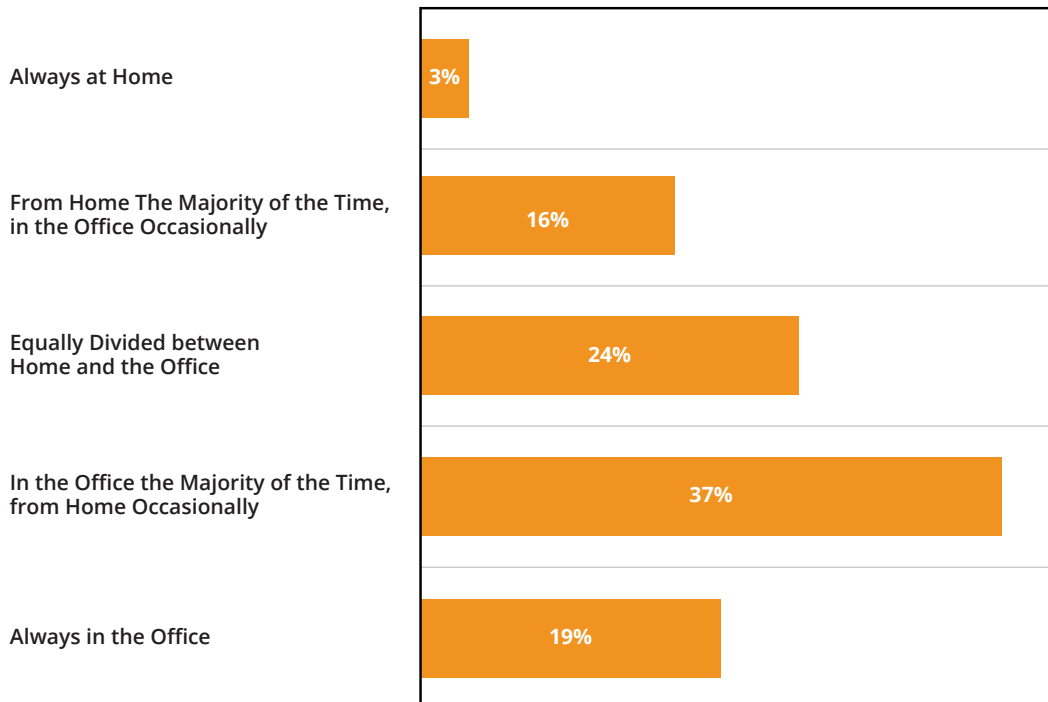


Always at Home — 3%

From Home The Majority of the Time, in the Office Occasionally — 16%

Equally Divided between Home and the Office — 24%

In the Office the Majority of the Time, from Home Occasionally — 37%

Always in the Office — 19%

Business owners, executives, and managers, even more than individual staff members of companies in Cambodia, prefer a hybrid work schedule.

***Figure 10:** This graph shows how individual staff members vs. business owners/managers responded to the question "how much do you want to work from the office?"*
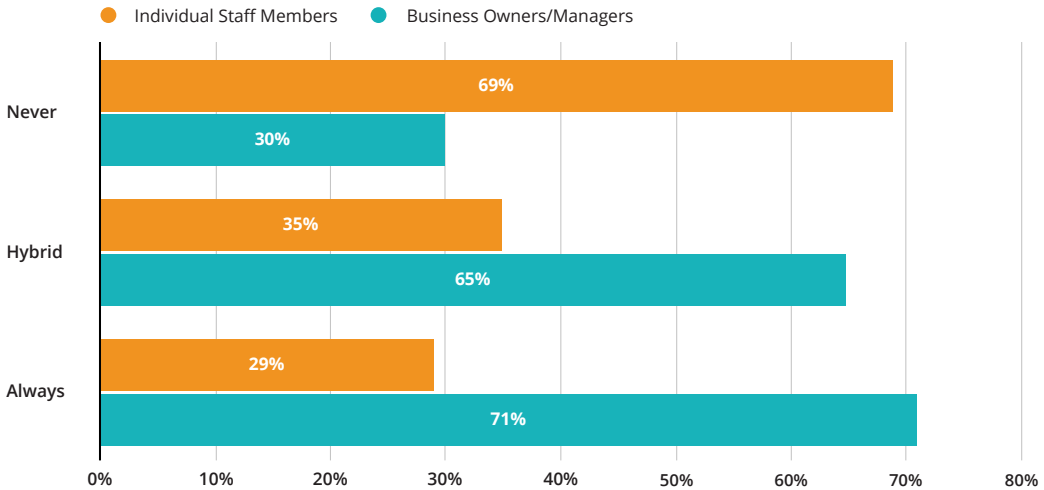


**Better Office Space Management**

Returning to the new normal will offer a chance to upgrade the work experience: Most workers who responded want to see the layout of their office space change significantly following the pandemic. These are the top priorities they included:

- **a.** More flexible meeting and collaborative areas - 77%
- **b.** More quiet and private working spaces - 52%
- **c.** More space between desks - 32%
- **d.** Other 14.6%

***Figure 11:** This chart shows top priorities workers would like to have after the pandemic*
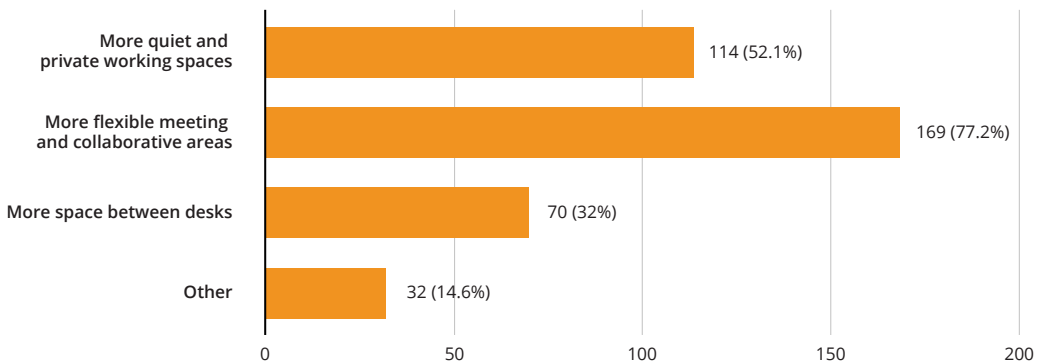
## Challenges

When challenges come, we feel the pain, we fail, we learn, and then we grow. The pandemic has given the world a chance to change where it should and go back to normal when it can. For most developed countries, frequent business travelers are eager to get back on the road or in the sky, and customers want some pandemic-era changes to stay. As the world moves forward, experiences and data will lead the way.

**Ready to Travel**

After a year and a half of empty airports, demand is building as business travelers look forward to getting back on the road and in the air. Many Cambodians want to return to their previous amount of travel. More than half (53%) of the respondents would like to travel even more than before.

*Figure 12:* This chart shows the response workers gave to the question, "Would you like to travel more after the pandemic"?
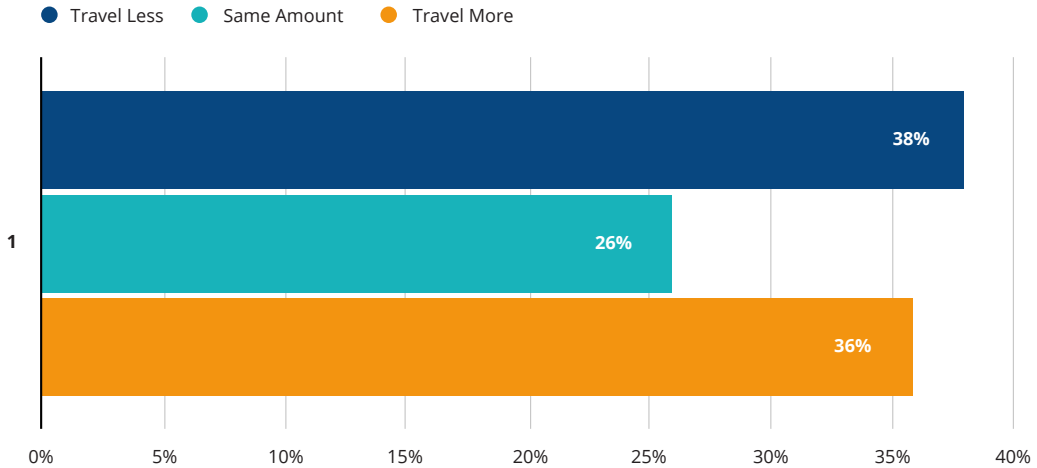
**46.6%**
No

**53.4%**
Yes

*Figure 13:* This shows the response to the question, "How much do you want to travel after the pandemic?"

**37.9%**
Travel Less

**62.1%**
Return to previous amount of travel or more

*Figure 14:* Graph showing the response to the survey question "Going forward, how much would you like to travel compared to pre-pandemic?"



The graph above presents the comparison between pre-pandemic and post-pandemic travel expectations of the Cambodian workers. The graph suggests no significant difference in the results between the travel pre-pandemic and the plan to travel post-pandemic.

**Experiences Consumers Want to Keep After the Pandemic**

The pandemic forced the Cambodian service sector to innovate or find good-enough alternatives to doing business and selling products. While some of these approaches may be costly to adjust to, many of them will have a post-pandemic future. According to some of the participants who gave their thoughts on the question, "what are the experiences you think consumers want to keep after the pandemic?":

● We think that household shopping will return to normal, with people going to the markets. However, we believe restaurant and coffee shop dining will reduce by 5-15% in favor of online orders. We believe that it is still human nature that people like to join with friends for meals. After the pandemic, there will be many unemployed delivery drivers when the demand goes down. Some entirely virtual businesses may close in favor of businesses that are hybrid (Respondent 19).

● Work from home will be more prominent. The use of Virtual apps like ZOOM for hosting company and branch meetings. The urgency for self-development and probably learning new technology for work (Respondent 42).

● Online purchasing and delivery. The ability to use ZOOM meetings for conferences instead of traveling for conferences (Respondent 25).

● Less enthusiasm for in-store visits. There will be more work from home and contactless payments. A whole lot on personal growth or self-improvement (Participant 60).

- Food delivery, flexible schedules, multi-engagement (doing other things while attending online meetings) - (Respondent 187).

Ultimately, the general feeling from Cambodian workers is that life would never be what it was pre-pandemic, and we must make changes, adapt, recognize and accept the new normal.

## Conclusion

Remote working is one leading future of work trends in Cambodia. A shift in this trend is reshaping the Cambodian active services-based sector during this pandemic. The pandemic has been extended, complicated, and devastating, but it has also created an opportunity to reflect and experiment in ways we otherwise may not have. As a result, business owners, managers, and employees have discovered better ways to work. We have realized that flexibility is the future, and that different people work in different ways. As a result, organizations across Cambodia are innovating, changing their approach to work, and those successfully undergoing this transformation will look, with deep empathy, at workers' needs and expectations. Furthermore, as businesses in Cambodia continue to adapt to remote work strategies, one approach will not fit all. Still, they can create these better experiences by continuously listening to their workers, then acting on the feedback they receive - now and in the future.

## Recommendations

Our recommendations will be in the context of taking action. For employees whose well-being has declined due to the pandemic and a new remote working experience, here are 5 ways they say employers can offer meaningful help:

1. Having conversations with peers about the difficulties workers are facing.

2. Having conversations with managers about the difficulties workers are facing.

3. Workers having access to the resources they need to do their job effectively (e.g. materials, equipment, technology, and support services).

4. Company leadership should communicate very well with their employees.

5. Managers should demonstrate an interest in the personal well-being of their workers.

Uncertainty is a bad experience. Something as simple as communication of plans can help Cambodian workers in cascading ways.

If you have remote employees (or plan to continue having remote employees), hardware and software tools are the most important resources they say they want from the company.

From on-demand space to occasional facetime, young employees cited the following as the changes that would improve remote productivity for them the most.

1. Access to office space when needed.

2. Ability to meet up with colleagues in person when needed.

3. Access to physical resources in the office when needed.

4. Ability to meet with clients, customers, and other external parties in person.

5. Being able to plan ahead more reliably.

# ABOUT THE AUTHOR

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A recognized expert with more than 10 years of successful experience teaching Academic and Business English. Ediri has a proven ability to identify and develop outstanding talents. He is currently an Associate professor with CamEd Business School.

Having earned his Masters in TESOL (Teaching English to Speakers of Other Languages) from the University of Hertfordshire, Hatfield, UK, Ediri went on to work as an English language teacher in Taiwan, Singapore, and in Cambodia, quickly earning a reputation for enhancing English language acquisition in the EFL setting and preparing young adults for various English language proficiency tests. Ediri is also a Harvard scholar (Master of Liberal Arts (ALM) in Extension Studies, field: Management). He has then moved into teaching Business Communication, steadily making the transition from teaching English language to teaching English for Business and Accounting (EAB).

Ediri is most fulfilled when helping students to maximize their potential, and having championed numerous personal development initiatives at CamEd Business School, in 2018, he mentored a CamEd student team (Cambodian debating and public speaking champions) to an Asian Pacific JCI debating championship in Japan. To date, he has successfully trained and mentored so many students through advancing public speaking and debating skills in the school's Debating and Public Speaking Club.

Leveraging his professional network, as a former US Embassy Phnom Penh Post Language Coordinator/Instructor prior to joining CamEd, Ediri has served in several working committees. He is a member of the CamEd Research Committee and a Faculty Council member currently. Ediri has authored and co-authored numerous research papers, including his latest (General Trends: Future of Work in Cambodia Post Pandemic). Ediri lives in Phnom Penh with his wife, a son, and a dog.

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# The Future of Work, Technology and the Social Market Economy in Cambodia

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## Introduction

The future-of-work in Cambodia will be driven by global megatrends including the balance of economic power, demographic change, urbanization, technology, climate change, consumer and social behaviour, health and social care and resource scarcity.

The challenge is to plan how organizations and young Cambodians adapt to these megatrends. The role of technology is the main enabling factor, and this will be the focus of this chapter. Drawing on our earlier research in the context of Malaysia we will discuss technology in terms of (1) the impact on tasks versus occupations; (2) adoption and speed of transition and (3) adaptation within a human-centred future-of-work.

We will also focus on the importance of promoting employment that adds value but resists the type of automation that replaces humans, privatises benefits and socialises costs. We will explore how the social market economy principles of solidarity or working in common interest with mutual support and subsidiarity or delegating responsibility from central government to local government, individuals and firms can help to deliver efficient and equitable outcomes in the future-of-work environment.

We will also look at the social challenges and obstacles to be overcome if Cambodia wants to embrace innovative technologies to become a digital society. We suggest that politics and power will shape how new ways of using technology are governed. We will examine the possible consequences of a 'Cambodia 4.0' including risks and opportunities and the costs and benefits in the manifesto of the World Economic Forum, Fourth Industrial Revolution - IR 4.0.[1]

Our conclusion is that IR4.0 technologies cannot be adopted effectively by societies without active participation from the people or the proper function of the rule of law within a social market economy framework to ensure inclusion of all stakeholders.

## The Big Substitution – Does Technology Destroy Jobs?

Most recent studies on technology and employment focus on its disruptive nature and wide-ranging implications for job destruction (International Labour Organisation.[2] Estimates of possible labour market disruption vary widely from less than 10% to more than 60%.[3]

Frey and Osborne, in their original research which highlighted this potential, estimated that 47% of US jobs are susceptible to technological replacement, and these include many professional jobs which are currently highly paid.[4] Estimates for Cambodia using a similar methodology are provided in a study for the ILO covering 7.1 million workers for which an automation risk could be estimated.[5]  Overall, they estimate that 57% of workers face a high risk of automation, 32% medium risk and 11% low risk. These are in-line with the ASEAN average calculated in the same study.

1.    Klaus Schwab, The fourth industrial revolution (USA: Portfolio Penguin, 2017).

2.    "Inception Report for the Global Commission on the Future of Work," Report, Genena: International Labour Organisation (ILO), 2017.

3.    Thereza Balliester and Adam Elsheikhi, "The future of work: A literature review," ILO Research Department, Working Paper 29 (2018).

4.    Carl Benedikt Frey and Michael A. Osborne, "The future of employment: How susceptible are jobs to computerisation?" Technological forecasting and social change, 114 (2017): 254-280.

5.    Jae-Hee Chang and Phu Huynh, "ASEAN in transformation the future of jobs at risk of automation, Bureau for Employers' Activities," Working Paper No 9 (Geneva, ILO, 2016).

*Table 1: Estimated impact of automation in Cambodia*

| Low-Risk Jobs | Worker 000s | Risk % | High-Risk Jobs | Worker 000s | Risk % |
|---|---|---|---|---|---|
| Shop Owners | 144.5 | 16.0 | Stall & Market Workers | 999.0 | 94.0 |
| Handicraft | 78.7 | 3.5 | Farm Labourers | 616.2 | 87.0 |
| Primary Teachers | 78.1 | 8.7 | Garment Workers | 446.9 | 89.0 |
| Secondary Teachers | 51.5 | 0.8 | Livestock and Dairy | 263.2 | 76.0 |
| Police | 44.4 | 22.4 | Building Labourers | 242.7 | 80.0 |
| Head of Communities | 39.3 | 1.5 | Bakers & Food | 92.4 | 89.0 |
| Construction Supervisors | 27.5 | 17.0 | Street Food Sellers | 89.8 | 90.0 |
| Senior Civil Servants | 23.1 | 5.9 | Bricklayers | 78.6 | 82.0 |
| Manufacturing Supervisors | 23.0 | 1.6 | Forestry Workers | 69.6 | 79.2 |
| Medical Practitioners | 22.9 | 0.4 | Clothing Workers | 68.0 | 84.0 |

*Source: Chang, Jae-Hee; Huynh, Phu (2016), category names have been abbreviated*

High-risk occupations include stall and market workers, farm labourers and garment industry workers, where there is an estimated 89% risk of automation affecting 447,000 people. By contrast in the handicraft industry there is a 3.5% risk of automation affecting 79,000 people.

More widely they find that 86% of manufacturing jobs are at risk compared to around 32% in the services sector. In terms of demographics, women, less educated workers, and those in lower-wage occupations are more likely to be impacted.

The study also finds that the risk of automation is greater for wage-earners, that is people employed in enterprises than for the self-employed at 68% compared to 49% respectively. One explanation for this is that there is a higher chance that employers will choose automation in preference to paying wages, but they will not automate their own job if it causes redundancy.

# Tasks Not Occupations

Recent empirical studies on job-losses such as those above have been criticised for focusing on occupations rather than tasks within those occupations. Future automation is unlikely to destroy complete occupations, but will rather change the type and number of tasks within most occupations. Job losses are likely to be lower and according to the World Bank, less than 20% of jobs are predicted to disappear completely.[6]

Our research surveyed multiple studies of the estimates of automation and displacement. Table 2 summaries the results from 13 such studies which contain 44 separate estimates for multiple countries. The summaries show that on average around 47.9% of jobs would be affected by automation but there is very wide variation from as little as 9% to as much as 85%.

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**6.** Mary Hallward-Driemeier and Gaurav Nayyar, "Trouble in the making? The future of manufacturing-led development," World Bank, 2017; David H. Autor and Michael J. Handel, "Putting tasks to the test: Human capital, job tasks, and wages," Journal of Labor Economics 31, no. S1 (2013): 59-96; Melanie Arntz, Terry Gregory, and Ulrich Zierahn, "The risk of automation for jobs in OECD countries: A comparative analysis," OECD Social, Employment and Migration Working Papers no. 189, Paris, 2016.

*Table 2: Estimates of the impact of automation on jobs*

|  | All | Occupation-level | Task-level |
|---|---|---|---|
| Average | 47.9 | 54.6 | 17.5 |
| Median | 49.5 | 54.5 | 18.0 |
| Mode | 47.0 | 47.0 | 25.0 |
| Min | 9.0 | 30.0 | 9.0 |
| Max | 85.0 | 85.0 | 25.0 |

*Source: Author estimates based on 13 studies covering 44 separate country-specific estimates over the period 2013-18.*

Part of this variation is accounted for by methodology. Estimates based on a similar methodology to Frey and Osborne have been shown to overstate the likely impact of automation on jobs.[7] This is because their methodology uses occupation-level analysis which assumes that all jobs in those occupations with high automation potential, taken as a 70% or more probability of automation, would be automated and so lost.

An alternative methodology follows a task-level approach which defines occupations as a collection of tasks or activities and then looks at the probability that the tasks would be automated. Only those where more than 70% of tasks are automatable are considered at high risk).[8] Estimates using this methodology are shown in the final column of Table 2 and are generally very much lower than the occupation-level estimates. On average only 17.5% of jobs are considered to be at high risk from automation, with a range of between 9% and 25%. We would expect a similar result for Cambodia so that the estimates of 57% of jobs lost to automation would be very much lower if calculated using a task-based approach.

## Slow Adoption Is More Likely

Another factor at play in the estimates of the impact of automation on jobs is the time for adoption of technologies and the delay in the impact of technologies which can be slowed by various economic, legal, regulatory, and organisational constraints. These include the time it takes for a technology to become widely feasible as a general application, the economic costs of switching to new technologies, the management disruption in organisational change and the social acceptance of technologies in many common forms of transactions.

This effect is illustrated in the summary data in Table 3, which shows how the automation process might unfold over different periods up to the 2030s in three overlapping waves which are defined as 1. The automation of simple tasks; 2. The automation of repeatable, routine tasks and 3. The automation of physical and manual tasks through robotisation.

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7.  Carl Benedikt Frey and Michael A. Osborne, "The future of employment: How susceptible are jobs to computerisation?" Technological forecasting and social change, 114 (2017): 254-280.

8.  David H. Autor and Michael J. Handel, "Putting tasks to the test: Human capital, job tasks, and wages," Journal of Labor Economics 31, no. S1 (2013): 59-96; Melanie Arntz, Terry Gregory, and Ulrich Zierahn, "The risk of automation for jobs in OECD countries: A comparative analysis," OECD Social, Employment and Migration Working Papers, No. 189, Paris, 2016.

*Table 3: The effect of technology adoption delays on the impact of automation*

| | Cumulative % Impact | | | % Impact by Stages | | |
|---|---|---|---|---|---|---|
| | Simple Tasks | Routine Tasks | Physical Tasks | Simple Tasks | Routine Tasks | Physical Tasks |
| **Average** | 2.9 | 19.1 | 31.2 | 2.9 | 16.2 | 15.0 |
| **Median** | 3.0 | 19.0 | 30.0 | 3.0 | 16.0 | 14.0 |
| **Mode** | 3.0 | 18.0 | 30.0 | 3.0 | 14.0 | 12.0 |
| **Min** | 1.0 | 12.0 | 22.0 | 1.0 | 10.0 | 8.0 |
| **Max** | 5.0 | 26.0 | 44.0 | 5.0 | 22.0 | 23.0 |

*Source: PwC (2018); Author estimates. Category names have been changed from the original study.*

Based on these assumptions the estimates of the immediate impact of automation are very low with only around 3% of jobs affected. In the routine-task wave around 16.2% of jobs will be affected but this may take a decade to roll-out. This would mean that cumulatively only around 19% of jobs will be affected by automation over the next decade or so. The full impact of automation will take more than a decade. Even well into the 2030s, only around 30% of jobs will be impacted on average.

We often call this the absorptive capacity of technology, and this is known to be much slower in developing economies such as Cambodia and so again, when taking the adoption time into account, as well as the task-based rather than occupation-based approach, the impact of automation on jobs is much lower than early predictions had suggested.

## Structural Factors are also Important

We must also consider basic structural issues in the economy, especially when looking at developing economies such as Cambodia. Estimates of the wide impact of technology on jobs often ignore economic and management issues such as whether the investment in new technologies is at least as profitable as existing low-cost, labour-intensive alternatives which are already profitable.[9] The nature of employment contracts also matters and the data for Cambodia shows that the self-employed will not adopt automation if this makes their own job redundant.

Also, automation is unlikely to destroy whole occupations but is more likely to change the types and number of tasks, for example automating e-hailing for rides and deliveries. Investment in jobs that uses skills and tasks that resist automation is therefore a rational strategy. The data for Cambodia shown in Table 1 above for example, shows that many people-oriented jobs resist automation. In addition, the most recent research on the impact of automation on jobs globally shows that the demand for skills and therefore jobs in the future will be based on social skills rather than technology skills.[10]

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**9.** David Kucera, "New automation technologies and job creation and destruction dynamics" ILO Employment Policy Brief 12, International Labour Organisation, 2017.

**10.** Hasan Bakhshi, Jonathan M. Downing, Michael A. Osborne, and Philippe Schneider, The future of skills: Employment in 2030 (London: Pearson and Nesta, 2017).

# The Effect of Automation on International Competitiveness

The IR 4.0 is likely to reshape economic growth around the world, pushing the pendulum of growth back to the advanced economies and away from developing economies in the next decade. The key driver pushing production of goods and services to Asia has been lower costs, mainly in manufactured goods and other basic sectors, which rely on very low-cost labour.

This often created a barrier to technology adoption because labour was cheap relative to new technologies. The increase in demand for low-cost products was an important factor boosting growth in emerging countries and slowing growth of the mature economies.

A second key driver came from foreign direct investment (FDI) from mature economies into the emerging markets. Emerging countries as a whole, but especially many Asian countries, benefited from a huge inflow of capital and technology, giving a second boost to those economies.

Automation and digitalization in IR 4.0 change this balance completely, and the old advantage of low-costs is no-longer the main driver of international trade and investment. In highly automatized production the cost of labour falls because labour is replaced and developed economies are better positioned, compared to the emerging economies, at the moment, to benefit from this.

As a result, we expect that the differential growth between the mature economies and the emerging economies to revert toward developing economies like a pendulum shifting back to an older equilibrium.

This is shown in Figure 1 where in the current state the benefit of growth is toward the emerging economies where we see higher growth rates in general, albeit from a lower base. Due to automation the growth advantage will shift back to the developed economies where technology will be cheaper than low-wage jobs. This may be a temporary overshoot if emerging economies can use technologies and lower wages to recover their advantage and shift the equilibrium back in their favour.

*Figure 1:* *Who benefits? The pendulum of international growth*

# Education and Human Capital Development

A key insight from our review of the trend in future of work research is that the demand for skills will focus on areas that resist automation and the availability of jobs will focus in areas where technology is at best augmenting non-automatable skills such as cognition, empathy, creativity, thinking, learning and social perceptiveness.[11] The preparedness of Cambodia for these changes should be a focus of the research agenda for the adoption of digitalisation.

This would be a radical shift away from instrumentalist ideas of education as a preparation for the workplace and is counter to the prevailing view that the next wave of education reform should merely replace twentieth-century job preparation in business, ICT, and engineering with IR 4.0 job preparation in Artificial Intelligence, data analytics and machine learning for example.

It will also most likely involve switching from formal structured courses in physical accredited education and training institutions to more flexible, less-structured courses in virtual learning spaces provided by global learning sources which may or may not be formally accredited. There is also likely to be a shift from curriculum-centred learning in which students are expected to meet the criteria set by learning authorities to individual-centred learning where learning providers must meet the criteria and expectations of learners in specific areas related to their self-development.

Three areas have been highlighted as particularly important. First, Life-long-learning (LLL) and creating a deeply rooted culture of learning throughout a person's life to constantly update and keep pace with changing ideas and learning opportunities renewing knowledge and skills through technology. Second, Self-directed learning (SDL) and a move away from "teacher-knows-best" based on formal structured curricula to learning paths created by individuals themselves with unlimited flexibility in choice of topic, subject mix and learning style and approach. Third, equal opportunities through access to learning and accreditation of learning outcomes for everyone irrespective of originating entry qualifications

# The Reality of Life in Cambodia

The Cambodian government recently announced the implementation of its "Digital Economy and Social Policy Framework of Cambodia 2021-2035". A policy prepared:

> *"...in accordance with the actual needs, potentials, resources and capabilities in the public and private sectors to orient the development and process of the digital revolution in Cambodia. To promote digital adoption and evolution in all sectors of society, the state, the people and the business community."[12]*

This raises many questions such as: If many people will be unemployed through technologies such as Artificial Intelligence (AI) and automation, how will new jobs be created and where will income come from? And if the goal is digital literacy for all, the problem of technology access becomes relevant, how many people, urban and rural poor, actually have smart phones and have

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**11.**  Ibid.

**12.**  Chea Vanyuth, "Cambodia's digital economic and society policy for 2021-2035 launched," Khmer Times, June 2021. https://www.khmertimeskh.com/50877443/cambodias-digital-economic-and-society-policy-for-2021-2035-launched/?p=877443.

access to the internet? Can the aim of a fair and inclusive Cambodian future of work, in accordance with peoples' actual needs, be built using innovative technologies? This presents a need to consider an approach protects social welfare and promotes solidarity to deliver efficient and equitable outcomes in the future-of-work environment.

Many poor Cambodians are struggling to survive by scavenging rubbish, begging, working abroad and crossing borders illegally in need for adequate income. Cambodia has vast gaps between the very rich and the poor, low incomes and an unequal distribution of wealth and life-chances. A social market economy approach helps to avoid the privatisation of benefits and socialisation of costs.

Buying a three-dollar cup of coffee in Cambodia is an indicator of middle-class status. Poor families survive on three dollars a day and less. Average daily wages are around five dollars. People need employment for income. The cost of living in Phnom Penh, especially housing and food, for Cambodian working people is high. Overcoming poverty, rather than digital adoption, is a basic and urgent challenge that a social market economy approach can help address.

A major problem blocking economic growth is an ethical and political problem of cronyism and patronage: concessions to and monopolies by political elites and rich and powerful Sino-Khmer 'oknha'.[13] Cambodia is a 'patrimonial oligarchy' in

which the market is not open but controlled by an elite-captured state.[14]  Andriesse argues that "oligarchs in Cambodia are certainly not seeking free markets with equal opportunities".[15] An illustration of a non-open market, reported by numerous Cambodians, is Cambodia importing Chinese and Vietnamese produce, which is not cost-effective and of inferior quality while local Cambodian produce is high-quality and often organic. This example shows an unequitable market which benefits the few not the many. This incentive misalignment is contrary to the principles of the social market and innovative technologies alone may not solve this domestic political problem.

## The Bleak Future of the Garment Sector?

The reality of work in present day Cambodia is a minimum wage of USD190 per month. People work in one of three sectors with 31% employed in agriculture, 30% in industry and 39% in the services. The Asian Development Bank (ADB) predicts that the Cambodian economy will grow by 4% this year and 5.5% next year.

The garment sector is key to promoting Cambodia's economic growth. An industry in which 90% of the workers are women coming from the provinces to work in urban factories. Women are the backbone of the Cambodian economy, an engine of economic growth for raising people's living standards. Garment exports in April 2021 worth USD

**13.**  Michael Sullivan, "China's aid to Cambodia," in Cambodia's economic transformation, ed. Caroline Hughes and Kheang Un (Copenhagen: NIAS Press, 2011), 50-69; Steve Heder, "Cambodia: Capitalist transformation by neither liberal democracy nor dictatorship," In Southeast Asian Affairs, ed. Steve Heder (ISEAS Publishing, 2012), 101-116; Sok Udom Deth and Daniel Bultmann, "The Afterglow of Hun Sen's Cambodia? Socioeconomic development, political change, and the persistence of inequalities," In Globalization and Democracy in Southeast Asia, ed. Chantana Banpasirichote Wungaeo Boike Rehbein, Surichai Wun'gaeo (Palgrave Macmillan, London, 2016), 87 – 109.

**14.**  Margaret Scolomb, An Economic History of Cambodia in the Twentieth Century (Singapore: NUS Press, 2010); Andrew Cock, "The rise of provincial business in Cambodia," in Cambodia's economic transformation, ed. Caroline Hughes and Kheang Un (Copenhagen: NIAS Press, 2011), 27-49; Caroline Hughes and Kheang Un, "The political economy of "good governance" reform," in Cambodia's economic transformation, ed. Caroline Hughes and Kheang Un (Copenhagen: NIAS Press, 2011), 199-218;

**15.**  Edo Andriesse, "Frontier Capitalism in the Lao PDR Versus Patrimonial Oligarchy in Cambodia" Journal of the Economic Geographical Society of Korea 16, no. 3 (2013): 419.

424 million, were up 10.5% from last year and according to the ADB, the sector will expand 7.1% this and next year.[16]

However, according to the ILO estimates above as many as 89% of jobs in the Cambodian garment industry will be replaced by automation. The people who own and control this industry, including 90% of owners and 80% managers are not Cambodians. These predominantly Chinese, Taiwanese, or Singaporean owners will likely "re-shore" this industry and a key pillar of the Cambodian economy will collapse. What will happen to the two million Cambodian workers who depend on the textile industry? A social market approach to fair competition and ownership can help mitigate this problem by providing re-skilling opportunities, social protection, and support for private, small enterprises to continue to provide employment opportunities.

Automation and digitalization can maximize profit and efficiency but must be coupled with a social market approach to help deliver equitable outcomes. A highly skilled workforce rather than capital, is needed to drive innovation, competitiveness, and growth but the consequences of this are gross inequality in a market "increasingly segregated into low-skill/low-pay and high-skill/high-pay segments."[17] So, Cambodian garment workers would have to be offered some form of social market protection or retraining in cognitive and creative work to meet the "new talent needs and mitigate undesirable societal outcomes".[18]

## Cambodia's Trap

Can Cambodia as a developing country close the gap with advanced rich countries or will it be left behind? Cambodia as a low-income country currently depends on low-cost labour and cheap manufacturing to attract global business but this may evaporate due to the "pendulum" effect and as global manufacturing "re-shores" to advanced economies in a winner-takes-all scenario creating high political risk, social tensions, injustice, inequality, and violent extremism.[19]

The social market economy promotes security through meaningful work to support workers and their families but what if there is no demand for labour or skills, the right sort of human capital, no longer match the demand? Cambodian workers could suffer mass unemployment from automation. Schwab acknowledges that exacerbated inequality is a systemic challenge consumers and providers of capital will benefit not workers.[20] Where is income going to come from, who will provide health and welfare provisions for unemployed workers? This is a challenge in Cambodia that will not be solved by technology alone but needs a broader social market approach to growth and development.

The future of work in Cambodia will also be affected by its vast rural-urban divide in resources and life chances. Emerging economies like Cambodia need to be cautious as the impact of new technologies will be disruptive on economies. For Schwab new technology will bring about a:

**16.** Badzmierowski Brian, "100+ factories closed since January: Ministry," Khmer Times, May 28 2021, https://www.khmertimeskh.com/?p=863854.

**17.** Klaus Schwab, The fourth industrial revolution (USA: Portfolio Penguin, 2017), 44-45.

**18.** Ibid.

**19.** Ibid.

**20.** Ibid.

*" … destruction effect as technology-fuelled disruption and automation substitute capital for labour, forcing workers to become unemployed … accompanied by a capitalization effect in which the demand for new goods and services increases and leads to the creation of new occupations, businesses and even industries".[21]*

This may be a Western myth of optimism about infinite human needs and desires whose supply is infinite so that there "will always be work for everyone"[22] because it is consumers not workers who benefit in this "brave new world of future work without work".[23]

An important question for policymakers is whether Cambodia is going to create workers who can work from anywhere as self-employed for an 'on demand economy' in human cloud platforms – in what could be a capitalist dream of no minimum wages, no employer taxes, no social benefits, and no regulation burdens for the employers. This freedom of flexible work can lead to exploited precariat workers with no security and rights leading to 'social unrest and political instability'.[24]  A future of slave-work with increasing levels of fragmentation, isolation, and exclusion across societies.[25] This emphasises the need for a social market approach in the adoption of IR4.0 technology.

## Existing Barriers

The adoption of new technology is seen as the way forward but as the ASEAN Digital Master Plan 2025 shows, the major barrier is "a lack of digital literacy among end-users"[26] Lack of education and training are the chief obstacles to digitalization of the economy, society, and governance. We suggest that the goal of creating a majority of digitally literate citizens in Cambodia is not easy to meet as some cultural differences can impede innovative technology. Cronyism and the unfortunate prevalence of corruption in Cambodia as in other economies can block the adoption of new technologies.[27] Greater transparency and the rule of law promoted in the social market can help to overcome this to some extent.

Domestication of risk and irrationality in economic behaviour must be factored in to create a positive future work. Cultural differences affect the acquisition of skills and capacities necessary for digital technology. A radical overhaul and injection of funds into the educational system is needed to reach the goal of a digitally literate population as most people don't know a second language or have computer and web skills.

Cambodian education is below international standards and is reduced in the majority of private universities to an act of consumption or acquiring a social credential and status rather than learning. The young generation must be encouraged to learn how to think

**21.** Ibid.

**22.** Ibid.

**23.** Ulrich Beck, The Brave New World of Work (Cambridge: Polity Press, 2000)

**24.** Ibid.; Klaus Schwab, The fourth industrial revolution (USA: Portfolio Penguin, 2017), 48-49.

**25.** Klaus Schwab, The fourth industrial revolution (USA: Portfolio Penguin, 2017), 49.

**26.** Ravindra Ngo, "3 ways Cambodia is using tech for good ASEAN 4.0 Southeast Asia technology Fourth Industrial Revolution," World Economic Forum, March 5 2021, https://www.weforum.org/agenda/2021/05/3-ways-cambodia-is-using-tech-for-good-asean-4-0-southeast-asia-technology-fourth-industrial-revolution/.

**27.** Caroline Hughes and Kheang Un, "The political economy of "good governance" reform," in Cambodia's economic transformation, ed. Caroline Hughes and Kheang Un (Copenhagen: NIAS Press, 2011), 199-218; Sebastian Strangio, Cambodia From Pol Pot to Hun Sen and Beyond (New Haven: Yale University Press, 2020).

critically and creatively, not rote learning and memorization to just acquire information skills. People need to be transformed by new ways of thinking and life if they want to be part of the fourth industrial revolution. Cambodia cannot be a knowledge-based society if people do not have basic technology skills. At stake are cultural forces which shape the adoption of new technologies in Cambodia.

Digital and innovative technology is adopted and used in ways other than intended in non-Western societies for four reasons.

First, technology is affected by power relations, patterns of inequality, elites and groups who will use it for their own interests. Second, how technology is received by local culture and traditions changes it as it is creatively adapted and transformed into local cultural ways of life and values. Its original purpose will be lost in translation. Digital technology has been readily adopted for social purposes, consumption, and entertainment, not for self-education or reading international news for new perspectives.

Third, if Cambodia were to become a knowledge-information society there exists a need for new critical ways of thinking and egalitarian ways of life. Values of self-interest and survival by any means in Cambodian culture are anti-social and can fetter the adoption and functioning of digital technology in non –hierarchical social relations.[28]

Fourth, one obstacle preventing Cambodians from being digitally literate and entrepreneurial global citizens' lies in Cambodian student's mindset: often (at least from the perspectives of their professors)

they do not possess the attribute of curiosity, analytic thinking skills and an ability to doubt and question. Cambodians need to be able to think outside the box of tradition and culture, dare to know that they don't know, work individually at problem solving, not group-think, accept criticism and take responsibility and to see things from the other's point of view, without losing face.

Adopting new digital technologies may impact negatively upon the Cambodian perception of the self, creating "anomie" a normless vacuum between traditions and customs and new ways of life. Psycho-social well-being is essential for a productive workforce, efficient human capital maximize performance. If people work on their own in a more fragmented and atomized way of life they are at risk from suffering from being isolated, alienated and depressed removed from a group and collective supports; this marks a transformation away from collective to individualized cultural identities and ways of life.

## Conclusion

Social security and human dignity must be upheld for prosperity and well-being in society. Innovative technology within the IR4.0 approach comes with risks of inequality and the privatisation of benefits with the socialisation of costs. Using technology for all, equal consideration of all interests and the greatest well-being for the greatest number of people, not just a minority of elites or technocrats can be achieved within a social market approach. The power-politics of the elite must not control innovative technology in a way that excludes the people, otherwise insecurity may create at best inequality and at worst disorder and oppression. All Cambodians, rich and poor, urban, and rural, must participate in shaping a digital future of work with social welfare protection of safety and income.

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**28.** Alexander Laban Hinton, Why Did They Kill? (University of California Press, 2004), 31.

# ABOUT THE AUTHOR

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Dr. Paolo Casadio is an economist, specialized in the interaction between business cycles and financial markets, focusing on forecasting. In his working experience he developed econometric models for the Italian economy and Eurozone as a whole, forecasting the main economic and financial aggregates. He was responsible for asset allocation in an asset management, building strategic and tactical portfolios.

In Malaysia, Dr Casadio was head of the University of London programmes at a HELP and later he taught different courses at postgraduate school covering Economics and Finance. His articles in international journals cover economic growth, consumption with wealth effects and financial markets forecasting. His current research interest is in the Start-ups, Future of Work and in Asian regional integration, building a model of ASEAN 10 countries as a whole.

## DR. TIM RACKETT

Dr. Tim Rackett gained his doctorate, a Foucauldian exploration of colonial and post-colonial concepts of race culture and madness, from Birkbeck College, University of London. The last 25 years he has been teaching ethics, globalization and world politics in Southeast Asian universities: 14 years in Thailand, 8 in Malaysia and 3 in Cambodia. Tim has published on Buddhism and violence, racism, ethnic and religious aspects of Thai politics and government and conflict resolution in Southern Thailand. He has developed BA and MA courses on Development and International Relations. Presently he is researching the cultural reception of digital and innovative technologies.

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# COVID–19, Digital Transformation, and Skills Gap among the Cambodian Young Labor Force

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## Abstract

The COVID-19 pandemic has brought significant digital transformation to many organizations, leading to an acceleration of their economic activities.  In this regard, assessing the digital skill gap within Cambodia's young labor force will be crucial for creating opportunities for skills development, and reducing the unemployment rate in the economy. The World Economic Forum (WEF) projects that by 2022 at least 54 percent of all employees will need reskilling and upskilling to respond to changing work environments.

In this study, we attempt to assess the digital skills gap in the youth of Cambodia. Overall, the empirical results from the study support the existence of a widening skills gap. It reveals that sectors such as finance/banking/insurance, real estate and construction, wholesale and retail trade, agriculture including agro-processing, and manufacturing in the economy will absorb future labor force only when they are equipped with additional in-demand skills. Enterprise owners/managers viewed that youth should strengthen their computer skills, particularly digital marketing and online selling as these skills will be highly required to communicate effectively for enhancing their business activities. We consider the necessity of having a multi-stakeholder initiative to overcome the digital skills gap. Also, we strongly suggest that to reach a wider audience and create long-lasting engagement, enterprises should come forward to collaborate with educational/technical and vocational institutes to improve the design and delivery of programs, provide advice regarding work-based learning through internships or on-the-job training, and continue a dialogue between the government, institutes, and youth during this period of rapid socio-economic change.

## Introduction

The COVID-19 pandemic has had an unprecedented impact on the global economy. The pandemic has accelerated the digitalization of several economic activities, and in particular, those activities with the potential to create decent work opportunities. In response to market needs, enterprises are gradually digitizing their operations to promote business activities and build resilience to future crises. However, acquiring digital skills is challenging, particularly in developing countries.   Even in high-income economies, only 62 percent of the population has basic digital skills, and in lower-income economies, this number is around 32 percent.[1]

Cambodia's young labor force presents an enormous opportunity to accelerate growth through their meaningful and productive involvement in economic activities. Relative to its total population, the Kingdom is home to the largest youth and adolescent population in Southeast Asia. With one in five Cambodians currently between the ages of 15 and 24 and almost two-thirds of the population under the age of 30, young people embody the great potential to drive economic and social development.[2] However, this potential demographic dividend can only be realized if the young labor force is properly equipped with market-driven skills. It is widely believed that an emerging skills gap is one of the factors that could limit Cambodia's economic growth and its aspiration to attain upper-middle-income status by 2030. According to the Youth Multi-Dimensional Deprivation Indicator (Y-MDI), one young Cambodian out of five is deprived

1. "Accelerating Digital Inclusion in the New Normal," Report, World Economic Forum, July 27,  2020, https://www.weforum.org/reports/accelerating-digital-inclusion-in-the-new-normal.

2. "Cambodia Youth Fact Sheet 2015," Report, United Nations Population Fund Cambodia, 2016, https://cambodia.unfpa.org/en/publications/cambodia-youth-data-sheet-2015

in two or more well-being dimensions at the same time. These wellbeing dimensions include health, employment, education, and civic participation, while 40 percent fare poorly in at least one of these dimensions.[3]

Young Cambodians are often entering the workforce unprepared and with low levels of education. More than four out of every 10 young workers lacked sufficient education to perform well at their jobs.[4] There is a widening gap between the skills that businesses need and what the education institutions, whether academic or vocational training, produce.[5]

This is of course unfortunate, given that skills development contributes towards sustainable enterprise development by improving the employability and productivity of the labor force. The linkage between skills and productivity not only supports the enterprise and the economy but can also contribute to more inclusive development. If provided with the right skillset, marginalized sections of the population can also reap the benefits of economic growth.[6] In addition to the ongoing skills gap among the young labor force in Cambodia, the COVID-19 pandemic has posed additional challenges by (temporarily at least) removing thousands of workers from formal employment. In many cases, it has required workers to reskill and upskill themselves to meet new market demand in areas such as E-commerce,

and other related technologies – such as acquiring the basic digital skills to enable them to maintain remote contact with their organizations. Cloud-based services such as Amazon Web Services, Microsoft Azure and Google Cloud support the basic infrastructure for remote work. With a higher share of consumer and employee reliance on "remote everything," it is expected that the digitalization of the economy will continue at an accelerated speed, and to foster a safe and successful economic recovery, it is necessary for job seekers and particularly the youth in the country to acquire digital skills. More importantly, the widening skills gap caused by the pandemic should be reduced, if not, eliminated, through the provision of technical acumen to support the changing commercial landscape.

Digitalization is what makes the world move on from this pandemic - it has made people's lives easier, and also more productive.[7] Looking at the economic opportunities, the digital revolution has brought a great change to daily business and life. With the advantage of new technologies like the internet, people in their daily lives have easy access to products without being concerned with the location.[8] Overall, the pandemic has influenced the rise of online commerce like ordering online using websites or a mobile phone.[9] This rise of E-commerce and the flexibility to digitalization provided greater awareness consumers on exactly

**3.** "Youth Well-being Policy Review of Cambodia. EU-OECD Youth Inclusion Project," Report, Paris: OECD Development Centre, 2017, https://www.oecd.org/countries/cambodia/Youth-well-being-policy-review-Cambodia.pdf.

**4.** "Cambodia: Addressing the Skills Gap," Report, Manila: Asian Development Bank & International Labour Organization, 2015, https://www.adb.org/publications/cambodia-addressing-skills-gap

**5.** Srinivasa Madhur, "Cambodia's Skill Gap: An Anatomy of Issues and Policy Options," Cambodia Development Resource Institute, Working Paper Series No. 98, 2014, https://cdri.org.kh/wp-content/uploads/wp98e.pdf.

**6.** Sunita Sanghi, and A. Srija, "Skill Development and Productivity of the Workforce," Economy Matters, 36–51 (2015).

**7.** Almeida, Fernando, Jose Duarte Santos, and Jose Augusto Monteiro, "The Challenges and Opportunities in the Digitalization of Companies in a Post-COVID-19 World," IEEE Engineering Management Review 48, no. 3 (2020): 97–103, https://doi.org/10.1109/EMR.2020.3013206.

**8.** Grewal, Dhruv, John Hulland, Praveen K. Kopalle, and Elena Karahanna, "The Future of Technology and Marketing: A Multidisciplinary Perspective," Journal of the Academy of Marketing Science 48, no. 1 (2019): 1–8, https://doi.org/10.1007/s11747-019-00711-4.

**9.** Klünder, Timo, Jan Niklas Dörseln, and Marion Steven, "Procurement 4.0: How the Digital Disruption Supports Cost-Reduction in Procurement?" Production 29 (2019), https://doi.org/10.1590/0103-6513.20180104.

online business works – modern platforms have created unrivalled product choices for customers, and they are far less time-consuming to use.[10] For organizations, this modern technology not only helps business processes, but enables the potential for customer retention and new customer attraction.[11] To continue operating, and to take advantage of digitalization, organizations can struggle to adapt. Companies need to recruit competent people to handle the new challenges of the digital economy, particularly meeting changing customer needs, effective data management and data security in the context of limited resources, etc. This may also lead to the requirement of certain educational backgrounds and training to enhance the skills of internal staff. Also, educational institutions and technical and vocational skills development centers should provide specific skills and knowledge such as computer-based skills and personal development that could respond to the emerging social challenges.[12]

Despite Cambodia's steady growth of the digital skills infrastructure in recent years, there are indications of a misalignment between private sector needs and the supply by skills providers. The skills mismatch is both a function of the quality of education as well as the adaptability of tertiary education to changing market dimensions.[13] It is expected that the post-COVID-19

situation will rapidly increase the need for digitalization as result of shifting consumer habits. Organization must therefore transform to stay resilient, competitive, and relevant to customers. To meet the growing demand, it is urgently required to examine the backgrounds of the Cambodian young labor force and find the digital resources to support them. Against this backdrop, the paper intends to understand the demand for skills from the Cambodian young labor force, and the gap in the supply of skills provided by training institutes and universities. Finally, the paper recommends actions to be taken to reduce the skills gap among the Cambodian young labor force, in the context of the COVID-19 pandemic.

## Methodology

To conduct this study, the capital city of Phnom Penh was selected due to its tremendous growth, the presence of well-diversified economic activities, along with the prevalence of established universities, and technical and vocational training institutes. To obtain the opinions of young job seekers, students from two technical and vocational educational institutes, and one general and professional higher education provider were randomly selected. Both physical interviews and online surveys were conducted, and in total, through convenience sampling, and by using a semi-structured questionnaire, opinions from 90 sample students were gathered. In addition, opinions from eight instructors/teachers/officials from the same institutions, and 12 employers/managers of various enterprises ranging from micro to large-scale units were collected and analysed.

**10.** Lyytinen, Kalle, Youngjin Yoo, and Richard J. Boland Jr, "Digital Product Innovation within Four Classes of Innovation Networks," Information Systems Journal 26, no. 1 (2015): 47–75, https://doi.org/10.1111/isj.12093.

**11.** Banalieva, Elitsa R, and Charles Dhanaraj, "Internalization Theory for the Digital Economy," Journal of International Business Studies 50, no. 8 (2019): 1372–87, https://doi.org/10.1057/s41267-019-00243-7.

**12.** Maresova, Petra, Ivan Soukal, Libuse Svobodova, Martina Hedvicakova, Ehsan Javanmardi, Ali Selamat, and Ondrej Krejcar, "Consequences of Industry 4.0 in Business and Economics," Economies 6, no. 3 (2018): 46, https://doi.org/10.3390/economies6030046.

**13.** "E-Commerce Strategy", Report, Ministry of Commerce & EIF, 2020, https://www.kh.undp.org/content/cambodia/en/home/library/E-commerce-strategy.html.

# Empirical Results

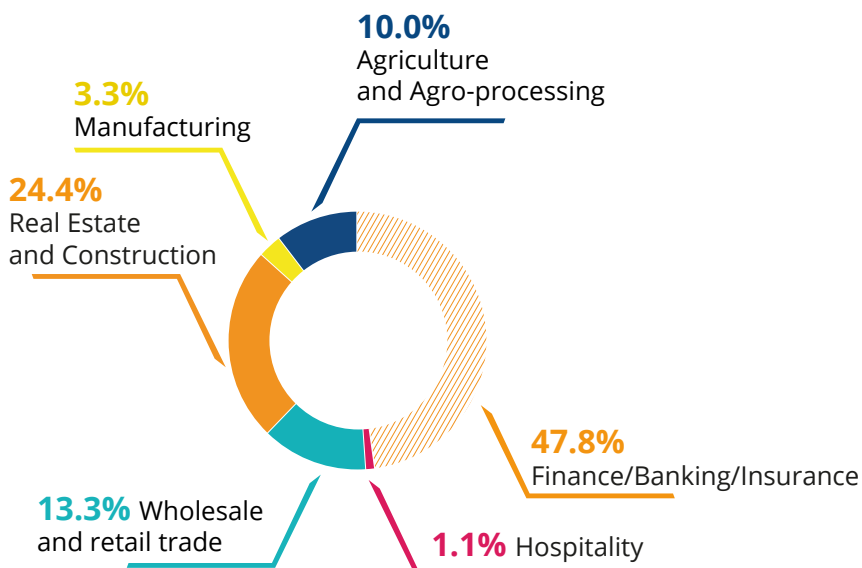## Socio-demographic Profile of Respondents

Among the sample youth job seekers, while 51.1 percent were pursuing their higher studies in professional programs, the remaining 48.9 percent were the students of technical and vocational programs. The percentage of female job seekers participating in the survey was 52.2%. Almost all surveyed youth (98.9 percent) were unmarried, and the majority of them (91.1 percent) belong to the age group of 20-23. While 44.4 percent of youth were dependent on their families and not working, 27.8 percent of youth were earning an income that ranged from less than 100 to more than US 200 dollars per month. The remaining 27.8 percent of youth participants preferred not to respond about their working and earning conditions.

All eight instructors/teachers/officials who participated in the survey were male, and their teaching experiences varied from two years to 20 years. The enterprises participating in the survey were from different sectors such as tourism and hospitality, accounting, human resources and legal service, electrical, electronic, and power supply, mechanic, garage, sales and service, construction, manufacturing, transport, etc.

## Employment and Skills - Supply-side Analysis

In the current deregulated business scenario, while employers are concerned about the supply of appropriately skilled employees, job seekers themselves are concerned about their levels of skill development as they seek employment in an increasingly competitive labor market. As such, a supply-side skill analysis is critical to explore the skill availability in the context of a knowledge-based economy. We intend to assess the current supply of skills from the perspectives of the job seekers and educational/vocational institutes.

*Figure 1: Potential sectors for youth engagement in Cambodia*



**10.0%** Agriculture and Agro-processing

**3.3%** Manufacturing

**24.4%** Real Estate and Construction

**47.8%** Finance/Banking/Insurance

**13.3%** Wholesale and retail trade

**1.1%** Hospitality

A mixed response was revealed in favor of the potential sectors for youth economic engagement in Cambodia. While 47.8 percent of youth respondents preferred finance/banking/insurance, etc., 24.4 percent of youth considered real estate and construction followed by 13.3 percent in favor of wholesale and retail trade. The preference for other sectors such as agriculture including agro-processing, and manufacturing was 10.0 percent and 3.3 percent respectively (Figure 1). Among the instructors/teachers, 25 percent each considered finance/banking/insurance, real estate and construction, and agro-processing as having the potential for greater youth engagement in Cambodia.

The higher preference of the youth to engage in the finance/banking/insurance sector is a result of the steady growth of the Cambodian banking sector over the past two decades. This sector continues to promote financial inclusion with the number of deposit clients currently reaching 8.2 million, and credit clients reaching 3.2 million accounts.[14] Apart from that, construction is one of the four pillars that support the Cambodian economy and currently generates numerous employment opportunities. The sector attracted a total investment of US 9.35 billion dollars in 2019, up 79 percent as compared to 2018. Further, despite COVID-19, construction investment value in the first half of 2020 reached US 3.8 billion dollars, indicating a 12 percent increase compared to the same period in 2019.[15] As per the Ministry of Land Management, Urban Planning and Construction, in 2019, around 1,081 construction and home design companies were operated in the country

and generated approximately 150,000 jobs.[16] Cambodian youth also found potentialities in the retail trade as this sector offers jobs to a wider range of youth, including undereducated young people.

Concerning the quality that youth considered as the most useful for them in finding a job, while more than two-fifths (41.1 percent) perceived technical education, 28.9 percent considered professional qualifications such as finance/banking/insurance and close to one-fifth (18.9 percent) favored soft skills. Most interestingly, while 43.4 percent of respondents agreed that youth possess the skills required to meet today's labor market needs in Cambodia, 60.0 percent believed, and 37.8 percent of youth somewhat believed there was a skills gap in the labor market. However, all the instructors/teachers were of the opinion that the youth possessed a certain skill level, but not all the skills needed for the modern labor market.

The young labor force needs to acquire various hard and soft skills to match the expectations and requirements of employers. According to the youth respondents, the three most pressing skills they need to develop are:

1. Analytical skills (62.2 percent);
2. Technical skills (55.6 percent); and
3. Professional skills – such as finance/banking/insurance (44.4 percent) and foreign languages (44.4 percent).

14. Sok Chan, "Finance Sector in Good Shape: NBC," Khmer Times, July 9, 2020, https://www.khmertimeskh.com/742892/finance-sector-in-good-shape-nbc/.

15. "Cambodia's Construction Investment Reached US$4 Billion in H1 2020, A 13% Increase," Construction Property, July 7, 2020, https://www.construction-property.com/cambodias-construction-investment-reached-us4-billion-in-h1-2020-a-13-increase/.

16. Xinhua, "Investment in Cambodia's Construction Sector up 79 pct in 2019," Xinhua, December 25, 2019, http://www.xinhuanet.com/english/2019-12/25/c_138657076.htm.

Analytical skills are the ability to deconstruct information into smaller categories for which it is necessary to collect and analyze information to solve problems and make decisions. Skills such as research, forecasting, problem-solving, data mining, communication, etc. are included in the analytical skills.

Against analytical skills, technical skills are the expertise required to perform specific job-related tasks such as engineering, technology, manufacturing, digital, etc. A successful career as a finance professional requires not only academic qualifications, but also the ability to use technology and standard packages designed to streamline processes. In addition, having the ability to communicate in a foreign language increases acceptability among a diverse customer base.

Most instructors/teachers stated that higher levels of technical skills, and foreign language skills are hard to find among the youth in Cambodia. Like hard skills, employers would also like to see several soft skills developed further in the young labor force. More than half of respondents (52.2 percent) agreed that critical thinking skills were hard to find, and 48.9 percent considered communication and problem-solving skills difficult to find in young jobseekers.

In the light of the COVID-19 pandemic, the study attempted to understand from the youth if they foresee any changes in the demand for skills in the labor market. Most agreed the pandemic would change the skills demanded by employers. When asked the question "has there been a change in the demand for skills due to the Covid-19 pandemic", 45.6 percent answered "yes" and 36.7 percent responded "somewhat" (Figure 2).

**Figure 2:** *Possible changes in the demand for skills due to COVID-19 pandemic*
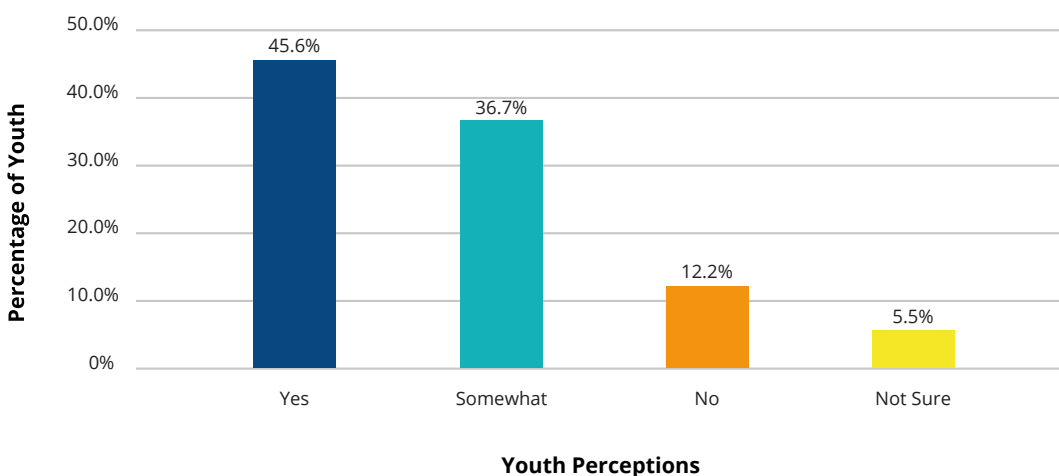


In addition, as shown in Figure 3, and notably, most respondents believed the skills gap was widening. 17.8% strongly agreed, and 45.6 percent agreed the skills gap was widening. 31.1 percent somewhat agreed, and only 5.5% disagreed that there was a widening skills gap in the country due to COVID-19, or the growing digitalization of economic activities (Figure 3).

*Figure 3: Possible widening of skills gap due to COVID-19 and digitalization*



**Youth Perceptions**
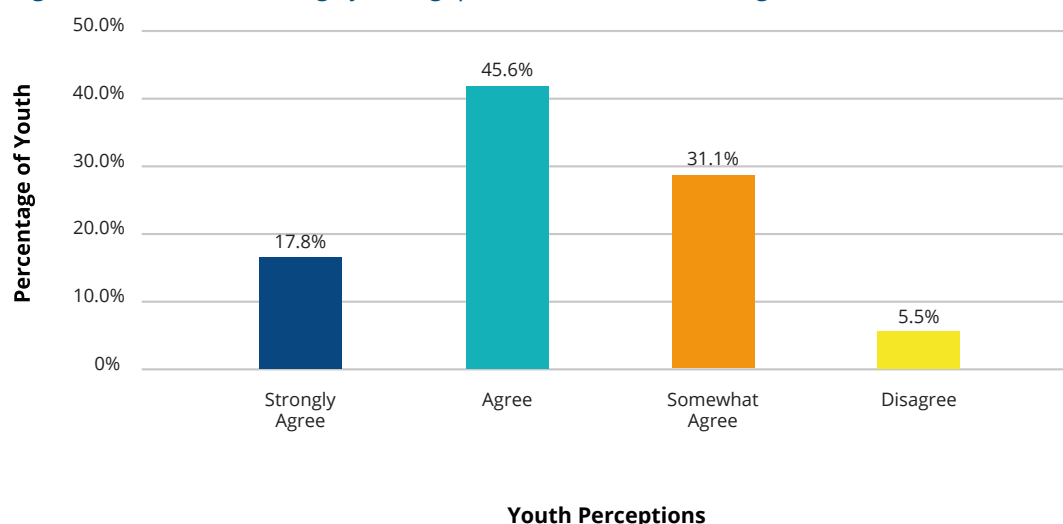
Perhaps more optimistically, 51.1 percent  of youth respondents agreed that they understood the basic digital skills such as communicating, handling information and content, transacting, problem-solving, being safe and legal online, etc. A further 44.4 percent perceived they understood these basic skills "to some extent". Only 4.4 percent of youth respondents stated that they did not have a fundamental grasp of these basic digital skills.

Despite the optimistic results in the last paragraph, it is clear that a widening skills gap perceived in the young labor force should be addressed by relevant stakeholders to ensure decent work opportunities are available in the future. In this regard, almost all instructors/ teachers viewed that youth should strengthen their digital and communication skills to cope with changing labor market demand in the wake of COVID-19. As the pandemic has accelerated the trend towards digitalization, learning E-commerce, and providing a basic core skillset of digital skills and understanding would certainly enhance the opportunities for young Cambodians.

## Employment and Skills - Demand-side Analysis

The demand-side skill analysis is critical as it shows the rapidly evolving skill needs for the labor market. This includes the skills gap, and the mismatch between the supply of and demand for certain skills. Skill needs are changing as a result of digital transformation, globalization, climate mitigation and demographic changes.[17] We intend to assess the demand for skills in the present context from the point of view of enterprises.

The survey enterprises viewed that they created enough job opportunities for the young labor force before COVID-19 in their areas of operations. While 50 percent of them employed skilled, semi-skilled and unskilled labor, 41.6 percent preferred only skilled labor for their business activities. However, it was often quite challenging for them to find the skilled labor relevant

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**17.** ILO and OECD, "Approaches to Anticipating Skills for the Future of Work," Report for the G20 Employment Working Group, 2018, https:// www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_646143.pdf.

to their sector. To cope up with this situation, sometimes they decide to recruit employees with low levels of skills and train them themselves. Realizing the fruitfulness of having collaborations between themselves and educational/technical and vocational institutions to recruit youth, 83.3 percent of enterprises stated they had continued their education-sector collaborations. From the perspective of the education institutions, collaboration is necessary not only to facilitate them to find jobs for their students, but also to enhance their reputation and understanding of the kind of jobs created by the enterprises.

The capital city of Phnom Penh holds ample employment opportunities due to the expansion of its businesses, and a general acceleration in the scale of investment into the city. This is particularly true in sectors such as real estate and construction, finance/banking/insurance, hotels and restaurants, wholesale and retail trade, light industries, etc. In this context, 75 percent of enterprise owners/managers felt that the education and skills training offered by education institutes met "to some extent" the demands of the current labor market, and 25 percent "fully agreed" that demands were met.

Further, 75 percent of enterprise owners/managers believed that skills gaps in the labor market existed (Table 1), and the majority of the enterprise owners/managers (91.7 percent) were of the opinion that youth possessed certain skills, but not all as demanded in the labor market.

**Table 1:** *Education/skills training offered by institutes and skill gap*

| Issues | Responses (%) | | | |
|---|---|---|---|---|
| | Yes | Some Extent | No | Total |
| Does the education/skill training offered by institutes meet the current needs of the labor market? | 25.0 | 75.0 | - | 100.0 |
| Is there any skill gap in the labor market? | 75.0 | 25.0 | - | 100.0 |

Concerning the ongoing pandemic and uncertainties, 41.7 percent of enterprise owners/managers agreed, while 33.3 percent agreed "to some extent" that they foresee a change in demand for skills in the labor market.

Most remarkably, among the surveyed owners/managers, 58.3 percent agreed, and 33.3 percent felt that to some extent the skills gap would widen because of Covid-19. As an optimistic finale, 50% of participating enterprise owners/managers agreed that youth have knowledge of basic digital skills, and a further 50% agreed with the statement to some extent (Table 2). Indeed, even with a skills gap, young Cambodians are often seen to have better digital skills than today's enterprise owners/managers, and this sentiment is reflected in our results.

*Table 2: COVID-19, digital transformation, and skills gap*

| Issues | Responses (%) | | | |
|---|---|---|---|---|
| | Yes | Some Extent | No | Total |
| Do you foresee any changes in the demand for skills due to the COVID-19 pandemic in the labor market? | 41.7 | 33.3 | 25.0 | 100.0 |
| Do you feel that due to COVID-19 and digital transformation, the skills gap will further be widening? | 58.3 | 33.3 | 8.3 | 100.0 |
| Do you think that youth have the knowledge of basic digital skills? | 50.0 | 50.0 | - | 100.0 |

Concerning the widening of skills gap due to COVID-19 and growing digitalization of activities, the enterprise owners/managers viewed that youth should strengthen their computer skills, particularly digital marketing and online selling as these skills will be highly required to communicate effectively for enhancing their business activities.

## Conclusion

To conclude, we argue that as COVID-19 has fundamentally altered market demanded skills, the emerging skills gap among the youth should be proactively reduced as a matter of urgency. To reduce the skill gaps, youth should be proactive to learn practical skills by volunteering. They should acquire basic digital and professional skills, especially market demanded technical and vocational skills, and in addition, should focus on learning crucial foreign languages such as English and Chinese. Further, they are required to develop the right kind of attitude and acquire soft skills such as critical thinking, problem-solving, teamwork, decision-making, etc. In addition, the employees of a few badly affected sectors such as tourism and hospitality, aviation, transport, etc. have to be re-skilled to find new jobs. The emerging environment requires a thorough assessment of sectoral skills gaps, to better direct efforts toward bridging gap as efficiently as possible. This is integral – as skill development is key to the growth of student employability, business sustainability, and even long term nationwide economic growth.

Further, to reach a wider audience and create long-lasting engagement, we recommend that enterprises proactively come forward to collaborate with educational/technical and vocational institutes. This will not only improve the design of education programs but will also lead to work-based learning opportunities, such as internships or on-the-job training. Finally, we believe continued dialogue between the government, institutes, and youth will be crucial in reducing the widening skills gap.

Our study is not free from limitations. First, our work is based on a limited youth sample of respondents from three educational/technical and vocational institutes in the capital city of Phnom Penh, and therefore, our findings may not be applicable to other areas - particularly poorer provincial areas, where the digital skills gap is likely to be even more prominent.

However, we assume that similar conclusions will be revealed in other geographical regions in the country with comparable environmental and socio-economic conditions. Second, though enterprises ranging from micro to large-scale were considered to understand the demand for skills, these enterprises did not represent every sector of the economy. As such, attempts should be made in future studies to extend our analysis to other geographical areas, and more diverse economic sectors. Despite these limitations, our study findings have implications for all stakeholders today: decision-makers, managers of enterprises, educational institutes, teachers and the young labor force. To solve the skills gap, a multi-stakeholder initiative is required to develop Cambodia's young labour force - and enable it to reach its true economic potential in today's increasingly digital age.

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# Establishing a Merit Based System to Combat Digital Corruption

RIM Sokvy

The Rectangular Strategy Phase IV of the Royal Government of Cambodia aims to elevate the welfare and the living condition of the citizen by becoming an upper-middle-income and high-income country by 2030 and 2050 respectively. The development of inclusive institutional capacity building and the quality of the government bureaucracy would be one main driving force. In this regard, the establishment of a merit-based system would be an important mechanism for the Cambodian government to achieve its goal of increasing the living standards of the population.[1] Meritocracy means hierarchical mobility and encompasses the recruitment, the rise and fall of individuals depending on their skills and knowledge. Theoretically, senior and important positions in society should be filled by highly trained and talented people, thus it paves the way for an inclusive society to flourish and prosper.[2]

A merit-based system is already partially adopted in Cambodia, which can be seen through the strict recruitment process to select potential candidates to get a government job, the entrance exam to study at the Royal School of Administration (RSA) is an example of that.

However, some loopholes need to be addressed. Loopholes can be illustrated by the level of corruption in the country. According to the Trace's 2020 Bribery Matrix, ranked Cambodia 186 out of 194 territories and countries in terms of risk of bribery.[3] More fundamentally, the latest

Global Corruption Barometer on people's perception and experience related to corruption was conducted by Transparency International in June and July. Through phone interviews with 1,000 people, they found that although people's perception of corruption has reduced from 66% in 2016 to 41 in 2020 (suggesting fewer people are directly affected by it), the majority (87%-72%) of the respondents believed corruption is still present in the system. In particular, they believe non transparent practices are still common amongst the judiciary, police officers, and government officials. Among the respondents, 37% said they had paid a bribe to obtain an official document or ID card.[4] This level of perceived corruption could clearly be improved upon, and suggests there are weaknesses in government recruitment systems - and a lack of a transparent and meritocratic HR processes.  It is often clear that government positions are more likely to go to those with financial clout, or political and family ties.

As a result, this can create conditions that are favorable for an unethical code of conduct and a recruitment process based on political and family ties rather than talent and skills. This contradicts with the idea of meritocracy, that talented people should be promoted and recruited. The government needs to put more effort into strengthening the merit practice in the government system, particularly through education. This would allow the government to gradually allocate talented individuals to the key leadership roles in government, society and economy. In addition, and of great importance, it would also enable the government to become more representative of Cambodian society – with people from all socioeconomic backgrounds finding positions within the government.

1.  "Can Cambodia become an upper middle-income economy by 2030 and a high-income country by 2050?" World Bank Group, October, 2018, https://documents1.worldbank.org/curated/Economic-Update-Nov-final-01Low-res.pdf.

2.  Kenneth Paul Tan, "How Singapore is fixing its meritocracy," The Washington Post, 16 April, 2016, https://www.washingtonpost.com/news/in-theory/wp/2016/04/16/how-singapore-is-fixing-its-.

3.  "Trace Bribery Risk Matrix," Trace Anti-Bribery Compliance Solution, 2020, https://www.traceinternational.org/trace-matrix.

4.  "Press Release on Global Corruption Barometer 2020," Transparency International Cambodia, November 24, 2020, https://www.ticambodia.org/press-release-on-global-corruption-barometer-2020-en/.

## Lessons Learnt From Singapore

Singapore is one of the major maritime Southeast Asia countries. Despite the lack of natural resources, Singapore still manages to be a successful developed country. The adoption of merit-based systems was one key factor contributing to this success. Singapore has successfully recruited the most talented people and efficiently allocated them to important and key leadership positions. This is possible due to three main factors. First, qualified educational institutions and schools are available and affordable for the average Singaporean household. Second, Singapore's merit-based system is centered around outcome orientation in combination with a reward and incentive system. To put it simply, the government has made it conducive for free and fair competition to exist, thus the potential and talented candidate would get a better chance to be selected and promoted. Finally, Singapore also pays the government top officials high salaries thus increasing the cost and risk of corruption.[5]

The success story of Singapore can be a lesson for Cambodia to develop an inclusive and qualified government institution. Especially, with the aim to raising the living standard of its population. This can also be an effective way to help reduce the level of corruption in Cambodia since recruitment based on political ties and family connections, and the system of patronage that this encourages, is a primary source of corruption.

Previous research shows that effective implementation and adoption of meritocracies in the public sector could effectively reduce corruption and nepotism.

This conventional wisdom can best be exemplified by the experiences from the Balkan states. It found that strict procedures of assessment through oral and writing examinations could help to reduce the influence of political parties which resulted in the reduction of corruption, especially in countries where the government is politicized and clientelism exists.[6]

With the effective implementation of merit-based systems, the newly recruited and promoted official feels no obligation to get the senior or party's support since their posts are legitimized by the system, not by political parties or family connections. Merit-based recruitment is divided up into three levels:

1. Dissemination of information about recruiting new posts and positions needs to be delivered to every segment of society. E-recruitment mechanisms and social media can help to ease the burden of sharing information. Public vacancy announcements are very important to attract more competent candidates. However, specific qualifications and eligibility should be prescribed to show transparency and accountability.

2. Evaluating and assessing the candidate competencies through well-defined assessment criteria. Writing and oral examination can be tools to assess the candidates' skills and knowledge, while it also makes the recruitment process more transparent and credible.

3. Appointment which is to appoint newly recruited candidates in their post. The top talented individual would

5.   Kenneth Paul Tan, "How Singapore is fixing its meritocracy."

6.   Huma Haider, "Merit-based Recruitment in the Public Sector: Effectiveness and Challenges," K4D Helpdesk Report, Brighton, November 20, 2019, https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14819

be allowed to choose their post first while the remaining candidate would allow selecting the remaining post afterwards.[7]

This practice has already been adopted in Cambodia which can be seen through the strict process to get students to study at organizations under the umbrella of the Ministry of Interior (MOI). The Royal School of Administration (RSA) is one of those organizations. However, many still believe that the family and political connection still play significant roles in getting posts.[8] The adoption of the current recruitment and promotion system is subjected to pockets of non-compliance and connection with political parties, with discretionary appointments still possible through political ties and family connections – and these have effectively overruled the merit-based recruitment system. On top of that, some positions might fall outside of the regular recruitment procedure. This often results in filling these positions with less talented officials, and can allow corruption to take place within the system.[9]

## Policy Recommendations

As discussed previously, there are a few flaws in the current recruitment process for government positions. It is key these flaws are remedied to enable the government to improve its institutions and bureaucracy. In this section, I will discuss the policy recommendation which are based on the

experience from the Balkan states, and based on the status quo of Cambodia's practice of meritocracy. These policy recommendations focus only on the public sector.

1. Social media (like Facebook and twitter) and app applications (like ZipRecruiter and Glassdoor) should be adopted to help enhance the user-friendliness and efficiency of the application. Social media tools appear to be the most common way of looking for a job especially during the pandemic. This method could help the government to attract a pool of competent applicants to apply for government jobs. Though currently, an E-recruitment mechanism has been adopted, it is mostly done on the vacancy public announcement. So, more effort should be concentrated on submitting documents as well as getting feedback from the applicant to increase transparency and accountability of the recruiting process.

2. The criteria and assessment framework should be clearly defined that can be used to assess candidates based on their job demands, competencies, and standards. Well-defined assessment criteria would make it hard for a patron to put their client into positions where skills and knowledge requirements are demonstrated rather than where they are left ambiguous. Without assessment criteria, the government would lack the criteria to select the applicant for the senior government official.[10] It is important that the selection criteria are publicly and widely available, so that talented individuals outside of the capital also have access to them.

7.   Ibid.

8.   Bunthoeun Thun, "RSA at a glance: past, present and future," Royal School of Administration, 2019, http://era.gov.kh/eraasset/uploads/2019/12/RSA-Highlights-past-present-future.pdf.

9.   Markus Petersson, "Cambodia´s Modern Patronage System: A Brief Reflection on Historical Foundations, Contemporary Articulations, and Future Policy Formations," Future Forum, http://ticambodia.org/library/wp-content/files_mf/1548300463Cambodia%C2%B4sModernPatronageSystem.pdf.

10.  Huma Haider, "Merit-based Recruitment in the Public Sector: Effectiveness and Challenges."

3. Currently, The Department of Personnel and Vocational Training and the Royal School of Administration are the two organizations responsible for promoting and recruiting government public servants. The transparency and accountability of these two organizations should be improved particularly on the recruiting and promoting process of the government officials.[11] In this regard, the involvement of civil servant organizations, academia, international organization, and think tanks are important external actors that should participate in the process of recruiting and promoting public civil servants. This can potentially enhance the professional independence and impartiality of the selection commissions as well as the transparency and credibility of the government official. The committee to promote and recruit the government official should be independent and comprise permanent members who are well-equipped with knowledge and experiences.[12] This could be an important factor contributing to combat corruption and nepotism. The experience from Estonia shows the commission that is independent and professional has a positive effect on the recruitment process.

4. The strong regulations need to be strengthened against the violation of the merit principle, particularly on paying bribes to pass the entrance exam. The bribe taker should be sanctioned to show strict measures against corruption. More fundamentally, the marking process and the result should be transparent to make sure the entrance exams are transparent and effective in recruiting competent public servants.[13]

5. The administration training and training facility should be expanded. Currently, the capacity to train government officials is limited; it could only produce a small portion of trained government officials to meet the demand of the government. For instance, from 2003 to 2008, the Royal School of Administration (RSA) and The Economics and Finance Institute, schools to train government officials, could only train a total of 284 and 26 from 2003 to 2008. Its capacity to train government officials is limited, and cannot meet the demand of the General Department for local Administration (GDLA), for example, which from 2003 to 2008 needed to train around 700 government officials.[14] Since then, there is no major reform regarding its training capacity. In this regard, it allows discretionary selected candidates to work in government officials through family ties and political connections.

6. The government should increase the salary for government officials to attract talented individuals. Currently, the general public official gets a salary of around USD270 to USD288 per month.[15] The top officials, like a Minister, have a salary of around USD1,115 per month

11. "Situational Analysis 2 Human Resources Development System of Civil Servants for Local Administration in the Ministry of Interior," Ministry of Interior, December, 2008, https://www.jica.go.jp/project/cambodia/0601331/pdf/english/SNA-2_eng.pdf

12. Huma Haider, "Merit-based Recruitment in the Public Sector: Effectiveness and Challenges."

13. Ibid.

14. "Situational Analysis 2 Human Resources Development System of Civil Servants for Local Administration in the Ministry of Interior," Ministry of Interior, December, 2008, https://www.jica.go.jp/project/cambodia/0601331/pdf/english/SNA-2_eng.pdf.

15. Mech Dara, "Gov't to spend USD8.2 billion this year," The Phnom Penh Post, 31 December, 2019, https://www.phnompenhpost.com/national/govt-spend-82-billion-year.

while an under-secretary of state could get around USD700.[16] This is relatively low compared to the private sector in Cambodia. Though the average formally employed worker in Cambodia receives around USD200 per month, a middle manager, working in a large company in the capital could obtain around USD878 per month.[17] Thus, the government needs to increase the public official salary to attract more talented people. Otherwise, they would work for the private sector and obtain a higher salary, or else, they could be tempted to find non-transparent means to boost their incomes to fit the responsibility of their positions. Strong mechanisms against corruption, and a high salary for government officials would make create fewer incentives to act in corrupt ways.

The previous research found that countries that are effectively improving and strengthening the recruitment capacity of the government's civil servant system could work better to professionalize their civil servants. This has been the case of a few countries in Latin America such as Mexico, Chile, and Brazil who made reforms in the recruitment procedure – (selection, training, performance, and promotion). Various establishments also included the creation of norms, rules, and models for career development and human resources management.[18] To successfully implement and strengthen a merit-based recruitment system is very integral to selecting and training professional civil servants, and curbing corruption.

Previously, there have been many cases involved with the irregularity of the recruitment process. According to the Committee for Free and Fair Election in Cambodia (COMFREL), in 2015 found there were around 135 cases involving paying bribes to get government jobs.[19] In 2020, the irregularity also happened when the candidate accused the committee of lacking transparency in the recruiting process, the candidate suggested they had been requested to pay a bribe to get selected.[20] Thus, many problems still need to be solved to help enhance the system.

## Utilizing Technology to Combat Corruption and Strengthen the Merit-Based System

While a merit-based system is an effective tool in combating corruption and making the working environment more competitive and productive, the arrival of modern technology can also allow the government to utilize modern technology. Modern technology can also add more layers to existing mechanisms to combat corruption, and can make the system more transparent and accountable. The government has used technology to combat corruption. For example, The Government Administration Information System (GAIS) and Provincial Administration Information System (PAIS) adopted by National Information Communication Technology Development (NiDa) enables citizens to access government services without directly meeting public officials at

16. May Titthara, "Government Salaries to Rise," Khmer Times, 24 October, 2016, https://www.khmertimeskh.com/61477/government-salaries-to-rise/.

17. "Average Salary in Cambodia 2021," salaryexplorer, 2021, http://www.salaryexplorer.com/salary-survey.php?loc=36&loctype=1.

18. Huma Haider, "Merit-based Recruitment in the Public Sector: Effectiveness and Challenges."

19. "The irregularity of Cambodia's politics," Report, COMFREL, March, 2016, https://comfrel.org/wp-content/uploads/2018/03/139_359585CM_Report_in_Full.pdf.

20. Vann Vichar, "Candidates for student-judge examination summoned by court after reading message about exam irregularities," VOA, February 04, 2020, https://vodkhmer.news/2020/02/04/a-judge-candidate-summoned-after-releasing-a-video-on-social-media/.

the counter.[21] On top of that, cutting-edge technology, like GAIS and NiDa can also reduce the risk of corruption as it helps to cut red tape. Modern technology also makes it possible for whistleblowers and citizens to share their reports with corrupt government officials through their experience, for example, the website, ipaidabribe.com (IPAB) which has been used in India. Since its adoption in 2012, the government has received numerous amount of anonymous reports from its citizens. In 2012 it received around 3,000 to 5,000 each day.[22]

The Cambodian government could use this (or a similar ) platform as a tool to strengthen the public official code of conduct by investigating the corrupt official when there is a report from the citizen. Those found guilty of corruption should be charged by the law. On top of that, ITC's infrastructure can enhance the transparency of the government recruitment process by dispersing the information, and recording it during the examination and marking process. Consequently, it not only helps the government to identify corrupt and unqualified public officers, but also allows the government to recruit talented individuals to replace the government post.

## Conclusion

An effectively adopted and implemented merit-based system could not only help the Cambodian government to combat corruption,  but could also improve the government's working culture, and promote

transparent and merit-based competition. Government institutions could and should become leaders in the effective process of recruiting, training, and promoting talented officials.

On top of that, digital technology through the applications adopted by the government such as PAIS and GAIS can also help make the government system more transparent and accountable. Since digital technology helps citizens to keep themselves informed about the government's performance. The top government officials who get their position through a merit-based recruitment process would feel no hesitation in making the government more transparent as they are also eager to make more accomplishments and get more support from the populace.

Nevertheless, to successfully implement an effective merit-based recruitment system and utilize the advantage of cutting-edge technology, it requires the willingness as well as the support from the government to invest financial and human resources. In an ideal future, the government merit-based system could be a model for the private sector to follow. It could help ensure that the future of work, and the future job market is based on ability and experience, rather than family and connections.

21.  Oum Chan Mono, "E-Government in Cambodia: Challenges and Practical Paths to Achieve a Functional E-Government," Cambodia Development Center, March 03, 2021, https://cd-center.org/wp-content/uploads/2021/03/P124_20210303_V3IS2_EN.pdf.

22.  Malini Goyal, "ipaidabribe.com: A website that encourages Indians to share their bribe giving experiences," December 2, 2012, https://economictimes.indiatimes.com/tech/internet/ipaidabribe-com-a-website-that-encourages-indians-to-share-their-bribe-giving-experiences/articleshow/17443931.cms

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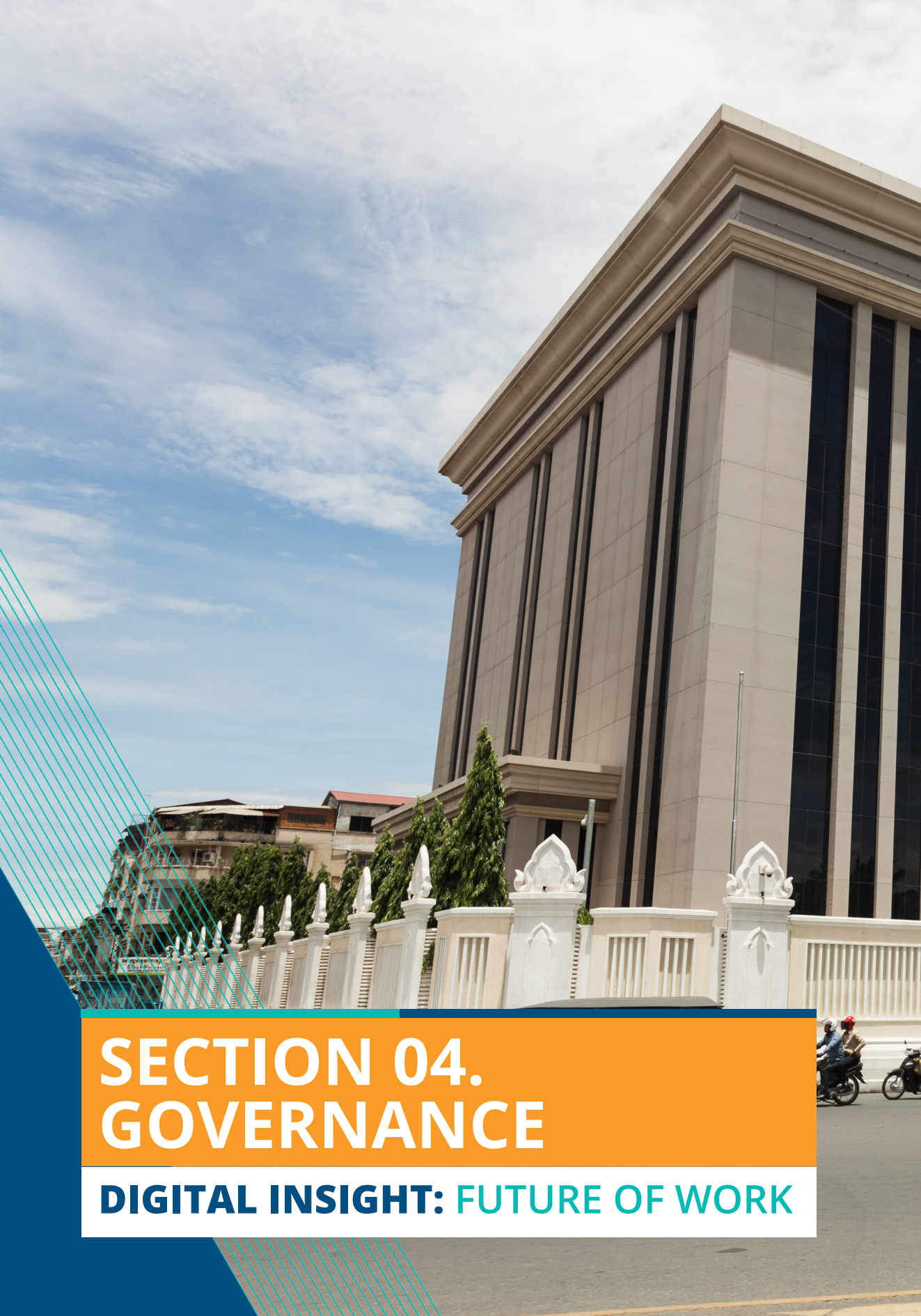
# SECTION 04.
# GOVERNANCE

**DIGITAL INSIGHT:** FUTURE OF WORK

# Shaping Collaboration between Public and Private Sectors for the Future of Work

DAN Dara

Technology is changing the fundamental nature of work. It is especially important to understand this change for developing countries like Cambodia. We see automation, digital platforms, and other innovations shaping the new outlook of the Fourth Industrial Revolution. It is hardly a debate but a race to be the first to quantify most accurately the impact of technology on the workforce. Particularly, automation is likely to affect developing countries more severely than developed countries, as the workforce in developing countries relies heavily on manufacturing and agriculture. To date, we have plenty of knowledge of developed countries. OECD analysis, for instance, estimates that 14% of jobs across the OECD area are at risk of automation, while another 32% are likely to see significant changes.[1] Studies subsequently make suggestions on how to best prepare for those changes – hire smarter, foster lifelong learning, and celebrate creativity.[2]

While that may be applicable and possible in developed countries, it is a much different story for developing countries. Cambodia faces an enormous challenge, for example, because garment production dominates the manufacturing sector. The people who are more vulnerable to poverty are also less able to adapt to the changes when it comes to automation and other technologies. In short, technology could potentially hurt many people if the rate of change is too fast, particularly as the manufacturing sector employs such a large segment of the Cambodian population. With the Covid-19 pandemic accelerating technology revolution in Cambodia, we could soon see more people

losing their jobs and very likely their only source of income. As Sol and Joyce state, "although every country should look for ways to respond to the effects of automation, it's critical for developing nations, which will be hit hardest and have the fewest resources to cushion the blows."[3]

With automation and other emerging innovations, multiple stakeholders need to better prepare and respond to trends. In Cambodia, these stakeholders should include policymakers, development partners, and more urgently, business leaders. They need to collaborate closely to have coherent and effective policies and strategies. More specifically on industrial policy, the private sector needs to commit and help shape the emerging landscape going forward.

Industrial policy over time has taken multiple names and forms. Broadly speaking, it is governmental intervention aiming to address market failures and inefficiencies, "be it in building markets, in nurturing enterprises, in encouraging technological upgrading, in supporting learning processes and the accumulation of capabilities, in removing infrastructural bottlenecks to growth, in reforming agriculture and/or in providing finance." Historical records have shown success and failures of industrial policy so there are certainly many different views on this, both supportive of and against such a tool to stimulate certain desirable market activities and outcomes. While there are of course conversations around whether there should or should not be industrial policy, it is more constructive to discuss how it should be carried out in Cambodia. It is even more necessary when preparing

1.  "Job automation risks vary widely across different regions within countries," OECD, September 18, 2018, https://www. oecd.org/newsroom/job-automation-risks-vary-widely-across- different-regions-within-countries.htm.

2.  Paulina Karpis, "3 Strategies To Prepare For The Future of Work," Forbes, 2018, https://www.forbes.com/sites/ paulinaguditch/2018/06/18/3-strategies-to-prepare-for-the- future-of-work/?sh=207baf622552.

3.  Pablo Egana de Sol and Connor Joyce, "the Future of Work in Developing Economies," MIT Sloan Management Review, 2020, https://sloanreview.mit.edu/article/the-future-of- work-in-developing-economies/#:~:text=The%20Future%20 of%20Work%20in%20Developing%20Economies%20 Although,Reading%20Time%3A%205%20min%20What%20 to%20Read%20Next.

for the future of work. Like countries at all levels of development, Cambodia needs to use targeted industrial policy to respond actively to contemporary challenges – from job creation and poverty reduction to participating in the technological revolution and global value chains.

Industrial policy should not just be about selecting sectors to prioritize or identifying incentives and subsidies on exports and foreign direct investments. Governments should understand and see industrial policies as a process of institutionalized collaboration between the public and private sectors, and various agencies, both government, and development. As Dani Rodrik of Harvard University explains, "the right model for industrial policy is not that of an autonomous government applying Pigovian taxes or subsidies, but of strategic collaboration between the private sector and the government to uncover where the most significant obstacles to restructuring lie, and what type of interventions are most likely to remove them." [4]

Traditionally, industrial policy presumes solutions are known when in fact the government has imperfect information. So does the private sector. Therefore, Rodrik argues that solutions can merely be discovered. In other words, instead of focusing on the policy outcomes, it is more important to get the process right, to continue monitoring and evaluation, and to adapt accordingly. The private sector and government are to work together to identify constraints and opportunities, so they can generate pragmatic public-private solutions. Lastly, it is not to disregard the fact that the government needs to maintain its autonomy from private interests. This is exactly where development partners can contribute even

more meaningfully to the ecosystem. They can support by acting as an independent body advocating for the public interest, and if necessary, a mediator in making sure that there is a reasonable balance between "autonomy" and "embeddedness" as intended with this new industry policy school of thought.

Today in Cambodia, there is the Rectangular Strategy and the Industrial Development Policy that aim to "help maintain sustainable and inclusive high economic growth through economic diversification, strengthening competitiveness and promoting connectivity." Unfortunately, it is not easy changing the economy from low-skilled to technology-driven and knowledge-based, much work remains despite these achievements, if Cambodia is to become an upper-middle-income country by 2030 and a developed country by 2050. The World Economic Forum in 2018 ranked Cambodia among the least ready countries for future production, citing institutional framework as the first and most important area of driving production, followed by human capital and technological innovation. As such, the private sector should take charge of the Fourth Industrial Revolution, to be what the United Nations Development Programme calls a 'champion' in promoting the widespread integration of information and communication technology in manufacturing.

Industry leaders should work closely with the government to outline clear, specific policies and shape the future of work in Cambodia. The private sector plays a critical role given that it can leverage existing knowledge and expertise. This presents an invaluable resource to the government for industrial policy formation. This is both an opportunity and a responsibility for the private sector to be at the forefront of the transformation, given that it is set to benefit heftily when

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**4.**  Dani Rodrik, "Industrial Policy for the Twenty-First Century," Harvard University, 2004.

Cambodia upskills and reskills at scale.[5] Development partners should continue to work with the government and the private sector on mechanisms to enhance the quality and effectiveness of dialogue between them. Led by the private sector and supported by development partners, Cambodia can create an ecosystem that ensures all workers are employable and productive in the new world of work.

The government should build on the Industrial Development Plan 2015 – 2025 if it is to prepare the workforce for the new future of work. Cambodia needs an industrial policy refresh that is more dynamic and strategic. Understandably, Cambodia is still working towards the three targets aimed for 2025: (1) increase the industrial sector; (2) diversity exports; (3) encourage formal business registration of SMEs. While these are necessary, the government must move aggressively now more than ever as the ravaging Covid-19 pandemic continues to take a toll on the economy. A further digital policy milestone is the recently launched Cambodia´s Digital Economy and Social Policy Framework 2021-2035. As with previous policies, it aims at promoting a digital society and to boost the ecosystem by further infrastructure developments, trust and confidence building, digital citizenship and supporting digital businesses. The two policies buttress a greater sense of urgency for innovative policy direction and guidance. The government is also starting to recognize that industrial policy includes human resources capacity building, access to finance, and technological innovations. These elements serve as the foundation for many if not all strategies. Highlighted in the document also are five key obstacles faced by the industrial sector and four strategies to adopt to realize the vision of the Industrial

Development Plan and the targets set by the government. A closer observation reveals many opportunities for the private sector to work together with the government such as issues related to the labor market.

The two megatrends – technological changes and globalization – are changing the skills people need for their jobs. More importantly, they are redefining the jobs that will be needed and where they will be located (BCG, 2019). The labor force in Cambodia is young, but there are skills shortages. Despite the steady increase in school enrollment rates over the years, Cambodia Socio-Economic Survey 2019-20 shows that only 13% of those aged between 25 and 34 years old have postsecondary education. The National Employment Agency 2017 report finds that of those employers with recruitment difficulties, more than half states that it is due to a low number of applicants with required skills and a lack of work experience or qualifications.

In summary, there is a scarcity of knowledge that is needed to transform the unskilled workforce into one that is more capable of higher-value skills. Undoubtedly the education system needs to improve in areas such as STEM, ICT, and language. The common narrative is that Cambodia needs to increase investment in education, especially with online learning. Nonetheless, the more important question is how to effectively enhance the education quality so that the workforce is ready for the future of work, to respond appropriately to the overall industrial development plan. The private sector understands firsthand these constraints so it can effectively identify different mechanisms to support policymakers.

To date, there are some notable efforts and considerations by the government in advancing industrial policy that should be

5. "Preparing for the Future of Work," World Economic Forum, https://www.weforum.org/projects/future-of-work.

highlighted. The Cambodia Development Resource Institute (CDRI) suggests university-industry linkage as a form of public-private partnership.[6] The government is to stimulate research and development activities by offering various incentives to increase research. Enterprises are to communicate their problems and needs to initiate a transfer of knowledge. Together with universities and researchers, this initiative would pilot many new ideas and innovations.

Additionally, Khmer Enterprise was recently established as an implementation unit of the Entrepreneurship Development Fund, a government trust fund mandated under the Ministry of Economy and Finance. Their programs aim to work with the entrepreneurship ecosystem by improving their capacity and providing financial and other non-financial supports. The programs are guided by Khmer Enterprise but also mobilize partners and beneficiaries. Recently, Khmer Enterprise and the Cambodia Rice Federation were in discussion about working together on the marketing and branding of Cambodian milled rice to capture more global market share.[7]

In 2020, the National Bank of Cambodia officially launched its Bakong payment system.[8] Co-developed by the National Bank and a Japanese-Swiss financial technology company Soramitsu, Bakong uses blockchain technology to enable banks and other financial institutions to work more seamlessly together. Ultimately, Bakong aims

to emphasize greater financial inclusion – It supports Cambodia's economic development and takes the country one step closer towards the digital economy of the Fourth Industrial Revolution.

While it is important to acknowledge these strides made by the public sector, we need also to continue to identify areas for improvement. Cambodia is different with a unique set of both challenges and opportunities, but it is never a meaningless idea to closely observe neighboring countries for more inspiration. These case studies serve as a learning tool for us to consider and adapt if applicable.

Take for instance the FinTech Regulatory Sandbox introduced in recent years by the Monetary Authority of Singapore. Simply put, the Singaporean government relaxes specific legal and regulatory requirements for the duration of the sandbox understanding that emerging financial products or services may have uncertainty over whether the innovation meets regulatory requirements. The benefits are twofold – the public sector can maintain the overall safety of the financial system and more importantly, it allows financial institutions and FinTech players to experiment with innovative ideas.

This perfectly exemplifies the collaboration we must see also in Cambodia between the public and private sectors for the future of work. It is undoubtedly a critical time for both sectors to join hands and tackle head-on the challenges of digital change and transformation in Cambodia. Like the FinTech Regulatory Sandbox in Singapore, Cambodia can introduce a sandbox concept to support SMEs.

According to the 2018 annual report by the Ministry of Industry and Handicraft, SMEs helped employ 70% of the workforce. They represented 99.8% of the companies in

**6.**   Rethy Chemm et al., "Industry 4.0: Prospects and Challenges for Cambodia's Manufacturing Sector," Cambodia Development Resource Institute, 2019.

**7.**   Hin Pisei, "CRF, KE consider international milled-rice marketing linkup," The Phnom Penh Post, 2021, https://www.phnompenhpost.com/business/crf-ke-consider-international-milled-rice-marketing-linkup.

**8.**   Sok Chan, "NBC officially launches its Bakong payment system," Khmer Times, 2020, https://www.khmertimeskh.com/50777909/nbc-officially-launches-its-bakong-payment-system/.

Cambodia, and they contributed over 50% to the GDP. However, SMEs lack support in many areas to grow their businesses including and not limited to access to finance, governance, go-to-market strategies, and human resources.[9] The SME sandbox could be a key government initiative, in partnership with private sector leaders, to introduce a cohort-based accelerator to develop next-generation businesses. Many businesses are yet to embrace all the tools available for improving productivity, not because they do not want to, but because many do not know how. The sandbox could run in parallel with the target to register SMEs in Cambodia. If SMEs know there are many available resources to support the growth and success of their businesses, they are more incentivized to formalize their businesses.

All in all, the advancement of the country calls for more strategic collaboration between the public and private sector. Building on the reform in the Industrial Development Plan to strengthen and streamline the Government and Private Sector Forum, the government can encourage business leaders to play an even more active role, to commit to this effort to increase industrial development impact and sustain high economic growth for Cambodia. Reciprocally, the government should embrace private sector input with open doors and a culture of true recognition, easy access, transparency, and effectiveness. New E-governance support systems, digesting data, streamlining processes and collaboration help to fasten implementing key activities. In particular, the high fragmentation of industrial policies and involved institutions concerning digital topics bear the potential to be condensed following the old wisdom "too many cooks, spoil the broth".

Technology will change the future of work with severe consequences for Cambodia. These constant changes certainly present challenges to policymakers and business leaders alike. To make sure Cambodia is well prepared for the Fourth Industrial Revolution, the government and private sector are by nature interlinked. If they overcome fragmentation, antiquated procedures, stigmata and commonly develop new initiatives, then Cambodia can go beyond strategizing and policy formulation, and become the implementer of its own 'Cambodia 2.0'.

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**9.** Chhea Layhy, "The Current Situation of SME in Cambodia – MSME Financing," Ministry of Industry and Handicraft, https://www.unescap.org/sites/default/files/SME%20Financing-Chhea%20Layhy%202019.pdf.

# ABOUT THE AUTHOR



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Dara was born in Cambodia and grew up in the United States. He earned his degree in Business Administration at the University of California, Berkeley. He is passionate about community organizing, particularly empowering youth to pursue higher education.

# The Future of Work in Cambodia: Potential of Emerging Digital Technology for SMEs

KUOK Fidero

CHHEM Siriwat

# Abstract

Routine work is no longer applicable. Office space is not an issue in the digital world, with the creation of online tools and platforms, offering more flexibility via telework. While focusing on job creation, existing policies and legal frameworks require explicit review to ensure the effectiveness and efficiency of the future of work. This paper aims to suggest policy frameworks to support the future of work in Cambodia given the potential of Emerging Digital Technology for Small and Medium Enterprises (SMEs). The authors explore the megatrends of emerging technologies that could potentially support SME expansion and tech-adoption. This paper also investigates the existing legal and policy frameworks, gaps, and enabling environment that contribute to the transformation of future work in Cambodia. Projects and initiatives that support SMEs in addressing the most influential barriers and key-Institutions are reviewed. Strategic programs to promote motivated and self-reliant SMEs to participate in the global value chain and in line with the Science, Technology and Innovation (STI) Roadmap, National Research Agenda, and national technology priorities, are also explored. Minding the gap – workforce transition and upskilling towards S&T professions in the main sectors: agriculture, manufacturing, construction, and services, is opted into. Strengthening the SME ecosystem in Cambodia and providing jumpstart funding for public-SMEs-partnership, offer a key opportunity for strategic tech-collaboration.

# Megatrends of Emerging Technologies

In the face of COVID-19, five megatrends: rapid urbanization, climate change and resource scarcity, shift in global economic power, demographic and social change, and technological breakthroughs, continue to impact organizations, industries, and societies around the world.[1] Technological breakthroughs and emerging technology play an essential role across all sectors, in today's digital era. Some examples include E-commerce platforms, ride-sharing applications, and news websites. PwC (2021) emphasizes that "maturing technologies" such as Artificial Intelligence (AI), Augmented Reality (AR), Blockchain, Drones, Internet of Things (IoT), Robots, Virtual Reality (VR), and 3D printing, act as technical foundations for the innovative technological applications and platforms that will continue to develop the growth of our organizations, industries, and societies, into the future.

Narrowing down the scope onto the impact of disruptive technologies on the infrastructure of work, technology has transitioned from Business to Consumer (B2C) models to 'all to all' models (PwC 2021). This paradigm shift signifies that disruptive technology now focuses less on corporate approaches and more on consumers. The inevitable digital transformation of the world has resulted in employees, as consumers of technology in their everyday lives, becoming accustomed to the efficiency of digital applications and platforms, even setting certain expectations that must be met at the workplace. As such, the overall sentiment of employees and their workplaces has created a complementary loop of reliance on technology as the backbone of growth and development, at the organizational and industrial levels. Social media platforms intended for personal use, such as Whatsapp and Telegram, have become integral tools at the workplace for communication and collaboration. Although from a cybersecurity standpoint, this overlap of usage naturally creates risks, employees and their

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1.　"Technological breakthroughs", PwC, 2021. https://www.pwc.co.uk/issues/megatrends/technological-breakthroughs.html.

organizations will continue to work in this way for instances where the confidentiality of specific cases are not a top priority. In other words, a trade-off between security and convenience is always at play, when using technological applications and platforms.

Given the endless number of digital tools, both readily available online or sourced from technology solution providers, emerging challenges and necessary skill transitions for SMEs must be taken into consideration. Navigating the Internet, connected from personal and corporate mobile devices alike, act as vulnerable sites for cyber threats and attacks. The more interconnected we are, the more vulnerable we are. This dilemma highlights our significant reliance on digital technologies for work, against the equally significant role of cybersecurity to protect organizations and industries from a new generation of challenges and problems. Furthermore, digital literacy and skills are of crucial importance, not only in the field of Information Technology (IT), but in any sector. Any employee that utilizes mobile devices connected to the Internet or any other forms of technological applications and platforms as part of their infrastructure of work, requires a basic understanding of digital skills and tools to work not only productively, but securely. This transition of skills is inevitable and will continue to play an increasingly important role at the workplace – now encompassing almost entire organizations and their employees across all levels.

## SME Policies and Legal Framework

The future of work is undoubtedly a paramount challenge faced by all. Despite all uncertainties, understanding the policy backdrop, particularly SMEs policies, offers the potential of not only future employment,

but also economic development. The main guiding policy – the Rectangular Strategy – Phase IV (RS-IV) put forward by the Royal Government of Cambodia (RGC) has become the de facto vision of Cambodia 2050[2] and the blueprint for the promotion of SMEs and entrepreneurship. The RS-IV overarches four interrelated rectangles focusing on human resource development, economic diversification, private sector and job development, and inclusive and sustainable development. These four rectangles lay out the foundation for SMEs' preparedness towards the digital economy and the Fourth Industrial Revolution (IR4).

In order to realize the said vision of Cambodia 2050, the expansion of future work is backboned by, among other cross-sectoral policies, the Industrial Development Policy (IDP) 2015 – 2025 with the ambition to enhance competitiveness and productivity of local industries through the transformation and modernization of Cambodia's industrial structure from a labor-intensive to a high-skill industry by 2025.[3] It is worth noting that the key to the IDP success relies on, among three other strategies, the development and modernization of SMEs, which includes the expansion and strengthening of the manufacturing base, modernization of the registration of enterprises, technology transfer, and industrial linkages. Nevertheless, failure to provide high-skill human resources and growing local talent will delay the growth and widen the gap for SMEs to participate in the global value chain.

As an immediate intervention to incentivize local SMEs, the RGC introduced a customs

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**2.** "Rectangular Strategy for Growth, Employment, Equity and Efficiency: Building the Foundation Toward Realizing the Cambodia Vision 2050 – Phase IV," prepared by Royal Government of Cambodia, (Phnom Penh: Royal Government of Cambodia, September, 2018).

**3.** "Cambodia Industrial Development Policy 2015 – 2025", prepared by Royal Government of Cambodia, (Phnom Penh: Royal Government of Cambodia, March, 2015).

incentive for SMEs that aims to create more jobs, increase the country's international competitiveness and promote the use of locally available raw materials.[4] Under this sub-decree, SMEs may obtain a customs duty exemption on imports of production equipment, construction equipment, and raw materials or other production inputs, if their business is within the prioritized categories of producers and suppliers of clean water, export-oriented enterprises, supporting industries for export-oriented enterprises, domestic sellers, enterprises engaged in research and development relating to Information Technology, and SMEs operating in industrial zones. Simply put, the success of this incentive scheme relies on the simplicity of the administrative procedures that SMEs undertake. As for the present context of economic development, the criteria for SMEs is based on their number of employees, annual sales turnover and assets, categorized into agriculture, industry, and service and trading.[5]

An additional initiative by the RGC is the recent launching of Cambodia's Digital Economy and Society Policy Framework 2021 – 2035, aiming to establish digital infrastructure, increase digital adoption, and facilitate digital transformation, with the expectation to boost economic growth and social welfare.[6] While supporting the ease of doing business, one of the three pillars of this policy framework intends to boost digital business, focusing on the industrial revolution, entrepreneurship and startups, and the digital value chain

ecosystem. Moreover, the ongoing draft of the SME Development Policy also emphasizes the priorities of (1) the enabling policy and regulatory environment, (2) the promotion of human capital development and entrepreneurship, (3) the promotion of productivity, technology and innovation, (4) the enhancement of foreign market access and internationalization, and (5) the increasing access to finance. Furthermore, in complement to the IDP strategies, Cambodia's new draft law on investment will provide an enabling environment for SMEs, such as the exemption of value-added tax (VAT) for the purchase of certain locally produced raw materials, the special tax deduction rate of 150% for companies' expenses on research and development (R&D) and innovation, vocational training and skills upgrading, and modernization of machinery.[7]

Despite the heterogeneous nature of SMEs, the policy and legal frameworks above play an essential role in the national strategic development of SMEs and future employment in Cambodia. It is expected that by creating a favorable ecosystem, the SMEs in Cambodia will position themselves in the global value chain, while the skills and technical spillovers could be achieved through foreign direct investment. As such, the upcoming draft law on public-private partnership will provide an opportunity to attract more private sector investment in public infrastructure, e.g., via SME clusters or parks.[8]

4.  "Sub-decree No. 124 ANKR-BK on Tax Incentive for SMEs in Priority Sectors", prepared by Royal Government of Cambodia, (Phnom Penh: Royal Government of Cambodia, October 2, 2018).

5.  The result of the 2nd Meeting of the SMEs Development Policy Committee at the Council Ministers of Cambodia on January 21, 2021.

6.  "Cambodia's Digital Economy and Society Policy Framework 2021 – 2035", prepared by Royal Government of Cambodia, (Phnom Penh: Royal Government of Cambodia, May, 2021).

7.  Phnom Penh Post, "Cambodia's new draft law on investment and its effects," Phnom Penh Post, February 16, 2021, https://www.phnompenhpost.com/opinion/cambodias-new-draft-law-investment-and-its-effects.

8.  Vuthika Hang, "Cambodia: Current PPP Development", October 15, 2020.

## SME Supporting Projects & Initiatives

As a systematic platform to support SME market expansion, the KhmerSME Website, under the initiative of the Ministry of Industry, Science, Technology & Innovation (MISTI), is expected to provide comprehensive business information not only in Cambodia, but also in the ASEAN region and the World. This KhmerSME platform is to be launched at the end of 2021. It should be noted that lack of technical staff and skilled workers for business operations is one of the barriers for SME expansion and filling the skill gap could take years before realization. Until now, the Skills Development Fund (SDF) founded in 2018, has been bridging specific skill gaps in five priority areas: manufacturing, construction, ICT, electronics, and tourism.[9]

The vibrant entrepreneurial ecosystem in Cambodia is actively supported by numerous key centers, among which the Entrepreneurship Promotion Center (Khmer Enterprise) was created in 2020 with the vision of becoming the national platform for promoting entrepreneurial activities.[10]

The ICT Startup Center established in 2020 aims to promote human resource development, research and innovation development and provide Tech University students the opportunity to access facilities for prototyping.[11]

By teaming up with Cambodian entrepreneurs and young talents, Techo Startup Center aims to build viable early-stage emerging tech startups by igniting

innovation and technology. This center was founded in 2019 with the support of the Ministry of Economy and Finance.[12]

With a focus on young entrepreneurs and startups, Impact Hub has been implementing pre-acceleration programs and community building since 2014.[13]

The recent establishment of the SME Bank, officially licensed as a commercial bank by the National Bank of Cambodia, is to assure a reliable and sustainable banking system for all SMEs in Cambodia.[14]

Finally, the Entrepreneurship Development Fund was launched as a complementing measure to provide synergistic support and build a vibrant entrepreneurial ecosystem.[15]

## Nascent Policy Options

The review of policy frameworks, supporting initiatives, and proof-of-concepts, reveals the need to further push SMEs to participate in the global value chain and therefore create the enabling environment for workforce transitions and upskilling – essential for the future of work in Cambodia. The instigation of the following policy options is to be considered:

### SME Export Competition

This strategic program aims to promote motivated and self-reliant SMEs to participate in the global value chain with support and facilitation by government agencies. SMEs with the capacity to export technologies in accordance with the Science Technology & Innovation (STI) Roadmap, National Research

**9.** Ministry of Economy and Finance (MEF), "Skills Development Fund: History of project", Skills Development Fund, 2020, http://www.sdfcambodia.org/en/about/history

**10.** "Vision and Mission," Khmer Enterprise, https://khmerenterprise.info/home.

**11.** "About Digital Innovation Center," NIPTICT, https://niptict.edu.kh/innovation-center/.

**12.** "Ignite Innovation, Lifting up Cambodia," Techo Startup Center, https://www.techostartup.center/.

**13.** "Vision and Mission," Impact Hub Phnom Penh, https://phnompenh.impacthub.net/about-us/.

**14.** "Home," SME Bank, https://smebankcambodia.com.kh/.

**15.** "Home," Entrepreneurship Development Fund, https://www.edf-cambodia.com/about-us.

Agenda, and national technology priorities: Agri-Tech, Health-Tech, and Edu-Tech should be focused on. The fledging SMEs that are proven to be successful in the international market should be rewarded with, e.g., favorable taxation.

## Professional Skills Training Program on Science, Technology & Innovation (STI)

This program aims to meet the demand for technicians and skilled workers, to increase SMEs' productivity and competitiveness. This high value-added skills priority should be in line with the STI roadmap and national research agenda. A designated STI institution overlapping with the public and private sectors is needed to ensure the implementation of this program with proper monitoring and evaluation.

## Network of Actors for SME Export

A network of local actors such as research and/or prototyping centers, accredited testing laboratories and testbeds, local-raw materials suppliers, manufacturing firms, technology and innovation support centers, private and government support offices/firms will help facilitate SME exports. The detailed information of all actors, including contact details and geographical indications, should be accessible by ALL.

## Funding for SME Tech Collaboration with Research Institutions

This funding is to support SMEs with the tech-export capacity to work in focused areas and form collaborative projects with qualified research Universities and Institutes in Cambodia. This high-collaboration strategy should be in accordance with the STI Roadmap and National Research Agenda of the RGC.

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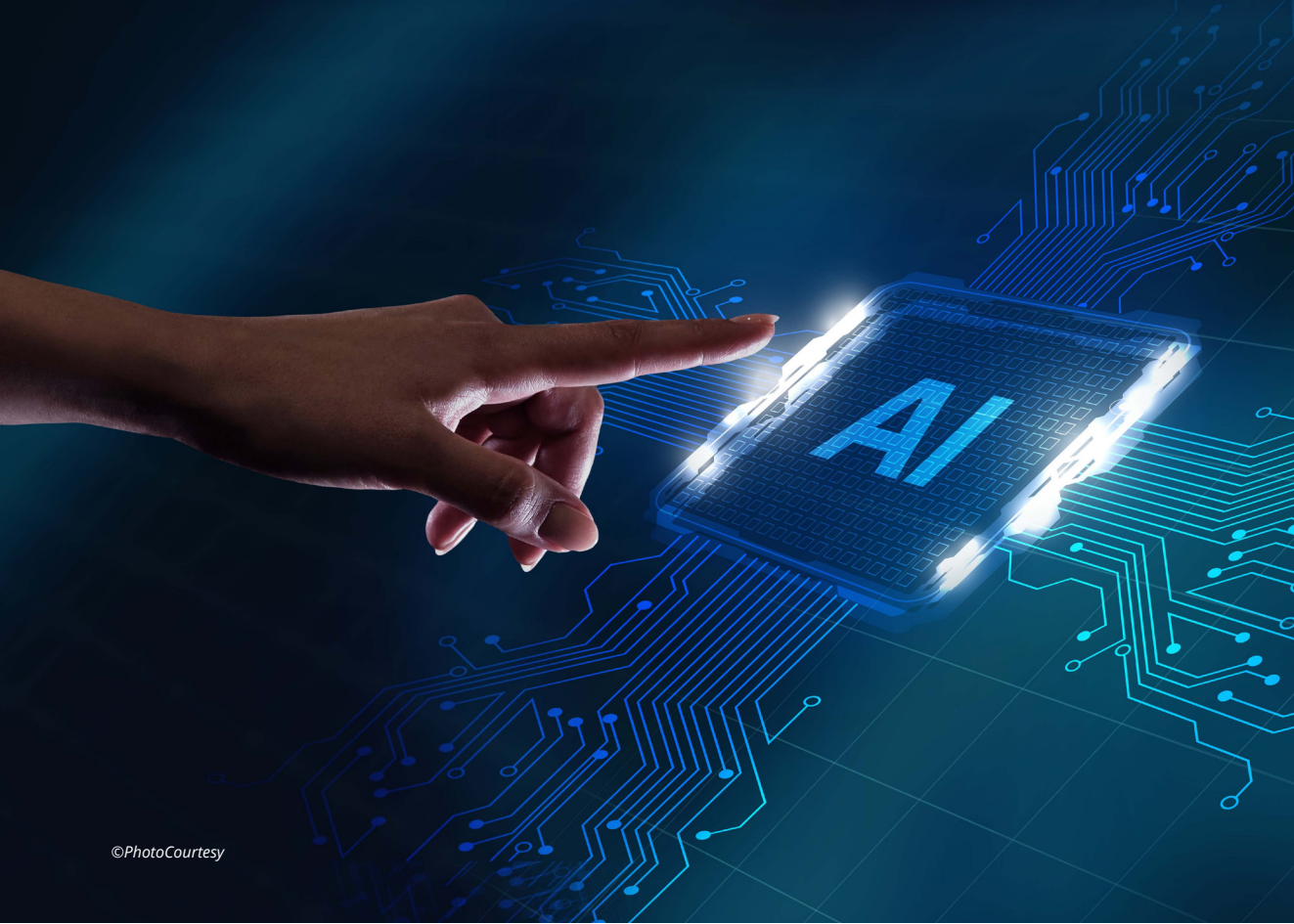
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# Governance and Policies Framework for Artificial Intelligence in Cambodia

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## Abstract

Cambodia is a digital frontier, unlike any other country.  The government, leaders, and citizens have demonstrated their ability to move fast and flexibly to capitalize on technological trends implementing solutions in a coordinated manner.  The government's industrial development plan (2015-2025) identifies various strategies to ensure "readiness for the digital economy and the fourth industrial revolution". Existing major policies and initiatives related to Artificial Intelligence (AI) are taking place in several frameworks including industry 4.0 and digital economy/nation. There are no AI official strategies, policies, or frameworks for Cambodia yet.[1] To leverage the real benefits of AI, the kingdom requires a structure and implementation framework of government policies to guide talent and investments in a coherent manner.

This research aims to raise awareness about potential applications for AI to create a fair and inclusive future of work in Cambodia. We reviewed existing policy frameworks that could support Digital Economy/Industry 4.0, and AI in Cambodia, accompanied by lessons learned from other existing policies in other countries. We organized a virtual interactive workshop with 30 industries, academic associates, government ministries, policymakers and other potential stakeholders. The objective of this workshop: to get recommendations for action-oriented approaches for Cambodia towards AI-ready. This approach would ensure the inclusiveness of industries and collaboration for the mutual benefit of all stakeholders for AI-readiness for Cambodia in the near future.

This paper is intended as an action-oriented guide to establishing policies, governance, and a framework for Artificial Intelligence in Cambodia. It provides leaders, educators, researchers, policymakers, financial institutes and government agencies a solid framework.

## Introduction

Popular media today portrays Artificial Intelligence (AI) as omnipresent autonomous flying robots and humanoid servants. And yes, of course, flying robots are real and used for specialized purposes. However, the vast majority of Artificial Intelligence including deep learning and predictive analytics has become ubiquitous in most automation and everyday tasks. Modern AI is easier, faster, and more practical to implement than flying robots. Leading countries have been investing heavily in technology.  These countries are preparing to drive innovation improving the efficiencies of the population and the quality of life for their citizens. Furthermore, many countries intend to maximize the competitive advantage that comes with superior rapid decision-making.

Estimates are that more than 50% of the work could be automated either partially or completely in the four biggest economies in Asia. This represents more than USD900 billion in wages in these countries.[2] Cambodia would not be immune to this global transformation brought by this technology. There is a general concern across well-informed nations that AI will have a significant impact on employment and specifically workflow within particular jobs.

For decades, organizations have had the capability to record vast amounts of information. Scientific and business metrics have been collected and trends established.

1.  Tim Dutton, Brent Barron, and Gaga Boskovic, "Building an AI World: Report on National and Regional AI Strategies," Report, CIFAR, 2018, https://cifar.ca/wp-content/uploads/2020/05/buildinganaiworld_eng.pdf.

2.  CISCO, "The Impact of AI on Workers in ASEAN's Six Largest Economies," in Technology and the Future of ASEAN Jobs (Cisco and/or its affiliates. its affiliates, September 2018).

However, more often these data sets sit quietly on hard drives in dark air-conditioned rooms and are rarely accessed. Artificial Intelligence has the capability to leverage these data sets and make rapid predictions (progress, challenges and disk) and appropriate decisions for different scenarios.

In this article, we present how Cambodia can take immediate action to build practical capability and establish foundational progress with proper structure and policies. This paper demonstrates recommendations for Cambodian leaders to consider in the adoption of a national Artificial Intelligence strategy based on reviewing Cambodia's current existing policies relevant sectors of economic and experience from regional and international countries for Artificial Intelligence readiness policy.

## AI Target Capabilities and Opportunities

With the power to think like human-being, AI has been considered as a valuable technology for industries, business, education, healthcare, environment and government services. From a business perspective, there are three major capabilities of AI, namely machine-learning, natural language processing (NLP), information fusion for decision-making and interactive capability.[3] Machine learning makes computers learn through experience. By processing with data, it can study the past behaviors, and predict the upcoming outcomes which are highly important for operational decision making. Understanding human language in both speaking and texts is the second capability of AI. NLP allows the machine to read texts, listen

to voices and interpret them for specific purposes. The last major capability is that AI enables human-machine interaction. It allows conversations between people and computers, communications between groups of employees in an organization, and provides recommendation systems.

The existence of AI is not to replace humans but to make our life easier and better. There are many opportunities we can take from the AI capabilities as follow:[4]

- For business: increase sales, provide better customer service, improve productivity and efficiency, save energy, reduce cost, enhance system security.

- For people: improve healthcare, safer transportation, do human's dangerous jobs, provide smart education, give a better experience in weather and disaster forecasts, accurate decision making through information fusion.

## Government Policy Facilitation

Advancements in Artificial Intelligence are rapid. Some governments have been slow to respond in a practical manner that would allow them to realize the technology's true benefits. However, with tremendous opportunities in health, transportation, education, science, energy, economic growth, and national security applications, a catalyst event that drives a solution, focused outcomes can help bring priorities into view and set necessary guidance to all

**3.** Thomas H. Davenport and Rajeev Ronanki, "Artificial Intelligence for the Real World," Harvard Business Review, January 1, 2018, https://hbr.org/2018/01/artificial-intelligence-for-the-real-world.

**4.** "Artificial Intelligence: Threats and Opportunities," News | European Parliament, September 23, 2020, https://www.europarl.europa.eu/news/en/headlines/society/20200918STO87404/artificial-intelligence-threats-and-opportunities.

stakeholders.[5] There are considerable risks of a delayed response with implications on the workforce, education, agriculture, healthcare.

Government plays a unique role in establishing policies and procedures that facilitate the adoption and general usability of technology for maximum innovation. Furthermore, they have the ability to establish principles of use that will help developers and business team members understand how to apply the underlying architecture.[6] Just as the government has the responsibility to establish nationwide electrical standards, they can improve the likelihood of faster and ubiquitous adoption by defining clear AI standards.

To manage risks and reap the most rewards from AI development, countries would benefit by developing a strategic approach and strong AI governance. The governance group can help drive strategic policies and priorities across the nation. Three key factors for good governance include 1) Establishing a multi-disciplinary approach. The implementation of AI is not all about technology. Success depends on providing solid leadership to understand the strategies and critical priorities before any technical solution is proposed. 2) Create a common "How To" playbook to provide guidance across the teams for collaboration and support and 3) Providing guidance on data models so that structures can be linked and leverage together across the solutions with

respect to ethics, privacy and security issues associated with AI applications.[7]

## International and Regional Experiences

Many developed and a few developing nations have developed strategies and policies specific to AI. These strategies vary from one region to the other, usually depending on their level of development, priority and research and technological capacity. We are reviewing the policy responses of a few leading countries as benchmarks of varying degrees for Cambodia to consider when developing Cambodia's own policy.

- China: New Generation Artificial Intelligence Development Plan (AIDP) was created in 2017 to lay out a national strategy with the short-term goal of establishing an AI industry worth nearly USUSD150 billion and the long-term goal of global AI leaders by 2030. AIDP is part of China's industrial development plan "Made in China", a national development priority ('AI as the impetus for economic transformation') and the Premier's grand vision. China's investment in AI start-ups accounted for nearly half (48%) of the global investment of USD15.2 billion and has already surpassed the United States (38%) (Insights 2018). Beijing alone is investing in a USD2.1 billion Industrial Park for AI research.[8]

**5.** Jeongmin Seong, James Manyika, Michaek Chui, and Raoul Joshi, "Notes from the AI frontier: Modeling the impact of AI on the world economy," McKinsey, accessed May 6, 2021, https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy.

**6.** "Beijing AI Principles," BAAI, accessed May 29, 2021, https://www.baai.ac.cn/news/beijing-ai-principles-en.html.

**7.** Chris Oxborough, Travis Ringger and Marc Skylar Versage, "Three Governance Considerations to Unlock Potential of AI," PwC, July 11, 2019, https://www.digitalpulse.pwc.com.au/ai-governance-considerations/.

**8.** Huw Roberts, Josh Cowls, Jessica Morley, Mariarosaria Taddeo, Vincent Wang, and Luciano Floridi, "The Chinese Approach to Artificial Intelligence: An Analysis of Policy, Ethics, and Regulation," AI & SOCIETY 36, no. 1 (March 1, 2021): 59–77, https://doi.org/10.1007/s00146-020-00992-2.

- Singapore: In November 2019, the National AI Strategy was set up to exploit five key AI projects including transport and logistics, smart cities and estates, healthcare, education, and safety and security with the vision to become a leading nation in AI solutions in 2030. To achieve this, the country has committed over SUSD500 million for AI-related research, innovation and enterprise activities.  In addition, SUSD200 million will be invested to upgrade computer and network infrastructure over the next 5 years.[9]

- Malaysia: After the launch of the National Big Data Analytics Framework in 2017, a National Artificial Intelligence Framework is being developed and is expected by the end of 2019. Malaysia Digital Economy Corp (MDEC) (est. and funded by the government since 1996) is also setting up an AI Unit to support the Framework. Malaysia's AI initiative has strong backing from the Chinese and the world's leading AI firm 'Sense Time' to build an AI park which in turn contributes to building an AI commercial ecosystem and governance. The Prime Minister has prioritized AI as a 'defining force of the industrial revolution and using AI as a game-changer in improving the lives of Malaysians'.[10]

- Indonesia: In 2020 Indonesia launched its strategy for Artificial Intelligence. One of the primary concerns was to ensure that progress is safe and beneficial for all of its citizens.

The plan begins in 2020 through 2045. The focus is primarily on law enforcement, the financial industry and healthcare. The primary agency handling development is the research and technology ministry and the national research and innovation agency. To provide guidance for the AI initiative the ministry published an E-book detailing standards and process requirements. The government is centralizing several parts of the strategy including a single submission system and single map policy to drive AI technology consistently through their work. Consistent with other countries the guidebook provides the country focus on infrastructure, common data sets, and industrial innovation. A major focus on ethics, policies, and talent development is also stressed.[11]

- Germany adopted a national AI strategy in late 2020 with EUR 5 billion allocated for AI research and development. The strategy aims 1) to make Germany and Europe global leaders on AI technological development and utilization; 2) to safeguard the responsible development and use of AI which serves the good of society; and 3) to integrate AI in society in ethical, legal, cultural and institutional terms. It also focuses on pandemic control, environmental and climate protection.[12]

- France launched a national strategy for AI "AI for Humanity" in 2018 after recommendations on a major study "For a meaningful Artificial Intelligence: towards a French and European strategy." France invests about USD1.7

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**9.** "National Artificial Intelligence Strategy," Smart Nation Singapore, November 2019, accessed June 28, 2021, https://www.smartnation.gov.sg/docs/default-source/default-document-library/national-ai-strategy.pdf?sfvrsn=2c3bd8e9_4.

**10.** Bernama, "MDEC to Complete National AI Framework by Year-End," NST Online, April 2, 2019, https://www.nst.com.my/news/nation/2019/04/475361/mdec-complete-national-ai-framework-year-end.

**11.** The Jakarta Post, "Indonesia Sets Sights on Artificial Intelligence in New National Strategy," The Jakarta Post, accessed June 1, 2021, https://www.thejakartapost.com/news/2020/08/13/indonesia-sets-sights-on-artificial-intelligence-in-new-national-strategy.html.

**12.** Susanne Wohlang, "Artificial Intelligence Strategy of the German Federal Government," n.d., 31.

billion into AI research between 2018-2022. As a precedent to the French Digital Republic Act, France's AI policy is driven and supported by various actors, including the secretary of state for Digital Affairs, Higher Education and Research, National Commission for Information Technology and Liberties.[13]

● "AI and Data" is one of the top four industrial challenges in UK industrial strategies for economic growth.

## Existing Policy Framework Supporting Cambodia's Digital Economy

Existing major policies and initiatives related to AI in Cambodia are discussed here within several frameworks including industry 4.0 and digital economy/nation. The government's industrial development plan (2015-2025) lays out various strategies to ensure "readiness for the digital economy and the fourth industrial revolution".[14] These strategic components include integration of E-learning into education and training curriculum, developing ICT and logistics infrastructure, promoting tech start-ups and mechanisms to link education and training providers, industry, and government. However, Cambodia's overall "digital government remains fragmented".[15]

STEM education policy[16] was introduced in 2016 by the Ministry of Education, Youth and

Sports (MoEYS) to boost student participation in STEM fields after graduating from high school. The policy highlighted that to boost the country's development and economy, there is a high demand for graduates in the fields.

Approved by the government in mid-2017, Technical and Vocational Education and Training (TVET) Policy 2017–2025 aims to enhance technology for the skill development system in Cambodia. To achieve its goal, the policy stressed 4 main priorities: TVET quality improvement, TVET accessibility, incremental public-private partnership boosting and TVET system advancement.[17]

Although there is an unclear government policy about AI, Cambodia is taking action for its digital transformation and Industry 4.0 with the vision to become an upper-middle-income country by 2030 and a high-income country by 2050. Since 2000, to move towards a knowledge-based economy, the country has developed its ICT infrastructure and deployed it for various sectors. To maximize productivity across the fields, emerging technology such as Artificial Intelligence (AI), Internet of Things (IoT), and Cloud Computing have been focused.[18]

In 2019, the Science, Technology and Innovation (STI) Policy 2020-2030[19] was approved by the Prime Minister. The policy aims to tackle the capability of STI for a country's sustainable and inclusive development. To achieve the goal, the

**13.** "France AI Strategy Report | Knowledge for Policy," accessed June 28, 2021, https://knowledge4policy.ec.europa.eu/ai-watch/france-ai-strategy-report_en.

**14.** "Rectangular-Strategy-Phase-IV-of-the-Royal-Government-of-Cambodia-of-the-Sixth-Legislature-of-the-National-Assembly-2018-2023.Pdf," accessed June 28, 2021, http://cnv.org.kh/wp-content/uploads/2012/10/Rectangular-Strategy-Phase-IV-of-the-Royal-Government-of-Cambodia-of-the-Sixth-Legislature-of-the-National-Assembly-2018-2023.pdf.

**15.** "World Bank Group. BENEFITING FROM THE DIGITAL ECONOMY: Cambodia Policy Note, July 2018," accessed June 28, 2021, https://openknowledge.worldbank.org/bitstream/handle/10986/30926/128267-REVISED-Digital-Economy-web.pdf?sequence=1&isAllowed=y.

**16.** Kao Sovansophal and Kinya Shimizu, "A Review on STEM in Higher Education of Cambodia: Current Status, Issues, and Implication of Initiatives," n.d., 2.

**17.** "Cambodia's New Technical and Vocational Education and Training Policy," ADB Briefs, 0 ed., ADB Briefs (Manila, Philippines: Asian Development Bank, February 2018), https://doi.org/10.22617/BRF189240.

**18.** "20201126_Policies_and_Approaches_of_Cambodia_towards_AI_by_Angkeara.Pdf," Google Docs, accessed June 28, 2021, https://drive.google.com/file/u/2/d/1efQj2DgI_i0SiLWTDkSRcHJJ00oglEwP/view?usp=sharing&usp=embed_facebook.

**19.** "Event: National Workshop to Craft Cambodia's Science, Technology and Innovation (STI) Roadmap," ARTNET on STI," accessed June 29, 2021, https://artnet.unescap.org/sti/events/national-workshop-cambodia-sti-roadmap.

government has requested ESCAP for helping to develop implementation strategies.

A 15-year policy framework for supporting Cambodia's digital economy[20] was recently launched with the aim to promote digitalization for society and boost the economic ecosystem (2021-2035). The policy focuses on developing digital infrastructure, creating digital trust and confidence, building digital citizens, establishing digital government and boosting digital businesses. This will provide economic advantages like new job creation, skill development, and improving business activity.

# Recommendations

We recommend the following policy options related to talent development, the roles of universities, corporate and technology networks, and finally a need for the establishment of a national task force for AI.

### National Innovation Challenges

Collaborative effort for talent generation could be a major issue – need strategic investment, industry-university collaboration, innovation strategy, young entrepreneurial support (both training and funding including bank loan). Building capability now inside the country is important to any progress as generations of talent will be required to realize the long-term vision is AI for Cambodia. The country should establish a national innovation challenge program directed at specific talent areas to drive development.

### University Integration

The integration of university programs with Artificial Intelligence is essential. Partnering with universities to drive specific technologies will help meet the longer-term goals of AI in the country. According to a study by Cisco and Oxford Economics[21], the ASEAN economies will need 28 million fewer workers to produce the same level of output. There will be an "acute lack" of IT skills that new jobs will demand. Therefore, country leadership should direct universities to focus on Artificial Intelligence as a core capability. The curriculum should be reviewed and tested to ensure that it meets international standards.

### Corporate Connections

Many global companies are already investing heavily in Artificial Intelligence. Some of the technology and algorithms are not trade secrets. Open AI is a common method for companies to acquire knowledge and combine various disciplines. This open-source approach fosters international cooperation and intercompany support. The government should incentivize the private sector to invest in R&D, and funding for local and international industries, research centers and universities to form research partnerships.[22]

Artificial Intelligence consortiums that link private and public solutions can provide a venue for discussing problems and solutions. They can also be used to build talent and highlight particular expertise. Furthermore, recognized leaders tend to value being promoted within their area of specialty which will help foster the entire community.

**20.** "Policy Framework on Digital Economy and Society in Cambodia 2021 2025," prepared by Supreme National Economic Council of Cambodia, (Phnom Penh, Royal Government of Cambodia, 2021) accessed June 28, 2021, https://cambodiancorner.files.wordpress.com/2021/06/policy-framework-on-digital-economy-and-society-in-cambodia-2021-2025_khmer-version.pdf.

**21.** CISCO, "The Impact of AI on Workers in ASEAN's Six Largest Economies."

**22.** Chhem Rethy, Ouch Chandarany, Roth Vathana, Song Sopheak, and Srang Sarot, "Industry 4.0: Prospects and Challenges for Cambodia's Manufacturing Sector," Cambodia Development Resource Institute, Policy Brief, January 2019, 1–12.

## International Connection

Critical to any country's plan is the need to connect with each other. It is essential for Cambodia to leverage the pool of international resources for research and development. Sharing also means a global understanding of norms and ethics. It will be important for all nations to maintain a cooperative disposition so that the real promise of AI can help around the world.

## A National Task Force

To reap the widest benefits from the digital transformation, the Cambodian government should create a national task force to identify the challenges and opportunities of AI, to propose specific policy options for all players to maximize productivity in the incoming industrial revolution. Among this task force is a need for Cambodia-based "brain-trust" and adequate resources for this task force to lead the movement.[23]

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**23.**  Rethy Chhem, Trond Gilberg, and Siriwat Chhem, "Unleashing the Potential of Artificial Intelligence for Cambodia," 2019.

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Professor CHHEM Kieth Rethy is a medical doctor, science diplomat, educator and historian with extended experience in Digital Science & Technology, Global Health Diplomacy, Nuclear Technology Policy, and Executive Education. He holds a MD, a PhD in Education and a PhD in History. He has published more than 100 scientific articles, edited 17 textbooks and has been invited as a keynote speaker in more than 70 countries. He was a Professor of Radiology in Canada (McGill), Singapore (NUS), Austria (Vienna Medical University) and Japan (Hiroshima, Nagasaki, Fukushima Medical University) for 30 years. He was the Chair of the Radiology and Nuclear Medicine Department of University of Western Ontario. He was the Director of the Division of Human Health at the International Atomic Energy Agency (IAEA). From 2014 to 2019, he was the Executive Director of the Cambodian Development Resource Institute (CDRI), a leading think tank in Cambodia, in the Top 100 of the University of Pennsylvania Global Think Tank ranking. He is the cofounder of the China Studies Center at CDRI. Currently, he is an Honourary Distinguished Fellow at the Asian Vision Institute and a member of the Advisory Board of the International Center for Higher Education Innovation (UNESCO) at the Southern University of Science and Technology in Shenzhen. He is a distinguished visiting professor at the Royal University of Phnom Penh, Atomic Bomb Disease Institute, Nagasaki, Hiroshima and Fukushima Medical University. He is an international advisor to the China Institute of International Studies in Beijing. He also serves as an academic advisor to the Kirirom Institute of Technology and the National Institute of Posts, Telecoms, and ICT (NIPTICT). In May 2019, Professor CHHEM Kieth Rethy was appointed Minister Delegate, Attached to the Prime Minister.

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# ABC4Industry4.0:
# A Collaborative Framework for the Artificial Intelligence, Big Data and Cybersecurity (ABC) Skills for the Industry 4.0

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## Abstract

In Industry 4.0, technological breakthroughs for mass production and automation include Artificial Intelligence (AI), big data analytics, cybersecurity, immersive technology, advanced robotics, Internet of Things, block-chain and 3D printing are changing the way we work and live. With interoperable cloud computing, ABC (AI, Big data and Cybersecurity) is playing key roles for safety, stability, performance, reliability, robustness, cost optimisation, and efficiency, in areas such as energy, transportation, construction, medical and healthcare, defence, manufacturing and agriculture. It is reported that at least 50% of the tasks (40% of current occupations) are at high risk and 65% of the jobs the next generation will do in 2030 do not yet exist.[1] This demands a new skill set from the workforce to ensure the sustainable economic growth of developing countries, like Cambodia, to enable them to remain competitive in the global market. To investigate these workforce demands for Industry 4.0 in Cambodia, we organised an interactive seminar with industrial leads, academics, policymakers, and potential young innovators focusing particularly on AI, big data, and cybersecurity. With a significant number of participants, we have identified the need to develop a collaborative framework with industries, academic institutions and policymakers to promote skill/upskill our workforces to support Industry 4.0.

## Introduction

This research aims to develop a collaborative and sustainable framework of universities, government agencies and industries for Industry 4.0 workforce development.

To achieve this goal, we organised an online interactive seminar with the key industrial partners, academics associated with the key ABC domains, government ministries, policymakers, potential young entrepreneurs, graduate students and other stakeholders. The objectives of the seminar were to identify the local industrial demand dynamics, related education offers at the graduate level and the knowledge required for the dynamic change. This includes the opportunity for rapid adaptation of the curriculum to ensure workforce skills, innovation projects, apprenticeship, life-long learning, empowering tools for engagement and investment for a collaborative digital industrialisation centre for mutual benefits of all stakeholders. With the support and participation of the Konrad-Adenauer-Stiftung, several Cambodian government advisors, CEO of industries and the presidents of two universities contributed to the seminar on the collaborative framework to develop the workforce for Industry 4.0. It is noted from the seminar discussion that Cambodia has the advantage of having a young population who are tech-savvy. It is also identified that qualified academics are essential to develop the skill sets of the students for knowledge transfer through working with industries.

## Role of Universities

Lessons from around the world indicate that universities are the backbone of the success of an independent nation in economic development and competitiveness. The extent in which universities are capable of conducting research is fundamental to a national innovation system.[2] University basic

1.  Chhem Rethy, Ouch Chandarany, Song Sopheak, Roth Vathana, Strang Sarot, and Liv Yi, "Industry 4.0: Prospects and Challenges for Cambodia's Manufacturing Sector," Working Paper, CDRI, 2020.

2.  Michael Gallagher, "The Role of Elite Universities in National Higher Education and Research Systems, and the Challenges of Prosecuting the Case for Concentrating Public Investment in Their Development in Australia," in Paths to a World-Class University: Lessons from Practices and Experiences, ed. Nian Cai Liu, Qi Wang, and Ying Cheng (Rotterdam: Sense Publishers, 2011), 29–66.

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research is a source of the skills, solutions to complex technological problems and a window to global knowledge hubs. The highly skilled graduates and the commercialization of the technologies developed in university labs benefit both public and private entities alike, especially through Open Innovation approaches. Beyond the teaching and research missions, advocates are demanding that universities become more "developmental" or "entrepreneurial" by collaborating with stakeholders (including private firms) to contribute to social and economic progress.

University entrepreneurship programs have a positive impact on the entrepreneurial intention of students.[3] In Cambodia, studies have documented "dynamic and vibrant" university-based entrepreneurship developments such as CS Cup, National Business Model Competition, Youth21 Digital Entrepreneurship, as well as stronger linkage between universities, industry, and support from intermediary organizations such as Impact Hub, Entrepreneurs Associations and Ministry of Education Youth and Sport. These initiatives support innovation and entrepreneurship across Phnom Penh-based universities in the last five years.[4] Under the framework of a digital economy vision and the Science, Technology and Innovation Policy (2020-230), universities can provide unique value propositions by integrating Artificial Intelligence and automation into their undergraduate and graduation programs. A useful modality for universities to achieve these triple missions is through building a University Consortium that engages specialized universities in information, communication and technology (ICT) with industry partners and government agencies (MOEYS and MISTI) who drive national innovation and AI policy framework and governance. The University Consortium should build on cross-boundary resources and knowledge by collaborating with regional and international research centres and other institutions of higher learning to leverage on the globalized and digitalized world.

*Figure 1:* *Roles of and priorities for university to partner with other stakeholders, including firms*



| MISSION | DEVELOPED COUNTRIES | DEVELOPING COUNTRIES |
|---|---|---|
| Teaching University | - Private Participation in Graduate Programs<br>- Joint Supervision of PhD Students | - Curricula Development to Improve Undergraduate and Graduate Studies<br>- Student Internships |
| Research University | - Research Consortia and Long Term Research Partnerships to Conduct Frontier Research | - Building Absorptive Capacity to Adopt and Diffuse Already Existing Technologies<br>- Focus on Appropriate Technologies to Respond to Local Needs |
| Entrepreneurial/ Developmental University | - Spin-off Companies Patent Licensing<br>- Entrepreneurship Education | - Business Incubation Services<br>- Entrepreneurship Education |

*Source:* *adapted from[5]*

3.  Julia Ferrandiz, Pilar Fidel, and Andrea Conchado, "Promoting Entrepreneurial Intention through a Higher Education Program Integrated in an Entrepreneurship Ecosystem," International Journal of Innovation Science 10, no. 1 (January 1, 2018): 6–21, https://doi.org/10.1108/IJIS-09-2017-0089.

4.  Bora Kem et al., "Cambodia's Vibrant Tech Startup Ecosystem in 2018," (Phnom Penh, 2019); Sothy Khieng, Sidney Mason, and Seakleng Lim, "Innovation and Entrepreneurship Ecosystem in Cambodia: The Roles of Academic Institutions," Working Paper Series, Phnom Penh, 2019.

5.  José Guimón, "Promoting University-Industry Collaboration in Developing Countries," Policy Brief, The Innovation Policy Platform, 2013.

# Role of Government Agencies

Government agencies play a crucial role in supporting national ABC developments, in terms of legal and policy frameworks, digital infrastructure for big data storage, strategic investment for applied research, innovation and entrepreneurial activities. The foundational block of all these aforementioned technologies and practices is data. Starting with Big Data, vast amounts of data are required in order to exhibit useful relevant trends in specific use cases. Conceptually, Big Data applications focus on overall general trends observed from high volumes of data, rather than accuracy. Therefore, applying Big Data methods on insufficient amounts of data would not yield significant results. Similarly, the implementation of Artificial Intelligence algorithms also demands extensive datasets, to rigorously train their models to actively learn and improve over time, with more datasets being introduced. Finally, one of the main priorities of Cybersecurity is to secure and protect data and information. From the big picture perspective, it is evident that data is the key pillar of all ABC technologies.

Consequently, adequate infrastructure and robust policies are absolutely essential in supporting the utilization of ABC applications, which fully encompass all aspects of data. Most directly related to data, policies on data privacy concern the protection and management of personal and confidential data. One of the leading global initiatives in the field of data policy is the General Data Protection Regulations (GDPR), which focuses on data protection and privacy in the European Union (EU). Furthermore, AI has brought about revolutionary impact across various sectors due to the ability to make predictions based on data, driven by self-learning and self-improving models based on Machine Learning and Deep Learning. However, challenges arise from the existence of "good" data and "bad" data. The value of AI predictions is only as "good" as the data that is fed to the model. Therefore, legal and policy frameworks must ensure that datasets are used ethically, to result in positive social and economic benefit. Concerning Cybersecurity policies and regulations, national Cybersecurity laws are of paramount importance to protect a state's Critical Information Infrastructure (CII). With the increasing overlap of public-private partnerships and personal-professional mobile devices, we are more interconnected than ever before, and correspondingly vulnerable to cyber threats and attacks.

# Role of Industries

For Industry 4.0, ABC with robotics, cloud computing, augmented and virtual reality has an enormous impact on employment. We expect that there will be many jobs lost in repetitive/non-creative tasks and new job creation in more advanced technology domains. However, new types of jobs also require a new set of skills, namely applied AI, data science, cybersecurity, block-chain, chatbot, colobotic, immersive tech, cloud computing, and intelligent decision making.

The role of industries is vital in building these new skill sets or upskilling their existing staff in collaboration with academic institutions and other stakeholders. To develop sustainable industrial growth in the competitive market, it is now essential to enhance efficiency and increase productivity with lower costs through using ABC skills. Unfortunately, it is often difficult for industry leads to understand the challenges that occur when attempting to

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implement new technologies, particularly due to their lack of knowledge, the dynamic changes of the global market, and the need to adapt new technologies in their existing infrastructures.

Collecting, storing, and analysing data for any industrial activity is essential for business process optimization, monitored through visualization and prediction for potential growth and prevention of risks. These require skill sets for data collection using IoTs, data storage/sharing using the cloud, data analysis using AI and data visualization using visual tools. However, the use of IoTs, cloud and data sharing framework may stimulate cybersecurity risks. It is worth mentioning that every connectivity is hackable in the world, and therefore, appropriate measures are essential to avoid hacking, for example, the recent colonial pipe hacking in the USA. In order to understand the skill sets required, every industry should set up an R&D team with academic institutions to build knowledge transfer activities. The industrial lead should continuously improve knowledge on the global dynamics, deliver/attend seminars with stakeholders to share the potential and challenges, and be proactive to provide projects to university students on applied research and innovation for mutual benefits.

## Workshop Findings

Multiple stakeholders from private sectors, academia, and government agencies as well as students and young innovators were invited to join panel discussions which in many ways functioned as focus group discussions – a globally known method for qualitative data collection. The workshop began by asking the participants from the private sector regarding the human resources required by their companies and if demand for such resources is met.

The answers, however, demonstrated their dissatisfaction with the skillset the university graduates possessed. According to the participants, the fresh graduates lacked hard skills such as practical & technical knowledge. Additionally, they share an alarming concern over graduate's lack of soft skills. These challenges are in line with some research findings which reveal that universities in general do not have proper curricula that offer students soft and practical skills.[6] The capacity of faculty members is also a major issue at many universities, as only a small number of them hold doctoral degrees and have research experience.[7] It is, nonetheless, entirely explicable because research is falsely perceived as unpaid work by many lecturers whose remuneration are based, in almost every respect, on their number of hours of teaching. Besides, most universities only hire lecturers on a part-time basis, and such practice, in addition to a lack of university funding for research, has a significant impact on the quality of teaching.

Nevertheless, it was suggested that universities should work closely with the private sector to design curriculum which would make their graduates job-ready for industry. Moreover, they should build an ecosystem with the latter to bring business problems to universities and they can subsequently involve students who will then be able to learn faster by solving real-world challenges. The collaboration will also allow the undergraduates to take internships at the industries so that they can learn practical skills at the workplace. Such a notion is

6.   Phyrom Eam et al., "Understanding Cambodian Deans' Conceptions and Approaches to University Accountability," Working Paper Series, 2020; Khieng, Mason, and Lim, "Innovation and Entrepreneurship Ecosystem in Cambodia: The Roles of Academic Institutions."

7.   Stephen H Moore, "A Case Study of Assessment in English Medium Instruction in Cambodia," in English Medium Instruction in Higher Education in Asia-Pacific: From Policy to Pedagogy, ed. Ben Fenton-Smith, Pamela Humphreys, and Ian Walkinshaw (Cham: Springer International Publishing, 2017), 173–91, https://doi.org/10.1007/978-3-319-51976-0_10.

supported by the participants from the private sector. But in reality, it is uncertain how much firms are willing to take and train interns who appear to be junior or senior university students since the former often perceives internships as costly and unprofitable to them.[8]

The study also poses questions for senior representatives from the public sector. In particular, we asked what framework and supporting policies were necessary for ABC. The responses were quite positive, and in general the government is optimistic about the future of AI development in Cambodia. One of the officials indicated that relevant authorities have been actively working to establish the National Internet Gateway and the National Data Center, not to mention the Cybercrime Law and the Cybersecurity Law. Building an ecosystem that stimulates entrepreneurship and innovation is also a government top priority currently. But despite such a tremendous effort, the representatives from the government side believe that it is not enough without public-private partnership, and therefore they strongly encourage participation from relevant industries in terms of investment, and from academia in terms of research and evidence-based policy suggestions.

From the interactive session of the seminar, we identified that collaboration among the industries, universities, government agencies and young entrepreneurs is extremely important to deliver the new skill sets or upskill existing staff. Strategic investment focusing on ABC areas of applied research and innovation for knowledge transfer with a clear vision on return on investment and societal impact is the key to achieve this. Moreover, we will require teacher's training for research-informed teaching, knowledge transfer capacity building with industries and professional training to the graduate students to increase their employability. As students are the future leaders/staff, nursing them through a collaborative framework (as shown in Figure 2) is the joint responsibility of all stakeholders, and also for their mutual benefit.

**Figure 2:** *A collaborative framework of the stakeholders to address the challenges of ABC4Industry4.0 through the development of new skill sets.*



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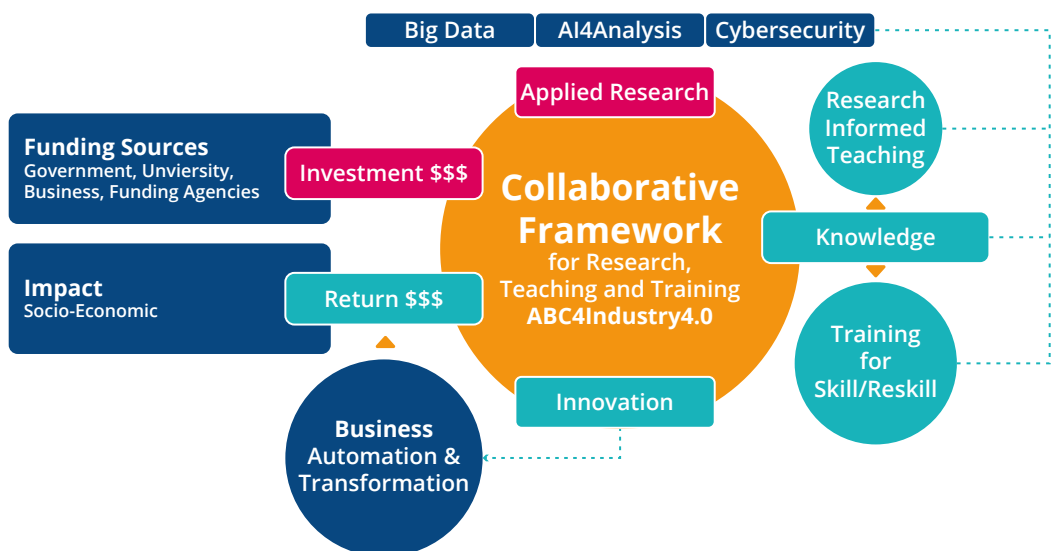
**8.** Phyrom Eam et al., "Characteristics and Issues of Internship at Cambodian Private Firms: A Scoping Study," Working Paper Series, 2020.

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# Conclusion

From the analysis of the seminar discussion, we have identified the following recommendations that may help in developing new skill sets for young people and upskilling existing staff of the Cambodia industries:

1. Set up a centre of excellence with leading experts from different backgrounds to work together with industries on ABC and advanced technologies.

2. Consider adopting a collaborative framework (see Figure 2) with industries, universities, government and young entrepreneurs for applied research and innovation for knowledge transfer.

3. Ensure regular engagement for knowledge sharing through meetings, seminars and interactive workshops.

4. Encourage government investment strategy with an appropriate policy framework to promote the job skills of the young people.

5. Develop research centres in the universities in collaboration with industries to promote research/innovation informed teaching.

6. Develop a database of experts in Cambodia to promote collaborative activities with government support.

7. Develop a policy and practices for security, privacy and ethical issues related to the ABC domain.

8. Conduct continuous exploration for potential regional and global research and innovation funds, staff/student exchange opportunities and partnership development to exchange knowledge.

9. Last but not least, develop a strategic framework to attract young people for new skill sets through a public-private partnership.

Finally, Cambodia is moving towards a digital economy with new challenges as a middle-income country. A collaborative framework as shown in Figure 2, with strategic investment and policy is essential to develop skill sets of young people for industry4.0. As applied research is key to generating knowledge, we need to embed this into the teaching, training and innovation for dynamic technology changes with a focus on sustainable economic growth.

LOW

MEDIUM

HIGH

AI

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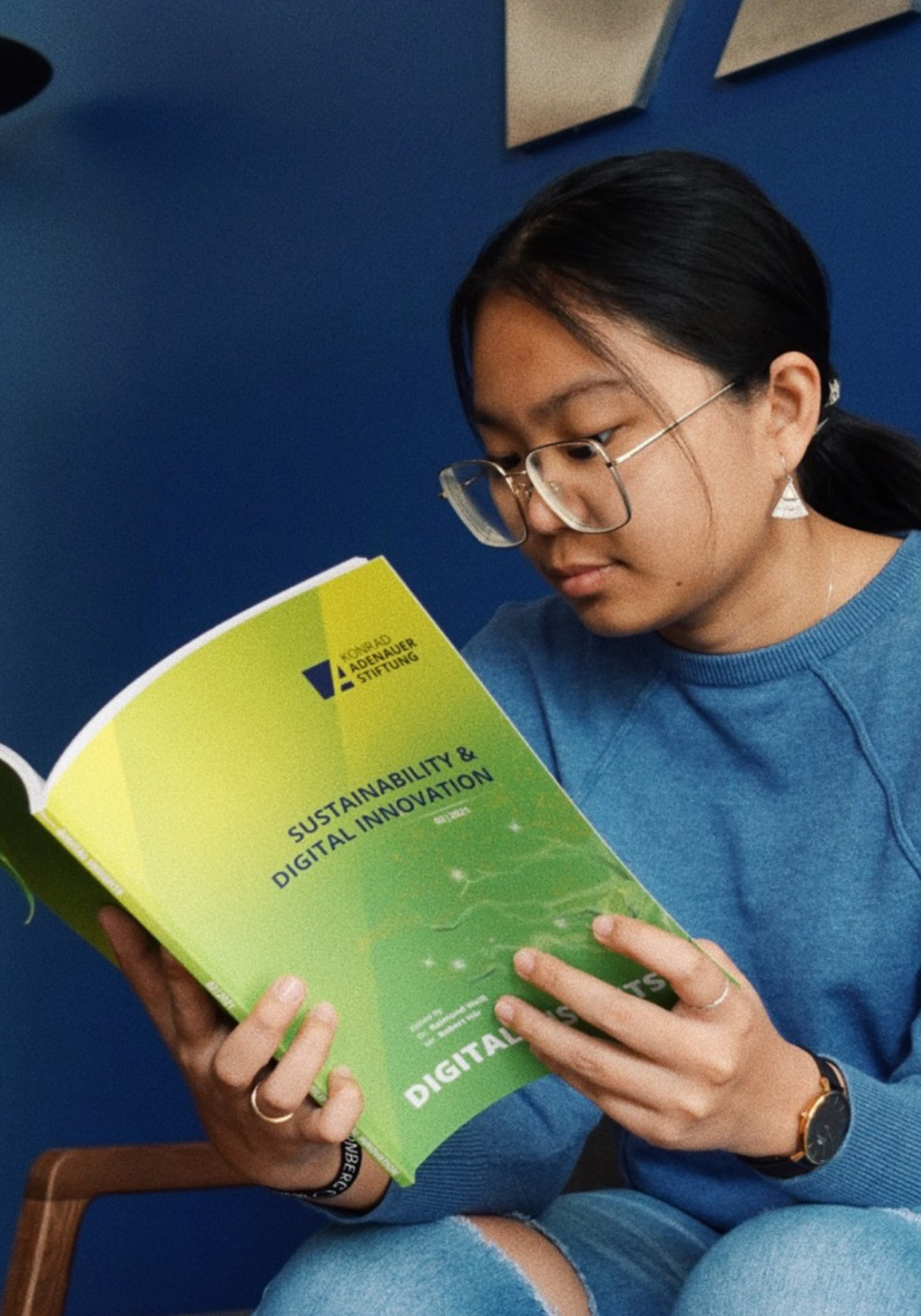
## KHIENG SOTHY, PHD

Dr Khieng is the founding President of Cambodia University of Technology and Science and advises the National Council of Science, Technology and Innovation. He served as the Vice President (Research and Administration) at Kirirom Institute of Technology between 2019-2021. Before joining KIT, he spent ten years at Cambodia's leading research think-tank, Cambodia Development Resource Institute (CDRI). At CDRI, he co-founded and was the Head of Education Unit from 2014-2018 where he was a co-editor of Book on Cambodia Education 2015: Employment and Empowerment. He is also the author of a book on "The dawn of social enterprise in Cambodia?" His interdisciplinary field of research interest includes post-secondary education, social entrepreneurship and innovation, and science and technology. He has held several research fellowship appointments, including at Griffith University, and University of Melbourne (Australia), and Swiss Federal Institute for Vocational Education and Training (Switzerland). He co-founded the Comparative Education Society of Cambodia and is currently serving as a board member in this society and as an international advisory board member in Compare: A Journal of Comparative and International Education (UK). He has a PhD in Organization Sciences from Vrije Universiteit Amsterdam, Netherlands and an MA in International Development Studies from Ohio University, USA, under the Fulbright Scholar Program. His publications can be found here https://scholar.google.com/citations?user=pJO_MbcAAAAJ&hl=en.

## PROFESSOR ALAMGIR HOSSAIN

Professor Alamgir Hossain received his PhD degree from the Department of Automatic Control & Systems Engineering, University of Sheffield, UK. He is currently serving as the Professor of Artificial Intelligence and Lead of the Centre for Digital Innovation at Teesside University (TU). Prior to this, he also served at Anglia Ruskin University (as the Director of the IT Research Institute), Head of Digital Research and Innovation of the National Horizon Centre (TU), University of Northumbria at Newcastle (as head of Computational Intelligence Group), University of Bradford, University of Sheffield, Sheffield Hallam University and the University of Dhaka (as the head of the Department of Computer Science and Engineering). He has extensive research experience in artificial intelligence, medical informatics, big data analysis, mobile enabled expert systems, cyber security, real-time algorithm design, decision support systems, robotics and adaptive active noise and vibration control systems. Professor Hossain has led many large EU funded projects as an international lead/co-investigator, worth over £16 million. With a publication in Nature, he has published over 300 refereed research articles, contributed in 12 books, received the "F C Williams 1996" award for an IET journal (UK) and 'Best Paper Awards' for five conference articles. See further details of articles and citations in his Google Scholar account.

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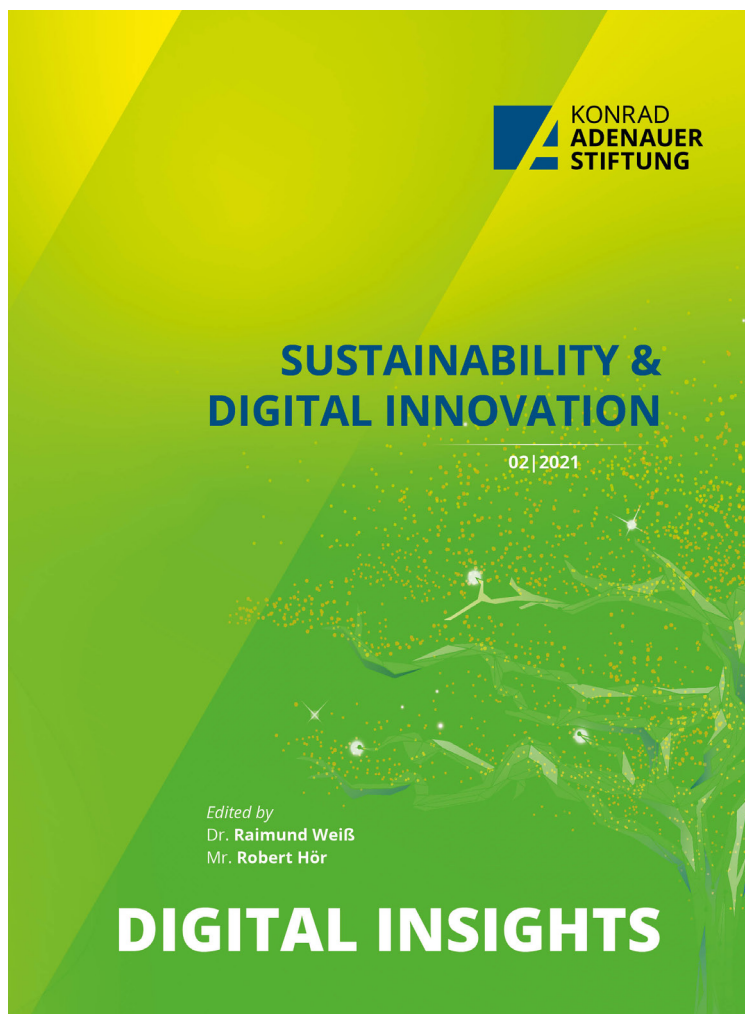
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