

# Interdisciplinary Approaches to Digital Transformation and Innovation

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A volume in the Advances in  
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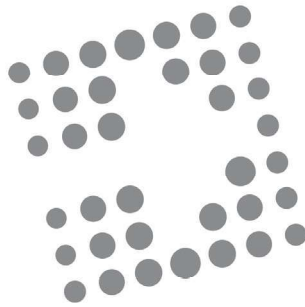
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*Rocci Luppicini, University of Ottawa, Canada*

Digital transformation is reshaping many areas of work and life within contemporary society. These include healthcare, education, government, politics, law, human rights, and ethical controversies. This chapter addresses the following questions, What is the current conception of digital transformation as an emerging interdisciplinary field of research and study? The objectives of the chapter are twofold: (1) to conceptualize digital transformation as an emerging interdisciplinary field and (2) to identify key research areas that currently constitute digital transformation. The chapter contributes by positing a comprehensive systems definition of digital transformation as an interdisciplinary research field to help guide researchers and other leaders in the field.

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Rural Economy Activation Through E-Commerce: Challenges and Opportunities ..... 22

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Rural economy has been characterized by low incomes and self-consumption production. With the expansion of global markets and the access of customers through internet, the possibility of moving traditional markets to e-commerce increases. This expansion allows the inclusion of rural economy into the e-commerce market. This chapter describes the challenges to be overtaken in order to activate rural economy through e-commerce. The chapter is organized in five sections: The first section focuses on the communication infrastructure available in rural areas. In the second section, the current state and challenges to be addressed for guaranteeing on time delivery are presented. The third section describes payment methods. The fourth section presents schemes of organization required into the communities to guarantee the quality of products. Finally, marketing, advertising, and social networks are discussed.

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This chapter explores the concept of trust and issues relating to how the construct is conceptualised and understood in a traditional offline context as well as in online environments. The chapter opens with a mini case study that highlights the complexities of being a privately-owned small firm operating in a dynamic and largely unregulated web environment. The firm is relatively new to the financial sector thus augmenting the challenges that lie in reducing perceived risk in an industry that has a chequered history with customer perceptions of credibility and integrity in the financial services sector. The chapter introduces the theoretical underpinning, which draws from the trust theories and technology adoption at firm level, which is critiqued through the lens of the technology acceptance model. Concepts related to institution-based trust are discussed and managerial implications are considered for pure play firms operating online. Each section of the chapter explores these theoretical perspectives from a FinTech context.

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*UK*

Universities have a meaningful function in motivating young graduates to become entrepreneurs in the technology field. Still, Indonesia has an unemployment issue for people's welfare. Indonesia has many potential markets. The first objective of the research is to investigate the indicators and success factors of business incubators in Indonesian public universities. Second is to examine the critical factors that influence the success of business incubators in the Indonesian public universities. The third is to propose and develop successful business incubators in Indonesian public universities, and fourth is to measure the influence of IT and e-commerce assistance factor to the success of the university business incubator. The results indicated that there are four significant success factors (i.e., information technology and e-commerce assistance – abilities of business incubator, mentoring and networking, funding and support, and university regulation) with the moderating factors of age of facility, credit and rewards, and good infrastructure system.

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This chapter focuses on predicting web user behaviors. When web users enter a website, every move they make on that website is stored as web log files. Unlike the focus group or questionnaire, the log files reflect real user behavior. It can easily be said that having actual user behavior is a gold value for the organizations. In this chapter, the ways of extracting user patterns (user behavior) from the log files are sought. In this context, the web usage mining process is explained. Some web usage mining techniques are mentioned.

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*Dapeng Liu, The University of New South Wales, Australia*

Translational research (TR) is the harnessing of knowledge from basic science and clinical research to advance healthcare. As a sister discipline, translational informatics (TI) concerns the application of informatics theories, methods, and frameworks to TR. This chapter builds upon TR concepts and aims to advance the use of machine learning (ML) and data analytics for improving clinical decision support. A federated machine learning (FML) architecture is described to aggregate multiple ML endpoints, and intermediate data analytic processes and products to output high quality knowledge discovery and decision making. The proposed

architecture is evaluated for its operational performance based on three propositions, and a case for clinical decision support in the prediction of adult Sepsis is presented. The chapter illustrates contributions to the advancement of FML and TI.

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*Michael Lo, President University, Indonesia*

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This study investigates the switching intention and actual behavior of e-wallet users in Greater Jakarta by using the push-pull and mooring model. There were 33 constructs distributed in Greater Jakarta. Using a quantitative technique, this research used non-probability sampling. The samples collected consisted of 357 valid responses. PLS-SEM and bootstrapping were conducted to check the validity, reliability, and hypothesis testing. Based on the results, low efficiency and personal experience had no significant influence towards switching intention. There was a significant influence from switching cost, social image, security, and alternative attractiveness towards switching intention. Lastly, there was a significant influence of switching intention towards actual behavior. The results gained from the study generated managerial and theoretical implications, which later can be used for the e-wallet provider to improve its services.

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*Ben van Lier, Centric, The Netherlands*

Thinking in terms of blockchain technology has developed rapidly over the past decade, with the focus primarily being on all the new possibilities created by this essentially technology-driven development. At its core, blockchain technology consists of a combination of reliable communication mechanisms between systems and the performance of joint decision-making processes by these systems. Consensus algorithms enable combinations of hardware, algorithms, and software (i.e., cyber-physical systems) to operate in networks and engage in secure intercommunication and interaction in these networks. Thanks to intercommunication, cyber-physical systems are able to reach consensus on decisions on information transactions to perform. This, in turn, empowers interconnected systems to increase their level of autonomy and adapt their individual and joint operations to changes that emerge from within them or from their environment.

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The main purposes of this research are (1) to reveal the virtual credit card (VCC) awareness of online shoppers and (2) to prepare a to do list for managers and relevant institutions to provide a more secured internet shopping process by enhancing the trust perception of consumers. To this end, a structured questionnaire consists of three sections was designed and conducted during the period April-May 2018 in Turkey. The findings achieved show that online shoppers mostly attach importance to the recognition of the website, which means they seek trust in online shopping process. On the other hand, they mostly use credit and debit cards, which may make consumers encounter serious fraud issues. VCC usage is only 4.9% in general although VCC awareness is 55.1%. This low level of VCC awareness is associated with education level and the information provided by the financial banks.

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The influence of social media such as Facebook, LinkedIn, and Twitter plays an increasingly influential role in the daily lives of people. Despite the rise of interest in this topic, the research discussing the ethical concerns of using social media for recruitment purposes remains in exploratory stages. This chapter provides a systematic review of recent research that was published from 2012 to 2018 and focused on ethical issues related to the use of social media for recruitment purposes. The techno-ethical lens, which studies the impact of technology on ethics, was used to explore the social and ethical aspects of how recruiters use social media for recruitment purposes.

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Germany*  
*Paul F. Langer, German University of Administrative Sciences, Speyer,  
Germany*

Artificial intelligence (AI) has become an integral part of e-business and our lives, promising significant benefits to e-business companies and society. However, at the same time, AI systems in e-business may produce biased outcomes, leading to discrimination of minorities and violating human rights. Against this background, this chapter first describes the foundations of bias and discrimination in AI, highlighting its scientific and practical relevance, as well as describing its meaning, emergence, functioning, and impact in the context of e-business. Based on these foundations, the chapter further provides implications for research and practice on how to deal with AI-related bias and discrimination in the future, opening up future research directions as well as outlining solutions and recommendations for eliminating and preventing AI-related bias and discrimination in e-business.

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Traditional security education, training, and awareness (SETA); cybersecurity awareness programs; and information security awareness programs are falling behind to deal with the current cyberthreat landscape in any organizational environment. Human behaviors are the weakest links in cybersecurity, especially in situations where cyberthreats are not isolated, blocked, or reported to the information security specialists for further action. Moreover, the study compares recent awareness frameworks, approaches, and methodologies. An extended research that includes an awareness training model to deal with existing challenges when delivering cybersecurity to different levels of positions in any organization. The cybersecurity awareness training model (CATRAM) has been designed to deliver training to different organizational audiences, each of these groups with specific content and separate objectives. The study concluded by addressing the need for future and innovative research to target new approaches to keep cybersecurity awareness focused on the everchanging cyberthreat landscape.

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## Foreword

It is with great anticipation and pride that I am writing this forward for a new IGI Global Research Handbook on Digital Transformation and Innovation. The editor, Dr. Luppicini has brought together an excellent set of articles that provide a good sampling of current research in this exciting new field.

Dr. Luppicini and I worked together in 2014 to create a new PhD Seminar course for the first cohort of PhD students in an interdisciplinary program between the Telfer School of Management, the Faculty of Arts, and the Faculty of Engineering at uOttawa. Then, as now, the challenge was to bring together students and researchers from diverse backgrounds and bring them up to speed on a wide range of topics from a wide range of perspectives to study a phenomenon that is transforming our world. In both cases, Dr. Luppicini has brought together a wonderful collection of contributions for us to learn from.

The phenomenon of digital transformation and innovation is the third communication revolution to fundamentally transform our world and redefine what it means to be a human society. The first communication revolution was when humans developed the capacity for speech (starting about 1 million years ago<sup>1</sup>) which distinguished them from all other living things. The second communication revolution was when humans developed the capacity for the written word, including mathematics and legal documents (3-5000 years ago<sup>2</sup>) which was the basis for civilization well into the 20<sup>th</sup> century. We are now, since about 1950, in the beginning of a third communication revolution brought about by digital electronic technology. From satellites to computers and telecommunications; and from the Internet to smartphones and ubiquitous sensors; and from online-shopping to global positioning systems and social media, technology is transforming human society. We are literally re-inventing and re-designing the way we are governed, engage in business transactions, and live our lives in community as human beings.

To understand and research this phenomenon, Digital Transformation and Innovation requires multi-disciplinary collaboration between technology, management and humanities researchers. At its heart, the technology enables the collection and communication of huge amounts of data that transforms how business and society

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work. It also creates a new online environment where the experience of business and social interactions by individuals is being reinvented. Innovation is an important aspect of the program to emphasize the re-invention and creative design of user experiences in business and social interactions

The collection of papers in the Research Handbook are organized into three main groupings. The first set of papers look at the overall impact digital transformation can have in developing economies, and the new opportunities and challenges that individual companies may face. The second set of papers drills into the more technical aspects of the technology and the potential applications that can improve user experience in this new world. While the final set of papers focus on challenges and potential pitfalls in this new world, in terms of trust, equity and security. Throughout the underlying message is that while digital electronic technology offers exciting new opportunities and challenges, human experience in this new world is the critical element that should guide our research and prioritize our focus.

Enjoy.

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**Liam Peyton** is currently Vice-Dean Graduate Studies for the Faculty of Engineering at the University of Ottawa, Canada. He has been a professor there and a principal investigator for the Intelligent Data Warehouse Laboratory since 2002. He had 10 years' experience, before joining uOttawa as a consultant specializing in digital transformation in government, telecommunications, healthcare, and online retail. He and Dr. Dominic Ferrand led the creation of first a diploma (2002), and then a masters (2008) and finally a PhD (2014) at uOttawa in Electronic Business which is now rebranded as Digital Transformation and Innovation (2020). These programs are the only ones in the world that are fully interdisciplinary between Technology, Management and the Humanities.

## ENDNOTES

- <sup>1</sup> <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?historyid=ab13>
- <sup>2</sup> <https://www.ancient.eu/timeline/writing/>



## Preface

### OVERVIEW

The increasingly complex, dynamic, and uncertain intertwinement of Internet technologies and business processes within our evolving knowledge society has created new challenges and opportunities that cross disciplinary boundaries and require the expertise and collaboration from experts within multiple fields and disciplines. What organizational changes are influenced by the introduction of new information and communication technologies and computer information systems? How do new information technologies and system architectures manage online business transactions, services, organizations and communities? How does information and telecommunication technology influence society and create innovations in fields such as health, education, law and visual arts? What are the social, cultural, ethical, legal, and political challenges of adopting digital technologies in life and work at the individual, organizational, and public level? Interdisciplinary approaches to Digital Transformation (DT) cross disciplinary boundaries needed solve complex real-world problems at the interface of business, technology and society. *Interdisciplinary Approaches to Digital Transformation and Innovation* provides selective sampling of current research within DT as an emerging interdisciplinary research field. This is the first major research publication that offers such a holistic vision of DT to help leverage knowledge concerning current practices, challenges and future opportunities.

The objective of *Interdisciplinary Approaches to Digital Transformation and Innovation* is to provide a selective sample of coverage of new research in DT as an emerging interdisciplinary field of research. This collection covers contributions that span Business, Engineering, the Social Sciences and Humanities, Health Sciences, and interdisciplinary areas of scholarship focused on the complex interconnections between technology, business, life and society. This edited volume makes a contribution to multiple disciplines by presenting key perspectives on the evolving research field of E-Business Technology. There is a growing demand for such a text to help guide technology designers, information specialists, researchers, engineers,

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managers, and administrators in areas where emerging new technologies are having an important impact on business and society.

This edited book has a unique interdisciplinary scope which should be of interest to students, instructors, researchers, and managers working in complex technological contexts who need expert knowledge about technology to inform current technology practices and research in multiple technology oriented fields including, Business, Engineering and Computer Science, Health Sciences, Social Sciences, Humanities, and Technology Studies. It will be of particular interest to individuals working closely in technology related areas of research and practice. Readers will gain a thorough understanding of the scope, complexity, and importance of e-business technologies in society from key experts leading the field

## **OBJECTIVES AND ORGANIZATION**

This edited book pulls together a growing body of work within the emerging interdisciplinary research field of Digital Transformation. This volume contains 12 chapters divided into three sections to highlight a logical flow of writing organized into key thematic areas roughly following Whitehead's (1929) logical description of essential activities for constructing knowledge through human learning cycles of romance, definition, generalization. In the romance phase of learning, *Interdisciplinary Approaches to Digital Transformation and Innovation* gets the reader acquainted with the conceptual roots and boundaries of DT at a global (big picture) and local (organizational) level. Section 1: Transformation and Impact on Developing Economies and Individual Companies focuses on the conceptualization of DT and how it is being applied within developing economies and select organizations. Part of the initiation to DT involves familiarization with where the field came from (roots), what it looks like at a macro level (developing economies), and what it means when applied strategically within particular contexts (individual organizations). This multi-faceted bird's eye view of DT begins to explore the reader to the richness of DT when treated as an interdisciplinary research activity. This is the view from outside.

The next layer of Whitehead's cycle is definition, which in this applied technological oriented field, takes the reader on a journey into the world of DT to meet the DT users interacting with applications in an effort to better define what users want (do not want), need (do not need), and how digital technologies are fulfilling (or not) these interests and needs. To this end, Section 2: Technology and Applications for Improving User Experience, takes a glimpse at the world of the user-technology interface to help define the locus of what matters most in DT. This is the view from insider. The final learning cycle from Whitehead, definition, pulls together the essence of DT and key concerns that remain after the romance

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is over (or transformed into lasting love) and the sun has set on the known horizon (definition). The generalization phase of the learning cycle leaves the reader with a pervasive list of lessons to take forward. Section 3: Trust, Equity and Security leaves the reader with essential ingredients (trust, equity, security) to DT and other technology-oriented fields where the intertwinement of humans and new technologies create both opportunities and challenges to navigate. With this vision in mind, detailed descriptions of the chapters are as follows:

- Chapter 1, “Digital Transformation and Innovation Explained: A Scoping Review of an Evolving Interdisciplinary Field,” by Rocci Luppigini, briefly reviews the recent explosion of Digital Transformation as an interdisciplinary research field to help set the tone for this edited collection. A scoping research is conducted to identify key research areas in the field and advance a comprehensive systems definition of Digital Transformation to help frame the current collection and guide researchers and other leaders in the field.
- Chapter 2, “Rural Economy Activation Through E-commerce: Challenges and Opportunities,” by Miguel A. Sánchez-Acevedo, Israel Álvarez-Velásquez, Beatriz A. Sabino-Moxo, José A. Márquez-Domínguez, and Ma. del Rocío G. Morales-Salgado, focuses on the expansion of the global economy and increased user Internet access, particularly with respect to rural economies. This creates a variety of new opportunities and challenges to understand and navigate. This chapter touches upon the role of e-payment methods, quality of products, e-marketing and the role of social networks
- Chapter 3, “In Digital Technology We Trust: A FinTech B2B Context,” by Roisin Vize, tackles the challenging issue of trust as it is understood in offline and online context. The practical case covered in the chapter looks at how a small firm operates in this complex new world of trust and business ethics from the perspective of the Technology Acceptance Model.
- Chapter 4, “Final Framework for a Successful Business Incubator for Indonesian Public Universities: The Influence of Information Technology Factor on Business Incubator Success,” by Lina Gozali, Maslin Masrom, Teuku Yuri Zagloel, Habibah Haron, Jose Arturo Garza-Reyes, and Benny Tjahjono, investigates key indicators and success factors related to business incubators in Indonesian public universities. Chapter findings uncover multiple success factors and moderating factors that help build success. This practical research study provides a useful case for other similar institutions to learn from and adapt to their own needs.
- Chapter 5, “They Know What You Will Do Next Click,” by Serra Çelik, explores Web user behaviour prediction. How can digital technologies be used to improve learner experience? How can web user experience be used

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to predict user likes, dislikes and behaviour? Does what you click shape what you like, what you do not like, and maybe even who you are? Can data mining tell users who they are and minimally help them decide what to buy or avoid buying? This chapter opens up the Pandora box to look at what might be looking back at users and learning from their online behaviors.

- Chapter 6, “An Assessment of Federated Machine Learning for Translational Research,” by Manoj A Thomas, Diya Suzanne Abraham, and Dapeng Liu, deals with the complexities of Translational informatics (TI) and how the power of machine learning (ML) and data analytics can be harnessed to improve clinical decision support.
- Chapter 7, “Factors that Determine Users’ Switching Intention From a Debit/Credit Card to Adopting E-Wallet as a Payment Method,” by Michael Lo and Adhi Setyo Santoso, discusses an empirical study on the switching intention and behaviors of E-wallet users. This chapter helps advance understanding of E-wallet payment methods and other similar applications becoming increasingly popular in DT innovation.
- Chapter 8, “The Phenomenon of Blockchain Technology and the Future of Self-Stabilising and Self-Adaptive Systems of Systems,” by Ben van Lier, focuses on one of the leading research areas in DT, blockchain technology, and how it is creating new decision-making processes through technologically driven communication mechanisms, increasingly sophisticated algorithms, ever advancing machine autonomy in decision making.
- Chapter 9, “Consumer Protection in Online Shopping: An Investigation on Virtual Credit Card Awareness in Turkey,” by Emre Yildirim; Chapter 10, “A Systematic Review of the Use of Social Media as a Recruitment Tool on the Social, Ethical, and Privacy Context,” by Ghadah Althawwad; Chapter 11, “Bias and Discrimination in Artificial Intelligence: Emergence and Impact in E-Business,” by Jan C. Weyerer and Paul F. Lange; and Chapter 12, “Delivering Effective Cybersecurity Awareness Training to Support the Organizational Information Security Function,” by Regner Sabillon, provide a rich take away of new ideas and core considerations for researchers and practitioners to grapple with in the next phase of DT research development.

Taken together, this 12-chapter volume, selectively covers key research areas and issues faced by the exciting new research field of Digital Transformation.

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## **CONCLUSION**

Taken together, the above chapters nicely illustrate the diversity of areas of research opening up to the interdisciplinary research field of Digital Transformation. At the same time, many of the current chapters leave unanswered questions for future researchers to take up. It is expected that scholarly work will continue to flourish within the expanding landscape of new research for years to come.


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# Chapter 4

## Final Framework for a Successful Business Incubator for Indonesian Public Universities: The Influence of Information Technology on Business Incubator Success

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### **ABSTRACT**

*Universities have a meaningful function in motivating young graduates to become entrepreneurs in the technology field. Still, Indonesia has an unemployment issue*

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*for people's welfare. Indonesia has many potential markets. The first objective of the research is to investigate the indicators and success factors of business incubators in Indonesian public universities. Second is to examine the critical factors that influence the success of business incubators in the Indonesian public universities. The third is to propose and develop successful business incubators in Indonesian public universities, and fourth is to measure the influence of IT and e-commerce assistance factor to the success of the university business incubator. The results indicated that there are four significant success factors (i.e., information technology and e-commerce assistance – abilities of business incubator, mentoring and networking, funding and support, and university regulation) with the moderating factors of age of facility, credit and rewards, and good infrastructure system.*

## **1. INTRODUCTION**

Business incubators perform as an active mover to help the structure of new enterprises, and deliver them the assistance and support their need to raise (Rice & Matthews, 1995). The role of business incubation is based on its ability to create jobs at a generally cheap public expense that remains in the environment and leads to economic development (Molnar *et al.*, 1997). The most significant component of incubators in their early phase is tangible incubator services. Tangible incubator services include: (i) Physical resources that an organization own that can be inspected and measured; (ii) Financial revenues such as fresh money, and the borrowing treasure; (iii) Organizational assets, for example the formal reporting frame; (iv) Physical building such as construction, machinery, materials, and productive room; (v) Technological resources: center of technology, intellectual property, and patents (Utami & Lantu, 2014). The incubator actually wants to serve the entrepreneur to exceed the obstacles and to help the accomplishment of promising business concept through specific works (Dietrich, 2010).

The university business incubator (UBI) is an ingenious system designed to helps businessmen, particularly businessmen in technology, and to build of new companies. By giving a variety of services and help the start-ups and newly firms, the incubator conduct to accelerate endowment, technology, resources, and knowledge effectively to leverage their talent, to link the growing of new firms, and thus rapidly to commercialize the technology (Smilor, Gibson, & Dietrich, 1990).

Faculty further give an effort to elevated emphasis on the trade of institutional culture and academic opinion in acknowledgement of the invention idea or innovation and the synergy of varied point of views and abilities are key supporting factors

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in the improvement of research (Babbar, 2017). Researchers, regulation creator, business-incubation managers and stakeholders have deficient of a systematic approach for managing and controlling the achievement of business incubators across industrial area and geographic zone. Despite increasing emphasis from both faculties and practitioners to assess the accomplishment and influence of business incubators, many studies continue to suffer from methodological, theoretical and empirical limitations (Lewis, 2001; Cornelius & Bhabra-Remedios, 2003; Cheng & Schaeffer, 2011; Motoyama & Wiens, 2015).

Indonesia has seen an increasing figure of new ventures or entrepreneurs. Entrepreneurship policies applied at the micro-level still focusing on expansion of ability, future chance, and encouragement. Abilities include the organisational, commercial and technological skills; encouragement relates coaching, mentoring, leadership, and exposure; while future chance relates advertising, channel of selling and channel of funding. At the macro level, government support stress on funding, business courses, entrepreneurship spirits, business infrastructure systems, and workshop for trainers (Mirzanti, 2015).

The objective of this research is to develop and propose a successful business incubator framework for Indonesian public universities.

## **2. CONCEPTUAL FRAMEWORK AND HYPOTHESES**

The initial framework by Campbell, Kendrick and Samuelson (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection process, funding, and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful product, tenant's profit, technology diversification, and job creation. Smilor's framework involved support system (i.e. administration, facilities, and business expertise), universities and the government. His work was probably the most extensive in ascertaining and elaborating the different elements of an incubation system.

Campbell (1989) introduced the new incubation process model consisting of pre-incubation process, entry criteria and selection process, monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) had not introduced the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved.

Mian (1997) gave more detailed processes, criteria, policies, and programmes; and had sought the involvement of universities, communities and other stakeholders in developing a theoretical model for the evaluation and management of the university-



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based technology business incubators' (UTBI) performance. Mian for the first time introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

The business incubator model is categorised as pre-incubation activities or input (entry criteria), incubation or process, and graduation or output (exit criteria) (Costa-David, Malan, & Lalkaka, 2002). Costa-David et al. for the first time gave the detailed skill requirement (such as management, finance, business advice, networking and training for start-ups until their graduation).

Verma's (2004) framework introduced more detailed success factors (i.e. shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria, exit criteria), as well as moderating factors (i.e. age and quality of facilities for successful business incubator framework). Voisey (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurement of business incubator practice achievement.

All the indicators, successful factors and moderating factors of successful framework of business incubator for Indonesian public universities have been explored in (Gozali, 2015) and (Gozali, 2016). The hypotheses for final framework such as:

## **2.1 Successful Factors**

### **2.1.1 The Ability of Business Incubator (H1)**

The need for assistances and enterprises advice grew important in the mid-1990s (InfoDev, 2009), which modify the model version from the first-generation incubators to become second-generation incubators. In addition to the typical office room, the second-generation incubators are characterized by shared facilities, proactive assistances, and mentoring, coaching, and counselling assistances (Lalkaka, 2001). Scillitoe and Chakrabarti (2010) found that prior study contributes the opinion that counselling activities are an important model of enterprise guidance. They continue advice that more rapid guidance activities will increase the incubator manager to study better about the needs of the entrepreneur, and thus give more proactive commercialize assistance (Hackett & Dilts, 2004b), and the shifting of business know how and skill, either straightly or by assisting to the company to employ the incubator network effectively (Rice, 2002).

The variety of enterprise guidance arranged by a business incubator is fundamental in business incubation performance (Hackett & Dilts, 2008). Martin (1997) recommended that networking within the incubator can take place in a natural way if a physical zone is set aside for the intention of mail box, photocopying, drinking shop, and canteen facilities. Rice (2002) mentioned that high-technology entrepreneurial

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companies are often not familiar about business skills such as marketing, accounting, financial and human resources required to manage an enterprise. Abduh et al. (2007) mention that incubation management services provide a wide variety of professional commercial development assistance services including strategic planning, writing a business plan, and giving assistance through accounting, financial management, sales or marketing advice, legal advice, and enrich them on government policy, product development, and human resource assistance. Abetti (2004) emphasized that incubators require to focus their activities in coherence with incubates' requirement and market orientation by mapping out demand and market challenge; product development and manufacturing process; sales and marketing; budget and profit and loss reports; and personnel assistance, in order to speed up the expansion and increaser of the incubatees' enterprises.

Furthermore, Rice (2002) advised that the connection between the incubator manager and the tenant company is of several significance to the development of the business proposal. A study by Kuang et al. (2003) found in the context of academic incubators that incubator management must form closer binds with tenant companies to ensure incubator eminence. Rice (2002) mentioned incubator manager-tenant company dyads co-produce the incubation process, suggesting that the time intensity of business advice interruption have to be strategically applied by the incubator manager to the tenant companies, and that tenant companies have to be properly ready to employ the assistance and insights resulting from such interruption. On the basis of the above considerations, the formulation of hypothesis as follows:

**H1:** The greater the focus is on the abilities of business incubator to be moderated by the age of the facilities, the more likely the business incubator is to succeed due to good facilities (Gozali, 2018).

#### **2.1.2 Incubator Governance (H2)**

Vedel, Stephany, and Gabarret (2011) found that assistance and frequency of counselling between incubator managers and tenant companies do not have a positive result on economic achievement, particularly on job maker. Strategic management afforded at incubators could provide collaboration with tenant companies to elaborate through such things as their business framework, marketing strategy, funding method, patent and invention strategy, and product development (O'Neal, 2005). The degree of strategic management assistance in incubators explored by incubation researchers point to the significance of developing strategic collaboration in incubators, as emphasized by Agarwal (2002).

The level to which the incubator controls and assists tenant companies with the establishment of their enterprises, including assisting them to learn about risks

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concerning the resources infused in a commercialization, and about including the expense of potential (terminal) failure (Hackett & Dilts, 2004a). Hackett and Dilts (2004a) mention that the deep interaction of support afforded, comprehensiveness of support afforded, and the quality of the support afforded all characterized this component of business incubation activities. Deep interaction of support afforded' refers to —the percentage of working hours related to controls and helps tenant companies (Hackett & Dilts, 2004a), while comprehensiveness of support provided is a method Hackett and Dilts (2004a) accommodated from Chrisman (1989), and it refers to the level to which strategic, operational, and administrative-related support are afforded by the incubator to the tenant companies. Finally, quality of support afforded contributes the relative meaning of the support afforded by the incubator to the tenant companies (McGrath, 1999; Rice, 2002; Hackett & Dilts, 2004a).

Service innovation, processes and management assistance have different advantages for business of the services area. service innovation is referred as a strategy that makes several advantages for companies, especially SMEs, then it is possible to enclose that enterprises that adopt and employ innovation process as part of their routine will have more opportunity of significant growth their level of company achievement. (Maldonado-Guzman, 2017). On the consideration of the above matters, then formulate the following hypothesis:

**H2:** The better the incubator's governance is moderated by credit and reward, the more likely the business incubator is to succeed(Gozali, 2018b).

### 2.1.3 Entry Criteria (H3)

Study on incubation selection factor remain to reproduce in search for the ideal set of criteria that would guide to elevated incubation achievement. Bergek and Norrman (2008) suggested a model for selection factor combining chosen primarily based on idea and chose primarily based on entrepreneur or the team. The authors proposed two basic method of incubate selection: (i) picking-the-winner; and (ii) survival of the fittest. In the first method, incubator managers try to examine a few successful enterprises before selection. In the second definition, incubator managers employ a more adaptive style of incubate selection and often take on a larger number of firms. This approach relies on the market and time to eventually determine success companies from failed companies. Therefore:

**H3:** The stronger the enforcement of tenant entry criteria, the higher the probability of business incubator success (Gozali, 2018b).

*Final Framework for a Successful Business Incubator for Indonesian Public Universities***2.1.4 Exit Criteria (H4)**

Peters, Rice and Sundararajan (2004) emphasized the importance of controlling, or guiding, which is related to as workshop and educational training offered, conferences, courses, either for a fee or free of charge to the incubates as factors associated with increasing incubate graduation level. Several studies invented that the degree of business advice provided at the incubators has a positive impact on the incubation process performance (Rice, 2002; Hackett & Dilts, 2004b; Bergeck & Norrman, 2008).

**H4:** The stronger the enforcement of tenant exit criteria, the higher the probability of business incubator success (Gozali, 2018b).

**2.1.5 Mentoring and Networking (H5)**

Researches exhibit that frequent meeting with incubator management makes a better relationship and mainly donates to the tenant companies' and incubators' success (McAdam & Marlow, 2008; Scillitoe & Chakrabarti, 2010). From a social-capital, more frequent counselling interactions allow the creation of stronger binds that facilitate transfer of know how, skill and education between the incubator management and the tenant company. This includes entrepreneurship education from the incubator management, and for incubator management to study about the trend of the enterprises, thus making incubator manager to offer regard support (Scillitoe & Chakrabarti, 2010). They emphasized more frequent counselling interactions can lead to both better venture and technical advice.

The incubation reference invented several incubator studies that explored incubators' resources such as incubators' networks (Bøllingtoft & Ulhoi, 2005; Studdard, 2006); the quality of the management teamwork (Mian, 1997; Costa-David, Malan & Lalkaka, 2002); the style and the quality of the incubator's connection to a university (Tamasy, 2007); a professional service network and initial government funding (Lalkaka 1996); institutional support (Mian, 1997); and the incubators' image or dignity (Mian, 1997). It has been cited in the reference that incubates' reputation is enhanced because of their association with the incubator (Chrisman, Bauerschmidt & Hofer, 1998).

Many Researches show that mentoring and networking are the most significant factors determine a tenant's success (McAdam & McAdam, 2008). Regarding the improving efforts to develop the management commitment, dedication and engagement, educational learning and organizational culture and also advocates the reduction of those barriers such as: missing of management commitment, dedication and engagement, unrecorded or not properly defined processes and deficient of

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employee training, that determine the successful application of a framework. (Andreadis, 2017). The reference originated in the rational positioning thought focuses ultimately on community factors such as stakeholder activities, business framework, design goals and external constraints, but ignore the function role of internal resource obstacles on enterprise framework design (Wei, 2017).

In a similar vein, Todorovic and Moenter (2010) revealed that the networking process upgrade the efficiency and effectiveness of start-up companies, causing them to achieve aims and sustain improvement (McAdam & McAdam, 2006). However, improving an efficient network requires considerable resources, which requires a dedication individual to assist the networking process. Thus:

**H5:** The better the mentoring and networking of the business incubator moderated by good system of infrastructure, the more likely the business incubator is to succeed (Gozali, 2018b).

### 2.1.6 Funding and Support (H6)

Hamdani (2006) presented that highly utilized resources include assistance with commercial skill, marketing guidance, support about accounting or financial control, access to angels investor or business venture-capital, office room, and a library. Tenant company do not contingent solely on break event point and payback, they also contingent on the current stage of productivity of the firm (Perroni, 2017). Program cannot be generalized since assignment and community conditions, among other factors diverse for every organization and processes (Rocha-Lona, 2015). Financial management of new enterprise is an ultimate knowledge that is mostly cited as insufficient among new ventures (Lalkaka & Abetti, 1999; Beng Hui, Fernandez & Sio, 2011). The importance of this lacking among start-ups is that it is a ultimate problem of incubate fallout level rates (Beng Hui, Fernandez & Sio, 2011). Scope of financial management skill that start-ups have been examined to required help with are in the writing of grant business plan, preparing annual meeting and capital budgets, assessing and presenting on financial achievement report, and budgets controlling (Read & Rowe, 2003).

Mian (1997) and Vedovello and Godinho (2003) emphasized that incubators require to manage a function in supporting financial advice for the start-ups by giving them with data which they may need to linkage a network of partner venture. The consideration of covering the right mix of advocate services, which emphasizes financial skill, was provided by Böhringer (2006) who claimed that the right services would help the expansion of area and the sustainability of startup.

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**H6:** The better the funding and support of the business incubator for its tenants is moderated by good system of infrastructure, the more likely the business incubator is to succeed (Gozali, 2018b).

### 2.1.7 Government Support and Protection (H7)

The incubator industry has developed through a partnership between incubators and local, nation and Commonwealth authorities, according to the fact of the Organization for Economic Co-operation and Development (Chandra and Chao, 2011 and OECD, 1999). A unique chance for creating business framework to fulfill the future difficulties of the development of commercialization, freight range and controlling economic performance, community and urban sustainability. The invention of explorative framework through the giving of information is allowed by this technology advancement. This activity has to be provoked as a government–industry collaboration where the enterprise design is managed by news supportive legislative and regulation model (Toh, 2009). From this perspective, a new hypothesis on government support and protection has been developed (H7)

**H7:** The better the support and protection from the government, the more likely the business incubator is to succeed (Gozali, 2018b).

### 2.1.8 University Regulation (H8)

In addition, regulators can improve the reward systems for faculty and researchers by acquainting new stimulant to cooperate with the businesses. Normally, faculty researchers are not granted in their dedication for cooperating with businesses, and in several nations it is even recorded as unethical to do so. Class training experience and publications improve to be dominant standard in profession record systems and salary level, and in several universities collaboration with industry is badly calculated and not measured in professional records. To solve this, a record by the Australian Advisory Council on Intellectual Property (Chandra & Chao, 2011) supports a reconsidering of the key performance indicators of public universities and research centers, creating scheme to improve the motivation of faculties and their researchers to cooperate with the industry. From this reference, a new hypothesis on the credit and reward system in University Regulation has been developed (H8).

**H8:** The better the university regulation is moderated by credit and rewards, the better the initiative programs and projects for business incubator success (university regulation) (Gozali, 2018b).

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### **2.1.9 System Infrastructure (H9)**

New business incubators do look to support and cover an infrastructure conducive to the establishment of incubates and arising nations (Hackett & Dilts, 2004b; Smilor, 1987). Universities either use government pattern and standard, private sector subsidizing or a mix of both to nurture and extend their 'third mission'. For the future, the goal should be a high scale of self-fluffiness of the university internal entrepreneurship assistance mechanism (OECD, 2010). Based on these literature studies, a new hypothesis on infrastructure and support system for a successful business incubator was formed (H9). All of the hypotheses have to be measured and analyzed, whereby the results will show either positive or negative relationships among all of the factors.

**H9:** The better the system and infrastructure are moderated by good system of infrastructure, the more likely the success of the business incubator (Gozali, 2018b).

## **2.2 Moderating Factors**

### **2.2.1 Age of Facilities**

A multitenant facility with onsite management that directs the business incubation program. An incubator facility (age and size) supports tenant companies proper leased room and adjustable rents. Collocating entrepreneurial companies in a business incubator facility makes more possibilities for clients to network, share experience, execute in a conducive circumstances for developing successful tenant performance (Lewis, 2011).

### **2.2.2 Good System of Infrastructure**

ICT and incubators provide a solution to SME problems. ICT expands the goal and quickness of network communication: telephone, fax, voice mail, e-mail, and teleconferencing are technology empowers that facilitate organizational exchange so that illustrations, concepts,, information, skill, know how, and energy can be shared and transformed with bigger productivity, efficiency, and synergy and all at a cheap expenditure. ICT also exceeds geographic and political limits. It expands ready access to business intelligence and enterprise information such as sophisticated invention, technology advances, (Lewis, 2011), building physical infrastructure (Carayannis, 2006), The right foundational regulation and infrastructure allow

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the Triple Helix participants in the sophisticated system to work cooperatively in establishing graduated tenants (Wonglimpiyarat, 2016)

#### **2.2.3 Credit and Rewards**

Disregarding investment in the elements of innovation such as: faculties, academics and research centers (Carayannis, 2006). It is challenging for faculties to absorb that the technical establishment and promoting of their invention is better done to the experts (with their guidance and help). This is connected to the challenging part for a technology discover to admit that they will not accept all of the tribute, incentives, or huge rewards. (McAdam *et al.*, 2006). However, creating an efficient network needs considerable resources (effort, time, and money). Hence, the implementation of a process method to the management of these resources will make much needed assistance to stakeholders, especially business liaison managers, faculty entrepreneurs and academic senior management (McAdam *et al.*, 2006).

One approach for providing start ups-entrepreneurship is the process of establishing something different with value, by dedicating the necessary time and energy, assuming the necessary funding, psychic, and social consequences, and accepting the resulting rewards of monetary and self- satisfaction. The intrapreneur requires to be properly rewarded for the energy and effort extended in promoting the spin-off company. Extensive performance goals should be developed with rewards based on achieving these targets (Hisrich, 1988).

### **3. METHODOLOGY**

This research used the qualitative and quantitative method, which involved sequential timing of the using of several methods. One approach is employed first, and the conclusion are used to select the sample, establish the instrument, or write the analysis for the other approach. Further application of establish designs were for dissimilar approaches of equal weight and sequential. Second method in data collection and procedure strategy, first, qualitative study and continued with quantitative study. The weight between the qualitative and quantitative study is ideally equal, although in practice one approach may yield priority to another.

The judgement to choose a proper approach in study hinges upon the goal of the research. It should be considerate by the research question (Marhall, 1996). Consequently, the use of the qualitative and quantitative approaches is deemed proper for this research. First, it seeks to examine the indicators and successful factors for business incubators for Indonesian public universities, then investigation



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of business incubator successful factors, and research framework performance through statistical analysis.

The survey questionnaire was developed based on literature review. A consolidated survey questionnaire consisted of different measurement scales and questions. Each related success factor was measured on a 1 to 5 Likert scale. The Likert scale was incorporated in the questionnaire as the respondents were asked to rate the importance of the factors relative to other factors. Further, the objective of the study was to establish those factors that have a relatively higher score. The quantitative study continued with reliability and validity tests which all the successful factors are valid and reliable (Gozali, 2018a), research hypotheses tests, and a structural model test. The research used the case study as a part of the qualitative method to study the differences among public university business incubators in Indonesia.

The qualitative study addressed from the literature review that was carried out by identification of the business incubator successful factors, and then the survey questionnaire was developed based on the face-to-face interview with Indonesian public university business incubator experts. The survey questionnaire has been validated by ten professors from six countries (i.e. United States of America, Scotland, Finland, Australia, Malaysia, and Indonesia) (Gozali, 2018). After the validation of survey questionnaire and correction process have been done, the final survey questionnaire was distributed to the respondents by face-to-face interview and through e-mail.

The quantitative study supplemented by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research is determined higher than the qualitative since the interviews with the expert were based on empirical data which was gathered first (Graff, 2016). Using a questionnaire for a large sample as the ultimately approach of quantitative data collection created this the survey of the research (Denscombe, 2007).

This research examined the result of identified business incubator successful factors, developed the survey questionnaire and the business incubator successful framework.

## **4. RESEARCH LOCATION AND SAMPLE**

### **4.1 Research Location**

For the actual research conduct, 66 respondents who are business incubator managers in Indonesian public universities were chosen from the following institutions, namely Institut Teknologi Bandung, Institute Teknologi Sepuluh November, Andalas University, Institut Pertanian Bogor, Diponegoro University, University of

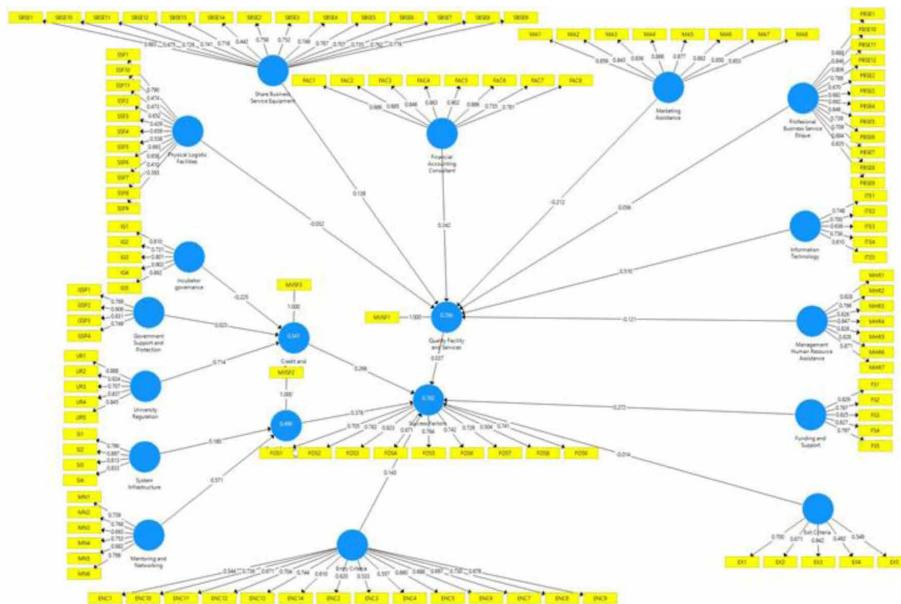
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Indonesia, Samratulangi University, Brawijaya University, Airlangga University, Riau University, Udayana University, Gorontalo University, Sebelas Maret University, Jambi University, North Sumatera University, Bandung Technopark, Padjajaran University, and Yogyakarta State University.

**4.2 Research Sample**

The sample used for this study consisted of business incubator managers in Indonesia public universities involved in the day-to-day operations of the incubator and graduated tenant companies. The business incubator managers as the sample or respondents would have the necessary insights and experiences of managing incubators and the relations within the incubator with tenant firms. the sample for this research covers 66 respondents, all of whom are business incubator managers from Indonesian Public Universities.

*Figure 1. An initial structural model for successful business incubators for Indonesian public universities (Gozali, 2018b)*



**Final Framework for a Successful Business Incubator for Indonesian Public Universities***Table 1. Structural model measurement for this research (Gozali, 2018b)*

Hypotheses	Construct Relationship	Path Coefficient	t stat	p value
H1	Information Technology -> Quality of Facility	0.513	<b>3.271</b>	<b>0.001</b>
H2	Incubator Governance -> Credit and Rewards	-0.225	0.994	0.321
H3	Entry Criteria_ -> Successful factors	0.148	1.332	0.183
H4	Exit Criteria -> Successful factors	-0.033	0.166	0.868
H5	Mentoring and Networking -> Good System of Infrastructure	0.571	<b>4.705</b>	<b>0.000</b>
H6	Funding and Support_ -> Successful factors	0.284	<b>3.535</b>	<b>0.000</b>
H7	Government Support and Protection -> Credit and Rewards	0.023	0.121	0.904
H8	University Regulation	0.714	<b>3.607</b>	<b>0.000</b>
H9	System Infrastructure -> Good System of Infrastructure	0.180	1.288	0.198

**5. FRAMEWORK AND ANALYSIS**

Figure 1 shows the initial structural model of successful business incubator framework for Indonesian public universities of which the content has all of the initial indicators. All of the loading factors for each indicator shows various values.

After obtaining the strong relationship between constructs, the hypotheses have the results. The structural measurements are shown in Table 1. It is observed that hypotheses H2, H3, H4, and H7 are not supported (insignificant t-values) while the hypotheses H1 (just for Information Technology), H5, H6, H7 and H9 are supported (significant t-values).

Table 2 shows the result of hypotheses analysis indicates that several hypotheses was supported directly (i.e. Funding and Support), was supported partially (i.e. Information Technology and E-Commerce Assistance), were fully supported (i.e. Mentoring and Networking, University Regulation). The hypotheses were not supported such as: Ability of Business Incubator, Incubator Governance, Entry Criteria, Exit Criteria, Mentoring Networking, Government Support and Protection, System and Infrastructure. The supported successful factors for business incubator for Indonesian public universities obtain the strong model with moderating factors.

**Final Framework for a Successful Business Incubator for Indonesian Public Universities***Table 2. The result of hypotheses testing (Gozali, 2018b)*

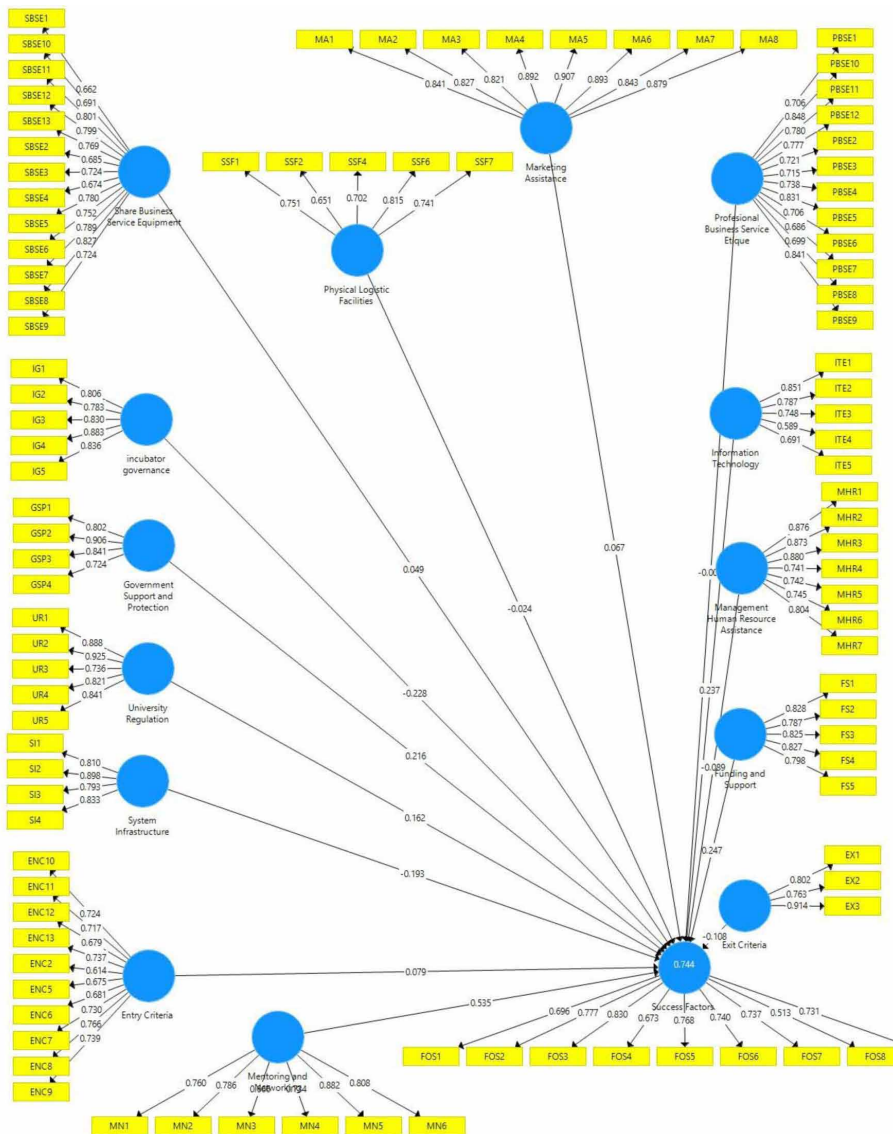
Hypotheses	Description	Result
H1	The greater the focus is on the abilities of business incubator to be moderated by the age of the facilities, the more likely the business incubator is to succeed due to good facilities.	Supported Partially (Information Technology and E-com Assistance)
H2	The better the incubator's governance is moderated by credit and reward, the more likely the business incubator is to succeed	Not Supported
H3	The stronger the enforcement of tenant entry criteria, the higher the probability of business incubator success.	Not Supported
H4	The stronger the enforcement of tenant exit criteria, the higher the probability of business incubator success.	Not Supported
H5	The better the mentoring and networking of the business incubator moderated by good system of infrastructure, the more likely the business incubator is to succeed.	Supported
H6	The better the funding and support of the business incubator for its tenants is moderated by good system of infrastructure, the more likely the business incubator is to succeed.	Supported Directly
H7	The better the support and protection from the government, the more likely the business incubator is to succeed.	Not Supported
H8	The better the university regulation is moderated by credit and rewards, the better the initiative programs and projects for business incubator success (university regulation).	Supported
H9	The better the system and infrastructure are moderated by good system of infrastructure, the more likely the success of the business incubator.	Not Supported

*Table 3. Square of endogenous variables (Gozali, 2018b)*

	BI Model without Moderating Factors (see Figure 4.2)	BI Model with moderating Factors (see Figure 4.3)
	R Square	R Square
Credit and Rewards		0.341
Good System of Infrastructure		0.490
Quality of Facility		0.294
Successful factors	0.744	0.782

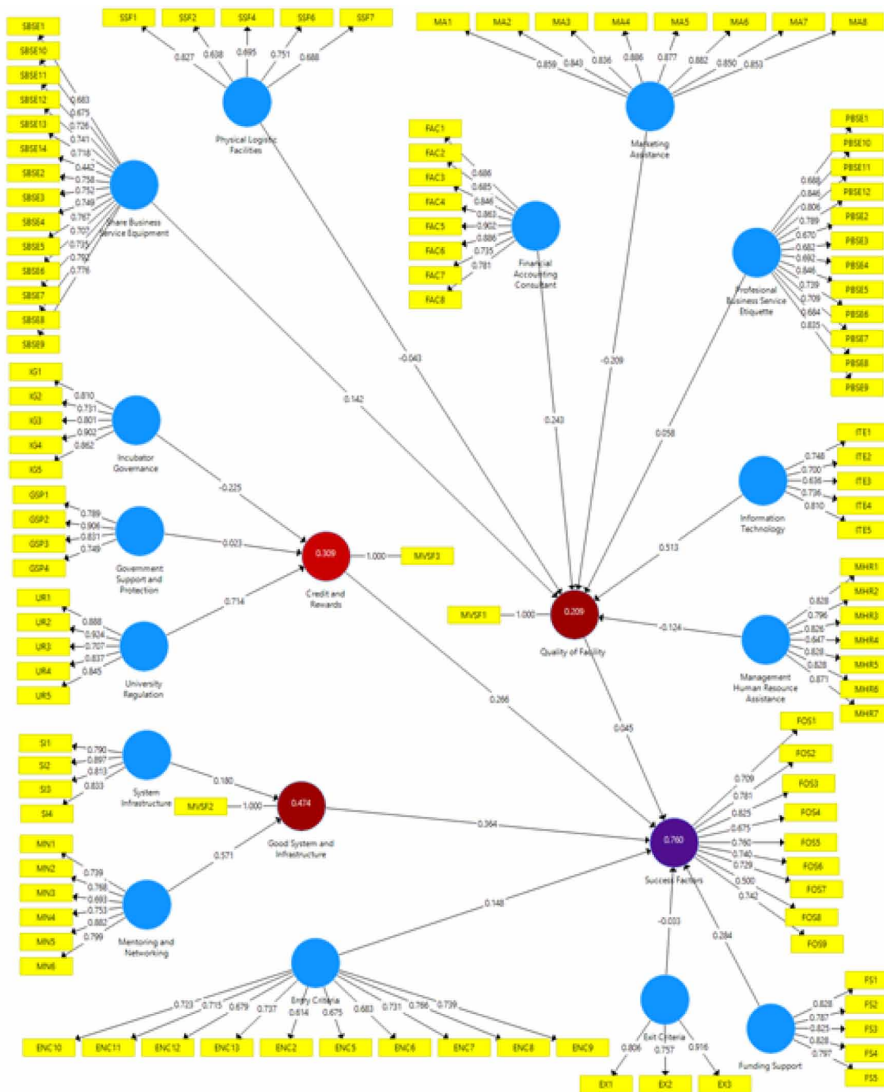
**Final Framework for a Successful Business Incubator for Indonesian Public Universities**

*Figure 2. A structural model of successful factors for business incubators for Indonesian public universities without moderating factors (Gozali, 2018b)*



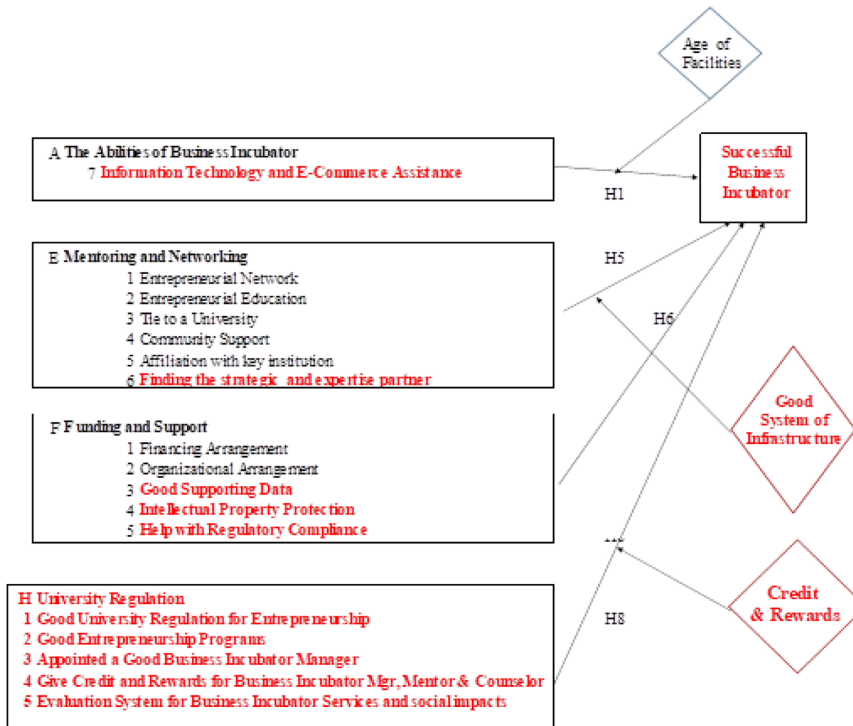
**Final Framework for a Successful Business Incubator for Indonesian Public Universities**

*Figure 3. A structural model of successful factors for business incubators for Indonesian public universities with moderating factors (Gozali, 2018b)*



### Final Framework for a Successful Business Incubator for Indonesian Public Universities

Figure 4. A final framework of successful factors for business incubator for Indonesian public universities (Gozali, 2018b)



This study has four endogen variables, which are, credit and reward ( $R = 0.341$ ), good system of infrastructure ( $R^2=0,490$ ), age of facility ( $R = 0.294$ ) and business incubator successful factors ( $R^2=0.782$ ). According to Chin (1998), the  $R^2$  value of credit and reward and quality of facility are weak models. The good system of infrastructure are mostly in the moderate model category. The Successful Factors for business incubator is a strong model. Comparing the Successful Business Incubator Model with moderating factors and without moderating factors, the results show that the Successful Business Incubator model with moderating factors gives the best value of R Square because 0.782 is larger than 0.744 as shown in Table 3.

Figure 2 shows the structural model of successful factors for business incubators for Indonesian public universities without moderating factors and figure 3 shows the structural model of successful factors for business incubator for Indonesian public universities with moderating factors.

### ***Final Framework for a Successful Business Incubator for Indonesian Public Universities***

Figure 4 shows significantly a final framework with supported successful factors for business incubator for Indonesian public universities. The Framework with moderating factors results more strong value than the framework without moderating factors. And the final framework of successful factors for business incubator for Indonesian Public Universities finally achieved as a theoretical contribution.

## **6. RESULT**

The first objective of the current research was to investigate the indicators and the factors for successful business incubators in Indonesian Public Universities using qualitative study by interviewing experts and validation from Business Incubator experts overseas to obtain several results. The result of qualitative study support the finding in literature review such as: government support and protection (funding problems, lack of government protection, short term government mindset), university regulation (lack of appreciation, no excellent entrepreneurship curriculum or programs, lack of support from professor and faculty), mentoring networking, incubator governance (lack of capable incubator manager), and system infrastructure. From the result of this research, 113 indicators have been discovered toward the successful business incubator factors for Indonesian public universities. From these 113 indicators, 9 successful factors with 3 moderating variables and 1 dependent variable are included.

The second objective of the current research was to examine critical successful factors that influence successful business incubators for Indonesian public universities by using statistical analysis by PLS and SPSS to obtain the results about critical successful factors of successful business incubators for Indonesian Public Universities. In testing the hypotheses, the result gave 5 critical successful factors that support the strong model or framework of successful business incubators for Indonesian public universities. The conclusion that was drawn from the research question indicated that government support has a role to play in an array of areas. University regulation is important in providing knowledge, resources and support to start-ups in Indonesia.

The third objective of the current research was to propose and develop successful business incubators for Indonesian public universities by using SEM analysis by PLS and SPSS to obtain results about the framework performance. The Framework with factors and moderating factors showed a strong model indication.



## **7. DISCUSSION AND CONCLUSION**

### **7.1 Theoretical Contribution**

This research makes a positive contribution to fill the gap and contributes to the development of theory in powerful ways. In particular, this research presents a structure model (Figure 3) and a final framework (Figure 4) for successful factors for business incubator for Indonesian public universities which is valuable to researchers, policymakers, and BI practitioners.

The new contribution is a business incubator framework which provides framework for the investigation of the under-researched phenomenon of business incubators in Indonesian public university. The conceptualization of the research design was guided and adapted from a previously developed framework by Verma (2004). It is worth investigating whether the successful factors for business incubators apply universally to all models/frameworks or if several factors need adaptation of their unique type of services offered.

The results of the quantitative study revealed the extent of the underlying factors impact on the business incubator framework. The significant factors from this business incubator framework are mentoring, networking, university regulation, funding and support and IT systems. In addition, one of the positive outcomes of frequent interactions in mentoring and networking (both formal and informal) could increase the understanding of incubate needs and in return, incubators are able to provide improved and tailored business assistance to the start-ups. The startup needs to produce performance reports to the incubator managers for financial support if the startup shows significant progress. The factors identified and scales that were developed have helped to display successful factors for the facilitation of the entrepreneurial process in Indonesia.

### **7.2 Methodological Contribution**

Analysis of the results indicates that the multidimensional development of the research design in this research has produced the successful factors of the Indonesian public universities business incubator framework. The qualitative and quantitative study results provides insights into the underlying components of the business incubation process.

The mixed-methods research design involved the use of qualitative and quantitative study in business incubator study. The mixed-methods approach enhances the interpretation of significant research findings as exemplified in the previous chapter where qualitative and quantitative analysis resulted in improved understanding of the framework of Indonesian Public Universities Business Incubators.

### ***Final Framework for a Successful Business Incubator for Indonesian Public Universities***

The use of the mixed-method has become an increasingly recognized research approach that is effective in addressing complex research issues. The mixed-methods design enabled the researcher to overcome many of the limitations that constrain mono-method studies.

The qualitative component of study enabled conceptual development, which guided the crafting of questionnaire seeking to further understanding of business incubation factors. The quantitative study with statistical procedures and SEM proved to be a powerful tool in predicting the successful factors for business incubator in Indonesian public universities.

In previous business incubator research or studies applied the qualitative method for data analysis, in this research for methodological contribution applied both qualitative and quantitative methods for data analysis.

### **7.3 Practical Contribution**

For practical contribution, the successful factors and framework could provide guidance for researchers, venture capitalists, incubator managers, and entrepreneurs in facilitating the business start-up process. The study is the first of its kind to empirically test successful factors within the Indonesian public universities. Incubators can use this study as a tool to examine their current strategies and accordingly invest resources in developing the business incubator successful factors.

The government also gets benefit from business taxes from the start-ups, and returns those benefits to develop many young start-ups to continue their business through many good business programs. The number of unemployment and criminal activities can also be reduced, and as a result, young people can elaborate their ability to build businesses in their expanded capabilities. Government also get benefit for set up new grand regulation for a new sustainable of national economic development strategy.

### **7.4 Limitation of the Research**

The results of this research may be affected by a few factors that could limit its generalization. This includes the focus on incubator types (such as: agricultural incubators, information technology incubators, etc.), the location of the incubators and the size of the sample. The analysis relating to the indicators and factors is based on the data collected from the questionnaires and therefore may inherit self-reporting biases. This study may have aspired in trying to cover far too many business incubator indicators and factors and link them to a set of growth measures.

In conducting this research exercise, a series of difficulties occurred which need to be identified for future researchers in this field. A central concern involves the

### ***Final Framework for a Successful Business Incubator for Indonesian Public Universities***

need to gain access to a large sample of incubator stakeholders, especially board of management participants, associations, government officials, etc.

Verma's business incubator framework adapted in this study delved deeply into government support protection, university regulation, system infrastructure factors and credit and reward system moderating factors.

A chief limitation of this study was the relatively small sample size of the quantitative study. As a result, the bootstrapping calculations cannot be in a complex category due to the limited number of respondents and the high complexity of the model (too many arrows). A further limitation involves the researcher's lack of experience in conducting and interpreting qualitative study. The selection of independent variables and definition of successful factors may be biased, as they are based on literature and practitioners' viewpoints.

The recommendations listed below are proposed as possible ways to improve this study. E-mail may not be the most effective medium for contacting top level respondents for research of this nature. It is recommended to conduct face-to-face interviews to obtain the respondent's answer. Business incubator seminars are the very best time to gather all the business incubator managers to be the best respondents.

The difficulty in gaining fully representative board members' involvement in this study suggests that cautious judgment should be exercised in any generalization of the results.

## **7.5 Recommendation for Future Works**

Conducting a mixed-methods research design to explore an unclear area of research such as the business incubator practice in Indonesia produced a considerable amount of data which required intensive effort and time for analysis. A more detailed study on this aspect would be an interesting topic for future research. A study with a large sample size required in order to test the relationship among the various successful factors and how they influence an incubator's success. More comprehensive investigation into the themes and successful factors looked at here would prove to be valuable both to the discipline and to stakeholders working in the sector.

As an initial step, the survey instrument can be improved by adding other indicators of successful business incubator practice. In addition, this categorization may be something that requires verification by a governing body, as interviewees indicated that stratification and regulation may prove to be of value. It is recommended that regulation makers, whether within government bodies or organizational structures, use this information as a basis for evaluating and updating their outlook and the scope and emphasis of existing programs and as a planning tool for future investment. It is important that policies governing this work remain in line with the key objectives outlined in the National Development Plan.

### ***Final Framework for a Successful Business Incubator for Indonesian Public Universities***

Business incubators could implement the monitor performance of start-ups (incubates), improve business assistance, sharpen positive attributes, and improve reporting practices of business incubators.

Future research should focus on the added strategic value of business incubators to start-ups, and the impact on local and regional economics, particularly to examine this in combination with developing better business incubator services. The incubator industry is evolving like any other industry, and research is essential to observe any common themes and patterns that eluded our investigation based on cross-sectional perspective research.

These Indonesian Public University successful factors in the business incubator framework would be very different to Indonesian private universities business incubators. The scope of further research could examine in detail the successful factors in Private Universities, Vocational Education Programs, Science and Technology Parks, and ICT Business Incubators, and Technology Business Incubators.

Internationally, incubators have changed over time and so has the context. For business incubation to have a long-term future, the need for well-supported research models, supported by incubator stakeholders and potential sponsoring organizations, and the Government's full support is an urgent priority.

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## Chapter Review Request: A systematic Review of the Use of Social Media as a Recruitment Tool on the Social Ethical, and Privacy Context

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From: IGI Global Book Submission System (booksubmissionsystemadmin@igi-global.com)

To: ligoz@gmail.com

Date: Thursday, October 24, 2019, 04:05 AM GMT+7

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Dear Dr. Gozali,

Thanks so much for the help on this Lina:)

You have recently submitted a chapter for possible inclusion in the upcoming book, "Handbook of Research on Interdisciplinary Approaches to Digital Transformation and Innovation." In addition to your contribution as an author, I would also like to request that you kindly assist me in the review process as well for the chapter, "A systematic Review of the Use of Social Media as a Recruitment Tool on the Social Ethical, and Privacy Context." I firmly believe that the inclusion of the authors of submitted chapters in the review process can make a significant contribution to the strengthen the quality of this upcoming book, as it would provide authors with the opportunity to become familiar with other submissions to this book and to participate in the review process of these chapters. Ultimately, your participation in the review process can provide you with additional direction and perhaps help to strengthen your own submission to this publication.

Please complete this review by the deadline or immediately decline the role as a reviewer for this chapter at the following web page:

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I will be sharing your comments with the author(s), so your constructive and candid comments are appreciated. Your thoroughness and detail will both assist the author(s) in improving and revising the submission(s) and will ultimately lead to a publication of the highest quality. To see a sample of a high-quality review, please view our [Sample Chapter Evaluation Form](#).

I would kindly request you please submit your completed review form to me by no later than October 30, 2019. If you have any questions, feel free to contact me, Rocci Luppini, at [rluppici@uottawa.ca](mailto:rluppici@uottawa.ca).

I look forward to receiving your review!

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