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Intrapreneurship and Business Model Innovation in ICT Incumbents in Hong Kong: The Mediating Role of Digital Transformation

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ABSTRACT

In the last decade, proliferating digital and AI technologies enabled digital entrepreneurs to create disruptive business models eroding incumbents' businesses. Incumbents must react to mitigate such erosion. This research hypothesizes a framework and examines whether characteristics of digital entrepreneurs, an intrapreneurship organizational structure and dynamic capabilities, enhance business model innovation of incumbent Information, Communication and Technology (ICT) companies in Hong Kong, the special administrative region of China. The study also examines the moderating effect of the stage of digital transformation

A quantitative survey analyzed responses from 181 Hong Kong ICT companies. The structural model shows that dynamic capabilities and intrapreneurship positively influence business model innovation, with dynamic capabilities being as an effective mediator. The stage of digital transformation enhances dynamic capabilities but does not moderate relationships in this framework. Companies with longer histories find it more difficult to innovate, but company age moderates the effect of dynamic capabilities on business model innovation. Respondents' education level, age, and industry age are associated with more intrapreneurial behavior. Three interviews with senior management from Hong Kong ICT incumbents provide qualitative insights supporting the framework.

The proposed framework offers heuristic guidance for ICT incumbents seeking to innovate business models during the digital transformation era.

Keywords: Intrapreneurship, organizational structure strategy, dynamic capabilities, business model innovation, digital transformation, disruptive technologies, incumbent, ICT industry in Hong Kong.

1. INTRODUCTION

Due to the emergence of unprecedented technologies, including mobility, cloud computing, artificial intelligence (AI), and big data analytics over the last decade, digital technologies have significantly transformed people's lives. These advancements have also revolutionized the way people conduct business (Davidson & Vaast, 2010; Giones & Brem, 2017; Pai & Kumar, 2021; Sussan & Acs, 2017). The transformation of the workforce has become even more imminent after the COVID-19 outbreak, as more remote work technologies have emerged, making work-from-home arrangements part of the corporate standard (Savić, 2020). Furthermore, the breakthrough of ChatGPT has demonstrated immediate and phenomenal potential for drastically transforming almost any business worldwide (Bommasani et al., 2021). These new resources, operational demands, and capability breakthroughs pose a complex challenge for senior management as they navigate ongoing digital transformation.

Competition is particularly fierce in the technology industry due to the rise of a new type of business player known as digital entrepreneur -- a sub-category of a digital native entrepreneur, where the process, product, or service is digitized. Digital entrepreneurs, leveraging digital resources from new technologies or ecosystems, have led to the creation of new digital business models. They offer digital artifacts or services by consolidating resources from various business partners within the ecosystem. Companies such as Airbnb, Uber, and e-commerce sellers on Alibaba are examples of those providing enhanced digital customer experiences through physical services (Davidson & Vaast, 2010; Sussan & Acs, 2017; Pai & Kumar, 2021). Digital entrepreneurship is a phenomenal and emerging trend in modern business. Its key characteristics include visionary leadership, high innovation, agility,

short-cycle digital processes, quick responses to the market, advanced digital capabilities, and effective utilization of a digital ecosystem's resources. With these characteristics, they can disrupt traditional incumbents' businesses easily in a short period of time and with far fewer human resources. Valdez-de-Leon (2016) highlights one such disruption, noting that the roaming and SMS revenues of incumbent Communication Service Providers have been significantly disrupted by over-the-top digital entrepreneur players, such as WhatsApp.

Works of literature about digital transformation indicate that technologies have a positive influence on any company, with benefits varying to different extents based on the digital capabilities a company has achieved. Oluwakemi (2019) studied digital literacy and suggested that it delivers positive returns among small business owners in Nigeria. This paper postulates that the benefits of digital transformation outweigh the transformation costs. Incumbent companies face several key barriers in their digital transformation journey (Piccinini, Hanelt, Gregory, & Kolbe, 2015). If an effective organizational strategy is chosen with which such barriers can be mitigated, companies could benefit significantly from digital technologies.

Companies have to undergo digital transformation to keep pace with rapidly changing customer demands. Even though they are technologically savvy, many Information and Communication Technology (ICT) companies are also struggling with disruptive changes in the business environment. These technology companies are either transforming themselves to remain competitive (Price, Lewin, & Cartwright, 1951) or facing the challenge of having their revenues disrupted by digital newcomers. How can ICT business stakeholders cope with these ever-evolving difficulties in the digital era? According to Kane, Palmer, Phillips, Kiron,

and Buckley (2015), the success of digital transformation is not about technology itself but rather the strategy adopted. Among the ICT well-developed regions, Hong Kong has world-class ICT infrastructure and holds the competitive edge of providing west-meets-east technology business and services. According to a report by the Hong Kong Trade Development Council (HKTDC), the Shenzhen–Hong Kong–Guangzhou technology cluster ranked second in the world—behind Tokyo–Yokohama, Japan—in performance among the top 100 science and technology clusters in the World Intellectual Property Organization's Global Innovation Index 2024 (HKTDC Research, 2025). In view of the significance of Hong Kong's ICT industry, it is worth studying digital transformation businesses in Hong Kong. Due to its west-meets-east nature, business administration scholars or practitioners can obtain insight from this research, especially if they want to study or enter the Greater China region market.

Research Problem and Research Questions

Scholars indicate that many incumbent companies fail to transform themselves and are eventually disrupted by digital entrepreneurs. Incumbents often struggle to adopt disruptive ideas due to their reliance on past successes, best practices in decision-making, and resource allocation processes. Even in the technology sector, where incumbents are presumed to have strong technical capabilities, they are not immune to threats from digital entrepreneurs. If these ICT incumbents fail to respond effectively with appropriate strategies, they risk following the same path as Kodak and Blockbuster. The research problem of this study is that incumbent companies face numerous barriers during the digital transformation process. The question is whether a framework that incorporates the characteristics of digital entrepreneurs, including an intrapreneurship organizational structure and dynamic capabilities, can effectively enhance business model innovation among incumbent ICT companies in Hong

Kong during the digital transformation process. Since digital entrepreneurship has become a growing trend in the digital era, incumbent companies could study and learn from the characteristics of digital entrepreneurs.

After reviewing the literature, the study identifies two critical areas: the organizational structure and the capabilities characteristics of digital entrepreneurs. Using various research methodologies, the study seeks to determine whether these characteristics positively influence ICT incumbents. For incumbent companies, the term intrapreneurship, also referred to as corporate entrepreneurship (Burgelman, 1983), will be used as the counterpart to digital entrepreneurship in the transformation process. The researcher hypothesizes that, since intrapreneurship shares characteristics with digital entrepreneurship, establishing a new business unit to exploit emerging opportunities could improve an incumbent company's business performance. Specifically, the research focuses on intrapreneurship organizational structures and dynamic capabilities. Some scholars, such as Zott and Amit (2010), advocate measuring business success based on the novelty and efficiency of the business model and the value it creates for stakeholders. They emphasize that business model innovation is a critical factor for long-term success. This research will therefore examine whether intrapreneurship and dynamic capabilities, as exhibited by digital entrepreneurs, can help ICT incumbents improve their business model innovation.

If a positive relationship is found between intrapreneurship, dynamic capabilities, and improvements in business model innovation, these attributes could serve as effective strategies for incumbents to adopt in the digital era. Digital transformation not only ensures the sustainability of businesses but also fosters innovation and the creation of new business models, providing a competitive advantage in the long term. While this research falls within the broader field of change management, it specifically focuses on studying the business

implications for incumbents when exploiting digital technologies during the digital transformation journey.

2. LITERATURE REVIEW

Digital Transformation and Change Management

Digital transformation has received growing academic research interest since the rise of digital computing in the past two decades. It is a concept that is not contributed to by a single source and occurs at the business, environmental, societal, and institutional levels. Kraus et al. (2021) consolidated a systematic literature review of digital transformation, which includes artificial intelligence, digital processes, collaborative and analytic tools, and the exploitation and exploration of digital technologies for different industries to achieve organizational agility, innovate business, respond to new opportunities, improve productivity, and reduce costs. Brown and Duguid (2000) mentioned that the renowned Moore's Law states that computing power is increasing exponentially (Schaller, 1997). Digital capabilities will transform our daily lives at an exponential rate, even faster than we expect. This trend is significantly accelerating, given the advancements in artificial intelligence technology since 2022.

Wirtz (2019) summarized that people began to conduct transactions online around 1997. These transactions demonstrated the definition of another type of e-commerce business, B2C (business-to-consumer). The term electronic commerce (e-commerce), also known as e-business, encompasses all business activities that use Internet technologies. Internet technologies include the Internet, the World Wide Web, and other technologies such as wireless transmissions on mobile telephone networks. E-commerce is related to the notions of the Internet economy and digital economy, which involve the use of new ICT technologies for economic activities (Tian & Stewart, 2006). Nowadays, through the maturity of dynamic capabilities of emerging digital technologies, as well as the environment, culture, and human behavior, the cost of individuals or companies accessing information or transaction services

has become minimal or insignificant. This is why organizations need to review their business strategies and understand how digital transformation can affect their competitive advantages.

Some scholars use the term digitization to describe the conversion of analog streams of information into digital bits (Gray and Rumpe, 2015). Digitization of Dunhuang Mogao Caves, and virtual reality technology are the example of digitalization. Satish (2019) defines three key themes of digitization: openness, affordances, and generativity. Such openness is a key characteristic of digitization, allowing innovation to be expedited. Affordance lowers the entry barrier for companies entering or expanding into new markets. For example, startup companies receiving funding from venture capitalists through crowdfunding platforms illustrates how digitization makes it more affordable for small companies to pursue innovation. Some studies focus on "servitization" and "Industry 4.0," which explore how traditional sell-and-buy business models can transform into new models centered on the purchase of broken-down services. Frank, Ayala, Mendes, and Ghezzi (2019) developed a framework and concluded that servitization is driven by customer demand-pull, while Industry 4.0 is driven by technology push during companies' digital transformation journeys.

The term digitalization is described as the integration of different technologies into all aspects of daily and social life (Brennen & Kreiss, 2016; Hagberg et al., 2016). In the business environment, digitalization also refers to the use of technologies to change business opportunities, improve processes, or innovate business models (Gartner, 2015). Digitalization has transformed physical products into digital services and significantly shortened the purchasing process. Hagberg, Sundström, and Nicklas (2016) proposed a conceptual framework for digitalization that includes four main concepts:

1. **The digitalization of exchanges:** This includes new omni-channels for communication, transactions, and distribution. For example, years ago, music and video were distributed through retail stores, but today they can be accessed through streaming services such as Spotify and Apple Music.
2. **The digitalization of actors:** This refers to the transformation of producers and consumers. For instance, through digital platforms such as YouTube, anyone can become a content creator (e.g., a YouTuber or Key Opinion Leader [KOL]). This has given rise to new advertising business models, blending the roles of producers and consumers.
3. **The digitalization of settings:** This involves creating virtual environments for conducting business.
4. **The digitalization of offerings:** This refers to digitized products, such as streaming music (e.g., Spotify) or video entertainment (e.g., Netflix).

Digital transformation is defined as the adoption of emerging digital technologies—including mobile platforms, artificial intelligence (AI), cloud computing, blockchain, and the Internet of Things (IoT)—to drive improvements in business practices, elevate customer experiences, optimize operational processes, and facilitate the development of innovative business models (Warner & Wäger, 2019). Westerman, Bonnet, and McAfee (2014) interviewed 157 executives to collect empirical insights into the actions companies had taken regarding digital transformation. They identified nine key elements that companies are either implementing or working towards. These elements are grouped into three main areas:

1. **Transforming customer experience**: By leveraging digital marketing techniques and collecting customer data from various modern touchpoints—such as social media

networks, mobile applications (apps), and devices—companies can gain a deeper and more accurate understanding of their target customers.

2. **Transforming operational processes:** Many companies automate traditional manual or paper-based workflows to improve efficiency. By measuring data in real time using digital tools, companies can enhance planning and performance measurement processes.
3. **Transforming business models:** The authors highlighted that one media executive described the imminent transformation of business models driven by digitalization.

Company could improve its business through newly established digital channels. Some companies create new digital artifacts (or combine digital and physical products), while others transform to reach their customers globally through new digital capabilities. These are examples of how digital technologies drive companies to change or innovate their business models (Westerman, Bonnet, & McAfee, 2014).

Digital Transformation: Why It Matters

Due to the emergence of digital technology and the changing business environment, many incumbents' market shares have been churned disruptively by digital entrepreneurs. Numerous case studies highlight the collapse of traditional incumbents in various industries, such as Kodak, Blockbuster, Hewlett-Packard, Barnes & Noble, Xerox and Warner Bros. These companies lost business to digital entrepreneurs such as Netflix, Alibaba, Amazon, Airbnb, Facebook and Uber (Christensen, 2014; Guttentag, 2015; Keen, 2015; Lucas & Goh, 2009; Tschmuck, 2016). Companies can leverage the characteristics of open innovation and platformization in digital transformation to increase external knowledge sourcing (in-flow) and accelerate internal innovation. This, in turn, improves their ability to monetize internal

assets (outflow; Chesbrough, 2003, 2006). Digitalization allows digital platforms to interconnect, forming clusters of digital platforms. This ecosystem offers additional benefits to digital entrepreneurs. For example, new ventures can easily access established markets, benefit from the reputation of platform owners, and ensure operability if their innovations align with platform specifications (Nambisan et al., 2018).

These are some of the major reasons why digital entrepreneurs are growing and dominating markets. Even small and medium enterprises (SMEs) can seize these unprecedented opportunities to exploit digitalization capabilities and improve performance. Research has shown that digital capability positively impacts SME performance (Cenamor et al., 2019). If incumbents fail to react quickly or adopt the right strategies for transformation, they risk becoming obsolete sooner than expected. Fitzgerald et al. (2013) highlighted that the benefits of digital transformation include improved customer experience and engagement, streamlined business operations, and the creation of new business models. This convergence of affordable technologies is driving modern business innovation and operations. Digital transformation is motivated by various factors, such as pursuing new markets and opportunities, mitigating threats posed by digital entrepreneurs, meeting higher customer expectations, and digitizing products or business processes to reduce costs. Through digital transformation, these goals can be achieved, and various positive results realized.

Digital Transformation: Why Incumbents Fail to Transform

The key barriers encountered during the digital transformation process stem from conflicts with existing company operations, assets, and business models. Traditionally, operating as an integrated company slows down the overall process and stifles innovation (Westerman & Bonnet, 2015). In the context of organizational change for large enterprise incumbents, such

change is often reactive, discontinuous, and ad hoc (Burnes, 2004; De Wit & Meyer, 2005; Luecke, 2003; Nelson, 2003). Moreover, research shows that over 70% of change initiatives fail. To overcome the barriers to digital transformation, companies should consider implementing an organizational change strategy that mitigates these obstacles and barriers.

Dynamic Capabilities

Warner and Wäger (2019) studied the impact of digital transformation on traditional incumbents. They examined the ongoing digital transformation process of incumbents and how these organizations develop their dynamic capabilities throughout this process. Many scholars define dynamic capabilities as the ability to sense opportunities and threats, seize opportunities, and transform the business model. Warner and Wäger (2019) explain the consolidated views of various scholars that, due to the disruptive nature of digital transformation, traditional incumbents need to build stronger dynamic capabilities to create and transform new business models within a shorter timeframe (Achtenhagen et al., 2013; Teece, 2018; Teece & Linden, 2017). In this digital age, incumbents must be able to scale their operations up and down more quickly and easily. They need to fulfill customer demand and respond to disruptive competition within a shorter timeframe. Digital technologies enable companies to achieve these new forms of dynamic capabilities. Like digital entrepreneurs, incumbents need to adopt a lean-startup approach and agile operations when experimenting with new ideas or business models. According to the definition provided by Teece, Leih, and Linden (2015), dynamic capabilities consist of three types of capabilities.

1. Sensing
    a. Companies need to spot and identify new capabilities frequently for their research and development (R&D). They need to regularly check if there are

new capabilities on the market and think if adopted such technology, what new value can it brings to the company.

   b. Be aware of any open innovation, the manager needs to have the sense of complementing his assets with various ecosystem partners.

2. Seizing
   a. Commit to R&D and commit the resource to implement or create a new business model.
3. Transforming
   a. Achieving recombination and change of existing business
   b. Managing threats and refining the new business model

Business Model Innovation (BMI)

Business Model Innovation is defined as designing a new or modifying an existing business activity system of a company (Amit & Zott, 2010, p. 2). Business innovation involves modifying the product or service offered and the value proposition to adapt to changing market situations. In the context of digital transformation, when disruptive technologies emerge, business models must be adapted. BMI is strongly associated with the radical change, reorientation, and development of such business models (Wirtz, 2019).

It is unusual that large firms, even when focusing on innovation, show weaker profitability growth compared to small firms. The main reason is that large firms face significant challenges when attempting to innovate. According to Christensen, Bartman, and van Bever (2016), incumbents often struggle to innovate because they lack appropriate organizational structures. They are typically more reluctant to change, finding it easier to replicate their existing business models—proven and familiar—rather than creating something entirely new.

As Schneider and Spieth (2013) emphasize, BMI is not merely the identification and adjustment of a business model; it also requires exploration and exploitation to achieve positive effects. Strategic entrepreneurship is suggested to be integrated across organizational and process design to facilitate this.

Based on the BMI literature review, the variables of BMI can be summarized as

- Whether the company has produced new types of goods.
- Whether the company has produced new types of customer-led products.
- Whether the company has created a new production method.
- Whether the company has expanded into a new market.
- Whether the company has developed a new source of supply.
- Whether the company has achieved new strategic flexibility.

Organizational Change and Intrapreneurship

When an organization implements a new business model, senior management must articulate a clear vision and go beyond the boundaries of the firm. Senior management also needs to consider changes to the organizational structure. Business model implementation requires an entrepreneurial spirit (Augier & Teece, 2009; Ireland, Covin, & Kuratko, 2009). Therefore, changing the organizational design can improve the recognition of new business opportunities. The evolving digital transformation has attracted researchers worldwide due to the surge in the creation of new disruptive business models. The success of digital transformation depends on several variables, including organizational strategy, technical expertise, and strategic planning. Agile methodology, combined with a team characterized by high competence and strong commitment, is essential (Gurusamy, Srinivasaraghavan, & Adikari, 2016). Intrapreneurship, also referred to as corporate entrepreneurship or corporate

venturing, involves developing a new venture within an existing organization. Intrapreneurship is a multidimensional concept comprising components such as new ventures, new businesses, product or service innovation, process innovation, self-renewal, risk-taking, proactiveness, and competitive aggressiveness (Antoncic & Hisrich, 2003). Kuratko, Montagno, and Hornsby (1990) studied and designed an instrument, called Intrapreneurship Assessment Instrument (IAI), to analyze and diagnose the degree of intrapreneurship culture within an organization. This research adapts from IAI to measure the degree of dimensional structure of organizations with respect to their ability to foster intrapreneurial activity. They are mainly grouped into the following clusters:

- **Factor 1: Work Discretion**
    - Job autonomy and decision-making empowerment
- **Factor 2: Management's support for intrapreneurship and risk-taking**
    - Top management’s experience with innovation
    - Individual risk-takers are often recognized, whether they are eventually successful or not.
    - Encouragement to take calculated risks
    - "Risk-taker" is considered a positive attribute.
    - Small and experimental projects are supported.
- **Factor 3: Intrapreneurial organizational structure and boundaries**
    - Difficulty in forming teams
    - Rigid job descriptions and clearly defined turf
    - Flexibility in organizational structure
- **Factor 4: Resource allocation for innovation**
    - Inadequate time for innovative activities

Conceptual Research Framework

After the literature review on intrapreneurship, dynamic capabilities, business model innovation, and digital transformation in the previous sections, the researcher has constructed a research framework. This framework investigates the relationships between three key constructs: intrapreneurship, business model innovation, and the dynamic capabilities of ICT incumbents in Hong Kong as they undergo the digital transformation journey. Figure 1 shows the conceptual diagram of the research framework.

The main theme of the hypothesis is that during a company's digital transformation journey, in order to catch up with the market's rapid digital technology advancement, the company must pursue an intrapreneurial organizational structure. When companies motivate the entrepreneurial spirit of their employees by adopting an intrapreneurial structure, they can better innovate their business model. Such a strategy improves the competitiveness and adaptability of the company in the dynamic business market. The framework also suggests that intrapreneurship enhances a firm's dynamic capabilities, which are crucial for responding to environmental changes in the business market. These capabilities allow firms to sense and act upon opportunities and threats. They can effectively enable the organization to revamp, sustain, stay relevant, and grow even when facing the disruptive threats of competitors. Dynamic capabilities are hypothesized to be the key drivers of business model innovation.

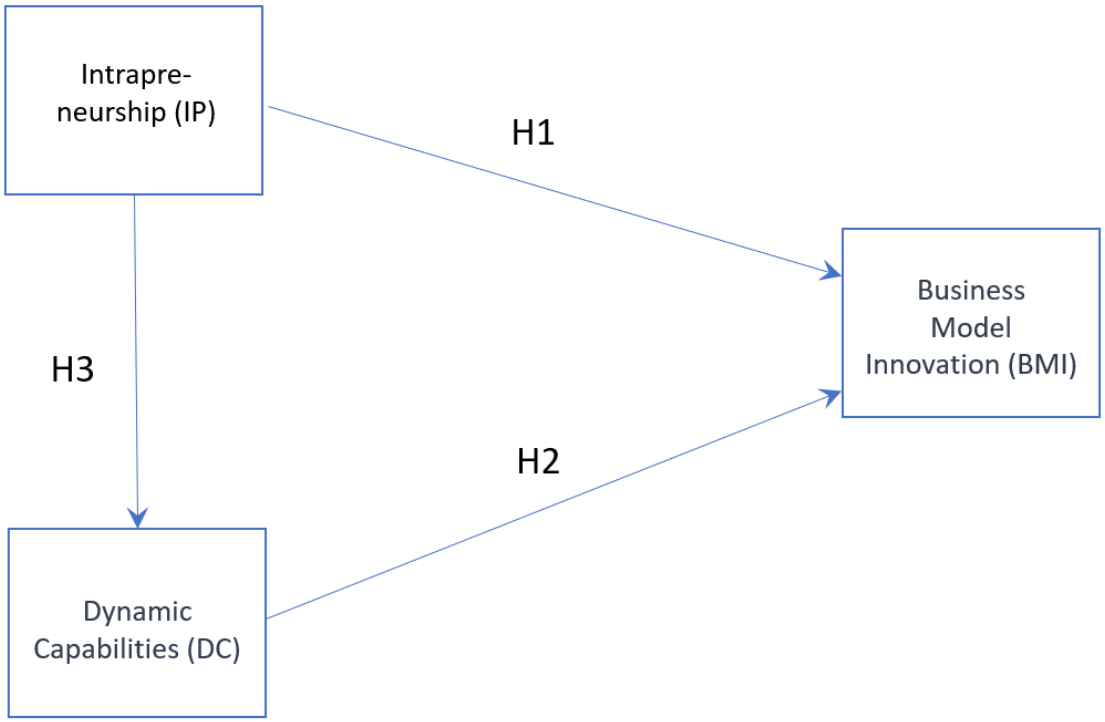

Figure 1 Research framework.

Source. Author's compilation, 2025.

3. RESEARCH METHODOLOGY

This research is based on a methodological foundation that combines empirical quantitative analysis with qualitative study to dissect the phenomenon of intrapreneurship within the process of digital transformation. The quantitative dimension will use statistical tools to measure the effectiveness of intrapreneurial initiatives and dynamic capabilities toward business model innovation, while the qualitative side will explore experiential narratives and strategic contexts through case studies of three ICT incumbents. Below are the research questions.

Research Question one (RQ1) : Can intrapreneurship foster the development of dynamic capabilities within established technology companies (incumbents) in Hong Kong?

Research Question two (RQ2) : During the digital transformation process, can intrapreneurship and dynamic capabilities contribute to enhancing business model innovation for technology incumbents in Hong Kong?

Research Question three (RQ3) : How does different maturity stages of digital transformation affect the relationships between intrapreneurship and business model innovation, dynamic capabilities and business model innovation, as well as intrapreneurship and dynamic capabilities among established technology firms in Hong Kong?

Research Question four (RQ4) : How does company age moderate the relationships between intrapreneurship, dynamic capabilities, and business model innovation in established technology firms in Hong Kong?

Research Question five (RQ5) : To improve business model innovation, does dynamic capability mediate the strength of intrapreneurship or digital transformation in Hong Kong's incumbents?

Moderating Variables

The stages of digital transformation (denoted as DT) variable may moderate the strength of each construct, thereby affecting the overall impact on the variables in this research framework. Recognizing and empirically examining these moderating effects is essential for a thorough understanding of each construct within established firms (Becker, Knackstedt, & Poppelbuß, 2009). **Figure 2** below illustrates the research framework, including the moderating variable "stages of digital transformation," which indicates the digital maturity level of a company.

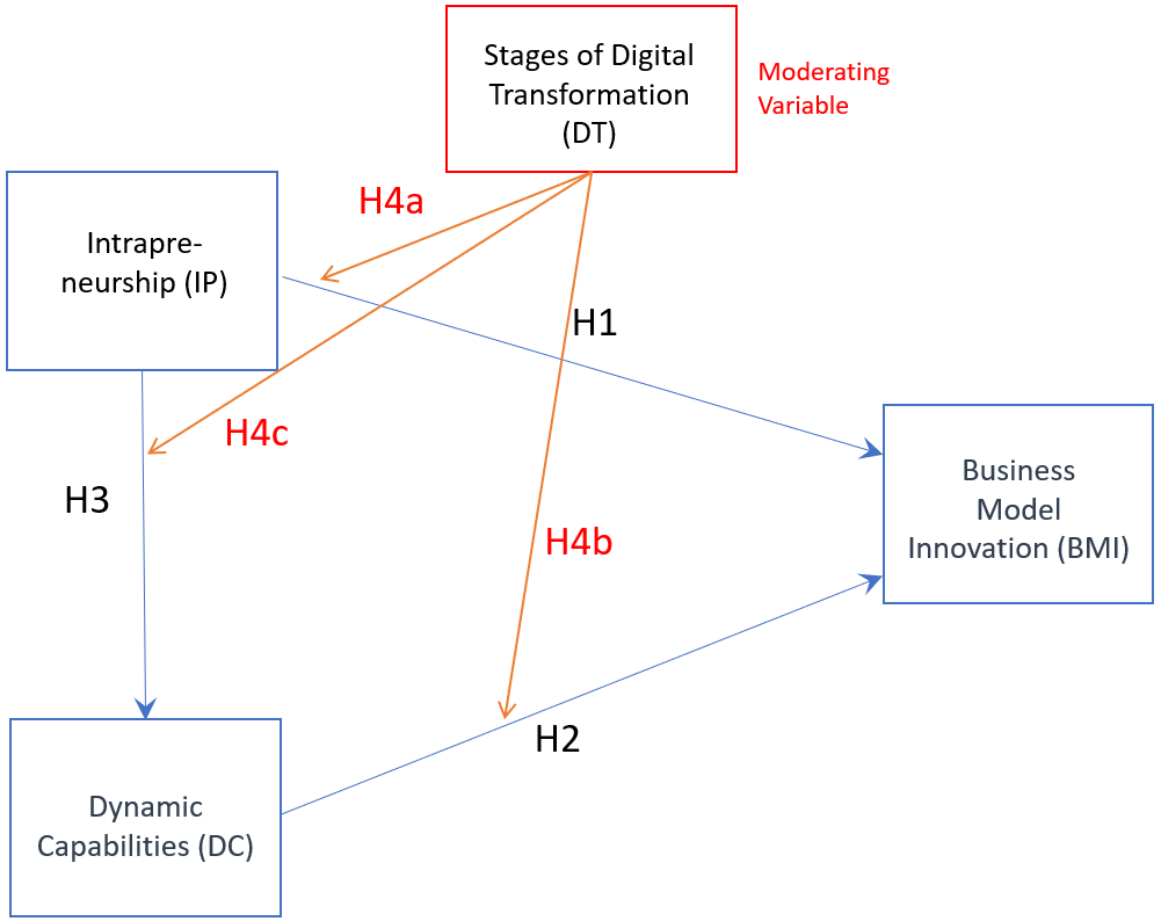

Figure 2 Moderating variables - Stages of Digital Transformation.

Source: Author's compilation, 2025.

Research has shown that company age can play a significant role in moderating organizational behaviors, including organizational structure, dynamic capabilities, and business model innovation. Incumbents typically have more established routines and policies, which may hinder entrepreneurial behaviors and agility in reacting to the market, but they can leverage their richness of resources established over the years. This research will explore whether company age moderates the relationships between the constructs under study. **Figure 3** illustrates the research framework, including the moderating variables "Company Age".

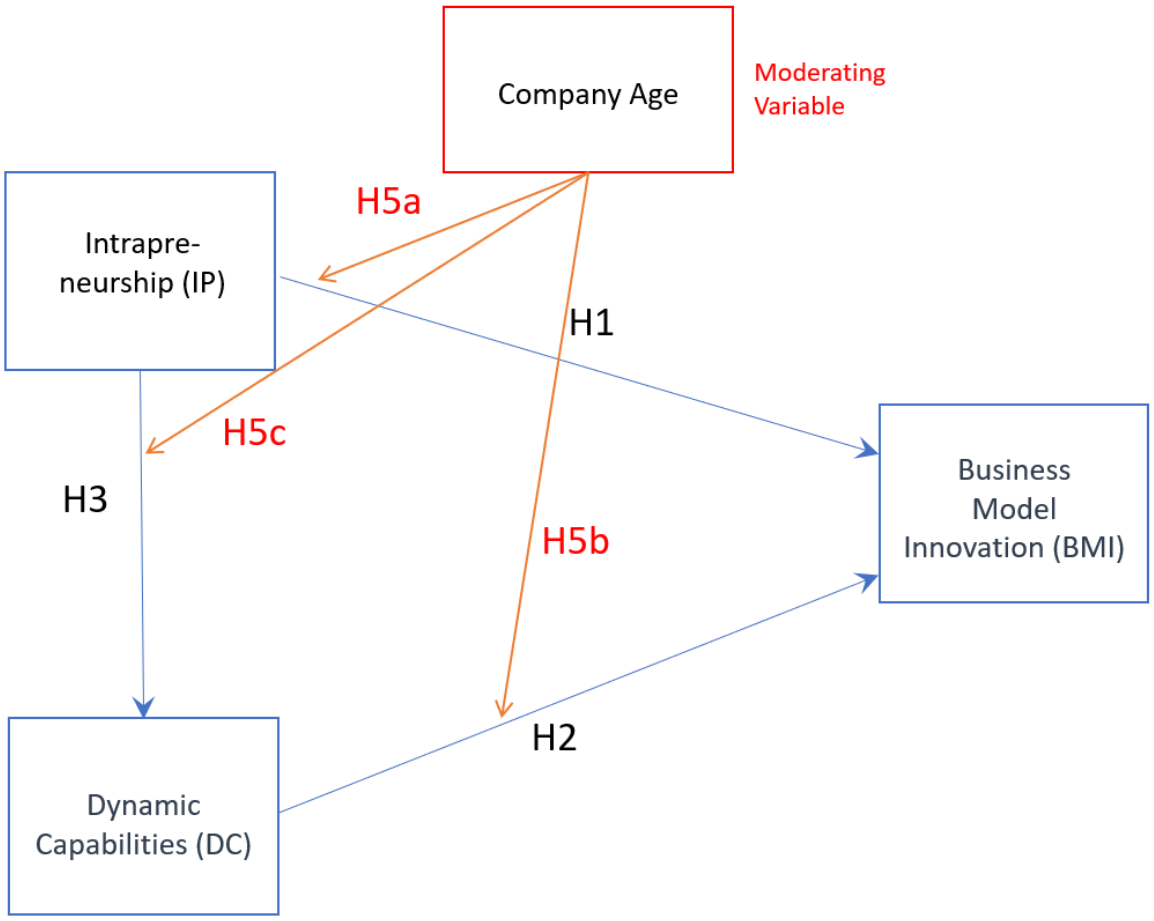

Figure 3 Moderating variables – Company Age.

Source: Author's compilation, 2025.

Mediating Variables – Dynamic Capabilities

Intrapreneurship is hypothesized to positively impact business model innovation by promoting entrepreneurial behaviors that drive creativity and adaptability. A key question in this research is whether dynamic capabilities can mediate this relationship. The diagram below (**Figure 4**) illustrates another view of the research framework, which indicates that dynamic capabilities act as the mediating variables.

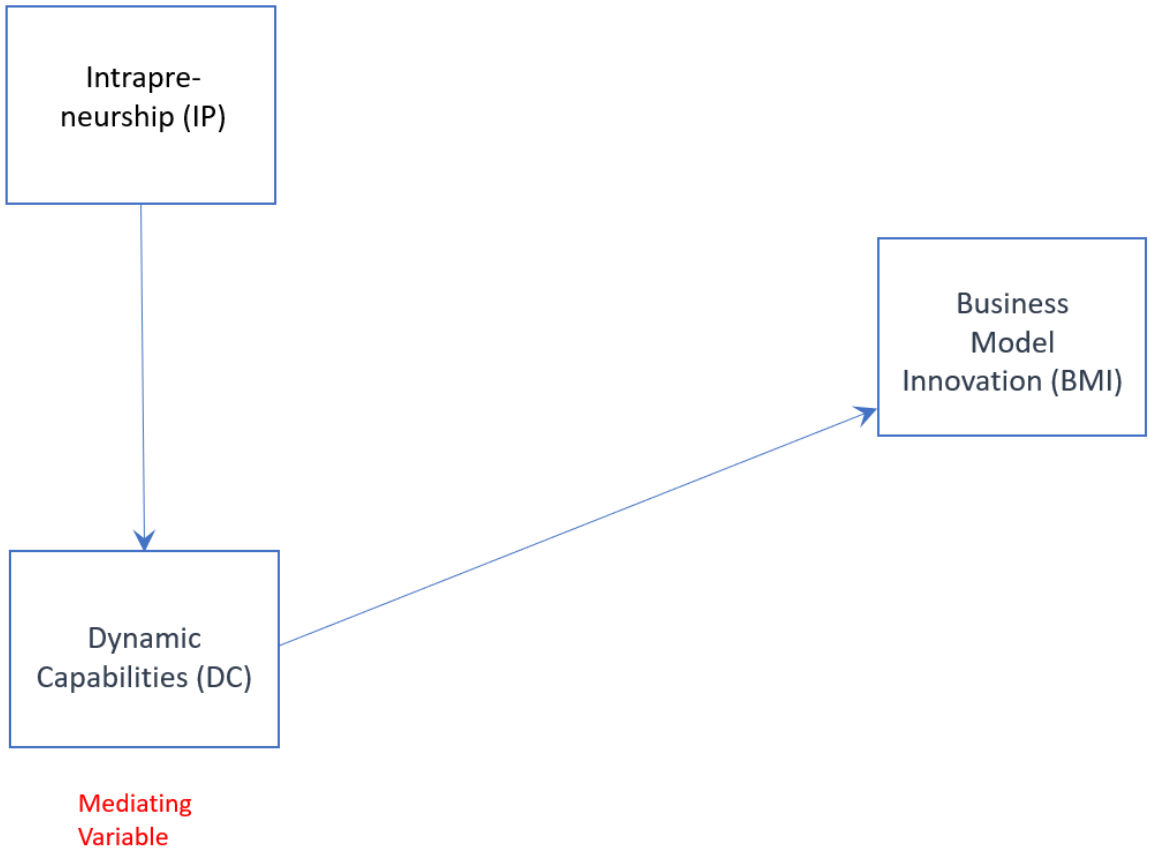

Figure 4 Mediating variables – Dynamic Capabilities.

Source: Author's compilation, 2025.

Research Hypothesis

In the context of the ongoing digital transformation, the objective of this research is to determine the validity of the proposed hypotheses using null hypothesis significance testing (NHST; Neyman & Pearson, 1928) for established technology companies operating in Hong Kong.

First hypothesis H1:

$H1_0$: Intrapreneurship does not have a positive effect on business model innovation.

$H1_a$: Intrapreneurship has a positive effect on business model innovation.

Second hypothesis H2:

$H2_0$: Dynamic capability does not have a positive effect on business model innovation.

$H2_a$: Dynamic capability has a positive effect on business model innovation.

Third hypothesis H3:

$H3_0$: Intrapreneurship does not have a positive effect on dynamic capability.

$H3_a$: Intrapreneurship has a positive effect on dynamic capability.

The specific hypotheses for each moderating variable are defined as follows:

Hypotheses for moderating variables the Stage of Digital Transformation (DT):

$H4a_0$: The Stage of Digital Transformation does not have a moderating effect on construct H1.

$H4a_a$: The Stage of Digital Transformation has a moderating effect on construct H1.

$H4b_0$: Digital Transformation does not have a moderating effect on construct H2.

$H4b_a$: Digital Transformation has a moderating effect on construct H2.

$H4c_0$: Digital Transformation does not have a moderating effect on construct H3.

$H4c_a$: Digital Transformation has a moderating effect on construct H3.

The specific hypotheses for each moderating variable are defined as follows:

Hypotheses for moderating variables the stage of Company Age:

$H5a_0$: Company Age does not have a moderating effect on construct H1.

$H5a_a$: Company Age has a moderating effect on construct H1.

$H5b_0$: Company Age does not have a moderating effect on construct H2.

$H5b_a$: Company Age has a moderating effect on construct H2.

$H5c_0$: Company Age does not have a moderating effect on construct H3.

$H5c_a$: Company Age has a moderating effect on construct H3.

The specific hypothesis for the mediating variable is defined as follows:

Hypothesis for mediating variable the Dynamic Capabilities:

$H6_0$: Dynamic Capabilities does not have a mediating effect between constructs Intrapreneurship and Business Model Innovation.

$H6_a$: Dynamic Capabilities has a mediating effect between constructs Intrapreneurship and Business Model Innovation.

Data Collection, Editing and Coding

After establishing the research goals and objectives, this study adopts pragmatism as its overarching philosophical foundation, incorporating positivist assumptions for the quantitative component and interpretivist assumptions for the qualitative component. Both deductive and inductive approaches will be used. The methodology includes a quantitative survey and analysis, as well as a qualitative case study. Due to time constraints, a cross-sectional design will be employed.

As per the Hong Kong Office of the Government Chief Information Office (OGCIO, 2023), as of April 2022, there were 112,425 individuals working in ICT organizations in Hong Kong, constituting a significant 2.99% of the local labor force. According to the Census and Statistics Department (2023), the data indicates that the total number of company establishments is 11,328. The total population (N) of this research is all the established ICT companies in Hong Kong, which is 11,328.

N = 11,328 companies

Partial Least Squares Structural Equation Modeling (PLS-SEM) is a statistical technique generally considered to be less sensitive to sample size requirements than covariance-based SEM (CB-SEM). The appropriate sample size for PLS-SEM is not determined solely by the population size but by the complexity of the model, including the number of constructs, indicators and the largest number of structural paths directed at a particular construct in the model. A common heuristic in PLS-SEM is the Ten-Time Rule which suggests that the minimum sample size should be ten times the number of formative indicators used to measure a single construct or the number of structural paths directed at a latent construct in

the structural model, whichever is larger (Hair, Ringle, & Sarstedt, 2011). In this research framework, the constructs variables are not formative indicators but reflective indicators. Therefore, the number of structural paths directed at a latent construct will be used to determine the minimum sample size. According to the structural model defined above, the latent construct with the most incoming paths is BMI. has four total paths leading into it. Applying the Ten-Time Rule: Minimum sample size required = 10 X 4 = 40 survey responses.

Given the impracticality of reaching all 11,328 ICT companies that constitute the population N, implementing an unrestricted or simple random sampling strategy for the whole population is not viable. Furthermore, considering Hong Kong's relatively small geographic area (2,755 km²), segmenting ICT companies by location offers little value, rendering area sampling ineffective for this study. Currently, there is no clear method to divide all ICT companies in Hong Kong into meaningful, mutually exclusive strata or clusters, thus making these probability sampling approaches (Cochran, 1977; Lohr, 2010) impractical. Nonetheless, there are several ICT-related associations in Hong Kong with member companies that provide a comprehensive representation of the sector. The three major associations that represent the ICT industry in Hong Kong are:

1) Communication Association of Hong Kong (CAHK), established in 1983 and with a history spanning 41 years.
2) Hong Kong Computer Society (HKCS), established in 1970, boasting a 54-year legacy.
3) Hong Kong Electronics and Technologies Association (HKETA), founded in 2017, which has been active for 7 years.

These associations encompass incumbent ICT companies in Hong Kong with more than a decade of operations, thereby serving as an appropriate representation of the target population for this study. The selection of these associations, due to their representative mix of ICT companies rather than through random selection, suggests that the sampling approach can be best categorized as purposive sampling (Patton, 2002) or convenience sampling (Etikan, Musa, & Alkassim, 2016). After deduplicating potential participants, the remaining target sample included 423 ICT companies. Following data cleansing and outlier elimination, the total number of valid responses was 181, which is much larger than the 40 responses suggested by the PLS-SEM ten-times rule.

Table 1 *Summary of the Survey Details*

Description	**Details**
Refined Target Population	423 Companies / Individual (After Removal of Invalid and duplicated Contacts)
Survey Administration Period	21st July, 2024 – 20th September, 2024 (2 Months)
Survey Response Rate	56.3%
Total Responses Collected	238 Responses
Responses Removed after Data Cleansing	26 Straight-liners 11 Contradictory records 19 Non-relevant records 1 Outlier record
Total Valid Responses Collected	181 Responses after data cleansing
Number of Survey Questions and Questions Types	30 Multiple-Choice Questions and 7-Point Likert Scale Questions

Description	Details
Estimated Time for Survey Completion	15 Minutes
Survey Language Format	Chinese and English (Displayed Simultaneously)

Note. Author's compilation, 2025.

4. RESEARCH FINDINGS AND DISCUSSION

Demographic Characteristics of the Sample (n = 181)

The demographic data collected from 181 respondents are summarized below (Figure 5). The majority of respondents were male employees, with most working in companies that have been established for over 20 years. Respondents' work experience was evenly distributed across three categories. The majority held a university degree or higher, and the predominant age group was between 45 and 60 years.

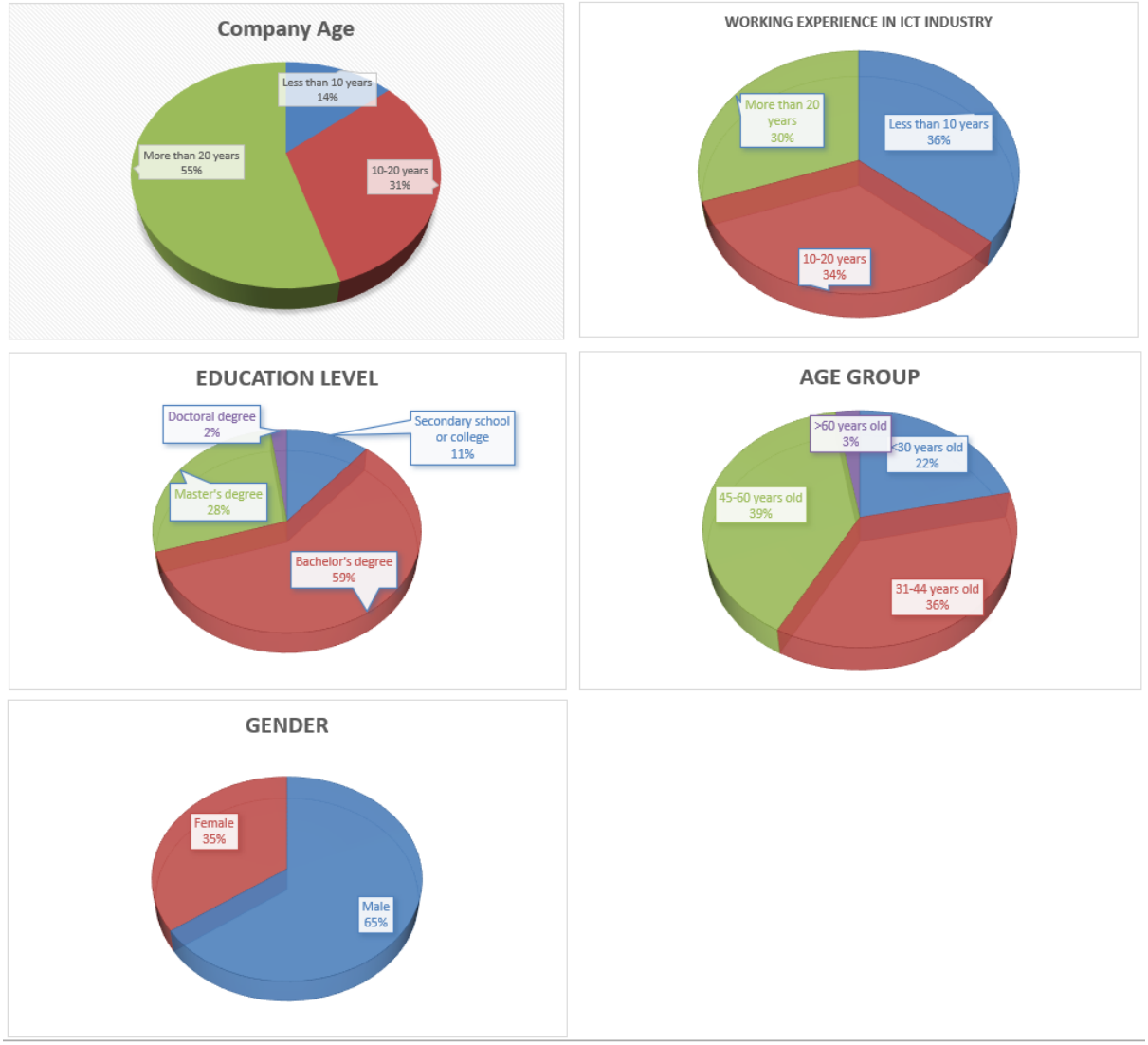

Figure 5 Demographic Characteristics

Comparison of Means

The Bayesian one-way ANOVA test results, as shown in Table 2, provide critical insights into how background factors, education, age, and the respondent's time in the ICT industry, influence the key constructs of intrapreneurship, business model innovation, and dynamic capabilities. These background factors were treated as control variables to account for demographic and organizational differences that might affect the constructs of interest (Antoncic & Hisrich, 2001; Wang et al., 2015).

The findings show a significant difference in education level for intrapreneurship (p =.013). This implies that intrapreneurial conduct is more common among those with greater educational attainment. Since people with higher education may be better able to spot possibilities and spur innovation within companies (Field, 2013). Age significantly impacts intrapreneurship, suggesting that certain age group (45 – 60 years old in the result), engages in intrapreneurial activities more than others. Additionally, respondent's time in ICT industry shows a highly significant relationship with intrapreneurship (p = .002), suggesting that individuals with more experience in their industry are more likely to engage in intrapreneurial activities.

Table 2 Bayesian One-Way ANOVA Test Summary

	IP	BM	DC
Education	.013*	.691	.536
Age	.023*	.808	.703
Time in industry	.002**	.302	.213

Note. $p<.05$*, $p<.01$**, $p<.001$***. BM = Business Model Innovation, DC = Dynamic Capabilities, IP = Intrapreneurship. Education and Age refer to individual respondents; Time in industry refers to the respondent's experience.

Source: Data analysis, author's compilation, 2025.

From

Table 3, the *p*-value (0.002) and Bayes Factor of 2.661, which provide moderate evidence for the model in comparison to the null hypothesis as shown below.

Table 3 Bayesian One-Way ANOVA Test for IP and Model Time In Industry

IP	Sum of Squares	*df*	Mean Square	*F*	Sig.	Bayes Factor[a]
Between Groups	11.713	2	5.856	6.447	.002	2.661
Within Groups	161.689	178	.908			
Total	173.402	180				

Note. IP = Intrapreneurship. a. Bayes factor: JZS method, testing model vs. null model.

Source: Data analysis, author's compilation, 2025.

The ANOVA results revealed a statistically significant difference in intrapreneurship across different industry experience groups ($F(2, 178) = 6.447$, $p = .002$). Further relationships can be found in the Bayesian Estimates of Coefficients. The mean level of intrapreneurship is highest among respondents with more than 20 years of industry experience ($M = 5.22$, 95% credible interval: 4.970–5.477).

The effect size, calculated as eta squared ($\eta^2 = 11.713 / 173.402 \approx 0.068$), indicates a moderate practical effect, meaning that approximately 6.8% of the variance in intrapreneurship is explained by industry experience. According to Cohen's (1988) conventional benchmarks for eta squared, an η^2 larger than 6% is considered more than a medium effect. This indicates that, apart from statistical significance, industry experience accounts for a meaningful portion of differences in intrapreneurial behavior among ICT employees. These findings highlight the practical importance of harnessing the expertise and networks of experienced professionals to promote intrapreneurship within organizations.

In summary, these results suggest that, in the Hong Kong ICT industry environment, intrapreneurship increases with employees' industry experience, with the highest levels observed among respondents with more than 20 years working in the ICT industry.

Validity and Reliability

Based on the analysis, the overall discriminant validity is supported by the Heterotrait-Monotrait Ratio of Correlations (all values are below 0.9, indicating no issues with discriminant validity), Fornell-Larcker criterion (indicating no discriminant validity issues), cross-loadings (confirming good discriminant validity), and Variance Inflation Factor outer model (all values are below 3, confirming that Common Method Bias is less likely to be present), and inner model (all values are below 5, confirming that multicollinearity is not a concern) results. Collectively, these findings suggest that the constructs in the model exhibit adequate convergent and discriminant validity, ensuring that the measurement model is both reliable and valid for further analysis.

As shown in Table 4, both Cronbach's Alpha and Composite Reliability values for the constructs are excellent, being close to 0.90, which indicates a very high level of internal consistency reliability. rho_c is provides a more flexible and precise measure of internal consistency compared to Cronbach's Alpha or rho_a. From the results, rho_c is higher than both Cronbach's Alpha and rho_a, indicating that the construct's internal consistency is good to excellent (values > 0.8) (Kline, 2016), with a more accurate estimation.

Table 4 Cronbach's Alpha and Composite Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
BM	0.835	0.842	0.879
DC	0.875	0.878	0.909
IP	0.888	0.894	0.912

Note. BM = Business Model Innovation, DC = Dynamic Capabilities, IP = Intrapreneurship, DT = Stages of Digital Transformation.

Source: Data analysis, author's compilation, 2025.

Research Model testing with PLS-SEM

PLS-SEM model includes both the measurement model and the structural model. The measurement model evaluates the relationships between latent constructs (IP, BM, DC, DT, and Company Age) and their respective indicators, ensuring reliability and validity (Hair et al., 2021). The structural model assesses the hypothesized relationships between latent constructs, the direct effects (IP -> BM, DC -> BM, and IP->DC) and moderating effects of Company Age and DT. The indicator loadings, path coefficients, and R^2 values offer valuable information about the relationships and predictive power of the constructs (Hair, Hult, Ringle, & Sarstedt, 2022). Figure 6 illustrates the structural model of PLS-SEM. It is generated using SmartPLS V3.0 (Ringle et al., 2015). This diagram presents the results of the path analysis conducted to explore the interrelationships among each construct. The analysis shows both direct and mediated relationships, emphasizing the roles each construct plays within the organizational framework.

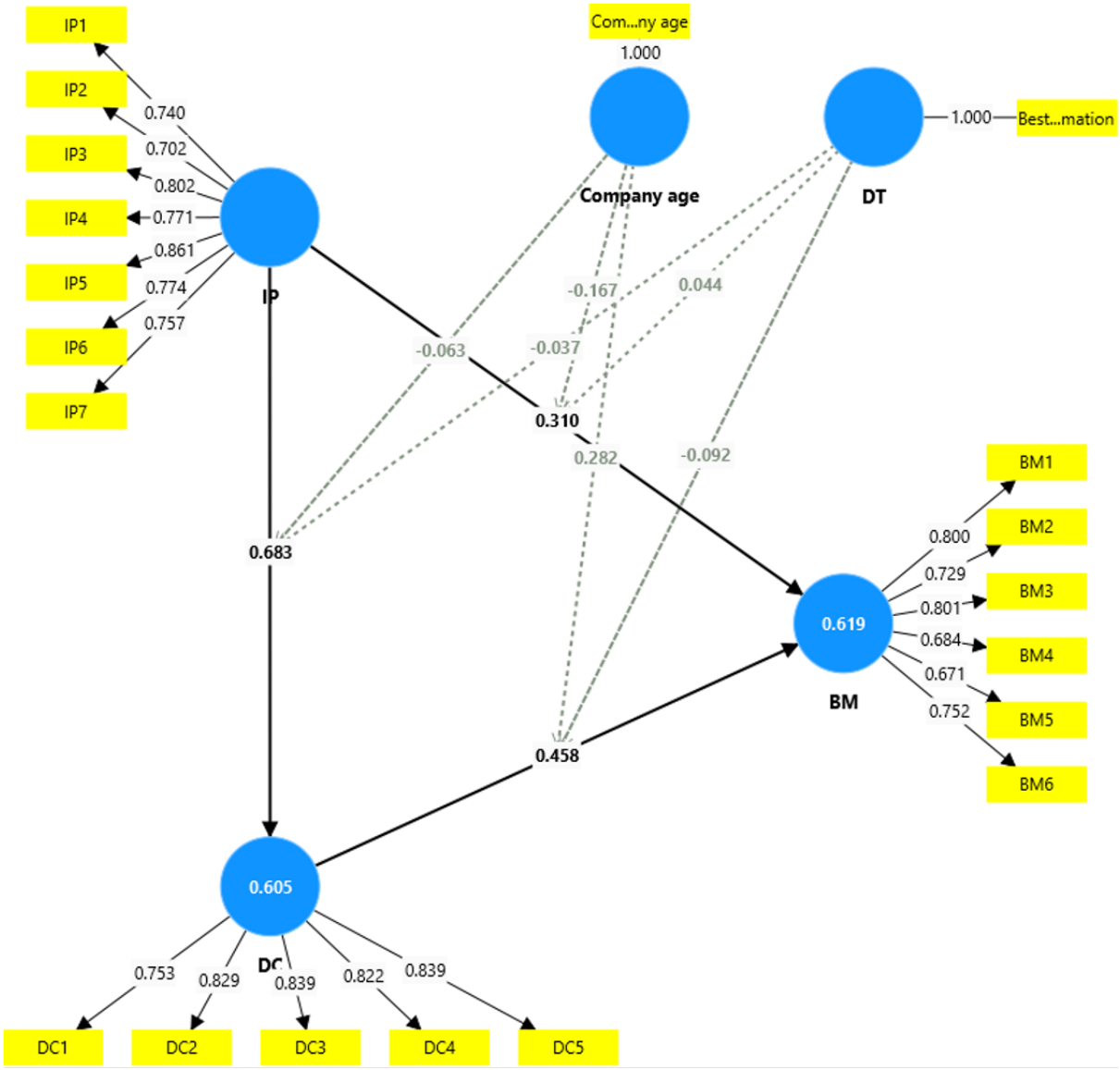

Figure 6 Structural model of PLS-SEM.

Note. Author's compilation, direct output from SmartPLS V3.0, 2025 (Ringle et al., 2015).

Dynamic Capabilities have a strong positive and significant effect on Business Model Innovation (.458, $p < .001$), indicating that enhanced dynamic capabilities significantly contribute to improving business model innovation. Similarly, Intrapreneurship positively influences BM (.310, $p < .001$) and has an even stronger positive impact on DC (.683, $p < .001$), suggesting that intrapreneurial activities play a crucial role in fostering both dynamic capabilities and business model innovation.

The stage of Digital Transformation a company possess shows a significant positive effect on DC (.220, $p < .001$), highlighting that if a company acquires high level of digital transformation maturity, the company's dynamic capabilities can be improved. Additionally, Company Age has a weak but significant direct negative effect on BM (-.137, $p < .01$), indicating that older companies may face challenges in innovating their business models. **Table 5** shows the t-statistics and p-values for each path in the research model.

Table 5 Path Coefficient - Mean, STDEV, T values, p values

	Original sample (*O*)	Sample mean (*M*)	Standard deviation (*STDEV*)	*t* statistics (|*O/STDEV*|)	*P* values	2.5%	97.5%	
DC -> BM	0.458	0.462	0.094	4.857	0.000	0.272	0.643	***
IP -> BM	0.310	0.314	0.091	3.400	0.001	0.136	0.494	***
IP -> DC	0.683	0.675	0.063	10.828	0.000	0.547	0.788	***
DT -> BM	0.020	0.018	0.049	0.401	0.689	-0.080	0.112	
DT -> DC	0.220	0.226	0.067	3.297	0.001	0.100	0.358	***
DT x DC -> BM	-0.092	-0.091	0.080	1.146	0.252	-0.248	0.073	
DT x IP -> BM	0.044	0.051	0.087	0.513	0.608	-0.113	0.222	
DT x IP -> DC	-0.037	-0.048	0.069	0.534	0.593	-0.183	0.075	
Company age -> BM	-0.137	-0.137	0.047	2.893	0.004	-0.232	-0.043	**
Company age -> DC	-0.073	-0.070	0.049	1.485	0.138	-0.165	0.027	
Company age x IP -> BM	-0.167	-0.174	0.086	1.931	0.054	-0.350	-0.012	
Company age x IP -> DC	-0.063	-0.065	0.042	1.478	0.140	-0.151	0.019	
Company age x DC -> BM	0.282	0.291	0.095	2.965	0.003	0.110	0.480	**

Note. * p<.05, ** p<.01, *** p<.001. BM = Business Model Innovation, DC = Dynamic Capabilities, IP = Intrapreneurship, DT = Stages of Digital Transformation.

Source: Data analysis, author's compilation, 2025.

The analysis of moderating effects reveals several notable findings. The interaction term Company Age x DC -> BM has a positive and significant moderating effect (.282, $p < .01$), indicating that Company Age strengthens the relationship between Dynamic Capabilities and Business Model Innovation. However, the moderating effects involving Digital

Transformation are not significant. For instance, the interaction terms DT x DC -> BM, DT x IP -> BM, and DT x IP -> DC fail to show significant moderating effects.

From the path coefficient Table 6, the items IP -> DC, DC -> BM, and IP -> BM, which represent the mediating effect of dynamic capabilities on the relationship between intrapreneurship and business model innovation, all have p-values < .001. This indicates that dynamic capabilities have a strong mediating effect on the relationship between intrapreneurship and business model innovation. Similarly, the items DT -> DC and DC -> BM, which represent the mediating effect of dynamic capabilities on the relationship between digital transformation and business model innovation, also have p-values < .001. This indicates that dynamic capabilities have a strong mediating effect on the relationship between digital transformation and business model innovation. It indicates that digital transformation enhances business model innovation through the improvement of dynamic capabilities.

Table 6 *Mediating Effect*

	Original sample (*O*)	Sample mean (*M*)	Standard deviation (*STDEV*)	t statistics (|*O/STDEV*|)	*P* values	2.5%	97.5%	
IP -> DC -> BM	0.313	0.313	0.074	4.210	0.000	0.177	0.467	***
DT -> DC -> BM	0.101	0.103	0.035	2.847	0.004	0.042	0.179	**
DT x IP -> DC -> BM	-0.017	-0.022	0.033	0.516	0.606	-0.091	0.036	
Company age x IP -> DC -> BM	-0.029	-0.029	0.020	1.415	0.157	-0.073	0.009	
Company age -> DC -> BM	-0.033	-0.032	0.024	1.407	0.159	-0.081	0.013	

Note. * p<.05, ** p<.01, *** p<.001. BM = Business Model Innovation, DC = Dynamic Capabilities, IP = Intrapreneurship, DT = Stages of Digital Transformation.

Source: Data analysis, author's compilation, 2025.

The Coefficient of Determination R^2 and Adjusted R^2 values for both business model innovation and dynamic capability indicate that the proposed model has a strong ability to

explain the variance in these constructs. This high level of explained variance, together with the robust outer loadings, which exceed .7, confirms that the model is well-specified and that the relationships among Intrapreneurship, Business Model Innovation, and Dynamic capabilities are both significant and meaningful within the context of this study. The Cohen's Effect Size f^2 values indicate the effect size of predictors (Cohen, 1988, 1992; Chuan & Penyelidikan, 2006). The results show that dynamic capabilities have a medium effect on business model innovation ($f^2 = .197$), making them a strong driver. Intrapreneurship has a small effect on business model innovation ($f^2 = .099$) but a very large effect on dynamic capabilities ($f^2 = 1.029$), highlighting its critical role in enhancing a company's adaptive capacity. Digital transformation has a small effect on dynamic capabilities ($f^2 = .106$) but a negligible direct effect on business model innovation ($f^2 = .001$), indicating that its influence is largely indirect.

Table 7 summarizes the results of the hypothesis testing, indicating whether each hypothesis was accepted or rejected based on the statistical analysis.

Table 7 *Results of Hypotheses Tests*

	Hypotheses	Result
$H1_a$	Intrapreneurship has a positive effect on business model innovation.	Accepted
$H2_a$	Dynamic capabilities has a positive effect on business model innovation.	Accepted
$H3_a$	Intrapreneurship has a positive effect on dynamic capability.	Accepted
$H4a_a$	The stage of digital transformation has a moderating effect on the relationship between intrapreneurship and business model innovation.	Rejected

$H4b_a$	The stage of Digital Transformation has a moderating effect on the relationship between dynamic capabilities and business model innovation.	Rejected
$H4c_a$	The stage of digital transformation has a moderating effect on the relationship between intrapreneurship and dynamic capabilities.	Rejected
$H5a_a$	Company age has a moderating effect on the relationship between intrapreneurship and business model innovation.	Rejected
$H5b_a$	Company age has a moderating effect on the relationship between dynamic capabilities and business model innovation.	Accepted
$H5c_a$	Company age has a moderating effect on the relationship between intrapreneurship and dynamic capability.	Rejected
$H6a_a$	Dynamic capabilities mediate the relationship between constructs Intrapreneurship and business model innovation.	Accepted

Source: Data analysis, author's compilation, 2025.

Based on the results of the hypotheses testing, intrapreneurship has a positive and significant effect on the development of dynamic capabilities within technology incumbents in Hong Kong (H3). This indicates that fostering intrapreneurial activities within an organization can indeed help in building and enhancing dynamic capabilities, allowing companies to adapt and respond to changing environments more effectively. The test results of hypothesis H3 provide a positive answer to Research Question one (RQ1). The results also show that both intrapreneurship and dynamic capabilities have a positive effect on business model innovation (H1 and H2). This suggests that during the digital transformation process, technology incumbents in Hong Kong can leverage intrapreneurial efforts and strong dynamic capabilities to drive innovation in their business models. These internal capabilities are crucial drivers for adapting and evolving business models in response to digital transformation challenges and opportunities. These test results of hypotheses H1 and H2 also

provide a positive answer to Research Question two (RQ2). The hypotheses testing results indicate that the stage of digital transformation does not moderate the relationships between intrapreneurship and business model innovation (H4a), dynamic capabilities and business model innovation (H4b), or intrapreneurship and dynamic capabilities (H4c). This means that the strength of these relationships remains consistent regardless of the stage of digital transformation the organization is undergoing. The test results of hypotheses H4a, H4b, and H4c provide negative answers to Research Question three (RQ3).

The research results reveal that older companies, with a higher company age, tend to face greater difficulty in innovating their business models. From the hypothesis testing results (H5a and H5c), company age does not have any significant moderating effect on the relationship of intrapreneurship to no matter dynamic capabilities or business model innovation. However, it is discovered from the positive result of alternative hypothesis H5b, that company age is moderating the relationship between dynamic capabilities and business model innovation. It provides answer to the Research Question four (RQ4).

In addition, dynamic capabilities are proven to mediate the effect of intrapreneurship on improving business model innovation (H6). Research Question five (RQ5) is concluded. After answering Research Questions four and five (RQ4 and RQ5), the researcher concludes that in Hong Kong's ICT industry, older companies have advantages in utilizing their dynamic capabilities to improve their business model innovation. Additionally, by adopting an intrapreneurship strategy, companies can improve their business model innovation, and by enhancing their dynamic capabilities, this effect can be strengthened.

5. CONCLUSION

The research findings indicate strong support for the key constructs under investigation: intrapreneurship, business model innovation, and dynamic capabilities. Based on the descriptive statistics, respondents from ICT companies in Hong Kong exhibited positive perceptions of these constructs.

Based on the research findings, it is implied that incumbent Hong Kong ICT companies (those older than 10 years) face difficulties in innovating their business models because they have operated for more than a decade with previous success. As a result, their internal processes and policies have become stringent and constrained. Regardless of the stage of digital transformation they are in, during the improvement process, when they attempt to exploit new digital technologies, dynamic capabilities—an organization's ability to adapt and reconfigure its resources in response to changing environments—are a crucial factor for them to innovate their business models. It is also observed, based on both the quantitative and qualitative analysis conducted in this research, that companies with a longer history tend to benefit more from enhanced dynamic capabilities. Therefore, improving the dynamic capabilities of an incumbent is key to amplifying the effects of an intrapreneurship strategy, as concluded by this research framework.

Intrapreneurship is proven to be a suitable organizational strategy and approach to facilitate this innovation. Given the strength of dynamic capabilities in mediating the relationship between intrapreneurship and business model innovation, it is important for Hong Kong ICT companies undergoing digital transformation to focus on improving their dynamic capabilities, as this will enhance their ability to innovate their business models.

From the interviews with senior management practitioners in the incumbent ICT industry, the hypotheses regarding intrapreneurship as an organizational structure and the importance of dynamic capabilities in improving business model innovation were supported. They also emphasized the importance of full endorsement from top management, an entrepreneurial mindset, and continuous market sensing of emerging technologies, which are key attributes for the successful innovation of business models.

Managerial Implications

Although Hong Kong is home to strong ICT companies, these companies are struggling to innovate in the face of many digital entrepreneurs who are disrupting their existing businesses. They face the same challenges when trying to innovate, as they cannot fully capitalize on their traditional strengths. Hong Kong is also well known as the gateway between the Western world and Mainland China. Multi-national ICT corporations that want to establish a presence in Mainland China might find it easier to set up their business in Hong Kong first. Therefore, this research is crucial in contributing to the development of a framework for ICT companies to improve their business model innovation not only in Hong Kong but also for Multi-National Corporations aiming to penetrate the Mainland China market. These insights are not only relevant for Hong Kong ICT firms but can also inform managerial strategies in other developed markets facing similar challenges in digital innovation. Based on the research findings, some practical recommendations can be made for senior management of incumbent ICT companies.

- **Strengthen dynamic capabilities:** Managers should prioritize building organizational agility and the ability to reconfigure their existing resources. This includes investing in talent development, flexible structures, and continuous learning

to adapt to new technological changes, as digital technologies are evolving at an unprecedented rate since the introduction of AI. Companies should dedicate resources to actively monitor emerging technologies and market trends. There should be mechanisms for reviewing customer feedback and conducting competitive analysis for timely business model adjustments.

- **Promote intrapreneurship:** Being a large and rigid company is no longer a definite advantage. Even though an incumbent company may be large in terms of human capital, it should encourage a culture where employees are empowered to experiment with new business ideas and approaches. This may involve setting up internal startup teams, creating reward systems for innovation, and granting autonomy to pursue new ventures. Failure of new business initiatives should not be discouraged; instead, acting quickly to pivot to new ideas is more crucial.
- **Ensure top management endorsement:** Senior leadership must visibly support innovation initiatives, provide clear strategic direction, and allocate sufficient resources for digital transformation projects.

Digital entrepreneurs are disruptive to traditional businesses. With just a small number of staff who can harness disruptive technology or new resources, they can disrupt the business or operations of incumbent companies - which often have large and complicated structures, redundant staff, and long business histories - in an unexpectedly short period of time. To conclude, by implementing these recommendations, managers of incumbents can renew and transform their companies, increase agility to remain competitive against small but strong digital entrepreneurs and challengers, better position their organizations, overcome barriers to rapid digital transformation, and maintain sustainable business model innovation in this unprecedented Artificial Intelligence and digital era.

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