Global Science Publishing

ISSN 2972-3183

# Economics & Management Information

Volume 2, Issue 1, June 2023


www.sgsci.org
ojs.sgsci.org/iournals/emi

# Contents

Vol.2 No.1 June 2023

https://doi.org/10.58195/emi.v2i1.34

Global Science Publishing

EMI

Economics & Management Information

https://ojs.sgsci.org/journals/emi

Article

# Study on the Development Path of Guangdong-Hong Kong-Macao Greater Bay Area and ASEAN Cross-Border E-Commerce Under the RCEP Framework

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**Abstract:** In recent years, with the rapid development of cross-border e-commerce and the transformation and upgrading of traditional foreign trade of various countries, both China and ASEAN regard cross-border e-commerce as an important content to promote the high-quality development of bilateral trade. The Guangdong-Hong Kong-Macao Greater Bay Area is a key global trade digital pilot area. The official entry into force of the RCEP provides a new environment for the development of cross-border e-commerce between the Greater Bay Area and ASEAN countries. From the background of RCEP framework, this paper analyzes the opportunities and challenges faced by cross-border e-commerce enterprises in the Greater Bay Area and ASEAN. Based on this, it proposes the innovative development path of cross-border e-commerce from the aspects of cross-border logistics system building, cross-border e-commerce talent team building and cross-border e-commerce intellectual property protection. It is aimed to activate the Greater Bay Area commodity trade market, and further promote the development of cross-border e-commerce between the Greater Bay Area and ASEAN countries.

**Keywords:** RCEP; ASEAN; cross-border e-commerce; path of innovation

## 1. Introduction

Lower trade costs are the basis for the globalization of production and consumption, and provide important support for the transformation and upgrading of foreign trade of all countries. In 2022, the Regional Comprehensive Economic Partnership (RCEP) officially entered into force, and 10 ASEAN members (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) and five non-ASEAN members (China, Japan, the Republic of Korea, Australia, and New Zealand) began to implement the RCEP. ASEAN is an important market for China's cross-border e-commerce, and the Guangdong-Hong Kong-Macao Greater Bay Area is a key global trade digital pilot area [1]. The RCEP's entry into force has injected new vitality into multilateralism and free trade, and brought inexhaustible impetus to the import and export trade of the Greater Bay Area. At the same time, under the framework of RCEP [2], the development of cross-border e-commerce in the Greater Bay Area and ASEAN countries also faces a series of challenges. How to grasp the new opportunities and challenges brought by RCEP has become an urgent issue to be solved [3–5]. Based on this, this paper discusses the innovative path for the development of cross-border e-commerce cooperation in the Greater Bay Area and ASEAN countries.

Received: 16 November 2022; Accepted: 20 December 2022.

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## 2. Opportunities for Greater Bay Area-ASEAN Cross-Border E-Commerce Development Under the RCEP Framework

### *2.1. Reduce the Transaction Costs of Greater Bay Area - ASEAN Cross-Border E-Commerce*

Under the RCEP framework, more than 90% of trade in goods in the free trade area is free of tariffs, which greatly reduces the import cost of raw materials and resource products for cross-border e-commerce enterprises [6]. Meanwhile, products processed into finished products are more competitive in price, and the reduction of export tariffs increases the profit margin of enterprises.

### *2.2. Reduce the Risks of Cross-Border E-Commerce Transactions in the Greater Bay Area and ASEAN*

In the whole process of cross-border e-commerce transactions, the trade standards of different countries in the world are not uniform, which brings certain risks to participants. Under the RCEP framework, there is mutual policy trust, mutual recognition of regulations, mutual exchange of enterprises among the participants, and unified rules on rules of origin, customs procedures, inspection and quarantine, technical standards, etc.,[7, 8] which to a large extent breaks the tax barriers in the development of cross-border e-commerce, promotes cross-border e-commerce enterprises in the Greater Bay Area to go overseas, and reduces risks in all aspects, opening up the Greater Bay Area-ASEAN market.

### *2.3. Enhance the Efficiency of Greater Bay Area-ASEAN Cross-Border E-Commerce Transactions*

The RCEP framework aims to facilitate multilateral trade, and explicitly proposes to promote paperless trade, electronic signature, electronic authentication and other technologies. It will help promote digital supervision of cross-border e-commerce, simplify procedures, and improve the efficient management of customs procedures [9].

### *2.4. To Foster a Sound Ecosystem for the Development of Cross-Border E-Commerce in the Greater Bay Area and ASEAN*

The RCEP provides that States Parties shall adopt or maintain laws and regulations to protect Internet consumers in the region from losses resulting from fraudulent and misleading practices. For cross-border e-commerce transactions, it is necessary to provide specific rules for the protection of rights and interests, adopt or maintain a legal framework for the protection of personal information, and take relevant international standards and principles into account. The provisions on consumer rights protection in RCEP have greatly fostered a healthy environment for the development of cross-border e-commerce and reduced possible differences among participants in different legal contexts.

### *2.5. To Facilitate the Transformation and Upgrading of Cross-Border E-Commerce Enterprises in the Greater Bay Area and ASEAN*

RCEP pays special attention to supporting the construction of overseas warehouses. For cross-border e-commerce enterprises, the construction of overseas warehouses can reduce logistics costs, improve the timeliness of logistics, optimize the procedures of return and exchange of goods, improve the satisfaction of trans-regional online consumers, improve the service system of cross-border e-commerce, and sustainably promote the transformation and upgrading of cross-border e-commerce enterprises.

### *2.6. To Optimize the Industrial Chain of Greater Bay Area-ASEAN Cross-Border E-Commerce Development*

The RCEP has established sound rules on the flow of resources, goods and human resources, and technical cooperation among member states, further promoting the free flow of factors of production within the framework. Cross-border e-commerce enterprises in the Greater Bay Area and ASEAN can fully optimize the allocation of production factors such as capital, technology and talents for the development of cross-border e-commerce, and comprehensively upgrade the industrial chain.

## 3. Challenges Facing the Development of Cross-Border E-Commerce in the Greater Bay Area and ASEAN Under the RCEP Framework

### *3.1. Cross-Border E-Commerce Enterprises in the Greater Bay Area and ASEAN Face Increased Risk of Violations*

The development of Greater Bay Area-ASEAN cross-border e-commerce is in its infancy, and extensive development will lead to irregularities. There are great risks of violations in terms of intellectual property protection, online consumer information protection, and sales of unqualified products.

### *3.2. Cross-Border E-Commerce Enterprises in the Greater Bay Area and ASEAN Are in Short Supply of Relevant Talents*

With the booming development of cross-border e-commerce, cross-border e-commerce enterprises have a growing demand for talents. Both in terms of quality and quantity of talents, there is a huge gap, and high-end compound talents are rare.

### *3.3. Insufficient Supply of Supporting Services for Cross-Border E-Commerce Enterprises in the Greater Bay Area and ASEAN*

Under the RCEP framework, cross-border export e-commerce enterprises in the Greater Bay Area are required to have a comprehensive understanding of the laws, tax rules, market preferences and other information of ASEAN countries, which requires them to provide more complete and refined services for the development of the industry. As a matter of fact, there are big gaps in logistics, payment, marketing, finance, supply chain and other aspects of cross-border e-commerce enterprises within the Greater Bay Area and ASEAN, and a complete cross-border e-commerce service system has yet to be established.

## 4. Innovative Development Paths for Greater Bay Area - ASEAN Cross-Border E-Commerce Enterprises Under the RCEP Framework

### *4.1. To Innovate the Greater Bay Area-ASEAN Cross-Border E-Commerce Service System*

Try to make innovations in the regulatory process, financing channels, transnational legal services, trade efficiency and other aspects of all links of cross-border e-commerce. In the aspect of multilateralization mode, it actively promotes the unification and recognition of regional standards. We will implement preferential tax policies for goods exported by cross-border e-commerce enterprises to overseas warehouses, and reduce tax expenditure of enterprises. We will improve RMB settlement facilitation, encourage financial institutions to provide diversified financial products and services based on the characteristics of cross-border e-commerce enterprises, and strengthen legal and regulatory training and advisory services for cross-border e-commerce enterprises to help them avoid relevant legal risks. We will promote the paperless process of cross-border e-commerce and improve trade efficiency.

### *4.2. To Improve the Logistics and Marketing Systems for the Development of Cross-Border E-Commerce in the Greater Bay Area and ASEAN*

In the whole process system of cross-border e-commerce, cross-border e-commerce logistics mode and cross-border e-commerce marketing mode are crucial.

First of all, for the development of cross-border e-commerce in the Greater Bay Area and ASEAN, the construction of intelligent logistics system should be accelerated and cross-border e-commerce enterprises should be encouraged to build overseas warehouses. On the one hand, competent enterprises should be encouraged to build overseas warehouses by themselves; on the other hand, they should explore co-construction of overseas warehouses with overseas logistics and warehousing enterprises to reduce logistics costs. We shall make full use of the technological advantages of the Greater Bay Area in big data, artificial intelligence, cloud computing and the Internet of Things, upgrade the intelligent service level of cross-border logistics systems, strengthen technical assistance to the relatively backward ASEAN countries, and enhance the networking,

information and intelligence of their logistics systems.

Secondly, the development of cross-border e-commerce in the Greater Bay Area and ASEAN should try new marketing models and vigorously develop cross-border e-commerce live streaming. Nowadays, the new marketing model of "cross-border e-commerce + live streaming" has become an important tool to drive the growth of e-commerce. The development of the Greater Bay Area - ASEAN cross-border e-commerce should take "live streaming" as the outlet, give full play to the advantages of minority language talent resources, and actively cultivate the Greater Bay Area live streaming and goods activities for ASEAN. Promote the rapid growth of cross-border e-commerce in the Greater Bay Area and ASEAN, so as to achieve a wider market coverage of cross-border live streaming e-commerce.

### *4.3. To Optimize the Greater Bay Area-ASEAN Cross-Border E-Commerce Talent Pool*

Cross-border e-commerce involves many links, complicated processes and high requirements for talents. For enterprises, they can adopt the mode of "bringing in", "going out" and joint training with colleges and universities to meet the demand for cross-border e-commerce positions and improve their competitiveness. There are many universities in the Greater Bay Area. Statistics show that more than 95% of the universities in the Bay Area have established government, industry, education and research bases. They can make full use of this resource advantage to train and improve the staff of cross-border e-commerce enterprises. At the same time, measures for the introduction of cross-border e-commerce talents should be formulated to increase subsidies for the talents urgently needed in cross-border e-commerce enterprises, so as to build a professional, socialized and international team of cross-border e-commerce talents.

In addition, innovation and entrepreneurship are the fresh driving force for the development of cross-border e-commerce. The construction of entrepreneurship demonstration bases can be strengthened, and the talents of cross-border e-commerce can be explored and cultivated by releasing the entrepreneurial vitality of cross-border e-commerce. We support cross-border e-commerce enterprises in the Greater Bay Area to cooperate with ASEAN related enterprises to establish a new business incubation platform, improve the incubation capacity through the combination of "talent incubation" and "project incubation", and continue to supply talents for the development of cross-border e-commerce in the Greater Bay Area and ASEAN. We encourage university students from the Greater Bay Area and ASEAN countries to participate in innovation and entrepreneurship in new markets, and further strengthen cross-border e-commerce cooperation and development.

### *4.4. To Continuously Promote the Transformation and Upgrading of Greater Bay Area-ASEAN Cross-Border E-Commerce Enterprises*

To promote the transformation and upgrading of Greater Bay Area-ASEAN cross-border e-commerce enterprises by strengthening competitive enterprises, upgrading traditional enterprises, and increasing support. Focus on supporting a group of advantageous enterprises, shaping the leader of cross-border e-commerce industry, and giving special guidance to advantageous enterprises in financing, overseas warehouse construction and other aspects. For small and medium-sized cross-border e-commerce enterprises, collective development can be achieved through the form of assistance to reduce their operating costs. We should seize new opportunities in the development of cross-border e-commerce under the background of RCEP, support and drive traditional foreign trade enterprises to engage in cross-border e-commerce, and exploit the Southeast Asian market through third-party cross-border e-commerce platforms. With the help of the marketing network of overseas e-commerce platforms, we promote goods and services to go overseas, and promote the accumulation and flow of domestic and foreign resources of cross-border e-commerce, extend the industrial chain, and optimize the supply chain of cross-border e-commerce.

### *4.5. Enhance the Awareness of IPR Protection of Greater Bay Area-ASEAN Cross-Border E-Commerce Enterprises*

First, cross-border e-commerce enterprises in the Greater Bay Area should enhance their brand awareness. It

is encouraged that cross-border e-commerce enterprises with characteristics and advantages to register their own trademarks, build quality brands by improving product quality, optimizing packaging design, strengthening overseas marketing, etc., and promote the "Made in the Greater Bay Area" brand to go overseas with the help of brand power; Secondly, we should promote the innovation of cross-border e-commerce rules. RCEP provides a basic framework for the development of cross-border e-commerce between Greater Bay Area and ASEAN countries. All participants should make efforts under this framework to encourage more participants to participate in the innovation of cross-border e-commerce rules, accelerate the communication and cooperation between Greater Bay Area and ASEAN countries in the field of cross-border e-commerce, and achieve higher quality trade development.

**Funding**

1. China Association for Trade in Services: Research on Innovation of Cross-border E-commerce Cooperation Mechanism between Guangdong-Hong Kong-Macao Greater Bay Area and ASEAN Countries under the RCEP Framework (FWMYKT-202103).
2. The third batch of Innovative Research Team of Zhaoqing University fund: Cross-border E-commerce Innovation Research Team (Project number: TD202101).
3. Special Innovation Project of Universities in Guangdong Province (Philosophy and Social Sciences) fund: Research on the Innovation of the Double Cycle Path Supporting the Guangdong-Hong Kong-Macao Greater Bay Area under the New Development Pattern: From the Perspective of Cross-border Export E-commerce (Project No.: 2021WTSCX093).
4. The "13th Five-Year Plan" of Education Science of Guangdong Province fund: Research on the Bottleneck and Countermeasures of Cross-border E-commerce Cooperation between Guangdong-Hong Kong-Macao Greater Bay Area and ASEAN Countries in the Context of "One Belt and One Road" Strategy (101).
5. Zhaoqing University Cross-border E-commerce Teaching Team fund (Project No.: zlgc201823).
6. Zhaoqing University cross-border E-commerce practice online and offline hybrid first-class courses project fund.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Not applicable.

**Conflicts of Interest**

The author declares no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.53

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Article

# Exploring the Road of Digital Transformation of Agricultural Marketing Based on the Perspective of Platform Economy

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**Abstract:** In order to meet the trend of digital transformation and build a marketing system for agricultural products in the form of platform economy, this paper adopts the literature research method to analyze the coupling of the two concepts of platform economy and agricultural products marketing under the framework of digital transformation, and explain the immaturity of marketing subjects, non-standardized marketing channels, unsuitable logistics system, unsuitable marketing products and unclear marketing rules under the current digital transformation mode of agricultural products marketing. The problems of quality assurance and unclear marketing rules. As a result, this paper puts forward policy suggestions, namely, taking the government as the leader, actively exploring new thinking, new ideas and new roads for digital transformation of agricultural products on the basis of improving the legal system, and building a standardized, extensive and innovative Internet agricultural products marketing platform by strengthening the training for relevant practitioners.

**Keywords:** platform economy; agricultural products marketing; digital transformation

## 1. Introduction

With the vigorous promotion of the rural revitalization strategy and the technological empowerment of high-tech digital technologies such as Internet+ , big data, and cloud computing, the degree of agricultural modernization has been further improved, the potential of the agricultural and rural reserve army has been further developed, the market of agricultural products has been further developed and expanded, and a new e-commerce consumption concept based on the Internet concept has been gradually derived. Under this new trend of e-commerce consumption concept, the marketing model of agricultural products has gradually evolved from the old model, which was fixed on the value of the agricultural products themselves, to an industry with the characteristics of a platform economy, especially emphasizing the coordination of three dimensions of experience sharing, interaction sharing and value sharing [1].

At present, many agricultural marketing industries that are still in the transition period have the problems of immature marketing subjects, non-standardized marketing channels, unsuitable logistics systems, non-qualified marketing products, and unclear marketing rules, which have not effectively met the diversified, novel, and shared consumption demands presented by consumers nowadays, and it is also difficult to effectively guide this emerging industry. In this context, it becomes crucial to building a marketing strategy for agricultural products that adapts to the current emphasis on digital transformation.

Received: 5 December 2022; Accepted: 20 December 2022.

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## 2. Definition and Characteristics of the Platform Economy

### *2.1. Definition of the Platform Economy*

The concept of the platform first originated in the field of natural science, referring to the part with the role of piggyback and support formed by the arrangement and combination of digital and physical elements of a hierarchical modular system in a certain way and rule. In the field of social sciences, there is no clear definition yet. According to the definition of the United Nations Commission on International Trade Law, a platform is an organizational form in which, in addition to the unilateral market, the operating business units are piggybacked on the Internet platform and interactively communicate, flow, and transform through an interdependent group of users among multiple subjects, thus bringing benefits to the subjects of at least one party. According to the definition of a platform in the "Antitrust Guidelines on Platform Economy", a platform is an organizational form that enables multiple subjects with interdependent relationships to interact with each other according to certain rules and methods through Internet information technology, and thus jointly create commercial value [2]. As for the platform economy, this paper gives the following definition: platform economy is a new economic form based on Internet information technology, through the construction of the rule interaction system of multiple subjects, relying on the Internet platform and platform economy operators, and through the role of the open effect, network effect and exponential effect of the Internet platform, to re-coordinate the allocation of resources.

### *2.2. Characteristics of the Platform Economy*

The platform economy is based on the open, interactive, and convenient Internet third-party platform website, and relies on the influence and credibility of the third-party service unit to bring benefits to at least one of the subjects through the reallocation of capital elements, product elements, technical elements and talent elements brought by the interactive experience among multiple subjects of interest. The platform economy has the following four basic characteristics according to its Internet properties.

#### 2.2.1. The Scale of the Platform Economy

The scale of the platform economy comes from the Internet effect itself. Through the information technology and user groups carried by the Internet, the platform economy itself is not restricted by objective conditions such as time, space, and natural resources, and the interaction of interests of multiple subjects is carried out on the Internet with the property of interoperability of all things, thus forming a huge economy of scale effect. In terms of cost saving, the platform economy through the intensive use of digital technology, with the help of Internet +, cloud computing and big data, and other functions, can effectively alleviate and solve the cost constraints of tangible or intangible products, attract the influx of traffic by the periodic windfall brought by the Internet effect, making the platform economy operation itself requires relatively smaller labor costs, technical costs or equipment costs, to create extreme The marginal critical value under the economy of scale, through the exponential growth of revenue to achieve the infinite growth of operating costs to zero. In addition, the platform economy has the characteristic of openness, through the huge number of users and huge market share to produce the economic effect of scope economy and acquaintance economy, to achieve the exponential growth and wave expansion of the platform economy model.

#### 2.2.2. Lock-in Nature of Platform Economy

The platform economy implements differentiation strategies for users at both the Customer end and the Business end, such as orientation differentiation strategies, i. e., attracting new users with low-cost entry thresholds, while discriminatory restrictive measures on platform rules are imposed on old users, making various factors enter digital channels using exclusivity, and making the most reasonable allocation of resources using the With the most reasonable market regulations, various factors are siphoned to the Internet platform because of digitalization, which leads to the narrowing of market differentiation and the gradual orientation of market resource allocation, and a certain extent, the rationality of market resource allocation is lost [2]. Under the premise of market expansion of large platforms, small platforms will gradually lose market share and

platform user ownership because of the phenomenon of "user plunder" from other large platforms, which eventually leads to large platforms gaining user stickiness, and once user stickiness is locked, it may lead to the problem of platform economic monopoly and the emergence of the phenomenon of "winner takes all" [3].

#### 2.2.3. Multi-Attribution of the Platform Economy

The multi-attribution of platform economy refers to the existence of two or more Internet platforms, which may be used simultaneously by consumers due to the existence of selectivity among users, especially when the cost to be paid for random selection among Internet platforms is extremely low. Therefore, to avoid losing potential consumers, merchants tend to adopt the marketing strategy of the co-existence of multiple platforms based on the profitability of capital. Although large platforms can bring huge economic dividends through powerful network effects, the potential special services, specific user groups, and marginal functional characteristics of small platforms are more adaptable to meet the needs of diversified merchants.

#### 2.2.4. The Efficiency of the Platform Economy

The high efficiency of platform economy refers to the platform's digital technology-based, interactive user experience, merchant-linked sales, and logistics tiling coverage, which presents characteristics of timeliness, materiality, accuracy, and convenience through new business processes, industrial form integration, and business resource allocation mode [4]. Through technologies such as Internet big data and cloud computing, marketing platforms can digitally process information such as users' click time, clock frequency, browsing time, and hot product positioning, and precisely match users' needs based on computer algorithms through database storage and calculation, and at the same time, implement precise satisfaction for users' needs through specific pushing and advertising guidance, etc. To better adapt to the increasingly diversified market demand.

## 3. Problems

As one of the main contents of implementing the new development concept and building a modernized economic system, the rural revitalization strategy has become a new strategy for the work of the "three rural areas" under the historical orientation of socialism with Chinese characteristics entering a new era. This is a major strategic deployment made by General Secretary Xi Jinping based on his profound understanding of new laws and new tasks at a new stage of the development of the "three rural areas" in the new era, reflecting the value orientation of the Party's compassion for farmers and concern for the "three rural areas", and concentrating on the inevitable requirements of agricultural and rural development in the new era. Thus, the concept of digital transformation of agricultural products has become an important initiative to use science and technology to create a strategy for rural revitalization under the new situation of agriculture and rural areas in the new era [5]. For the new situation of agriculture and rural areas, the digital transformation of agricultural products has certain positive significance for opening up the market and solving the phenomena of stagnant agricultural products and reverse market cycle inputs brought about by problems such as information asymmetry and logistics behavior capacity constraints.

However, the digital transformation process which is initially located in the marketing of agricultural products with the help of Internet platforms still has the following five dimensions of problems.

### *3.1. The Immaturity of the Main Body of Agricultural Products Marketing*

From the perspective of production subjects, farmers generally lack reasonable marketing concepts, professional marketing skills, timely and accurate information channels, etc. Under the impact of the traffic economy era, the concept of a "short and fast" traffic economy has become a reasonable support concept for farmers' short-sighted thinking after the sinking of classes [6]. Accordingly, farmers generally tend to be more interested in the "short and fast" flow economy. Accordingly, farmers generally tend to blindly invest, concentrate production, put in large quantities, and make quick profits, which is unfavorable to building a reasonable, timely, legal, and profitable agricultural brand. Compared with farmers, agricultural production

cooperatives have greater comparative advantages in agricultural machinery and equipment, agricultural chemical technology, agricultural start-up capital, etc. Under the advantage of agricultural product scale management, agricultural production cooperatives are further extended on the road of large-scale operation, and modern agricultural organizations of initial scale appear. Nonetheless, agricultural production cooperatives also have the problems of blurred positioning, confused management, lack of brand awareness, and other modern enterprise normalization due to their large organization [7]. As for the leadership in the direction of rural revitalization, the existing agricultural production cooperatives still have not reached the level of leaders that they should have, plus some village committees and village collectives lack the concept of making the collective economy bigger and stronger, do not know how to adopt scientific and reasonable methods of working with the masses, and adapt in different ways to deal with village cadres' daily work obstruction, which often makes the village collective assets in a state of "wanting to develop but not being able to, and in case of trouble, being obstructed". The village collective assets are often in the dilemma of "wanting to develop but can't, encountering things and then blocked".

From the perspective of the main sales body, the relative requirements for the quality of agricultural products retailers in the era of platform economy tend to be initially higher, and the increasingly inward-looking competition makes some agricultural products retailers unable to keep up with the needs of the outside world through study and training, thus gradually lacking scientific and rational understanding of the publicity methods and promotion concepts of agricultural products, resulting in insufficient publicity efforts, biased publicity methods, misplaced publicity angles, and dissatisfied publicity users. Social problems such as misalignment of publicity angle and dissatisfaction of publicity users [6]. Compared with agricultural retailers, farmers as the supply side are often in a vulnerable and passive position in the era of the platform economy, and in the face of intensive management and management of agricultural products, they often need to use the layer of agricultural retailers, while agricultural retailers are prone to right-leaning opportunism due to the problem of capital profit-seeking, i. e., frequently changing agricultural suppliers to pursue maximum capitalized interests. This is not only detrimental to the formation of a stable supply and demand relationship but also easy to causes vicious competition among farmers, thus undermining the smoothness and authenticity of agricultural market information and seriously affecting the efficiency of agricultural marketing channels.

### *3.2. Agricultural Marketing Channels Are Not Standardized*

From the perspective of channel members, there are mainly problems of unstable relationships, easy vicious competition, and unequal status among channel members, as shown below.

#### 3.2.1. Unstable Relationship

Due to the problems of education level, capital level, and technology level, farmers generally lack reasonable information and cooperation consciousness, which leads to backwardness in agricultural production, singularity in agricultural marketing, and confusion in agricultural management, and cannot build an effective and benign cooperation relationship among farmers [8]. At the same time, the self-interest consideration as a rational person in the market will further intensify the irregularity of agricultural marketing channels, for example, disturbing the regular channels of the market and maliciously suppressing peers, which will become a great resistance to the large-scale production of agricultural products and the organization of agricultural products marketing by agricultural e-commerce.

#### 3.2.2. Easy Vicious Competition

At present, due to the narrow and single characteristics of agricultural marketing channels, the number of agricultural intermediaries does not reach the level of meeting the market demand, which is unfavorable to the further expansion of the agricultural market. On the other hand, the unreasonable audit of agricultural intermediaries' entry into the market is likely to lead to the profit-seeking behavior of agricultural intermediaries in the process of marketing agricultural products, thus making the marketing channels appear bloated. In the

absence of a reasonable system to restrain the situation, due to the intermediaries arbitrarily toggle the price scales, it will lead to the formation of vicious competition among farmers and suppliers, making the interests of farmers damaged, which will be greatly detrimental to the formation of a healthy and sustainable development of agricultural market order [9].

#### 3.2.3. Unequal Status

The low status of farmers in the market is the problem we have to face for the three farmers. In the free and profit-oriented market relationship, the relationship between farmers and intermediaries is often characterized by profit-oriented antagonism due to the different positioning of market subjects, and this profit-oriented antagonism derived from the assumption of rational man in the market will further harm the enthusiasm of agricultural products producers due to the damage of farmers' interests. On this basis, the market relationship among agricultural subjects will eventually evolve into a "production incentive frustration - middlemen speculation - production speculation - supply and demand information imbalance - supply and demand information imbalance. -supply and demand information imbalance - production misdirection - supply and demand mismatch" closed-loop vicious relationship.

### *3.3. Unsuitable Logistics System for Agricultural Products*

From the perspective of logistics structure, due to the characteristics of agricultural products such as difficulty to preserve, large demand, and small differences, it will inevitably lead to the physical system of agricultural products showing characteristics that need to be reasonably matched with product positioning. Therefore, the sales of agricultural products are often unsuitable for excessively long logistics channels. The width of the logistics channel requires a reasonable market system to match it. Accordingly, the existing logistics channel structure and market system of agricultural products in China do not match the problem, and the needs of the platform economy era require the establishment of a more efficient, reasonable, timely, and accurate logistics information platform to further improve the cost performance of agricultural products with the convenience of logistics channels, to gain more love from consumers.

From the perspective of logistics facilities, the third-party services of logistics will also inevitably affect the efficiency of agricultural marketing. For example, from the perspective of logistics, the longer the logistics channel, the more links, distances, and time it needs to go through, while agricultural products as a primary product have particularly high requirements for freshness. Therefore, cold chain transportation has become a necessary part of agricultural products logistics transportation. At present, domestic cold chain transportation generally has the problem of high initial cost investment and price sensitivity. In the face of high initial investment, the parties related to agricultural products do not fully understand the role of agricultural logistics as a hub connecting upstream and downstream. As the short-term profit-seeking behavior of capital tends to present objective blindness, many agricultural marketing subjects will appear to reject new technologies and blindly pursue the short-sighted problem of short-term interests, which further leads to the lagging development of agricultural e-commerce and the objective blindness of logistics supply chain development. It is mainly reflected in the following aspects.

#### 3.3.1. Information Asymmetry

Due to the lagging development of agricultural products e-commerce and the forced blindness of logistics supply chain development, agricultural products e-commerce as a whole presents a problem of inaccurate, untimely, and inconvenient communication of business information. From the supply perspective of market supply and demand information, there is no scientific and reasonable agricultural products logistics platform to provide timely and accurate supply and demand information guide for business subjects and build a new supply relationship based on the normalization, stabilization, and modernization of logistics supply chain [10].

#### 3.3.2. Cold Chain Is More Backward

At present, the cold chain transportation of agricultural products in China shows the phenomenon of "partly advanced, but overall lagging ", and the cost of cold chain transportation is relatively low for traditional large-scale bulk logistics transportation [11]. However, the main body of China's e-commerce business is generally scattered in various places with discrete distribution, and there is no third-party unit to integrate this e-commerce resource effectively, which leads to the lack of reasonable and scientific best distribution plan for the marketing of agricultural products. From the perspective of logistics supply distortion, the logistics supply side often needs to scientifically plan the distribution plan in real-time according to the order situation of agricultural products due to the lack of a unified logistics and transportation system, while digital technologies such as big data and cloud computing provided by the logistics information supply platform do not meet the consumption needs of different customer groups in different regions more efficiently [12]. Accordingly, due to the overall backwardness in the construction of the logistics supply platform, some agricultural products e-commerce subjects do not fully enjoy the quality services brought by the agricultural products supply platform. They may even continue to take less efficient traditional logistics because of behavioral capacity constraints and limited choice of parties, thus the problem of failure to preserve the quality and freshness of agricultural products is likely to occur, which damages the rights and interests of consumers and the reputation of the supply side.

#### 3.3.3. The Source Is Not Traceable

Due to the overall backwardness in the construction of the agricultural products logistics supply chain, there are certain defects in the function of the logistics infrastructure. For the real-time supervision of agricultural products transportation and logistics information traceability of agricultural products, the problem of misplaced information and lagging information is to be solved. In terms of governmental supervision departments, governmental subjects cannot generally trace the logistics of big data, showing excessive reliance on external subjects to consciously provide information and corresponding technical support to realize the phenomenon of traceability of agricultural products at source, which is undoubtedly a new challenge for governmental departments in the era of the platform economy.

### *3.4. Agricultural Products Marketing Products Are Not Quality Assured*

Due to the incomplete and undeveloped logistics supply system of agricultural products, the marketing process of agricultural products often has problems such as "goods not matching" and "misrepresentation", which present a certain degree of resistance to the ultimate purpose of further penetrating the market with the power of the online platform. Market promotion resistance. At present, only some developed regions in China have a complete storage system for agricultural products, and the scope of third-party services related to agricultural products is limited due to the general dispersion of farmers. Therefore, some farmers will choose to enter the Internet platform for marketing by looking for agricultural intermediaries or agricultural agents in the form of commission agents out of consideration of excessive logistics costs. Internet marketing, under the posture of technical barriers, relies on this form of online marketing of agricultural products with the help of highly skilled intermediaries, which is conducive to further promoting their agricultural products and creating their brands of agricultural products. Accordingly, this form of marketing can not only save money costs, but also save a lot of manpower and material resources, and even further promote the agricultural products in the hands of farmers overseas to build their own unique brand effect of agricultural products. However, from the perspective of the efficiency of online marketing of agricultural products, on the one hand, online marketing of agricultural products is subject to the unstable market cooperation relationship, and in the case of information asymmetry, the phenomenon of agricultural products stagnation will inevitably occur; on the other hand, online marketing of agricultural products is subject to the regional logistics level and often lacks a scientific and reasonable centralized hub for agricultural products to deal with different agricultural products in the product stage. For the time being, China's first-line agricultural products are often consumed in regional farmers' markets and are not adequately and reasonably planned, transferred, and utilized.

### *3.5. Unclear Marketing Rules for Agricultural Products*

From the current situation, China's agricultural products quality and safety standard system letter to be improved, the existing ISO9000 has not yet fully adapted to the rapidly changing consumer market and present diversified consumer demand in the era of the platform economy. With the rapid development of the economy, people's demand for products is characterized by personalization and high specification, and the previous ISO9000 is not well adapted to the current era of the platform economy. In addition, for the diversification of agricultural products marketing methods, the concept of shared value is deeply rooted, agricultural products gradually present shared use value, shared ornamental value, and shared financial value, and the increasingly capitalized symbolic agricultural products gradually evolve from the past use value to the product with multiple value evaluation system. In this process, the new marketing rules of agricultural products are not better adapted to the current capital market demand. For the agricultural products consumption market which gradually presents diversified value choices, it is crucial to establish scientific and reasonable quality standards, and the agricultural products marketing rules built on the blueprint of scientific and reasonable quality standards will become the rule’s guideline to regulate the current chaotic and unbalanced agricultural products consumption market, to profoundly prevent the emergence of the "short and fast" flow economy concept which overemphasizes the "short and fast". The negative social effects brought by the concept of flow economy. For example, the secretary and the mayor are keen on the local economic development driven by agricultural products, but the invisible guidance of the flow gradually makes the government officials present capitalized symbols, some gradually capitalized symbols of the official persona have become the object of the market flow competition, pursuit and discredit have become a kind of market consumption of existing traffic rules of the game, however, regardless of the prosperity of this flow competition game or not, for the government's However, no matter whether this traffic game is prosperous or not, it is a loss for the credibility of the government, because the official persona itself has the credit backing of the government, and on this basis, any behavior that is detached from the actual government influence will be against the original intention of serving the people.

## 4. Countermeasures for marketing agricultural products in the context of the platform economy

### *4.1. Taking the government as the leader and strengthening the status of marketing subject*

For agricultural products, due to their weak and primary characteristics, government policy support often becomes the vane of agricultural product marketing [9]. Therefore, the establishment of a diversified, innovative, standardized, creditable, and convenient "Internet + agricultural products platform" led by the government is crucial. From the perspective of market consumption demand, the government binds the agricultural products trading platform to the social credit system with public power, establishes the transaction credit standard with public power, and builds an honest market order, to strengthen the market status of marketing subjects and fully guarantee their economic rights, which is beneficial to building a healthy socialist market economic order. From the perspective of rural finance, using the government's credit endorsement to provide farmers with small loans from formal rural credit cooperatives and provide farmers with sufficient amounts and right guarantees to apply for agricultural financial services is conducive to ensuring that farmers receive actual financing from the supply side of rural finance, thus fully guaranteeing farmers' production incentives [13].

### *4.2. Upgrading the marketing rule level with the law as the criterion*

From the perspective of maintaining fair competition in the market, the government should implement legal constraints on the behavior of infringing marketing subjects based on a full understanding of the actual local situation. From the perspective of adequate and reasonable legislation, the government should ensure the accurate flow of information through public opinion surveys, market mapping, and expert seminars, to avoid individual leaders from making "brainstorming decisions" and "changing orders overnight" and other problems, and to ensure that the government's credit is not Under the premise of ensuring the government's credit is not

damaged, the policy research can achieve the requirements of "taking the essence and removing the dross", "removing the roughness and extracting the essence", "removing the falsehoods and keeping the truth", to take the words of a hundred schools of thought and come up with a good policy, so that The marketing rules of the current platform economy era can be better adapted to breed new. From the perspective of the safety of market supervision, the market supervision department of the government should be the core force to strengthen the regulation of the whole channel and the whole process of agricultural products marketing, and the construction of the supervision system of agricultural products marketing should be qualitative and quantitative with the help of digital technology, meanwhile, the front-line personnel of the market supervision department should be the basis and the new digital supervision technology talents should be the main body to create the real objective, strict, safe and fair market full traceability supervision system [14].

### *4.3. Improve the quality of marketing personnel with training as the foundation*

At present, the main contradiction in the marketing of agricultural products is reflected in the structural contradiction of talent demand, which is specifically reflected in the contradiction between advanced marketing technology and the backwardness of the quality of marketing personnel. To this end, this paper proposes that the government, enterprises, and universities should jointly set up an industry-university-research collaborative education system, imitating the form of Peking University night school and Peking University staff adult college, use big data and cloud computing technology to classify the professional personality of the trainers, to target the teaching according to the material, to achieve systematic and substantial training for the quality of the future practitioners, to promote the strength of their proprietary skills, to complement their comprehensive quality To build a new structured system of professional quality personnel. At the same time, we should combine theory with practice, regularly take the typical deeds of advanced agricultural dragon enterprises as cases, and lead trainers to carry out in-depth theoretical study and discussion, and for places where theoretical narration and understanding are not sufficient, we should establish offline practice bases in the corresponding enterprises to combine field research visits and in-depth theoretical study. For example, the model of "enterprise + university + farmer" of WEN and the model of "government + enterprise + university" of Beidahuang are quite successful and have cultivated a batch of high-quality professional talents for the country. Finally, with the government's credit backing, we can issue credible training certificates for those who pass the training test, to further standardize and upgrade the structured system of marketing personnel in the future.

### *4.4. Quality as the bottom line to ensure healthy marketing channels*

It is well known that the first step in solving food safety problems is to start with primary products. From the point of view of establishing food safety regulation standards, it is crucial to build a quality standard system for agricultural products that are adapted to the current era of the platform economy. As history evolves, the establishment of the ISO 9000 system has laid the foundation for China's agricultural quality standard system. However, as the economy takes off and technology advances by leaps and bounds, foreign consumers' demand for agricultural products is gradually becoming more diversified and standardized. Due to the improvement of international technical standards and international safety standards, China's agricultural marketing exports are facing two major problems: "technical barriers" and "standard barriers", therefore, the construction of a new agricultural quality standard system is important to promote the quality of China's agricultural products and solve the problem of agricultural safety. Therefore, the construction of a new agricultural quality standard system is of great significance to promote the improvement of the quality of agricultural products and the solution of the safety of agricultural products.

## **5. . Conclusion and outlook**

In the era of platform economy, the major premise of the road of digital transformation of agricultural marketing is the consistency of service objectives. Under this premise, such as marketing subjects, marketing channels, marketing products and marketing rules and other minor premises should be oriented toward the

alliance development of farmers, government, intermediaries, retailers, enterprises and universities and other multiple subjects.

Therefore, the government should actively act as the credit backing party of agricultural marketing alliance to provide credibility guarantee for agricultural marketing alliance. In terms of sales channels, the agricultural products marketing alliance should be based on the Internet platform to provide the agricultural products marketing alliance with large, wide and long sales channels; in terms of sales rules, the government should provide stable guarantee for the agricultural products marketing alliance and remove obstacles for the agricultural products marketing alliance with the advantage of good legislation of socialist market economy; in terms of sales subjects, the agricultural products marketing alliance can lead enterprises and universities as technical In terms of marketing subjects, the agricultural marketing alliance can provide marketing technology guidance for the agricultural marketing alliance, so as to fully integrate the resources and advantages of all parties and build a stable market supply and demand relationship.

In the process of exploring the road of digital transformation of agricultural marketing, for the application of big data, cloud computing and other technologies in the era of platform economy, the government should make legislation for a rainy day and write the national big data security governance system into the 5-year government planning report, so that the legislation has an edge and the establishment has responsibilities to avoid "data pollution" and "data silos". "Data silos" and other problems. In terms of platform legislation and supervision, the scope of data utilization of individuals, government, enterprises and universities should be well divided to achieve the unity of authority and responsibility within the scope in order to fully guarantee the security of personal information, government information, enterprise information and university information, and do the relevant work in advance for the information security of the country [15]. In terms of platform regulation, this paper argues that on the basis of the principle of inclusive regulation, on the one hand, it should encourage diversified competition and in-depth technical excavation of enterprises, and on the other hand, it should do a good job of grasping the degree of use of the "roll-back clause" to avoid the problem of once the enterprises "choose one or the other On the other hand, the paper argues that we should make sure that the "roll-back clause" is used properly, so as to avoid the situation that once a company "chooses one" monopoly, it will use the way of stripping the core business to hit the platform economy, which will aggravate the economic instability in the epidemic era.

**Funding**

Not applicable.

**Author Contributions**

J.C. is in charge of writing, Y.Z. is in charge of data collection, R.Z. is in charge of statistics. All of the authors read and agreed to the published the final manuscript. Institutional Review Board StatementNot applicable. Informed Consent StatementNot applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Not applicable.

**Conflicts of Interest**

The authors declare no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.58

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https://ojs.sgsci.org/journals/emi

Article

# Internal Corporate Social Responsibility in the Spanish Computer Consultancy Industry and Its Impact on Worker Turnover

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**Abstract:** The Covid-19 pandemic has brought a new form of work that is here to stay, the remote work, this way of working favors turnover between companies since employees can work anywhere in the world regardless of where the worker lives. The aim of this paper is to analyze how internal corporate social responsibility and, particularly, human resources policies can influence the employees job satisfaction, their organizational commitment and their turnover intention. This paper can help companies know how to retain their "intellectual" capital. Methods for this research we have used a questionnaire with a scale composed of 5 levels which has been distributed among professionals from different companies in the spanish computer consulting industry. A structural equation model was applied to test the hypothesis with the help of SmartPLS software. Results from the analysis of the data, it is concluded that there is a positive relationship between human resources policies and workers job satisfaction, as well as a positive relationship between job satisfaction and organizational commitment and a negative relationship between workers' job satisfaction and their turnover intention, namely, the better the human resources policies, the greater the job satisfaction and minor the turnover intention. Secondly, we also observed the existence of an indirect or mediating relationship which indicates that job satisfaction has a positive impact on organizational commitment and this in turn in the turnover intention with an even greater impact than that of the direct relationship. Conclusions from this work we can conclude that adequate human resources policies improve the employees job satisfaction, thereby improving organizational commitment and significantly reducing their turnover intention, which is very important for companies that want to retain their employees and can provide a competitive advantage over other companies in the sector.

**Keywords:** HRM policies; organizational commitment; job satisfaction; turnover intention

## 1. Introduction

An important factor when it comes to making a difference within the business environment is to achieve

Received: 27 February 2023; Accepted: 20 March 2023.

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highly motivated, productive, committed workers willing to continue in the company [1]. At present, this factor is even more critical since the pandemic has boosted remotework which has the advantage for the employee of being able to work in any company in the world, which favors the change of companies by the worker.

On the other hand, the long-term success and survival of any organization depends on its ability to retain key employees, which is called intellectual capital. A study distributed in the United States [2] indicates that about 76% of workers were looking for a new company, and this is something that should alert and concern employers. Aspects such as the work environment or company performance depend on the company's ability to retain the best, more motivated and and most committed employees in the organization [3].

This problem has been increased in recent times due to the call Great Resignation, term attributed to Anthony Klotz, and that has caused the U.S. Bureau of Labor Statistics will report 4.6 million resignations in September 2021 and 4.3 million resignations in October of the same year in the USA [4], and although the labor and economic characteristics of the USA are not comparable to the Spanish ones, we are beginning to appreciate a similar behavior in some professions in Spain.

There are different aspects capable of affect the level of workers well-being and that have an important impact on their degree of organizational commitment, their job satisfaction and, mainly, on the turnover intention, an aspect that in Spain has an incidence of 17% in 2022 [5].

Knowing these aspects and understanding how they are capable of influencing workers is key if we want to retain the best talent and keep our workforce motivated. Although managing to keep talent is important in any organization, even more so in an industry as competitive and dynamic as that of computer consulting, in which there are fairly high turnover rates and which requires large professional experience and high qualifications in many times difficult to achieve.

According to data from the active population survey of the National Institute of Statistics for the year 2018 [6], the information and communications technology sector was the one that presented the highest employment rate, more of 79%, so retaining the best talent becomes a priority for companies in this industry.

Although there are numerous papers that have analyzed the impact of satisfaction with human resources policies on the turnover intention [7–10] we have not found significant paper that analyze this impact in the Spanish IT consulting industry, so we hope that this work can help fill this gap.

### *1.1. The Importance of Retaining Talent in Spanish Computer Consulting Industry*

According to data collected in Spain [11] in its report for the year 2021, this industry obtained revenues of 15,921 million euros that year, achieving this last year an improvement in its revenues of 9.5% compared to 2020. In the employment area, the IT sector saw its workforce increase by 11.9% in relation to the previous year, reaching 227, 000 workers. We are, therefore, facing a sector of great importance both for the national employment and for economy, for which it is necessary to know what aspects are likely to improve the commitment of workers to their organization and work and help them to diminish the high level of demotivation and turnover of your staff [5].

While some people say that employees turnover shouldn't be a problem since new hires tend to have lower costs, and new blood brings new ideas and perspectives [12], reality is different. The problem of high levels of turnover among workers is one of the main concerns in companies due to the high cost, both in time and money, that the training and replacement of qualified personnel entails for organizations [13] therefore, ensure continuity in the company for the most productive and experienced personnel becomes one of the main priorities in any organization.

Recent studies look at the dangerous effects of high levels of employees turnover on companies performance and profits [14], that affect the IT industry in particular due to their important dependence on intellectual capital, knowledge and training [15]. The impact of high levels of employees turnover includes aspects such as knowledge transfer and training costs, the cost of hiring, support and mentoring, in addition to the behavioral and operational impact [14] affecting employees frustrations and productivity.

### *1.2. Why Do Employees Leave Their Jobs?*

There are different factors that may affect the employees turnover intention which have been studied in different jobs, among these aspects we find stress [16–19], ambiguity in the assigned position [20], job overload [21], job satisfaction [22–24], organizational support [25,26] or occupational health and safety [27,28], Although all of them are important, in this paper we have focused on analyzing how satisfaction with human resources policies has an impact on job satisfaction of employees in the IT industry in Spain and how this influences the employees turnover intention and his organizational commitment, thereby attempting to improve current knowledge on how human resources policies are related to employees job satisfaction, organizational commitment and turnover intention within the Spanish computer consulting industry and analyze how organizations should focus on these aspects to diminish the current problem of low organizational commitment and high turnover in this industry in Spain.

## 2. Literature Review

### *2.1. Internal Corporate Social Responsibility, Human Resources Policies and Their Impact on Employees Job Satisfaction*

Over the years, the traditional vision of the company that shows it as an institution whose sole objective is to maximize value for its owners has evolved, consolidating the idea according to which companies must provide value to all their stakeholders and not only to its shareholders [29].

Broadly speaking, when we talk about corporate social responsibility and depending on the different stakeholders affected, we can develop this social responsibility both externally and internally [30,31], finding that the external dimension focuses on the community, the local environment and relationships with its partners, suppliers and consumers as well as on aspects such as human rights or ecological problems, while, on the other hand, the internal dimension focuses in the attention to the employees of the organization, to the aspects that affect these employees as well as the internal context of the company, the management of human resources, occupational health and safety, training, etc... In this paper we are going to focus on this second aspect of corporate social responsibility, the internal one, and more specifically on the human resources policies developed by companies, an aspect that, although it has been less studied than that of social responsibility external corporate social, has begun to receive increased interest from researchers in recent years [32–36].

Over the years, different theories have been developed on job satisfaction, which tend to assign different degrees of importance to the sources of satisfaction, which are usually classified as intrinsic, those that depend on the characteristics of people, such as attitudes, or extrinsic that are situational and depend on the environment, such as the workplace. Depending on the field of study, research tends to focus more on intrinsic or extrinsic causes, the latter being the most studied in the field of management [37] and the aspects that we are going to analyze in this paper. Job satisfaction is an attitudinal variable that reflects an employee's general feeling towards job [38]. It has been found to be positively related to positive mood, participation and performance [39] and is especially important in technical workers due to the high levels of competence required [40].

In recent decades, numerous studies have analyzed the impact that human resources policies have on job satisfaction [41–44], therefore, we find ourselves before a relationship that has been widely analyzed over the years, and although in Spain we also find works that analyze this relationship [45–47], in Spanish computer consulting industry, it is a little discussed topic.

In this paper we analyze the impact that the human resources policies of organizations have on the employees job satisfaction in the Spanish IT consulting industry. That is why we propose the following hypothesis: Hypothesis 1. There is a relationship between satisfaction with the company's human resources policies and employees job satisfaction.

### *2.2. The Relationship Between Employees Job Satisfaction and Turnover Intention*

Turnover intention refers to the process by which a worker decides to leave their company [48]. Although

this rotation can be involuntary or voluntary in this article we have focused on the rotation of a voluntary nature or the worker's intention to change, which has an important effect on both the productivity and efficiency of the company, also causes high costs in companies [49,50].

There are numerous previous works in which the relationship between job satisfaction and turnover intention to leave has been analyzed in different professional environments and countries, such as computer consulting in the United States [17], public sector in Germany [22], retail in the United States [18], retail in South Korea [23] or high school teachers in Turkey [51].

The second hypothesis to be tested in this paper is: Hypothesis 2. There is a relationship between employees job satisfaction and their turnover intention.

### *2.3. The Importance of Employee Organizational Commitment*

According to [52], interest in research on organizational commitment appeared in the 1960s. With the passage of time, new approaches to commitment began to appear, not so focused on organizational aspects, but more focused on the work group and the position [53].

Organizational commitment has been defined as the magnitude of the identification that a worker shows with his company and his desire to continue in it, the degree to which an employee is willing to continue in his organization [54, 55] defined organizational commitment as the force that unites workers with organizations. [56] determined that organizational commitment, in addition to having a positive effect on the professional performance of workers, makes committed employees willing to make additional efforts and perform other tasks such as helping their colleagues, and the impact of commitment may even be greater organization on these behaviors outside their obligations than on their own performance.

For the elaboration of this work we have assumed the existence of a mediation relationship on the part of the organizational commitment between employees job satisfaction and their turnover intention, a relationship already studied previously in the manufacturing sector in Turkey [51] and Indonesia [57], prison officers in the United States [58], flight attendants in Taiwan region [59] or banking in Malaysia [60].

In our paper we are going to analyze whether organizational commitment has a partial mediation relationship between employees job satisfaction and their turnover intention. There are previous works that study both the mediation effect of different organizational and human resources policies and such as the possibility of adequate compensation [61] or professional development [62], as the mediation that organizational commitment has between employees job satisfaction and their turnover intention in different countries and sectors, as we have seen previously. In our paper we are going to focus on the impact of this mediation relationship in the Spanish computer consulting area.

Hypothesis 3. There is a mediation relationship of employees organizational commitment between their job satisfaction and their turnover intention.

The concept of job satisfaction has been widely studied over time, it can be understood as the affective response of people towards their job [63] and it's basically the degree to which people like their job [64].

Job satisfaction is one of the most frequently measured organizational variables and has been extensively studied in the areas of psychology and organizational behavior [65], given that job satisfaction can be an important indicator of how workers feel about their jobs and a predictor of their level of organizational commitment.

In this sense, numerous studies have found that job satisfaction can be considered as an antecedent of organizational commitment [66–70], in line with our hypothesis.

We consider that achieving a high level of job satisfaction will have an important impact on the organizational commitment of workers in activities such as computer consulting in Spain.

Hypothesis 4. There is a relationship between employees job satisfaction and their organizational commitment.

When treating the organizational commitment of a construct of motivational character that generates a positive attitude of character related to work and which is decisive in order to predict the employees performance and motivation [71,72], it is very important for companies to be able to achieve this motivation and

commitment among their workers, all the more so if we consider the potential for development and long-term duration of organizational commitment and job satisfaction [73], and also knowing that it also has an impact on the improvement of job performance and high-performance job practices[74].

According to [17], working to maintain and improve organizational commitment is of high importance for companies, even more so if we consider that job satisfaction together with organizational commitment plays an important role in the employees turnover intention.

According to [75], job satisfaction is, together with the organizational commitment of employees, key when it comes to predicting job turnover intention therefore, we believe it very important to find out what factors are capable of negatively influencing these aspects.

Although this relationship has already been studied in previous papers [76,77], we will focus on analyzing the impact of it in the industry of computer consulting in Spain.

Hypothesis 5. There is a relationship between employees organizational commitment and their turnover intention.

Figure 1 shows the research model used in this paper.

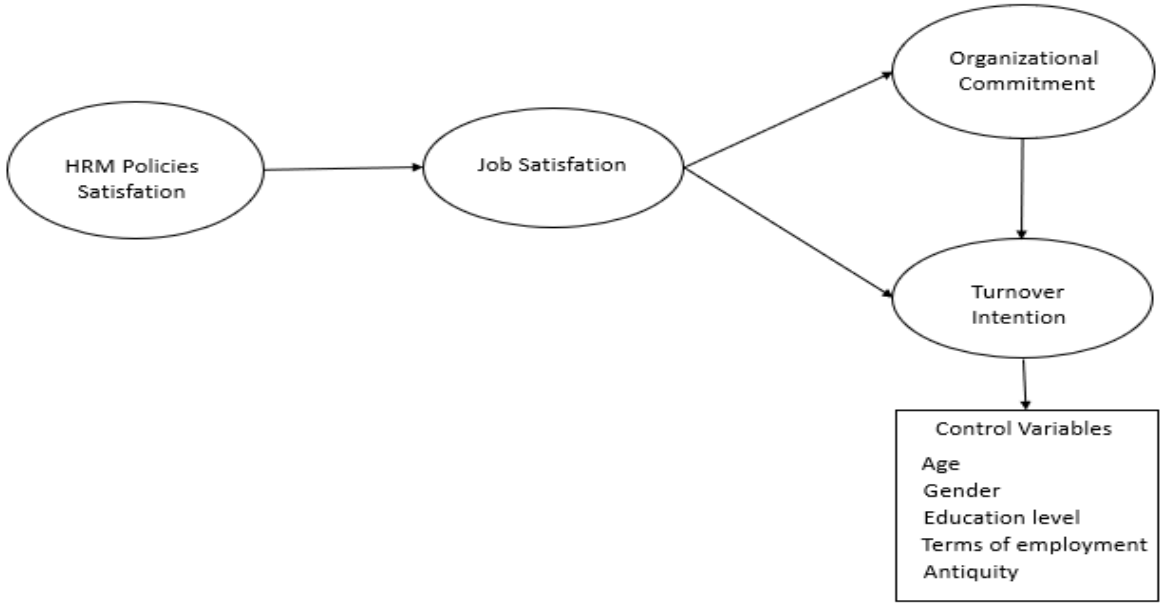


**Figure 1.** Research model.

## 3. Materials and Methods

For this paper we have used a form consisting of 24 questions, which uses the 5-level Likert scale that goes from 'totally agree' to 'totally disagree' and was sent to 800 professionals in the computer consulting area of the main Spanish companies during the month of October 2021, receiving a total of 268 complete answers with which we elaborated this study.

The questions we used for this paper were used in previous works [78–80], and adapted to the needs of our research. Of the 24 questions that the questionnaire consists of, 5 correspond to socio-demographic characteristics of the respondents, the other 19 having been grouped into 4 different constructs, HRM policies satisfation [79], job satisfaction [80], turnover intention [78], and organizational commitment [78], which have been used for statistical analysis.

## 4. Results

To analyze this model, the PLS-SEM technique was used, as it is the most appropriate for this type of study due to its great predictive capacity [81].

The results were analysed following the recommendations of [82], and [83], first evaluate the measurement model and in second place evaluate the structural model.

The demographic characteristics extracted from the data on which we have worked, can be seen in Table 1.

**Table 1.** Demographic variables.

| **Age** | |
|---|---|
| 18-29 | 22.39% |
| 30-39 | 35.07% |
| 40-49 | 29.10% |
| 50-59 | 13.06% |
| More than 60 | 0.37% |
| **Gender** | |
| Men | 63.81% |
| Women | 36.19% |
| **Education level** | |
| Primary studies | 0.37% |
| Secondary studies | 29.85% |
| University studies | 39.93% |
| Post-graduate studies | 29.85% |
| **Terms of employment** | |
| Permanent contract | 88.81% |
| Temporary contract | 11.19% |
| **Time of current company** | |
| Less than 5 years | 54.85% |
| Between 5 and 10 years | 17.16% |
| Between 11 and 15 years | 10.82% |
| More than 15 years | 17.16% |

*4.1. Measurement Model*

We decided to use PLS-SEM technique given the predictive strength and reliability that this method provides and the complexity of the proposed model [84].

Different factors were validated to evaluate the model, such as the level of significance of the model, which is 95%, internal consistency, which has been evaluated through composite reliability and Cronbach's Alpha. The Fornell Larcker criterion was used to evaluate the discriminant validity of the model. The convergent validity of the model was evaluated through the reliability of the indicator and the average variance extracted (AVE). Cross loadings between indicators and latent variables were also evaluated. Finally, and to validate the internal consistency of the model, we verified that all the variables reached an adequate value in Cronbach's Alpha and that the values of the CR (composite reliability) are correct [85,86]. All this can be seen in Table 2.

**Table 2.** Means, standard deviations, factor loadings, reliabilities, and average variance extracted.

| Construct | Item | Mean | SD | Factor loading | Cronbah's Alpha | CR | AVE |
|---|---|---|---|---|---|---|---|
| HRM policies satisfation | A1 | 4,078 | 0,815 | 0,822 | 0,888 | 0,915 | 0,643 |
| | A2 | 3,832 | 0,811 | 0,781 | | | |
| | A3 | 4,265 | 0,794 | 0,707 | | | |
| | A4 | 3,910 | 0,834 | 0,853 | | | |
| | A5 | 3,765 | 0,853 | 0,838 | | | |
| | A6 | 4,142 | 0,746 | 0,802 | | | |
| Job satisfation | B1 | 3,761 | 0,790 | 0,798 | 0,837 | 0,881 | 0,554 |
| | B2 | 3,765 | 0,798 | 0,754 | | | |
| | B3 | 3,951 | 0,755 | 0,616 | | | |
| | B4 | 3,653 | 0,863 | 0,764 | | | |
| | B5 | 3,619 | 0,918 | 0,797 | | | |
| | B6 | 3,776 | 0,726 | 0,721 | | | |
| Organizational commitment | C1 | 3,321 | 0,862 | 0,783 | 0,754 | 0,844 | 0,576 |
| | C2 | 3,280 | 0,784 | 0,735 | | | |
| | C3 | 3,362 | 0,812 | 0,774 | | | |
| | C4 | 3,511 | 0,762 | 0,741 | | | |
| Turnover intention | D1 | 2,209 | 0,671 | 0,822 | 0,723 | 0,844 | 0,644 |
| | D2 | 2,190 | 0,696 | 0,797 | | | |
| | D3 | 2,172 | 0,755 | 0,788 | | | |

Average variance extracted (AVE) is used to assess the convergent validity of each composite [87], which must be equal to or greater than 0.5 for the AVE. This condition was valid for our data, whose value we can observe in table 2 and indicates that the proposed model also meets this requirement.

We must also assess the discriminant validity which is mainly measured by the Fornell-Larcker criterion which considers the amount of variance that a variable capture of its indicators (AVE) and whose value must be greater than the variance that the variable shares with the other variables of the model. In Table 3 we can observe the values.

**Table 3.** Discriminant validity – Fornell-Larcket criterion.

| | Organizational commitment | HRM policies satisfation | Job satisfation | Turnover Intention |
|---|---|---|---|---|
| Organizational commitment | 0,759 | | | |
| HRM policies satisfation | 0,598 | 0,802 | | |
| Job satisfation | 0,725 | 0,601 | 0,744 | |
| Turnover Intention | -0,567 | -0,441 | -0,692 | 0,802 |

According to [83] we must also verify that the value of the cross loads is greater for the variable itself than for the others variables evaluated. In table 3 we can see how the analyzed model also complies with this assumption.

*4.2. Structural Model*

For this paper, we used a structural equation model which can be seen in Figure 2, through which we were

able to simultaneously evaluate the value of the relationships between the different variables of the model.

Based on the data from this analysis, we observe how HRM policies satisfaction has a positive influence on job satisfaction (0.601), which, in turn, has a negative influence on turnover intention (-0.592) as well as a positive impact on organizational commitment (0.725). It is also observed how the organizational commitment maintains a significant negative relationship with the turnover intention (-0.138).


**Figure 2.** Structural equation model.

*4.3. Mediation Analysis.*

According to [88], when a variable, the one that acts as a mediator, is able to modify the influence that an independent variable has on a dependent variable or predecessor significantly modifying the magnitude of the relationship between these two variables, we can affirm the existence of mediation.

When the inclusion of the mediator variable is capable of modifying the strength of the relationship between the variables, but it continues to be significant, we consider the mediation as partial, being the same of complementary character when the two point in the same direction [89]. In the analyzed model, the inclusion of the Organizational Commitment variable between the Turnover Intention and Job Satisfaction variables reduced the strength of the direct relationship between these two variables from -0.692 to -0.592 (Figures 2 and 3), although maintaining the same sign, which indicates that we are faced with a partial mediation of a complementary nature.

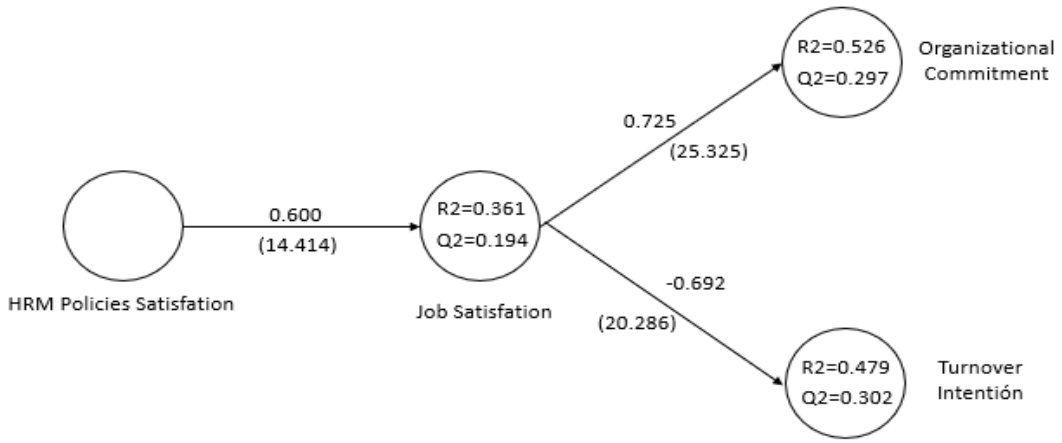


**Figure 3.** Structural equation model without moderation.

Accordind to [90], to know the size of the total indirect effect, we need to review the value of the VAF (variance accounted for), which was 0.288 for our model, so we can say that we have a partial mediation whose magnitude is 0.288.

The predictive relevance of Stone-Geisser (Q2) was calculated, whose results indicate that the proposed models have an adequate predictive capacity for estimating values, as shown in the Figures 2 and 3.

Additionally, the mediation model was evaluated using the bootstrapping method [91], valid both for the analysis of simple and multiple mediation. According to [90]. it is considered suitable for the PLS-SEM method. Some of the aspects to be evaluated are their confidence interval, the magnitude of said effects, the significance based on the value of p and the value of t [89], values that we can observe in Table 4.

**Table 4.** Direct and indirect effects.

| **Direct effect** | **95% confidence interval for direct effect** | **t value** | **Significance (p < 0,05)** |
|---|---|---|---|
| -0,592 | \|-0,780, -0,468\| | 9,524 | Si |
| **Indirect effect** | **95% confidence interval for indirect effect** | **t value** | **Significance (p < 0,05)** |
| -0,239 | \|-0,271, -0,021\| | 2,173 | Si |

Therefore, and based on the results of the analyzed data, we can consider as proven the existence of a complementary partial mediation between these constructs.

## 5. Discussion

Based on the results obtained from the analysis of the statistical model, we can observe how the satisfaction construct with HR policies has a positive impact on the job satisfaction (hypothesis 1).

We also see that the job satisfaction has a positive impact on the organizational commitment (hypothesis 4) and a negative influence on the employees' turnover intention (hypothesis 2).

We also observe how the organizational commitment has a negative impact on the employees' intention to leave the company (hypothesis 5). Likewise, we can see how organizational commitment mediates significantly, albeit partially, between employee' turnover intention and organizational commitment (hypothesis 3).

We can, therefore, consider that all our research hypotheses have been verified with the proposed statistical model.

These results ratify our theory that, in the Spanish computer consulting industry, satisfaction with human resources policies is a factor that is of great importance in terms of employees job satisfaction, a result consistent with that observed in studies previous in different professional areas [41–47], as in the employees turnover intention, an aspect also widely analyzed in different professional sectors and countries [92, 93] highlighting the importance for companies in the sector of improving this aspect in the organization.

It is, in short, a result in line with what we expected, workers who feel satisfied with the human resources policies of their organization will be more satisfied at work, which coincides with the previous studies referenced earlier in this paper.

This data also helps us to corroborate the hypothesis 1 of our article, the existence of a positive relationship between satisfaction with the company's human resources policies and employee job satisfaction.

We can also see how employees job satisfaction has a positive influence on their organizational commitment, also in accordance with previous works referenced in this paper.

These data ratify our hypothesis 4, the existence of a positive impact between employees job satisfaction and their organizational commitment.

As in the the previous case, it is also something to be expected, if the workers feel satisfied with their work they will be more committed to their organization.

We also observed the existence of a negative impact between the employees organizational commitment and

their turnover intention, which implies that employees highly committed to their organization are more reluctant to leave the company, which is in accordance with previous referenced studies.

This is in agreement with our hypothesis 5, the existence of a relationship between employees' organizational commitment and their turnover intention.

Finally, we also see the existence of a negative relationship between employees job satisfaction and their turnover intention, which implies that employees who are satisfied with their work are more reluctant to leave the company, which is in accordance with previous referenced studies.

This is in agreement with our hypothesis 2, the existence of a negative relationship between employees' job satisfaction and their turnover intention.

The inclusion of the mediating effect indicates that employees who, in addition to having high job satisfaction, have high organizational commitment tend to have lower levels of intention to leave the company, evidencing the latter that employees organizational commitment mediates between employees job satisfaction and their turnover intention, which is consistent with our third working hypothesis.

## 6. Conclusions

According to the data analyzed by this work, we can affirm that workers who are satisfied with the human resouces policies of their company tend to have greater job satisfaction, which increases the degree of organizational commitment, decreasing, in turn, their intention to leave the company. Conversely, employees who are dissatisfied with these policies tend to be less satisfied with their jobs, which leads to a lower degree of organizational commitment, thereby increasing their interest in leave the company.

Although this impact had previously been dealt with in other industries, with this work we demonstrate how it is the case of computer consulting in Spain, it is also important to consider human resources policies and employee job satisfaction as a priority.

Based on this work, and considering both the strategic importance of the sector both from a job creation point of view and from an economic point of view, and its high level of turnover, there is a need for the management of these companies to strengthen its internal corporate social responsibility policies, especially in the field of human resources policies.

On the other hand, it is not only important to improve human resources policies in order to improve the employees organizational commitment and reduce their turnover rate, but companies must also work on making known what advantages they offer to workers in order to improve their job satisfaction.

In previous studies, the impact of human resources policies on employees job satisfaction and organizational commitment and their turnover intention had been analyzed, but we have not found studies that analyze in depth the impact of these factors in the Spanish IT consulting industry, for which we believe that this work can help organizations to implement the appropriate policies in order to minimize the impact of the high turnover rates in this industry and fill this gap.

Other studies have dealt with different aspects such as Total Quality Management [94], labor flexibility [95] or ethical leadership [96] improves employee engagement and performance.

Although with this work we have managed to contrast the selected work hypotheses, it is limited only to the impact of the human resources policies of the companies without delving into the impact that other aspects may have on employees job satisfaction and organizational commitment and their intention to leave the company. From a practical standpoint, what this study teaches us is that improving human resources policies helps organizations improve both employee job satisfaction and organizational commitment, and decrease employee turnover. In previous recently published works we have delved into the impact that other factors such as organizational support [26] , organizational health and safety [27] or team autonomy and emotional intelligence [97] have on the well-being of workers and their turnover intention, thus achieving a broader analysis that includes different labor factors and helps us understand more broadly the relationships between them, an analysis that we hope to improve by including new aspects of internal corporate social responsibility in our study.

**Funding**

Not applicable.

**Author Contributions**

This paper is the result of teamwork (J.S.-A., A.V.-B., S.G.-B. and P.J.-E.). The study was conceived of and designed by the authors. The authors contributed equally to writing the paper and integrating and organizing the results. All authors have read and agreed to the published version of the manuscript.Institutional Review Board StatementNot applicable.Informed Consent StatementNot applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding author.

**Conflicts of Interest**

The authors declare no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.65

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Article

# Digital Shadow and Its Legality Aspects

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**Abstract:** It can be said that technology has enabled countless new forms of social relations, which has resulted in a reality that poses challenges to the most conservative sectors. It is in the face of this new scenario that the present investigation will address the concept of digital shadow, as well as the legality of its exploitation by suppliers in consumer relations, considering the right to privacy of consumers who use electronic equipment that transmit digital data. For this purpose, the deductive research method will be used. About the method of procedure, in this research the bibliographic method was used, with research in books, scientific journals and specialized websites on the subject. Finally, it was possible to foresee that the exploitation of consumers' digital shadow by suppliers is illegal.

**Keywords:** digital shadow; privacy; digital data

## 1. Introduction

With the arrival of the computer, the spread of mobile telephony and the implementation of broadband internet, profound transformations occurred in commerce and influenced consumer behavior, so that new technologies brought activities that were restricted to schedules and commercial points, such as lan houses, for example. From then on, the beginning of the cultural change that starts to assimilate the virtualization of the real can be seen [1].

It can be said that technology has enabled countless new forms of social relations, which has resulted in a reality that poses challenges to the more conservative sectors of legal science [2]. Its application to commercial relations resulted in new legal scenarios, different from the traditional context, which deserves attention mainly about consumer protection and defense.

The internet has significantly enhanced the scope and use of commerce, providing innovative legal relationships, as it allows not only the completion of the business by electronic means, but also the presentation of contractors and the formation of supporting documentation.

This potentialization is because the internet is a means of communication that allows the communication of many with many, at a chosen moment, on a global scale. It is a new world of communication, defined by Castells [3] as the “Internet Galaxy”, to which he attributes the modification of all domains of social life, given that communication is the essence of human activity.

In the words of Cláudia Lima Marques [4], the internet is “the new space for commerce in the world”. Through it, it is possible to search, order, pay, receive and use various items, such as books, music and other digital products, on portable devices that can be used anywhere, whether in the garden of your home, while shopping at the shopping center or supermarket, when using public transport, when moving by bus or

Received: 30 March 2023; Accepted: 12 April 2023.

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subway [5].

There is a new reality in which large suppliers can develop new cultures worldwide, given that the absence of borders, previously imposed by distance and now overcome by electronic transactions that bring everyone together through virtual platforms in time real, enables the dissemination of new products capable of awakening needs in consumers, henceforth shaping their culture, which is now increasingly globalized.

Undoubtedly, we live in a new era. Technological progress made it possible to reduce costs and opened the possibility of "building greater cooperation between all those involved in electronic commerce" [6].

However, the multiplication of electronic commerce and digital networks has facilitated the options for sharing information, knowledge, images, videos, music, among other resources, including consumers' personal data, at low cost and regardless of geographic distance [7].

This ease of sharing data presents a new legal reality in relation to people's intimacy and privacy, which can now be observed, analyzed and studied through their digital traces, left with each access they make on the internet, or even for the simple fact to carry a smartphone.

In this sense, it is up to the legal system to understand the new digital relationships and, in view of them, safeguard the right to privacy, which is a fundamental right, inserted among the personal rights that, due to its historical development, is classified as a fundamental right of the first generation.

This is because, in addition to being a subjective right, it is a positive and essential right in social organization, an institutional guarantee of pluralism and democracy, because if the public is governed by the pretense of equality, the private is at the origin of singularity.

Thus, respect for difference originally implies respect for private life and, therefore, can be considered as an expression or manifestation of freedom, as well as a consequence of human dignity in its condition as the foundation of political order and social peace [8].

The protection of this subjective right requires, then, the individual's knowledge of the existence and characteristics of the databases that have information related to him, so that the extension of the right to privacy, in a specific area such as the digital one, is capable of providing a solution, not for a new threat, but for a way of maintaining the development of digital relationships while preserving the intimacy and privacy of users of new technologies.

It is in the face of this new scenario that the present investigation will address the concept of digital shadow, as well as the legality of its exploitation by suppliers in consumer relations, considering the right to privacy of consumers who use electronic equipment that transmit digital data.

To do so, the deductive method will be used. About the method of procedure, in this research the bibliographic method was used, with research in books, scientific journals and specialized websites on the subject.

Finally, it was possible to foresee that the exploitation of consumers' digital shadow by suppliers is illegal.

## 2. Digital Shadow: a New Profile (Virtual)

Currently, because of technological advances and, mainly, the use of the internet, fundamental rights and freedoms are somehow threatened, given a new context different from the traditional one. The rights considered most vulnerable are those exercised through this network (the internet), such as freedom of expression, access to information, people's private lives, the secrecy of communications and the protection of personal data.

The right to privacy is threatened, in particular, with the proliferation of large databases, which are generated both by State infrastructure and by the private sector.

This does not mean that the right to privacy was born as a consequence of these new technologies, but rather that these are the creators of a new right to privacy, which even in the face of the same concepts and general parameters, starts to gain new peculiarities.

In a utopian sense, the advancement of information technology should be seen as a scenario of greater freedoms, as technology should not generate fear, but rather the hope of a greater degree of personal and professional development, with the respective growth and development in all areas. aspects.

However, the use of technologies in the information society and, mainly, through information technology,

has allowed tracking, storing, manipulating, matching, crossing, using and easily transmitting pieces of information about people, called "personal data" that can , to a greater or lesser extent and, depending on the use and purpose, negatively affect privacy, confidentiality of communications, honor, freedom of association, religious freedom or any other fundamental right, as well as other rights or interests protected by law . That's because the internet is the biggest showcase for data ever known, and consequently the main security threat of this data itself [9].

It is in this new scenario that the so-called Digital Shadow appears. Everything that is sent over the internet, from users' personal data in a purchase register to a photo posted on Facebook or Instagram, generates the so-called digital identity, even when browsing anonymously, given the possibility of capture of information through cookies.

These cookies are “data programs generated with the main purpose of identifying the user, tracking and obtaining useful data about him, especially based on navigation and consumption data” [10].

Souza and Amaral [11] clarify that cookies perform more than the user navigation tracking function. This is because there are several types of cookies, the most common being session cookies, first-party cookies and third-party cookies.

Session cookies are typically essential for navigation, as they constitute a website's short-term memory as the user moves from one page to another within its domain.

First-party cookies help websites to record information and settings when the user returns to visit a page in the future, allowing settings preferences to be saved, such as menu, themes, language selection, etc.

However, it is estimated that 70% of cookies are third-party cookies, originating from a different domain, offering no benefit to the user. Its use is for tracking, to “learn” about the user's browsing history, online behavior, consumption habits, among other things [11].

In this way, there is a lot of data that leaves traces while browsing the internet, and such data is captured and recorded in a way that the user is not even aware of it. The very fact of accessing the present study through the world wide web is enough to generate a digital trail.

Whether through the computer, smartphone or other digital devices, hundreds of digital traces are left daily: bits of information that are created, stored and collected.

When these digital traces are gathered, it is possible to create user profiles and even tell stories about them. The set of these traces, which makes it possible to draw conclusions about people, is what is currently known as digital shadow.

The “Me and My Shadow” Project points out that the digital shadow is built mainly through location tracking and navigation, adding that smartphones are extremely efficient trackers [12].

The same Project points out that location information collected over time can tell a surprisingly well-detailed story about the user and what their life is like. Adding to this the available public addresses, miscellaneous posts, photos and call logs, the shadow is even more complete.

Location information does not only reveal where you live and work, but also visits to the doctor, banks, universities, bars, friends' houses, etc.

This social mapping using location can also be done through cell phone towers, GPS tracking, location records, WIFI history, IP address, among others.

Every time you make or receive calls or text messages, for example, when communicating with cell phone towers, the location where the services were used is registered with the service providers and becomes part of the digital shadow of user.

In the same way, when activating the smartphone's location service, it works as a constant GPS, collecting records of all the places where it has passed.

Most applications installed on smartphones request access to the user's location with the justification of improving performance. When access is granted, the information is made available not only to the respective developers, but also to Apple or Google, through the APIs, depending on the operating system used.

Through Apple's IOS operating system, for example, the user himself has access to his location over time, information that is certainly also available to Apple itself, which can use it for various purposes.

To do so, just go through the following path in the IOS system: Settings → Privacy → Location Services → System Services → Important Locations → and select one of the recorded locations, which are the most frequent by the user. A map will be made available that even shows the number of times the user has visited the site over time.

This information, which is part of the digital shadow, allows Apple, for example, using algorithms, to identify where the user's home is (where he usually spends the night) and also where his work is (where he usually spends the day).

This digital shadow presents new vulnerabilities to the consumer, typical of the technological era, such as practices called geo-pricing and geo-blocking.

Geo-pricing consists of charging different amounts for the same product and/or service due to the geolocation of the consumer, favoring some over others [13].

By knowing the consumer's location (which is possible due to the geolocation provided by Internet access devices, such as smartphones, tablets, etc.), the supplier can assign different prices to its products and/or services, according to with the purchasing power of people in a particular region or country.

The practice has already been observed in sales of airline tickets and hotel rates. The company Decolar.com was punished for simultaneously offering the same hotel room at different prices to Brazilian and Argentine consumers (a value 49% higher for consumers located in Brazil). On that occasion, the practice of so-called geo-blocking was also verified, which is characterized by blocking the availability of the product or service for consumers of a certain location, while it is available for those of another.

It appears that geo-pricing and geo-blocking practices transcend consumer vulnerability. They go much further: they are likely to cause impacts on the market itself.

The geolocation made possible by smartphone-type devices allows suppliers, through the most diverse applications installed on consumers' devices, to explore their digital shadows and thus follow their routines in real time, such as consumption preferences and the route taken each day. Consumers are often not aware that they are being monitored, as they have agreed to a clickwrap-type adhesion contract, whose numerous mandatory adherence clauses for installing the application have not even been read.

The sudden change in the routine and preferences of consumers allows suppliers to identify, for example, that the consumer has lost his job, as he no longer makes that route daily, which theoretically increases the risk of defaulting on obligations assumed. Under these circumstances, it is natural for insurers to increase the price of insurance premiums and for credit houses to increase the interest rates on their lines of credit.

It appears that the internet has enabled the supply network subjects to act in new ways towards consumers, through the exploration of their digital shadows and contractual connectivity resulting from new economic needs that require different contractual forms from traditional legal types [14]. These are businesses typical of the current technological scenario. However, it is necessary to reflect on the legality of these practices.

## 3. Conclusion

The expansion of electronic commerce, resulting from new technologies, brought more dynamics to business relations, providing the transfer of the most diverse data in real time through the world wide web.

When surfing the internet, or even simply by carrying a smartphone in their pockets, consumers leave a digital trail, predominantly resulting from their browsing and location, capable of building their profile and stating their preferences, which is currently called digital shadow.

This digital shadow is often used by suppliers of products and/or services in order to implement more assertive commercial strategies, with the aim of seducing the consumer and leading him to the realization of consumption.

It was verified that the access and use of consumers' digital shadow by suppliers, as a rule, does not find express consent, which is done, when done, through accessions via clickwrap, which do not always express the real will of the contractor.

As a result, there was a need to rethink the right to privacy, taking into account these new electronic relationships and the current legal system.

Through the study of the legal system, it was possible to foresee that the exploitation of consumers' digital shadow by suppliers is illegal.

**Funding**

Not applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding author.

**Conflicts of Interest**

The authors declare no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.66

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Article

# The Significance of Planning and Scheduling on the Success of Projects

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**Abstract:** The overriding purpose of the study was to examine the significance of planning and scheduling on project success. Accordingly, taking the research objective and the researcher's experience into account, descriptive type of research design was nominated to be the research design that best fits the research objective. Then, 23 projects completed in the last five years and 138 project professionals working on different projects at different levels were chosen to represent the target population of the study. Similarly, interviews, questionnaires, focus group discussions, and review of documents were used as data collection tools, among others. The research data analysis revealed that all of the project managers involved in this research indisputably recognize the impact of planning and scheduling on project success. Likewise, 100% of the sample population stated that if project success is defined as meeting project goals, then planning is the framework that explicitly states project parameters, resource requirements and work flows for the realization of the project goal. In this sense, the planning stage is the most imperative stage as it dictates subsequent project actions and decisions. In addition, records of the 23 selected projects depicted that 17 of them were recorded as successfully completed while the remaining six projects were documented as failed. Further review of the documents also revealed that all of the successfully completed projects were initiated with detailed project plans of their own on hand. Conversely, even though all the failed projects had 'plans' to refer to, the plans were either superficial or adapted from analogous successfully concluded projects. In other words, all of the failed projects were commenced without having detailed project plans of their own developed to fit their size and circumstance. So, the data analysis publicized that launching a project without a project plan is like going on an adventure without having a map. Simply put, executing a project without a project plan is easier said than done. In brief, this finding of the study is in good agreement with the old saying "Failing to plan is planning to fail". In conclusion, the better the planning is, the better the project outcome becomes. Finally, not only the project outcomes, but even the career path of the project manager depends on the quality of the project plan/schedule.

**Keywords:** project; project planning; project scheduling; project success

## 1. Knowledge Gap

The first and perhaps the most important task a project manager has to do before anything else is to plan. A plan is a guideline that directs every move of the project team during the execution of project milestones in an attempt to achieve project objectives. In short, a plan is a document that the project team refers to during project implementation. It is worth developing as it portrays the project goal and possible courses of actions for its

Received: 31 March 2023; Accepted: 15 April 2023.

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attainment. In addition, a project plan provides direction and stipulates important project parameters and timings along with relevant tools and techniques. It also gives bases for implementation, monitoring and evaluation of activities. Similarly, project planning is among the primary phases and activities to be accomplished which enables project managers to determine project scope (that is what is to be done and what is not) and project schedule.

Usually it is uncommon to commence project works without having a well-developed project plan at hand as the plan is the roadmap that directs every project moves and decisions. Since a project plan helps project teams to have a clear picture of the project goal in general and upcoming project activities in particular, it helps project stakeholders to own the project and develop sense of responsibility with clear project objectives in their mind. Moreover, planning makes project teams accountable for their actions and decisions. When planning a project the most likely future project environment wherein the project will be executed should be taken into account for the smooth execution of the project with the minimum possible risks of failure. Similarly, the planning team should also make every effort to see the unseen and expect the unexpected and make all the necessary arrangements as may be called by prevailing situations. In brief, project plans are made in an attempt to prevent any surprises in our own work that could turn our failings into "news".

On the contrary, every so often a number of project professionals disagree with the notion that planning increases project success [1]. They argue that not planning is much better than planning. To these project authorities, because project plans are developed in a predetermined future project environment, unforeseen situations are sure to show up during project execution. Hence, it is not uncommon to experience unexpected project environments that force project teams to revisit their plan or discard it otherwise. According to these project professionals as no one can develop project plans that do not call for continuous revisions along with changing project settings, planning is a continuous process that calls unceasing efforts. This makes planning, itself, a project [2]. Therefore, according to these experts, developing a plan for a project is like undertaking two distinct projects simultaneously, which deviates project team's efforts and lessen its concentration on the execution phase of the project. They also argue that, more often than not, project plans are very likely to be modified not much later that they get completed.

We also often hear it said that project teams need to focus on the ultimate goal of the project and shape and reshape their actions and decisions in such a way that the pre-set project goal is attained with the minimum possible project cost and effort [3]. This, in turn, requires decisions made and actions taken with the prevailing project environment in mind. In brief, since the future is full of uncertainty, the attempt to frame future project actions today is unwise. It is a complete wastage of scarce project resources. Generally, to these people, the idea of planning is totally nonsense.

Finally, it is interesting to know that some project professionals do not want to devote their project resources to plan their project, but they are willing to devote their scarce resources to rectify the mistakes they made as a result of unplanned tasks. What recklessness!

## 2. Background

The old saying, "Failing to plan is planning to fail" reflects the reality of most projects. It is true that projects are hardly successful without having apt project plans at their kick-off. Often project plans help project teams to monitor their actions and minimize (avoid if possible) risks of failure before they show up and begin to hinder project success. Therefore, the role of a project plan is substantial in terms of putting early warning signs of failure in place so that project teams may take corrective actions as appropriate instead of being victims of the unforeseen causes of failure.

Planning is usually the first and the most important stage of any project. Every so often successful projects are those that kick-off with good project plans on hand [4]. Since plans are deliberated to direct future project undertakings, they should be developed before commencing the project. Besides, as planning involves identifying resource requirements, determining project budget and scope, and stipulating specific timings of major project milestones, it boosts wise and economic usage of organizational resources and efforts [5]. Planning is cheap when compared to reworks that result from unplanned tasks. Often unplanned tasks are very

likely to result in errors or omissions; and errors materialized as a result of unplanned jobs done can be very expensive to rectify. Therefore, planning is cheaper than working over again!!!

Since planning is a roadmap for future project activities, it needs to be comprehensive and encompass each and every aspects of the project. Likewise, planning and scheduling dictates the logical sequence of tasks and their duration. On the other side of the line, conceptual skills should be supported by procedural considerations for developing first-rate project schedule, scope, cost and quality planning and control. In addition, projects should have clearly set chain of command and line of communication for their successful accomplishment. In a project setting, communication matters. Project work is a team work; and teams function well only if the communication among team members is facilitated or eased. After all, team members are humans, not robots that don't have their own thoughts. Hence, the communication and social interaction among the team members is potentially able to determine the project's fate. Thus, setting and communicating lines of communication within and outside the project team is fundamental for project success. To sum up, project success is the upshot of the project team's collective efforts that have come together via well-established communication schemes.

Project scheduling is as important as project planning. Of course, it is part of a comprehensive project planning. Scheduling principally focuses on time frames of project activities. It is obvious that the project implementation process becomes simple if the sequence of activities, the relationship among distinct tasks, and their duration is made clear. Here, it is worth mentioning that some project activities cannot even be initiated unless one or more of the other project activities are completed. Failure to comprehend this plain fact of projects leads to project schedule overrun and eventually failure of the entire project. Therefore, identifying core project activities, recognizing their most reasonable duration, and allocating project resources to individual tasks simplifies the implementation process thereby significantly contributing to the successful accomplishment of the project.

Surprisingly enough, for quite large number of people in the project arena, the demarcation between project schedule and project plan is unclear. However, a project schedule is limited in its scope compared to a project plan and mainly focuses on the sequence and duration of activities. Project planning answers the questions "What will be performed?", "How will it be performed?", "Where will it be performed?", "Who will perform it?", and "In what sequence?". On the other hand, project scheduling answers one strategic yet unanswered question, which is "What is the sequence of activities?" Planning a project has numerous benefits that can be harvested if done properly. One of the benefits of a project plan is disclosing envisioned project activities for decision makers to secure their support. It is clear that the better project sponsors understand the project, the more they support it. Accordingly, a project plan is an important instrument for securing helping hands and facilitating the project execution process. Likewise, project scheduling discloses logical order of activities for timely and on budget completion of projects.

## 3. Statement of the Problem

Project planning is an art of determining "What" is going to be done, "How" things are going to be done, "Who" will be doing activities and "How much" activities will cost. Here we can see that planning does not take account of scheduling, which addresses the "When". But once planning is complete scheduling can follow. (See Figure 1)

A project plan is said to be complete only if it includes scheduling. Scheduling is the process of converting a broad-spectrum plan for a project into a time-based graphic presentation using information on available resources and time constraints. Simply put, scheduling refers to the process of identifying the activities and sequencing them in a logical order and finding out if dependencies exist among the activities. It is clear that the activities that occur prior to execution and along with planning are important to project success. Scheduling, being just one of the many tools available to project managers during the planning stage of a project, may be one of the most important project instruments because it not only lowers the chance of project schedule overrun but also it assists in recovering from delays. Undeniably, delays often result simply from poor planning. As a matter of fact, project schedule overruns are often accompanied by project cost overruns. On the contrary, a properly done project schedule sheds light on confusions; and elucidates such project stuffs as expenditure estimates for

crews and materials, expected opening dates (there may be situations where a strict opening date is highly important, such as a new production facility), and others.

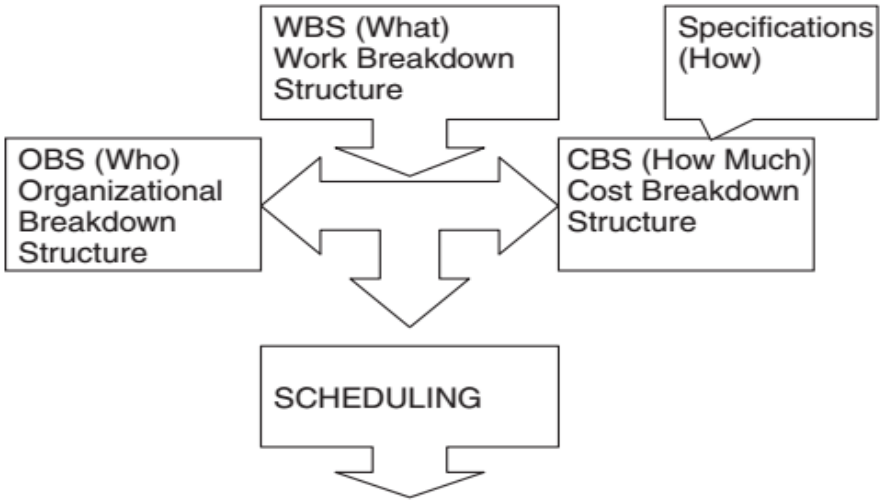


**Figure 1.** A brief outline of project planning.

On top of the aforementioned benefits of scheduling, it also allows for accountability. Setting milestones from the beginning allows for the project managers or the owners to pinpoint exactly what went wrong and who or what was responsible for a delay. A schedule is also a good communication tool between the managers, the owners, investors, and the general public. Schedules give an overall sense of the project's expected progress. Without schedules, it's much more difficult to explain to someone unfamiliar with the project what is expected to take place.

Some project managers question "How can project planners develop a realistic project plan or schedule when project activities cannot be foreseen or their implementation depends on the outcomes of earlier activities?" This question has some grains of truth. Since no two projects are identical to one another and every project is unique, the project activities are often executed in yet unseen and totally new project environment. This makes project planning complex; and the project plan untried or untested. This, in turn, makes the project plan perhaps unrealistic and unfeasible. What is even worse is that the plan is to be put into practice in an unknown upcoming project environment that doesn't take after any of its kind. Certainly, this is very risky and hardly dependable. These project managers also argue that the cost of planning a project is by far more than its benefit. Moreover, they affirm that too much project planning can limit creativity. Hence, according to these project managers planning is a purposeless wastage of project resources and unwise use of project efforts. In brief, to these project managers, project planning is unnecessary and should not be done in projects (Here, please note that scheduling is part of planning).

On the other hand, other project managers do not agree with the conclusion that planning should not be done in projects. They say let alone to perform a project without a plan, even the complication of inadequate planning is too large to correct and too expensive to rectify the errors occurred. To these project managers, even the most effective project team cannot overcome the drawbacks of a poor project plan; and projects initiated without (or with inadequate) planning can lead to the most incredible project failures. Decisions made at the early definition stages of a project set the strategic framework of the project. Once things go wrong at the inception of a project, then without doubt the project will be wrong for a long time. In this regard many researches reveal that for a project that is flawed from the start, successful execution may matter only to the project team, while the wider organization will see the project as a failure. Because plans are a cornerstone of any project, planning is a dominant activity within a project context. Planning is inherently important to project success or one could argue project management would not exist. Therefore, projects are unlikely to succeed without being supported by detailed project plans. In a nutshell, to these project managers, project plans are inescapable and indispensable.

As discussed above, there are two conflicting positions of project professionals on the essence of planning and scheduling to project success. In conclusion, it is the above-mentioned two disparate extreme thoughts of planning that led the researcher of this study to undertake the study. Thus, in this study the researcher strived to solve the aforementioned dilemmas of planning and aimed to come up with a clear position of planning and scheduling in project management. In addition, surprisingly little research has been done on how much planning and scheduling should be done in projects. Therefore, it is this gap that the researcher wanted to fill.

## 4. Basic Research Questions

With the aims and objectives of the study in mind, the following basic research questions were formulated:

(1) How important is planning to project success?

(2) What is the significance of scheduling to the success of projects?

(3) Do project managers recognize the impact of planning and scheduling on project success?

(4) Does failing to plan or schedule projects lead to project failures?

(5) What is a successful project?

## 5. Research Objectives

### *5.1. General Objective*

The general objective of the study is to examine the significance of planning and scheduling on the success of projects.

### *5.2. Specific Objectives: Some of the specific objectives of the study include*

(1) To inspect the significance of project planning to project success;

(2) To find out how important project scheduling is to the success of projects;

(3) To ascertain project managers' attitude towards the impact of planning and scheduling on project success;

(4) To discover the relationship between failing to plan or schedule a project and project failure;

(5) To study what a successful project is; and

(6) To scrutinise if the rate of project success increases with project planning/scheduling.

## 6. Significance of the Study

As a matter of fact, projects are hardly ever completed on time, within budget, and to the specified scope and predetermined project quality. Everything considered, projects are not always successful. Sometimes they are overdue; and some projects do not meet the quality expectation of clients; some projects are over budget, and some others completely fail. A number of projects in the private and public sectors significantly overrun their project schedule and budget, and as a consequence fail to achieve the organization's financial and strategic objectives. The project schedule overrun is often complemented with sizable increases in project costs and with substantial financial losses to the organization. More often than not, this is due mainly to the failure to properly plan and apply the tools and techniques of modern project planning. Hence, this study is designed to acquaint its readers with the worth of project planning.

Regarding project scheduling, the development of a good project schedule is vital to an understanding of project performance and control [6]. Good scheduling represents a roadmap for project managers, planners and schedulers in monitoring and tracking critical activities and milestones during the progress of a project [4]. Virtuous project planning and scheduling can also provide tangible benefits for key project stakeholders. It sets chain of command and line of communication among project team members; and discloses accountability at times of discovering wrong doings. Despite these theoretical discussions on the significance of project planning and scheduling, little empirical research has attempted to understand the effectiveness of its application in projects. It is this knowledge gap that this research seeks to fill.

## 7. Research Methodology

Since the quality and reliability of a research predominantly depends on the research methodology employed, the researcher of this study has considered all possible research methodologies available before choosing one. Accordingly, taking the research objective and the researcher's experience into account, descriptive type of research design which describes the significance of planning and scheduling on project success was chosen/ designated to be the research design that best fits the research objective. Besides, the target population of the research was the entire project team members working on six different purposely selected projects. The researcher also used Yamane's (1967) to find out the applicable research sample size. In addition, with the intension of obtaining a sample that best represents the target population of the study, a sample of 138 project team members working at different levels of the said projects was selected using judgmental sampling technique. Furthermore, the research also made use of both primary and secondary data sources, one of which is questionnaire. In view of that, among the 138 questionnaires distributed to respondents, only 132 questionnaires were collected back. Likewise, secondary data were collected from project track records, reports, documentations on lessons learned and project closing reviews, etc. Finally, the data collected was analysed using descriptive statistics such as frequency, percentage and tabulation.

## 8. Major Research Findings

This section of the study reviews the most important findings of the study. To better present the impact of planning and scheduling on the success of projects, which is the overriding objective of this study, this section begins with discussing what a successful project is (see research question number 5 above) as revealed via methodical analysis of the data collected for the purpose of this research.

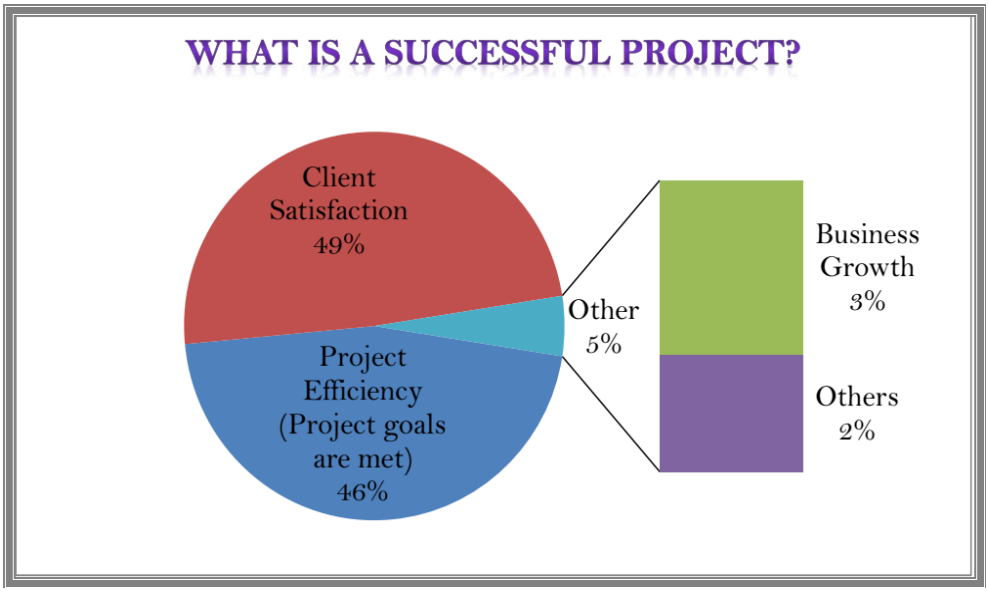


**Figure 2.** When is a project said to be successful. (Source: own survey).

As depicted on Figure 2, 49% of the respondents define project success as clients' satisfaction. They argue that clients' satisfaction is very subjective. During focus group discussions, they mentioned their experiences wherein project goals were not even near to getting met, yet the client was highly satisfied. The exact opposite scenario was also mentioned: All the project goals were met, but the client was rather unhappy to say the least. Generally, as to 49% of the respondents, meeting project goals doesn't guarantee clients' satisfaction; and equally failing to meet the goals doesn't necessarily lead to clients' dissatisfaction. Yet, they argue, a project team should work for clients' satisfaction to complete a project successfully. After all, according to these project experts, project success is clients' satisfaction!!! In contrast, 46% of the respondents stated that project success is measured by providing the deliverables on time, within project scope & budget and at an agreed upon quality.

By the same token, the respondents took three clearly distinct positions concerning the significance of planning on the successful conclusion of projects. As presented on Figure 3, only 67% of the respondents believe that planning increases the rate of project success. On the contrary, the data analysis revealed that 26% of the respondents are uncertainty about the contribution of planning to the successful execution of projects; whereas the remaining 7% think planning is totally wastage of project resources and should not be done. Surprisingly enough, this research also disclosed that all project professionals who have experience of managing projects (i. e. a subclass of the research sample having only the project managers involved in the sample) strongly support project planning.

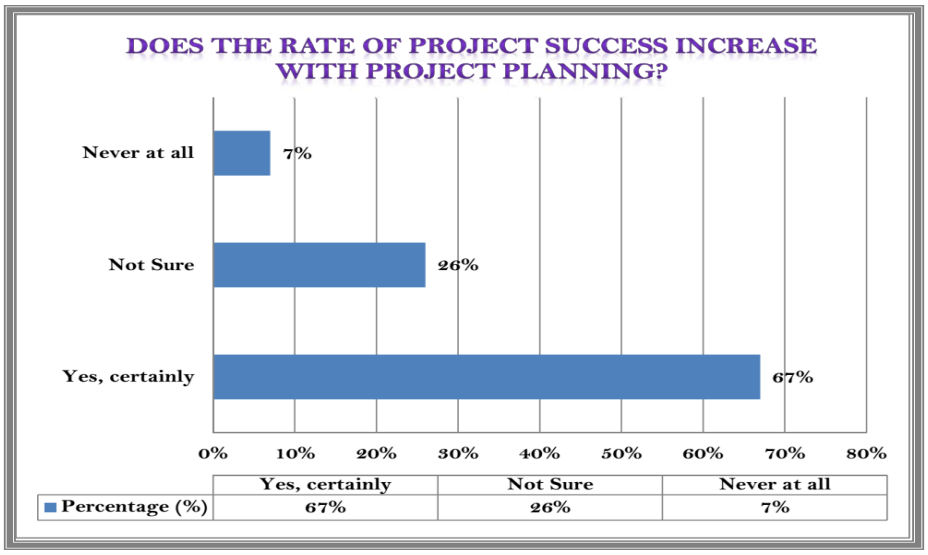


**Figure 3.** The contribution of planning to project success. (Source: own survey).

A project plan is an all-inclusive scheme of a project; and proper project planning includes a logical and detailed schedule that marks project milestones. A project plan is never complete without a project schedule. Accordingly, this study revealed that to most people the most important part of a project plan is the project schedule. In view of that, as displayed on Figure 4 below, out of the 132 project management professionals involved in this study, 127 of them believe that project scheduling (not the whole project planning) is crucial to project success. What is even more interesting is that all of the project managers targeted in this study consider project scheduling as fundamental to project execution and should always be done.

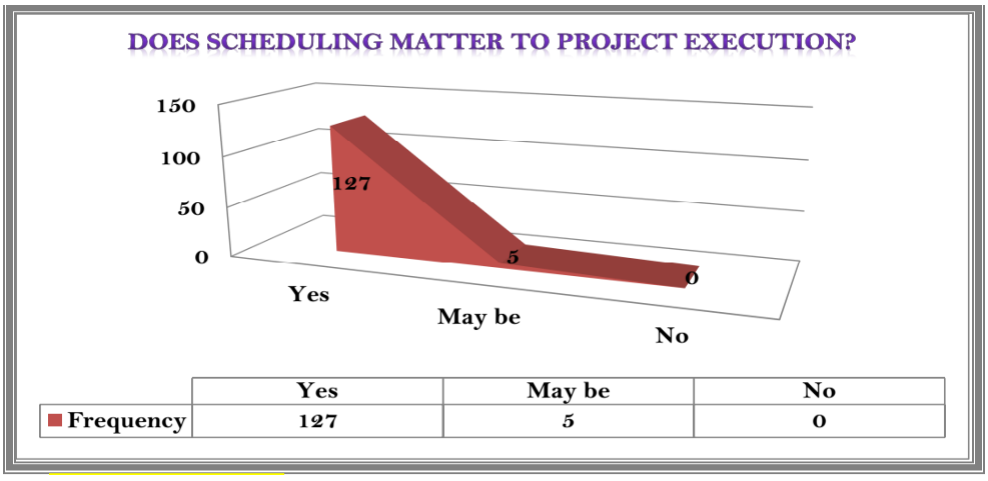


**Figure 4.** How important is project scheduling to project success. (Source: own survey).

On the other side of the spectrum, one of the major findings of this research supports the idea that project planning affects key project parameters. As shown on Table 1, 10% of the respondents stated that planning affects project schedule. Similarly, 94% of them admitted that project cost changes with project planning. To sum up, the data on the table below indeed portrays how important project planning is to project success.

**Table 1.** Does having a complete project plan at the inception of a project affect key project parameters.

| Point of reference (Benchmark) | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|
| Project Budget | - | - | - | 8 | 124 |
| Project Schedule | - | - | - | - | 132 |
| Project Scope | 36 | 18 | 32 | 21 | 25 |
| Project Quality | - | - | 4 | 57 | 71 |

(Source: own survey)

To conclude, data analysis revealed that all of the project managers involved in this research indisputably recognize the impact of planning and scheduling on project success. Likewise, 100% of the sample population stated that if project success is defined as completion of projects on schedule and within project budget at predetermined project scope and quality, then planning is the blueprint for goal achievement that specifies the necessary resource allocations, schedules, tasks, and other project parameters. In this sense, projects do not fail at the end; they fail at the beginning. This is true as a carefully planned project takes into account all the necessary aspects of a project (such as tasks, risks, communication lines, milestones, scope, schedule, cost, quality, etc.) and provides a plan which project teams can refer to during execution and evaluation.

On the other hand, twenty three (23) projects completed in the last five years were chosen to help the researcher appraise if there is any link between project planning/scheduling and project success. A critical review of the documentation of the projects disclosed that seventeen (17) of these projects were recorded as successful (in their own definition of success) while the remaining six (6) projects were documented as failed (for one or another reason). Besides, the records of the projects depicted that all of the successfully completed projects were initiated with detailed project plans of their own on hand. Conversely, even though all the failed projects had 'plans' to refer to, the plans were either superficial or adapted from successfully concluded analogous projects. In other words, all of the failed projects were commenced without having detailed project plans of their own developed to fit their size and circumstance. Here, it is worthy to mention that since no two projects are identical to one another, no one project plan (no matter how wonderful it may be) can be used for two or more different projects. Every project is unique, and the plan/schedule involved contributes to that uniqueness. This finding was a clear indicator of the significance of planning and scheduling on project success. That is, it signposts that a detailed project plan/schedule is an invaluable tool in a well-managed project. The plan, and how it relates to the project environment, is a major factor in the success of any project. In brief, this finding of the study is in good agreement with the old saying "Failing to plan is planning to fail".

## 9. Conclusion

In this segment of the study, core research findings extracted from analysis of the research data (which was gathered mainly through both focus group discussions and review of documents) are presented for readers' special attention.

Accordingly, the data analysis revealed that launching a project without a project plan is like going on an adventure without having a map. Simply put, executing a project without a project plan is easier said than done. Thus, a project plan/schedule is indispensable. However, even though planning is an essential step in project management, too much detailed planning might not help. Detailed plans perhaps limit the project team's creativity and obstruct its ability to respond to evolving project circumstances. This is especially true when the

project team is using an agile methodology. Nevertheless, this doesn't mean project plans are not needed. The importance of a project plan is indisputable, but the plan should neither be too detailed nor too sketchy to refer to during project progress. Planning provides the benchmark for measuring project progress. Likewise, a thorough schedule developed during the planning stage always provides an insight to what's happening during the execution stage. The better the planning is, the better the project outcome becomes. In a nutshell, a rational project plan increases the rate of project success.

Although the initial project plan or schedule (which is set at the start of the project with all the information available by then) should be used as the benchmark for the project, it must be regularly revised as new information becomes available. All of the focus group discussion participants highlighted that project planning is not a one time job, it is a continuous endeavor. Thus, they say, project managers need to realize that project planning is an iterative process and must be performed throughout the life of the project, in accordance with the reality on the ground.

Because proper project planning offers a long term perspective with a good understating of the project environment, it has intense implication on the outcomes of projects. Here, investigation of secondary documents disclosed that the development of a project plan that incorporates the strategic management and development of project human capital helps build a strong HR team that, in turn, helps in achieving better project outcomes. To make the matter even more appealing, not only the project outcomes, but even the career path of the project manager depends on the quality of the project plan. In order for the project manager to be effective, he/she must understand how to work with the various stakeholders who interface with the project. To be brief, in a project management environment, the project manager, team members, and other stakeholders at different levels may have their own subjective expectations of what their relationships should be with the other parties. Therefore, both individual and team authority and the communication relationships necessary for the project organizational system to function effectively must be made known to all project stakeholders, at every level of the project. If this information is not communicated accurately, then it is completely possible that they may all have different interpretations of the planning authority relationships, a situation that invites conflicts. Yet properly done project plans can bridge this communication gap, minimize possibility of conflicts, and bring about industrial peace, and eventually secures project success.

At last, but most importantly, analysis of focus group discussions publicized that each project has at least one objective. And it is the project plan that best publicizes these project objectives. This, in turn, helps the project team to recognize the project objectives and figure out where they are heading to. This motivates the project team members and boosts their determination and commitment for the successful completion of the project.

## 10. Recommendation

In this study the researcher has contributed his part in researching a much-neglected but indispensable subject in scholarly works on project management, namely the significance of planning and scheduling on the success of projects. The researcher also forwards the following two sets of recommendations for both practitioners in the area and future researchers.

### *10.1. Recommendations for enhanced impact of planning and scheduling on project success*

(1) A project manager should be nominated before commencing the development of a project plan, and he/she should be the key player in the planning process. This helps the project manager to wholly understand any commitment assumed in the beginning work. Besides, it will be easier for the project manager to execute his own plan than somebody else's plan.

(2) A project plan should be comprehensive; but neither too detailed nor too shallow. In brief, it should be rational enough.

(3) The project plan must be regularly revised as new information becomes available.

*10.2. Recommendations for further studies in the area*

(1) The researcher's first recommendation would be a replication of this study in different settings to provide more interesting insights into the subject.

(2) Finally, the researcher recommends further studies on how planning and scheduling allows for accountability.

**Funding**

Not applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Not applicable.

**Conflicts of Interest**

The author declares no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.67

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Economics & Management Information

https://ojs.sgsci.org/journals/emi

Article

# Having the Resilience to an Ever-Changing Business Environment Through Strategic Collaboration Supported by Digital Innovation

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**Abstract:** Purpose-This research aims to find out how a company can be resilient to an ever-changing business environment through the development of collaboration strategies and digital innovation to improve business performance and to find out which is more dominant in adapting to an ever-changing business environment to improve business performance, whether collaboration strategies or digital innovations? Research Design-This research uses a quantitative approach. Observations were made in a cross-section/one-shot, in 2022. The population of this research was the ISP industry in Indonesia, which amounted to 474 companies, and the unit of observation was the top management. Samples were taken from as many as 240 respondents. Testing the causality hypothesis in this research used Structural Equation Modelling (SEM). Results -The results of this research indicate that the business environment has a significant indirect effect on business performance through collaboration and digital innovation strategies, while the direct influence of the business environment on business performance is not significant. The effect of mediating collaboration strategies on the relationship between the business environment and business performance is more dominant than the mediating effect of digital innovation. Conclusion -By developing and implementing digital collaboration strategies and digital innovation to adapt to an ever-changing business environment, making changes in the business environment does not have a direct effect on business performance, so companies will have the resilience to an ever-changing business environment the business environment, and because collaboration strategies have a more dominant influence than digital innovation, then companies should prioritize collaboration strategies that are supported and complemented by digital innovation.

**Keywords:** business environment; digital innovation; collaboration strategies; business performance; internet service provider

## 1. Introduction

In 2019-2020 based on research conducted by the Indonesian Internet Providers Association (APJII) that the growth in the number of users of the Internet in Indonesia is nine times greater than the population growth in Indonesia. The growth of Internet users is also due to the growth of internet service providers in Indonesia, currently based on APJII data are 474 providers. In addition to facing competition with the 474 local ISPs, ISPs also face competition with the presence of foreign ISPs that operate in Indonesia, such as Starlink. This

Received: 2 April 2023; Accepted: 24 April 2023.

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condition puts the ISP industry in Indonesia in a hyper-competition situation.

Because of hyper-competition, internet access rates continue to decline from year to year, starting in 2009 until now, it's made the profitability growth of ISP companies tend to stagnate/decline. The existence of the Covid-19 pandemic has resulted in a further decline in ISP profitability, especially ISPs where most of their customers are business customers with a B2B business model, this is due to the reduced purchasing power of companies, governments, and schools, which led to a reduction in Internet spending. Besides hyper-competition, ISPs in Indonesia also have problems; regulations that are not in favor of internet service providers, digital technology disruption, increase in bank loan interest rates, and ever-increasing customer demands and preferences, these are part of the business environment. The business environment includes the microenvironment and macroenvironment [1].

The inventiveness of industry participants in growing the ISP business often does not adequately reflect the needs of the current market. Many ISP companies in Indonesia only provide basic internet services, therefore they must act quickly to innovate and discover new services with the new business model, such as IoT (Internet of Things) -based smart home services, video, games, payments, and others. The phenomena of digital innovation in ISP companies demonstrate that businesses still struggle to identify customer needs that have untapped potential for capturing market share. In addition, businesses have the propensity to innovate slowly in response to digital disruption, particularly when it comes to developing new products, services, and business models. In managing innovation in digital goods and services, five main areas have been identified that may be monitored and evaluated. These five main areas are user experience, value proposition, digital evolution scanning, skills, and improvisation [2–4].

The present performance of ISPs, according to APJII, is also correlated with the need for collaboration with pertinent stakeholders and industry participants, both of which have not yet been completely established adequately, for example; collaboration with the government as a policy maker to benefit the ISP industry such as tax amnesty and rescheduling USO (universal service obligation) payment, collaboration with banks to negotiate loan interest returns and loan installment payment time, collaboration with universities and suppliers for joint research on the use of new technologies to improve services. The company develops its collaboration strategy to deal with the ever-changing business environment by optimally utilizing its resources to improve its business performance. With the right collaboration, the company is expected to have "Strategic Resources" so that the company will have a long-term competitive advantage compared to other companies that do not have it [5].

The relationship between the business environment and business performance that was examined by previous researchers turned out to get inconsistent results, studies stated that the relationship between the business environment and business performance was significant [6–11] while other studies gave insignificant results [12], as shown in Table 1, The inconsistency of the results of previous studies is a research gap, so this study aims to improve this research gap by using digital innovation and collaboration strategies as mediating variables for the indirect relationship between the business environment and business performance.

**Table 1.** The inconsistency of the results from the previous studies that studied the relationship between business environment and business performance.

| Author | Result |
|---|---|
| [6-11] | Significant |
| [12] | Not Significant |

## 2. Hypothesis, Theoretical, and Research Model Framework

### *2.1. Theoretical Framework*

This study uses the logic that the more attractive the business environment, such as market potential, economic growth, political stability, and government regulatory support, the company's performance will increase. Industrial Organizational Theory emphasizes that a company's competitive advantage comes from an attractive industry or external factors and a company's competitive ability is determined by the company's ability

to analyze opportunities and threats to external factors. Therefore, companies must have the ability to adapt to an ever-changing business environment to maintain a competitive advantage and sustainable business performance [13].

Business performance is the business result or the achievement of all operations related to the business; indicators of business performance are asset growth, sales growth, ROA, ROIC, and EBITDA margins [3, 14-16]. Other indicators such as return on equity (ROE), return on assets (ROA), earnings per share (EPS), and Tobin's Q ratio [17]. Research on digital technology, digital capabilities, and organizational performance, used ROA as a measuring tool [18], ROA, and ROE to measure the success of a business [19].

The digital innovation management framework identified in five main areas that can be measured and evaluated in managing digital product and service innovation, which include: value proposition, digital evolution scanning (observation of digital evolution), user experience, skills, and improvisation (improvisation) [4]. Digital innovation refers to the use of information and communication technology as the main driver of innovation that can have an impact on organizational structures, processes, and landscapes [20], and digital innovation is the result of new combinations of physical and digital components to produce new products [21],

The concept of a collaboration strategy is a planned cooperation activity that is mutually beneficial, involving all stakeholders including horizontal stakeholders (lateral, internal), and vertical stakeholders (customers, suppliers), who complement each other, this concept was developed based on a combination (cohesion) of the collaboration concept [22 – 25] with the concept of excellence collaborate through a meta-strategy [26,27]. A partnership strategy is a business strategy that determines the overall goals of business unit alliances (eg to develop new technologies or enter new markets) [27] and the configuration of portfolio business alliances [28]. These portfolio business alliances include collaboration with suppliers, collaboration with complements, cooperation with customers, and cooperation with competitors. Collaboration can be used effectively to resolve conflicts or produce a shared vision, namely, stakeholders agree on the potential benefits of working together [29]. Collaboration is “a process of shared decision-making among key stakeholders” [23].

The business environment is internal environmental factors (internal environment) and external environment that can still be controlled (narrowed external environment) and institutions outside the company's control (broader external environment) that can affect the company's business performance either directly or indirectly [30]. The external environment includes economic strength; social, cultural, demographic, and environmental forces; political, governmental, and legal power; technological power; competitive strength [15]. The external environment includes the microenvironment and the macro environment. The microenvironment is the environment over which the company’s stakeholders have control i. e. control over suppliers, customers, retailers, and competitors. And the Macro Environment, namely the environment over which stakeholders do not have direct control consists of politics, economy, society, and technology [1].

#### 2.1.1. Variable Dimensions

Based on the results of previous studies which were then adjusted to the unit of analysis of this study, namely ISP in Indonesia, the dimensions of the variables of this study are business environment, digital innovation, collaboration strategy, and business performance. Business performance variables are measured using 5 indicators, namely asset growth, EBITDA margin, ROA, ROIC, and share growth [14–16]. To measure collaboration strategy variables used 5 dimensions included internal cooperation, cooperation with suppliers, cooperation with customers, cooperation with laterals, and cooperation with complementarities [27, 31, 32]. Digital innovation variables are measured using five dimensions [4], which consist of observation of digital evolution, user experience, value proposition, skills, and improvisation. While the business environment variables are measured with two dimensions [1], which consist of the macroenvironment and microenvironment.

### *2.2. Hypothesis*

Based on previous studies, this study developed the following hypotheses:

Previous research shows that the business environment has a significant direct relationship with business performance, such as Studies that had shown that the business environment has a significant effect on business

performance: promotions carried out by local authorities had a beneficial impact on the performance of small and medium enterprises (SMEs) [9], small and medium enterprises must recognize and be able to adapt quickly to market changes to produce flexible and effective strategies to improve business performance [7], the success of a company is strongly influenced by environmental factors [6], the business organizational factors, psychological factors, government attitudes, international variables, marketing strategies, and company performance growth are influenced by the business environment [8]. According to the findings of previous studies, the first hypothesis is as follows:

H1: business environment has a significant effect on business performance.

Previous research shows that digital innovation has a significant direct relationship with business performance: process and product innovation had a substantial beneficial impact on business performance [33], the business relationships will have an impact on the company's success through product innovation [34], the capacity for innovation has a direct effect on product quality and operational performance [35]. According to the findings of previous studies, the second hypothesis is as follows:

H2: digital innovation has a significant effect on business performance.

Previous research shows that collaboration strategies have a significant direct relationship with business performance: The entrepreneurship, marketing capabilities, relational capital, and empowerment have an important effect on innovation capability and business performance [36]. Buyer involvement in international markets affects company performance [37]. Collaboration has positively affected business transformation [38]. According to the findings of previous studies, the third hypothesis is as follows:

H3: collaboration strategies have a significant effect on business performance.

Previous research shows that the business environment has a significant effect on business performance through digital innovation. Digital innovation mediates the impact of digital orientation and capabilities on performance both financially and operation [39]. Innovation aptitude mediates performance effects during economic expansion but only to a limited extent during recessions [40]. In times of economic expansion, innovation capability mediates the impact of customer orientation on firm performance; while, in times of economic contraction, the mediating effect is primarily driven by competitor orientation [40]. Business relationships influence a company's performance through product innovation [34]. According to the findings of previous studies, the fourth hypothesis is as follows:

H4: digital innovation mediates the relationship between the business environment and business performance.

Previous research shows that the business environment has a significant effect on business performance through collaboration strategies, the business environment greatly determines the success of the company, so companies need to develop strategic collaborative relationships with the right business model in response to industry competition to improve business performance [10]. According to the findings of previous studies, the fifth hypothesis is as follows:

H5: The collaboration strategies mediate the relationship between the business environment and business performance.

### *2.3. Research Model Framework*

This study first aims to determine the direct effect of the business environment on digital innovation, collaboration strategy, and business performance, and secondly, to determine the effect of digital innovation mediation and collaboration strategy on the relationship between the business environment and business performance, the research model framework is shown in Figure 1.

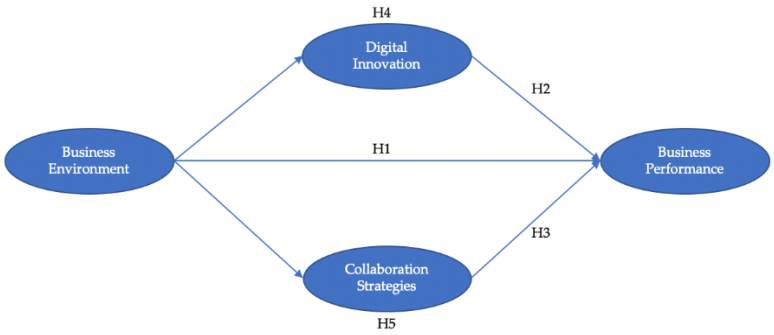


**Figure 1.** The research model framework. Source: researcher.

## 3. Research Methods

The method used in this research is a quantitative research approach. Observations were made in one shot, in 2022. The population of this study is the ISP industry in Indonesia, and the unit of observation is management. Samples were taken using stratified random sampling, i.e. the population elements were grouped at a certain level and the samples were taken evenly throughout the group so that the sample represented all heterogeneous population elements. The survey was conducted by selecting a sample from the population, namely ISPs that have licenses to operate in Indonesia and are members of APJII (Association of Indonesian Internet Service Providers), totaling around 474. ISPs are grouped based on the number of subscribers and the branch city where the ISP operates, which are divided into 3 groups, namely: small, medium, and large. A sample of 240 ISPs and samples taken from each classification were carried out randomly based on a list of population members, as shown in Table 2. This study used an ordinal scale with the Likert method which produced ordinal data. The ordinal measurement scale is the scale where the data shows a certain sequence or order [41]. To test the causality hypothesis, this study used Structural Equation Modeling (SEM).

**Table 2.** Population and sample. Source: APJII & stratified random sampling output, source: APJII, researcher.

| Classification | Population | Samples |
|---|---|---|
| Large | 14 | 7 |
| Medium | 65 | 33 |
| Small | 395 | 200 |
| Total | 474 | 240 |

## 4. Result

### *4.1. Goodness of Fit Analysis*

Structural equation modeling is an ideal tool for analyzing data that aims to examine complex relationships among the many variables analyzed. Aim To examine the extent to which the hypothesized model provides a precise characterization of the collective relationships between the variables of the model, the researcher must measure the "fit" between the model and the sample data. Guidance for measuring whether a theory-based model fits empirical data or if the resulting model describes actual conditions. Structural Equation Model (SEM) as a statistical test tool can explain the suitability of a model to actual conditions with several index criteria to assess model suitability.

Table 3 below is the result of measuring the goodness of fit in this study, with Chi-Square = 669.90, and Chi-Square p-value = 0.65287 > 0.05. So based on the Chi-Square index, the suitability of this research model is fit (Hair et al., 2010) [42]. RMSEA<0.05. The goodness of Fit Index (GFI) = 0.83 > 0.80, and so is AGFI. From the results of the Goodness of Fit analysis, it can be concluded that this research model describes actual/empirical conditions.

**Table 3.** The goodness of fit analysis. Source: lisrel 8.7 output.

| No. | Degree of Fit | Value | Acceptable Match-Rate | Explanation |
|---|---|---|---|---|
| 1 | Absolute Fit Test | | | |
| | Chi Square | 669.90 | P -value>0,05 | Close Fit |
| | Normed Chi Square (x2/df) | P -value = 0.65287 | | |
| | Goodness of Fit Index (GFI) | 0,83 | >0,80 | Close fit |
| | Root Mean Square Error of Approximation (RMSEA) | 0,000 | RMSEA≤ 0,08 (good fit)<br>RMSEA< 0,05 (close-fit) | Close fit |
| 2 | Incremental Fit Measures | | | |
| | Adjusted Goodness of Fit Ind ex (AGFI) | 0,81 | AGFI> 0,8 | Close fit |
| | Normed Fit Index (NFI) | 0.93 | NFI > 0.90 | Close fit |
| | Comparative Fit Index (CFI) | 0.98 | CFI > 0.90 | Close fit |
| 3 | Parsimonious Fit Measures | | | |
| | Parsimonious Normed Fit Index (PNFI) | 0.96 | PNFI > 0.90 | Close fit |
| | Parsimonious GFI (PGFI) | 0.93 | PGFI > 0.90 | Fit |

### *4.2. Validity and Reliability Test*

Validity is the degree of suitability between conceptual and operational development. If the instrument is said to be valid, it means that the instrument is appropriate for measuring what you want to measure by looking at the extent to which a measurement measures the construct you want to measure [43]. Research instrument items are said to be valid if they have a positive correlation with a correlation ⩾ 0.3 and/or p-value <0.05 [44].

Reliability indicates that the instrument used is consistent and can be trusted as a data collection tool and can reveal actual information in the field [45]. An instrument that is said to produce measurements that have high reliability means that it can provide reliable or reliable measurement results. The reliability measure is calculated by Cronbach Alpha [45].

And convergent validity was achieved through Average Variance Extracted and factor loadings with an expected value >0.50.

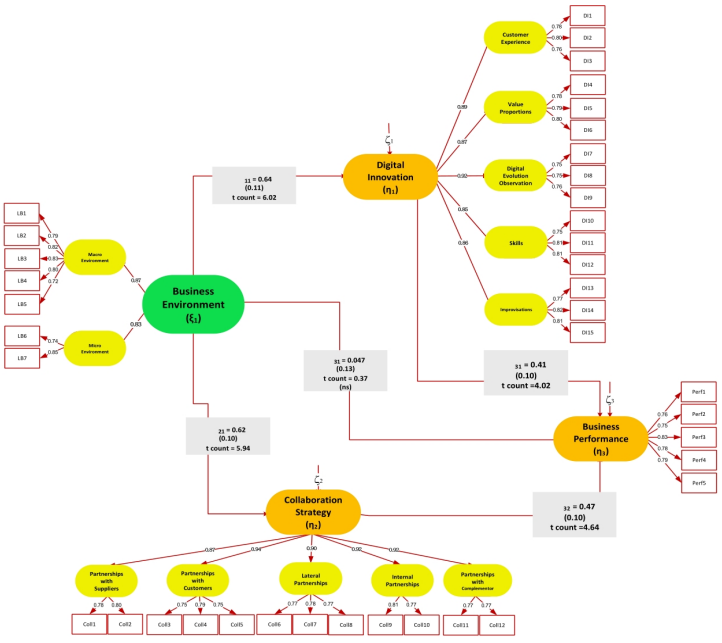


**Figure 2.** The model result, source: researcher.

**Table 4.** Measurement model. Source: lisrel 8.7 output.

| Variables | Dimension -Indicators | Code | Loading Factor | t-value | P-value | Average Variance Extracted (AVE) | Composite Reliability |
|---|---|---|---|---|---|---|---|
| Business Environment | Macro Environment | | 0,87 | 8,88 | 0,000 | 0,629 | 0,894 |
| | Economy | LB1 | 0,79 | - | | | |
| | Politic | LB2 | 0,82 | 10,16 | 0,000 | | |
| | Social & Culture | LB3 | 0,83 | 10,28 | 0,000 | | |
| | Government Regulation | LB4 | 0,8 | 9,91 | 0,000 | | |
| | Technology Trend | LB5 | 0,72 | 8,85 | 0,000 | | |
| | Lingkungan Mikro | | 0,83 | 7,26 | 0,000 | 0,635 | 0,776 |
| | Industry Competition | LB6 | 0,74 | - | | | |
| | Customer Profile | LB7 | 0,85 | 7,54 | 0,000 | | |
| Digital Innovation | User Experience | | 0,89 | 8,55 | | 0,609 | 0,823 |
| | Product/service usefulness | DI1 | 0,78 | - | | | |
| | Product/service aesthetics | DI2 | 0,8 | 9,15 | 0,000 | | |
| | Customer engagement | DI3 | 0,76 | 8,79 | 0,000 | | |
| | Value Proposition | | 0,87 | 8,47 | 0,000 | 0,624 | 0,833 |
| | Customer segment | DI4 | 0,78 | - | | | |
| | Bundling | DI5 | 0,79 | 9,13 | 0,000 | | |
| | Commission | DI6 | 0,8 | 9,27 | 0,000 | | |
| | Digital Evolution Observation | | 0,92 | 8,45 | 0,000 | 0,568 | 0,882 |
| | Digital equipment | DI7 | 0,75 | - | | | |
| | Marketing channel | DI8 | 0,75 | 8,44 | 0,000 | | |
| | User behavior | DI9 | 0,76 | 8,55 | 0,000 | | |
| | Skill | | 0,85 | 8,05 | 0,000 | 0,625 | 0,833 |
| | Learning | DI10 | 0,75 | - | | | |
| | Role fulfillment | DI11 | 0,81 | 9,00 | 0,000 | | |
| | Team building | DI12 | 0,81 | 8,92 | 0,000 | | |
| | Improvisation | | 0,86 | 8,34 | 0,000 | 0,640 | 0,842 |
| | Innovation space development | DI13 | 0,77 | - | | | |
| | Timing | DI14 | 0,82 | 9,46 | 0,000 | | |
| | Coordination with related parties | DI15 | 0,81 | 9,33 | 0,000 | | |
| Collaboration Strategies | Suppliers | | 0,87 | 8,39 | 0,000 | 0,624 | 0,769 |
| | Software | Coll1 | 0,78 | - | | | |
| | Hardware | Coll2 | 0,80 | 8,64 | 0,000 | | |
| | Customers | | 0,94 | 8,85 | 0,000 | 0,583 | 0,807 |
| | Customer Loyalty | Coll3 | 0,75 | - | | | |
| | Customer database | Coll4 | 0,79 | 9,01 | 0,000 | | |
| | Fast & Easy Services | Coll5 | 0,75 | 8,55 | 0,000 | | |
| | Lateral | | 0,90 | 8,68 | 0,000 | 0,598 | 0,817 |

**Cont.**

| Variables | Dimension -Indicators | Code | Loading Factor | t-value | P-value | Average Variance Extracted (AVE) | Composite Reliability |
|---|---|---|---|---|---|---|---|
| | Government | Coll6 | 0,77 | - | | | |
| | Business Association | Coll7 | 0,78 | 8,94 | 0,000 | | |
| | Competitor | Coll8 | 0,77 | 8,84 | 0,000 | | |
| | Internal | | 0,92 | 9,28 | 0,000 | 0,625 | 0,769 |
| | Functional Coordination | Coll9 | 0,81 | - | | | |
| | Effective Communication | Coll10 | 0,77 | 9,04 | 0,000 | | |
| | Complementor | | 0,92 | 8,73 | 0,000 | 0,593 | 0,744 |
| | Banking | Coll11 | 0,77 | - | | | |
| | University | Coll12 | 0,77 | 8,56 | 0,000 | | |
| Business Performance | ROA | Perf1 | 0,76 | - | | 0,620 | 0,830 |
| | EBITDA Margin | Perf2 | 0,75 | 8,83 | 0,000 | | |
| | ROIC | Perf3 | 0,83 | 9,79 | 0,000 | | |
| | Asset Growth | Perf4 | 0,78 | 9,16 | 0,000 | | |
| | Market Share | Perf5 | 0,79 | 9,29 | 0,000 | | |

In Figure 2 and Table 4, shows that the loading factors > 0.50, with the t value > the t-table (1.98) at a significance of 5%, can be concluded that dimensions and indicators are valid in measuring latent variables. With composite reliability > 0,7 and AVE > 0,5, it can be stated that the dimensions and indicators used in this research are reliable.

### *4.3. Hypothesis Testing*

The results of hypothesis testing can be seen in Table 5.

**Table 5.** Hypothesis testing.

| No | Hypothesis | Coefficient Estimation | t-value | $R^2$ | P-Value | Conclusion |
|---|---|---|---|---|---|---|
| 1 | Business Environment → Business Performance | 0,047 | 0,370 | 0,002 | 0,712 | Not Significant |
| 2 | Digital Innovation → Business Performance | 0,410 | 4,020 | 0,168 | 0,000 | Significant |
| 3 | Collaboration Strategies → Business Performance | 0,470 | 4,640 | 0,221 | 0,000 | Significant |
| 4 | Business Environment → Digital Innovation → Business Performance | 0,262 | 3,351 | 0,262 | 0,001 | Significant |
| 5 | Business Environment → Collaboration Strategies → Business Performance | 0,291 | 3,745 | 0,291 | 0,000 | Significant |

Source: Researcher.

It is found that:

The business environment does not have a significant direct effect on business performance but has a significant indirect effect on business performance either through the mediation of digital innovation or collaboration strategies. The indirect effect of the business environment on business performance is more dominant through strategic collaboration mediation (R2 = 0.291) than through digital innovation mediation

(R2 = 0.262).

Digital innovation and collaboration strategies have a direct and significant impact on business performance with a t value > 1.98 (Prob < 0.05). Strategic Collaboration has a more dominant influence on business performance (R2=0.221) compared to digital innovation (R2=0.168).

This research does not support the previous research results of [6–11] which describe the significance of the direct relationship between the business environment and business performance but supports the results of research of [12] which states that the direct relationship between the business environment and business performance is not significant.

This study also supports previous research which states that there is a significant direct effect of digital innovation on business performance [33, 34] and also supports previous research [37, 38] which state that collaboration strategies have a significant direct effect on business performance.

This finding also supports the results of research [34,39,40] which stated a significant indirect effect of the business environment on business performance through the mediation of digital innovation. And also supports the results of [10] which explains the indirect effect of the business environment on business performance through the mediation of collaborative strategies.

Companies must correctly know the condition of their business environment, whether it is an opportunity or a threat, then anticipate it in order to have a competitive advantage. Industrial Organization Theory states that a company's competitive advantage is determined by the ability to anticipate opportunities and threats from external factors of the company [13]. It is proven that the business environment does not have a direct influence on business performance, however, it has an indirect effect through digital collaboration and innovation strategies. Table 4 shows that the macro environment is slightly more dominant than the microenvironment, the macro environment has a loading factor (of 0.87) while the microenvironment (has 0.83). The macro-environment consists of aspects: politics, government policies, economics, social culture, and technological developments. The microenvironment consists of industry competition and consumer profiles. These results indicate that in developing digital collaboration and innovation strategies to anticipate changes in the business environment, ISPs need to prioritize anticipating changes in the macro environment and then the microenvironment.

Digital innovation is the process of observing digital evolution and developing user experiences, value propositions, skills, and improvisations [4]. By developing digital innovations, ISPs are expected to be able to anticipate and/or adapt to changes in the business environment that occur in order to maintain a competitive advantage, so that the company's performance does not depend directly on the business environment. Table 4 shows that the observation of digital evolution has the largest loading factor (0.92) followed by user experience (0.89), value proposition (0.87), improvisation (0.86) and skill is the smallest (0, 85).

The collaborative strategy has a significant direct effect on business performance, and collaborative strategy also has a mediating effect on the indirect relationship between the business environment and business performance. Table 4 shows that collaboration with customers has the largest loading factor (0.94), followed by collaboration with complement (0.92), internal collaboration (0.92), lateral collaboration (0.90), and collaboration with suppliers is the smallest (0.87). The company implements its collaboration strategy to deal with changes in the business environment to improve performance. Through collaboration, companies are expected to be able to have "Strategic Resources" so that companies have a long-term competitive advantage compared to other companies that do not have them (Barney, 1991) [5]. The mediation of collaborative strategy towards the indirect relationship between the business environment and business performance has a greater coefficient value (0.291) compared to the mediation coefficient value of Digital Innovation (0.262).

## 5. Discussion and Conclusion

The findings of this study are new and very interesting to implement because they provide managerial implications that can be directly applied, namely how to anticipate a changing business environment in order to continue to improve business performance, as well as the results of this study have theoretical implications.

The theoretical implication of this research is to produce a model that can make companies resilient to an

ever-changing business environment through the development and implementation of collaborative strategies supported by digital innovation to increase competitive advantage in order to produce sustainable business performance. The results of this study provide evidence that changes in the business environment do not directly affect business performance, and this ever-changing business environment can be anticipated, adapted, and can provide added value to business performance if companies are able to develop appropriate collaboration strategies that are supported by the application of innovation. digital.

The managerial implication of this research is that it can be used practically by ISP management in Indonesia to anticipate the ever-changing business environment in order to improve business performance and develop appropriate collaboration strategies supported by the implementation of digital innovation.

To anticipate the ever-changing business environment in order to improve business performance through developing appropriate collaboration strategies and supported by the implementation of digital innovation, ISPs must carry out the following operational steps:

1. In terms of business performance, prioritizing achieving ROIC (return on invested capital) is achieved, because the ISP industry requires investment in deploying its service infrastructure, this investment is generally obtained from bank loans, so ISPs must ensure they are able to repay the loan. Then ensure the achievement of market share control indicators through asset growth while ensuring the achievement of ROA (return on assets) and the company's EBITDA margin.

2. Prioritize the development of the right collaboration strategies start with collaboration with customers because from this collaboration the company will know what customers really need and want, this will answer the problem of ever-increasing customer demands and preferences; then collaboration with complementary that will answer the problem increase in bank loan interest rates thru collaboration with banking and digital technology disruption thru joint research collaboration with University; internal collaboration will improve thru efficient functional unit coordination and effective communication; collaboration with lateral will answer the problem of hyper-competition and government regulations that are not in favor of the ISP industry, thru collaboration with business association, government, and competitor; and lastly collaboration with suppliers will help to answer the problem of digital technology disruption and selection of the right technology that can be used to enhance the ability to develop new products and services

3. The development of digital innovation prioritizes observing digital evolution in order to be able to choose the right digital tools and marketing channels to be used to develop digital innovations, further enhancing the customer experience through the development of products/services that have aesthetic and usability values for customers, trying to provide a value proposition for customers by ways of giving healthy commissions, bundling products and implementing customer segmentation, increasing improvisation in digital innovation by providing the right time, coordination and opportunities to innovate, finally increasing skills in digital innovation by developing teams, assigning the right roles, and providing learning. Apart from implementing a collaboration strategy, this digital innovation development support will also enhance the company's ability to anticipate and adapt to an ever-changing business environment, particularly to changes caused by digital technology disruptions, increasingly numerous and dynamic changes in customer preferences, and intense competition. , by producing products and services that have the best aesthetic value and usability so as to enhance the customer experience.

4. In anticipating and adapting to changes in the business environment, ISPs need to prioritize anticipating and adapting aspects of the macroenvironment first and then the microenvironment, because macro-environmental aspects (social & culture, politics, government regulation, economics, and technology trend) are beyond the ISP control.

In conclusion, companies can have resilience to an ever-changing business environment, namely by developing collaborative strategies supported by digital innovation so that companies will have a competitive advantage and be able to achieve sustainable business performance. The results of this study can also be applied to other industries that have the same characteristics as the ISP industry, namely industries that experience hyper-competition, are capital intensive, must always keep abreast of digital technology developments, must be creative in developing new products/services requested by customers, and must always innovate to stay in

business.

It is interesting to continue this research by examining how the mediation effect of collaboration strategy has on the relationship between digital innovation and business performance, as well as how the mediation effect of Digital Innovation has on the relationship between collaboration strategy and business performance, as well as finding which of the four mediation channels will have the most dominant influence in anticipate and adapt to the ever-changing business environment to improve business performance, whether it is the business environment-digital innovation-business performance path or the business environment-collaboration-strategy-business performance path or the business environment-digital innovation-collaboration strategy-business performance path or the environment pathway business-collaboration strategy-digital innovation-business performance. So that further research will provide better practical guidance for companies on how to anticipate and adapt to an ever-changing business environment and have better business performance.

**Funding**

This research received no external funding.

**Author Contributions**

S.H. is the main author of this article and also played a role in analyzing the statistical data generated in this study. M.S. is an expert in the field of economics and research management. She is also an expert in the field of economics, and she was very instrumental in providing input on the use of theories in this research to produce quality research. F.R. is an expert in the field of research management. He was very helpful in providing input in this research to produce quality research. A. S. H. is an expert in strategic marketing. He played a role in providing input in this research to produce quality research. All authors have read and agreed to the published version of the manuscript.Institutional Review Board StatementNot applicable.Informed Consent StatementNot applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding authors.

**Conflicts of Interest**

The authors declare no conflict of interest.

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https://doi.org/10.58195/emi.v1i1.68

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Article

# Research on Vocational Education Personnel Training Under the Strategic Background of Guangdong-Hong Kong-Macao Greater Bay Area -- Taking Zhaoqing City As an Example

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**Abstract:** The economic development of the Guangdong-Hong Kong-Macao Greater Bay Area depends on the intellectual and talent support of vocational educators. Based on the analysis results of talent cultivation needs of the Greater Bay Area, on the basis of the strategic planning opportunities of the Greater Bay Area and the successful experience of vocational education at home and abroad, combined with the basic conditions of Zhaoqing city, this paper puts forward the strategy of building a vocational education talent base in Zhaoqing City, and puts forward the concrete realization path and safeguard measures such as encouraging enterprises to run universities.

**Keywords:** Guangdong-Hong Kong-Macao Greater Bay Area; vocational education; personnel training

## 1. Introduction

### *1.1. Opportunities for Vocational Education Personnel Training and Development in Zhaoqing City Based on the Strategic Background of Guangdong-Hong Kong-Macao Greater Bay Area*

In February 2019, The State Council of China issued and implemented the Outline of the Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area. By rearranging and planning the existing economically developed areas in China, the construction of the Guangdong-Hong Kong-Macao Greater Bay Area will further revitalize the driving force of economic development in the Guangdong-Hong Kong-Macao region and effectively promote the coordinated development of resources. The Guangdong-Hong Kong-Macao Greater Bay Area covers Hong Kong, Macao and the cities of Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing in Guangdong Province, covering a total area of 56,000 square kilometers, which exceeds the combined area of the three bay areas of New York, San Francisco and Tokyo. By the end of 2021, the Guangdong-Hong Kong-Macao Greater Bay Area had a population of about 86,692,300, accounting for 6 percent of China's total population. It is the most open and economically dynamic region in China. In 2021, the economic aggregate of the Greater Bay Area was about 12.6 trillion yuan, generating 12% of the national economic aggregate with less than 1% of the land area. In 2022, the value is expected to reach 14.76 trillion yuan, surpassing Tokyo Bay Area to become the world's largest economic aggregate [1].

Received: 4 April 2023; Accepted: 19 April 2023.

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The Guangdong-Hong Kong-Macao Greater Bay Area focuses on the application and transformation of high and new technologies. Through the engine of scientific and technological innovation, regional economy will be driven to achieve rapid development and China's economic strategic layout of rejuvenating the country through science and technology will be completed. For a long time, economic development and promotion cannot be separated from the support of outstanding talents, and as a unit that continuously exports talents to the society, professional colleges and universities bear the great responsibility of revitalizing economic development [2]. In this paper, from the aspects of talent training methods and key contents of vocational education, the reform ideas of teaching mode and the transformation path of training methods of vocational colleges in the construction process of Guangdong-Hong Kong-Macao Greater Bay Area will be discussed, so as to promote the continuous strengthening of technological innovation strength of our city and the development process in the new era with the upgrading of talent strategy.

The development of vocational education based on the perspective of Zhaoqing City, its demand not only comes from the local "small environment", but also is affected by the overall environment of the larger region and even the country. Therefore, the demand analysis of vocational education development from the perspective of Zhaoqing should adhere to the principle of "based on location advantages", analyze internal and external demands, and reveal the three-dimensional relationship and multiple demands among education, people and society [3].

## 2. Demand for Talent Cultivation in the Context of the Guangdong-Hong Kong-Macao Greater Bay Area Strategy

As the global economic form from industrial economy into the digital economy stage, human resource demand to high-tech and innovative features, the traditional education mode to cultivate talents and the actual demand of the talent market there is a huge deviation, education reform is imperative. It is a general trend to focus on developing vocational education. Zhaoqing City strives to cultivate professional talents and build a talent base, which can provide important skilled human resources support for the construction of Guangdong-Hong Kong-Macao Greater Bay Area, and is an important foundation and necessary condition for the development strategy of Guangdong-Hong Kong-Macao Greater Bay Area. Under the background of Guangdong-Hong Kong-Macao Greater Bay Area, the goal of developing Zhaoqing vocational education is to cultivate new-type technical talents with modern vocational abilities, which should not only meet the requirements of current vocational work, but also adapt to future career development.

In order to fully understand the actual situation of talent demand in the Guangdong-Hong Kong-Macao Greater Bay Area, the research team conducted a survey by issuing questionnaires and interviewing to various large, small and medium-sized enterprises in the Bay Area. The questionnaire was issued in Guangzhou, Shenzhen, Dongguan, Zhongshan, Zhuhai, Zhaoqing and other cities. The enterprises involved mainly included state-owned Huafa Group, listed enterprises Gree Group, Lizon Pharmaceutical, Taiwan-funded enterprises Guangsheng Sports Equipment Co., LTD., science and technology enterprises Xiaopeng Automobile Co., LTD., and micro-startups in Vipshop South China Warehouse and Zhaoqing University Innovation and Entrepreneurship Park. The questionnaire was mainly filled out online and distributed on site. In the process of investigation, various ways were adopted to eliminate the adverse effects and improve the reliability and validity of the questionnaire. The objects of filling in are mainly human resource department directors, production department directors or persons in charge of small companies. The directors are invited to fill in the form voluntarily and anonymously and give thanks as gifts. Among them, 300 paper questionnaires were issued, 31 were found invalid after examination. After removing invalid questionnaires, 269 effective questionnaires were actually collected, with an effective rate of 89.67%. Multiple choice questions, ranking questions, scoring questions and freelance questions were set to assess the vocational competency needs of Greater Bay Area enterprises. Of the respondents, 70 percent are small and medium-sized private companies with 100 to 300 employees, 10 percent are foreign companies and the remaining 20 percent are large listed companies. 62% of the people who fill in the questionnaire are human resources-related positions or other middle and senior management positions of the company. They have a better understanding of the actual requirements of

professional ability than ordinary employees and know what kind of talents the company needs for development.

According to the questionnaire analysis, the top three talents in the Greater Bay Area are scientific and technological innovation talents (33.20%), cross-border e-commerce talents (26.1%) and AI (artificial intelligence) related industry talents (16.8%). The needs of other talents are listed in order: hotel management talents, modern logistics talents, tourism industry talents, engineering and technology talents, cross-cultural communication talents and minority language talents, etc. It can be seen that the talent demand of enterprises in the Greater Bay Area has distinct high-tech characteristics. Large enterprises, small and medium-sized enterprises, listed companies and start-up companies all have a great demand for new composite talents such as technological innovation and advanced manufacturing.

Combined with the current economic development of cities in the Guangdong-Hong Kong-Macao Greater Bay Area, we can see that this distinctive talent demand comes from the regional characteristics of high-tech enterprises concentrated in the Greater Bay Area. Based on this talent demand, Zhaoqing City should build a base for the cultivation of professional talents in the Greater Bay Area, which should be targeted to train professional talents, meet the job needs of enterprises in the Bay Area and adapt to the development needs of enterprises in the Bay Area. In recent years, the "order-type" talent cultivation mode is just a new talent cultivation mode which has been verified by some countries and regions.

## 3. The Theory and Practice of "Order-Type" Talent Cultivation Mode

### *3.1. The Development of "Order-Type" Talent Cultivation Mode in Foreign Countries*

The "order-type" talent training mode originated from the cooperative education mode of the United States, which was formed in the 1950s. Cooperative education is a teaching method that combines classroom teaching with practical operation. Schools and enterprises participate in the training process of students. In the American co-op model, students take classes in school for a period of time, then work in a company for a period of time, and so on until graduation. At present, there are more than 1,000 colleges and universities running various kinds of cooperative education programs in the United States, and more than 50,000 companies have participated in the cooperation. The cooperative education model of the United States plays a great role in promoting the economic and educational development of the United States, and also provides a reference for the educational development of other countries [4].

Germany's "dual" education system means that schools must provide two learning institutions: an academic learning institution and a vocational training place. There is a cooperative agreement between the two learning institutions on the content and the common teaching goals. In 2004, the German Ministry of Education announced that vocational university qualifications were the same as regular university undergraduate qualifications. In the decade since, the number of vocational college students has more than doubled, while the number of participating companies has nearly tripled. Germany's "dual system" teaching model has trained a large number of engineers who strive for excellence, making "Made in Germany" a name card and providing huge talent support for the rapid development of German industry.

### *3.2. The Development Status of "Order-Type" Talent Cultivation Mode in China*

In China, vocational education has been moving towards school-enterprise cooperation for several decades, but the order-type talent training mode is still a relatively new form of school-enterprise cooperation. It is an educational system in which schools and industries cooperate in the field of education, teaching and research, that is, students participate in the working practice of enterprises during their study at school. A search of "ordnance training mode" and "doctoral papers" by CNKI showed that there were only 43 master's papers and no doctoral papers, and the rest were journal papers. Thus it can be seen that the order-type talent training model is still in the primary stage of research in the domestic theoretical circle. The main points of relevant researches in the past decade are as follows: In terms of the advantages of order cultivation, Zhang Xiangyun (2013) believes that order cultivation has five advantages: (1) it avoids blindness in talent cultivation; (2) The resources of the university and the enterprise are optimized; (3) It provides guarantee for the teaching, practical training

and double teacher training of the school; (4) to meet the talent needs of enterprises; (5) Design conducive to students' study and career [5]. Sun Xiaojing (2010) believes that order training fully reflects the concept of higher vocational education under the new situation, conforms to the cognitive law of students, makes full use of teaching resources and improves the utilization rate of experimental and practical training bases [6]. Chen Xuan (2016) believed that the order training mode, for the training side of the school, can ensure that the school has a target in talent training. For the students to be cultivated, they have made clear their own development direction and learning objectives from the beginning, which helps to improve the efficiency of learning. For the employer of the entrusted training party, the allocation efficiency of human resources is improved [7]. In terms of the innovation and practice of the order training mode, Zhou Jiansong (2008), through a comparative analysis of the oriented entrainment training mode, the enterprise-centered mode and the loose order training mode of 2+1, believes that the "culture + order" talent training mode represented by Zhejiang Vocational College of Finance, It can effectively overcome the defects and deficiencies of the above four order-type talent training modes, realize the organic integration of academic education and vocational training, and has certain promotion and reference significance [8]. Wang Guijun (2015) proposed that the "order-based" talent training model, due to the highly targeted training process, leads to the goal bias, the decline of talent quality and the lack of educational ethics [9]. Zhu Chunhui (2009) elaborated the connotation and significance of "order-style" talent training mode, and took the character design major of Chongqing Urban Management Vocational and Technical College as an example to discuss the practice process of "order-style" talent training mode in higher vocational colleges from the perspective of professional construction and teaching organization [10].

### *3.3. A Case Study of China's "Order-Style" Talent Training Model -- Country Garden Vocational College*

Guangdong Country Garden Vocational College is a full-time higher vocational school founded by Country Garden Group in 2014 in Qingyuan Vocational Education City, Guangdong Province. Centering on the industrial development strategy of Country Garden Group, the school has set up specialties such as architecture, engineering, mechanical and electrical, property, hotel, landscape architecture, accounting and computer, which are highly consistent with the industries and positions covered by Country Garden Group. On the one hand, this professional setting mode is conducive to enterprises selecting skilled and experienced technical talents and management elites from employees to teach students and guide students' practical operation; on the other hand, it is conducive to enterprises arranging practical training, internship and employment positions for students, realizing the goal of "entry immediately after admission and employment immediately after graduation" proposed by scholars in charge of management [9]. This model is truly "teacher as coach, student as apprentice". The chairman of Country Garden Group promised, "I will attach importance to the interaction between the school and the enterprise. I will open all the positions of the group to the training of students. At the same time, I will let skilled talents to teach vocational skills in the school." His teaching requirement: "All graduates are qualified for the role of assistant to the general manager of a department of Country Garden Group upon graduation."

Backed by Country Garden Group, the college, which provides free room, board and clothing to students, ranked first in a survey of satisfaction among Chinese universities in 2022. Advanced and complete professional practice base is the characteristic of the college. Teachers from enterprise management positions guarantee the academic and technical characteristics of the university. In the past seven years, the employment rate of Country Garden Vocational College has reached 100% almost every year. The education system of Guangdong Country Garden Vocational College belongs to the typical "order-type" talent training mode, which has opened up a unique road to success of "enterprise-run university" in the field of vocational education.

To sum up, "order-type talent training mode" has developed into an innovative stage in the long-term practice of many colleges and universities at home and abroad, and has been proved to be an advanced vocational education mode conducive to the common development of schools and enterprises and conducive to the combination of work and study.

## 4. Analysis on the Basic Conditions of Zhaoqing to Build the Vocational Education Talent Training Base

Situated at the edge of Guangdong-Hong Kong-Macao Greater Bay Area, Zhaoqing ranks low in economic development, which restricts the development level of vocational education to a certain extent. The distribution of vocational schools in Zhaoqing is relatively simple, with only 1 higher vocational school, 1 higher technical school and 18 secondary vocational schools. In general, its development level is still far lower than that of neighboring cities. Although the professional matching rate of Zhaoqing's two higher vocational colleges is relatively high, there is still a large employment gap in the human resources market, which is not enough to match the current situation of economic development. At the same time, Zhaoqing occupies the first place in the nine cities of Guangdong-Hong Kong-Macao Greater Bay Area, with very rich natural resources. However, the development of vocational education corresponding to the industry has been stagnant, and the local advantages have not been fully utilized, so the talent training structure is in urgent need of optimization.

We have made a SWOT analysis of Zhaoqing City's basic conditions for developing vocational education and building vocational education talent training base, as shown in Table 1.

**Table 1.** SWOT analysis of Zhaoqing's vocational education talent training base.

| S | W |
|---|---|
| Large geographical area and rich land resources;<br>Famous historical and cultural city with profound heritage;<br>3. Rich tourism resources, healthy and livable cities | Poor geographical location on the edge of the Bay Area<br>Mountainous areas are large and their economic development is unbalanced<br>Single vocational colleges with small scale |
| **O** | **T** |
| National Strategic Opportunities in the Guangdong-Hong Kong-Macao Greater Bay Area<br>Undertake the spillover function of Guangzhou and Shenzhen<br>Great demand for talent in the Bay Area | Significant siphon effect of surrounding cities<br>Traditional development concepts are deeply rooted and vocational education is not paid enough attention to |

(1) Zhaoqing City's advantages in developing vocational education personnel training. Firstly, with a total area of 14,891 square kilometers, Zhaoqing is the largest city in the Guangdong-Hong Kong-Macao Greater Bay Area, accounting for 26% of the total area. Among them, the space available for development reaches 1725 square kilometers, which has enough land resources for Zhaoqing City to support the development of vocational education, establish or expand more vocational schools, and drive the development of local economy. Zhaoqing City has rich cultural heritage. It is the birthplace of Lingnan culture and Guangfu culture, as well as the intersection of Western culture and Chinese civilization. More than 430 years ago, Matteo Ricci, a European missionary, landed in Zhaoqing City and spread Catholicism in the mainland. Zhaoqing City is rich in natural resources and has the country's first nature reserve -- Dinghu Mountain. Because of its fresh air and beautiful scenery, it is a suitable back garden for living and working in the Greater Bay Area. With the emphasis on health and environmental protection today, the natural conditions of Zhaoqing City have a unique attraction for the introduction of high-end talents. Such unique natural and historical conditions are suitable for the development of education.

(2) The disadvantage of Zhaoqing in developing vocational education personnel training. First of all, the geographical location of Zhaoqing city is poor, located in the edge of the Greater Bay Area, far away from the economic and political center, often ignored; Due to the distribution of more mountains within Zhaoqing City, economic development is backward, the development of the city is extremely unbalanced. The lag of economic development restricts the development level of vocational education to a certain extent. The scale of vocational colleges is small, the quality of education is not high, the majors of the colleges are relatively traditional and single, the follow-up development is weak, and it is in urgent need of transformation breakthrough.

(3) Zhaoqing City to develop vocational education talent training opportunities. Since 2018, with the gradual implementation of the national strategy of building the Guangdong-Hong Kong-Macao Greater Bay Area, Zhaoqing City is facing a rare historical development opportunity and a good opportunity for transformation. Close to the mega city, Zhaoqing can undertake the spillover industries of Guangzhou, Shenzhen, Foshan and Dongguan. Vocational education is the foundation of building a modern city. To build a vocational education talent base in the Greater Bay Area is a new opportunity and a new task given to Zhaoqing by history. The Guangdong-Hong Kong-Macao Greater Bay Area has a large population base, a large number of enterprises, traditional manufacturing and service industries as well as a complete high-tech industrial chain. There is a huge gap in human capital demand, and a large number of talents at all levels are urgently needed to support the construction of the Bay Area. This has prepared a broad job market for Zhaoqing to develop vocational education.

(4) The threatening factors of developing vocational education talent training in Zhaoqing City. The development of vocational education in Zhaoqing City is influenced by the strong siphon effect of surrounding developed cities, which is a challenge. Both enterprises and talents tend to flow to big cities, while small cities are prone to hollowing out. The advanced manufacturing industry in the Greater Bay Area is concentrated in Shenzhen, Dongguan, Foshan and other cities around Zhaoqing City. The local enterprises in Zhaoqing City are mainly traditional and extensive small and medium-sized enterprises, which develop slowly. For a long time, Zhaoqing has been positioned as a tourist city, downplaying the industrial development, resulting in it missing the key period of industrial construction. In the past decades, Zhaoqing has failed to develop into a national popular tourist city because of its lack of tourism resources. Deep-rooted traditional development thinking has influenced the economic development and urban planning of Zhaoqing city, but also restricts the development scale and level of vocational education in Zhaoqing city.

To sum up, although Zhaoqing City faces difficulties and obstacles in developing vocational education, it also meets the historical opportunity of national construction of the Greater Bay Area. It is an important opportunity given to Zhaoqing City by history to provide suitable talents for the Greater Bay Area and build a vocational education talent base.

## 5. Problems Existing in Zhaoqing City to Build Guangdong-Hong Kong-Macao Greater Bay Area Vocational Education Talent Training Base

### *5.1. There Is a Gap Between the Development of Vocational Personnel Training and That of Other Cities in the Greater Bay Area*

Based on the analysis of the regional distribution characteristics of vocational education in the Greater Bay Area, there are obvious differences in the distribution of talents and educational levels among cities. The government and relevant departments generally have strong autonomy and pertinancy in talent introduction and independent training, and the actual results are relatively ideal. However, the coordination among cities in the Bay Area is weak. That is, municipal governments only formulate management measures and development strategies for higher vocational colleges and personnel training within their jurisdiction, but lack a comprehensive and overall plan for the Greater Bay Area. This has brought certain obstacles to the coordinated development and quality improvement of talent introduction and training in the Greater Bay Area. Compared with the developed cities and regions in the region, Zhaoqing ranks behind in total economic development, and the development of vocational education is also relatively backward. Table 2 shows the vocational education development gap between Zhaoqing City and Guangzhou City and Foshan City in 2022.

**Table 2.** A brief table of the scale of vocational education in Guangfo Zhaozhao Mountains.

| Area | Higher Vocational College | | | Secondary Vocational College | | |
|---|---|---|---|---|---|---|
| | Number of schools | student at school | Proportion(%) | Number of schools | student at school | Proportion (%) |
| the Greater Bay | 44 | 312000 | - | 234 | 58.8 | - |
| Canton | 23 | 167300 | 53.6 | 51 | 9.68 | 16.5 |
| Foshan city | 4 | 32500 | 10.4 | 48 | 8.84 | 15.1 |
| ZhaoQing city | 2 | 20600 | 2.8 | 18 | 5.83 | 9.9 |

*5.2. The Setting of Majors Is Not Reasonable, and the Matching Degree Between Majors and Industries Is Low*

Different from the traditional higher education, vocational education pays more attention to the cultivation of professional skills to ensure the output of high-quality, practical labor force to the society. In order to gain enough competitive advantages in talent training, vocational colleges take measures to increase the source of students and mass education, and set up popular majors with a high employment rate in the current or the past few years. However, the number of newly created jobs in the human resource market is limited every year, and the demand for talents is shifting to the direction of intelligence and science and technology, resulting in deviations between the employment of graduates and the market demand. In 2021, finance and commerce will be the major of secondary vocational schools in Guangdong Province, among which e-commerce majors will have the largest number of locations, and preschool education and e-commerce majors will have the largest number of students. According to the statistics in 2022, Zhaoqing vocational colleges still focus on traditional majors such as finance and commerce, electronic information, civil architecture, medicine and preschool education. There are almost no majors in intelligent manufacturing, big data and science and technology, which is inconsistent with the needs of enterprises in Zhaoqing and talents in Guangdong-Hong Kong-Macao Greater Bay Area. Due to the prominent phenomenon of repeated construction of majors, economic management and other majors set too many points, resulting in a low employment rate, employment quality is not high, reflecting the characteristics of vocational education specialty set unscientific.

*5.3. The Proportion of Technical Talents and Economic and Trade Talents Is Unbalanced*

The geographical location and regional environment of the Guangdong-Hong Kong-Macao Greater Bay Area determine that its reserves of economic and trade talents are more abundant than other areas in China. It takes a relatively long process for technical talents to promote regional economic development through scientific and technological strength. This indirect source of economic growth has no advantages over commercial activities that directly promote economic development. The proportion of economic and trade talents in Guangdong-Hong Kong-Macao Greater Bay Area is higher than that of technical talents, which leads to the lack of a relatively ideal development environment for technical vocational education. Therefore, to expand the scale of the introduction and training of technical talents is the key to the strategic development of talents in the Greater Bay Area.

*5.4. Lack of System, Enterprises Lack of Channels to Participate in Vocational Education*

At present, Guangdong Provincial high schools are actively promoting the integration of production and education, collaborative education. In 2021, the number of enterprises participating in the integration of industry and education is nearly 20,000, and the number of industry-education cooperation majors is about 2,000. More and more enterprises are participating in vocational education by jointly formulating talent training programs, jointly recruiting and enrolling students, jointly training teachers, jointly developing teaching resources, jointly carrying out teaching activities, and jointly building quality assurance systems for talent training. Although the number of participating enterprises is increasing, the initiative and enthusiasm of enterprises to participate in the

integration of industry and education are not enough due to the lack of policy support, the lack of coordination and guarantee platform of school-enterprise cooperation, and they fail to give full play to the main role of enterprises in vocational education.

## 6. Zhaoqing City to Build Vocational Education Personnel Training Base of the Main Implementation Path

(1) Strengthen the system guarantee, give play to the main role of enterprises in the development of vocational education.

Establish system mechanism, give full play to state-owned enterprises in Zhaoqing vocational education development process of the main role. In the investigation of Zhuhai Huafa Group, it is found that whenever Zhuhai city has a new plan and idea for urban development, Huafa Group is the first one to explore the road and realize the dream for the government. The rapid development of Zhuhai Special Zone in the past 40 years has perfectly explained the courage and wisdom of Huafa Group to fulfill its social responsibility and demonstrate its responsibility as a state-owned enterprise. Similarly, in Zhaoqing City's plan to build the Guangdong-Hong Kong-Macao Greater Bay Area vocational education talent cultivation base, it is also necessary to give play to the leading role of state-owned enterprises, take the policy as the guidance and the system as the guarantee, set the main role of enterprises as the system, and take school-enterprise cooperation and the integration of industry and education as the long-term task to consolidate the responsibility. Zhaoqing City can combine the development experience of Zhuhai City with the experience of Country Garden in running a university, creatively give play to the leading role of state-owned enterprises in school-enterprise cooperation and vocational education development, and lead Zhaoqing City vocational education development out of a road of innovative development.

(2) Build a platform to promote the integration of industry and education between Zhaoqing City and Hong Kong, Guangzhou, Shenzhen and other big cities.

Zhaoqing is building a vocational education city to become an important higher education base in Guangdong. With the industrial upgrading, the demand for skilled talents is increasing. Zhaoqing city should give full play to the advantages of vocational schools. It can not only form its own rare advantages to attract related industries to Zhaoqing City, but also transport a large number of skilled talents to Guangzhou, Shenzhen, Foshan and other places to support industrial development. Therefore, in the direction of talent training, it is necessary to combine the common industrial needs of Zhaoqing City and the core cities of the Greater Bay Area, and train targeted skilled talents.

(3) Enterprises are encouraged to set up universities and develop "order-type" personnel training through multiple channels.

In recent years, Zhaoqing constantly introduces a number of high-tech enterprises, enterprise development is in urgent need of a large number of high-tech talents. Zhaoqing secondary vocational schools and higher vocational colleges can directly carry out cooperative education with the newly introduced science and technology enterprises and train talents according to the actual needs of enterprises. There are many small and medium-sized enterprises in Zhaoqing city, which can learn from the jewelry town model of Panyu District, Guangzhou, and keep close contact with higher vocational colleges on talent training with industry associations as the leading. It can also rely on the local industrial clusters to establish close production-education integration with higher vocational colleges. For example, Zhaoqing auto parts industrial base and local colleges have in-depth talent training cooperation, the establishment of multilevel industrial base and training base, convenient for students to do in the middle school, learning to do. The education mode of Guangdong Country Garden Vocational College has brought a successful example for the development of vocational education in China. This new education mode with enterprises as the main body not only guarantees the combination of academic and practical teaching structure, but also meets the employment needs of college students. The tuition and accommodation fee free mode also effectively solves the problem of poor students going to college. Embodies the strong sense of social responsibility of the enterprise.

(4) We will strengthen the construction of teachers who integrate industry and education, and establish a

disciplinary and professional system suited to industrial transformation.

Teachers are the key to success in teaching. In the process of promoting the reform of talents training with the integration of production and education, we should strengthen the construction of teachers with the integration of production and education, create teachers with dual skills, integrate the cultivation of craftsman spirit into basic education, and promote the development of collaborative education with production and education. Vocational school teachers is different from ordinary high school or university teachers' requirement, should not only possess professional knowledge, and have strong ability of practice guidance. According to the characteristics of vocational education, each specialty has formed a teacher team consisting of professional leaders, young and middle-aged backbone teachers and enterprise engineers with front-line practical experience. Under the order-type talent training mode of enterprises running universities, professional teachers introduced from other schools have more opportunities to improve their practical skills by participating in the production, service and management of enterprises. And from the enterprise internal selection of professional and technical personnel and management personnel can through the teaching skill training to improve their teaching ability and teaching practice. Such teacher resource integration and system optimization can ensure the combination of students' classroom theoretical learning and enterprise practice, and fully realize the connection between school and enterprise and the integration of production and education [11].

(5) To help build an application-oriented higher education base and improve the comprehensive education level of Zhaoqing.

To build a pattern of deeply integrated development of education and industry, it is necessary to simultaneously plan the integration of industry and education with economic and social development, and coordinate the layout of vocational education and regional development, so as to truly implement the integrated development of vocational education and local industry. The improvement of vocational education level depends on the drive of the good development level of higher education in the region. Only when the overall level of education is improved, can we have more power to develop vocational education. Zhaoqing has 8 colleges and universities with undergraduate degrees, 97,000 students and more than 5,300 teaching and administrative staff. Zhaoqing covers a total area of 3.58 million square meters, the total construction area of school buildings is 2.06 million square meters, and the total value of fixed assets is 4.4 billion yuan. Both in terms of the scale of school running and the number of university students, it ranks among the top in the province, and has initially formed the Guangdong-Hong Kong-Macao Greater Bay Area applied higher education base. Higher vocational school education is an important part of applied higher education. We should vigorously develop vocational education to help Zhaoqing City build an applied higher education base in the Greater Bay Area, and provide talent and intellectual support for the development of scientific and technological innovation in the Guangdong-Hong Kong-Macao Greater Bay Area.

**Funding**

Zhaoqing Philosophy and Social Science Project（22GJ-22）.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding author.

**Conflicts of Interest**

The author declares no conflict of interest.

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https://doi.org/10.58195/emi.v1i1.69

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Article

# Research on Countermeasures of Guangxi Small and Medium-Sized Enterprises' Value Chain Climbing Under the Background of Digital Economy

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**Abstract:** Guangxi is an important channel to connect China and ASEAN in "the belt and road initiative" and an important window to promote open communication and cooperation. The small and medium-sized enterprises in Guangxi urgently need to use "digital economy" as a new "engine" to gain new momentum and promote its accelerated development. This paper focuses on the small and medium-sized enterprises in Guangxi. Through the analysis of the current situation and difficulties of the small and medium-sized enterprises moving up the value chain in Guangxi during the post-epidemic period, it is found that the scale of small and medium-sized enterprises in Guangxi is increasing, which leads to the pressure of market competition, coupled with the relative shortage of funds, poor innovation ability, insufficient market, lack of human resources and other issues. It further puts forward the corresponding countermeasures and measures to improve the market mechanism and system, establish a platform cooperation mechanism, provide financial policy support for small and medium-sized enterprises, and transport talents.

**Keywords:** Guangxi; digital economy; small and medium-sized enterprises; up the value chain

## 1. Introduction

At present, the international situation is complicated and changeable. On the one hand, under the influence of the political and economic situation in Europe and the United States, the phenomenon of "anti-globalization" has emerged. The world economy is in structural recession, trade protectionism is on the rise, the global multilateral mechanism is sluggish, regional and sub-regional cooperation is on the increase, and trade barriers are on the rise. All countries in the world are facing severe challenges [1]. On the other hand, new technological revolutions such as big data, cloud computing and artificial intelligence, as well as new trade models such as cross-border e-commerce and digital trade are accelerating the restructuring of the world value chain and affecting the division of labor and the pattern of comparative advantages worldwide [2]. Since the reform and opening up, China's enterprises have developed rapidly and made breakthrough achievements in many fields, especially in the high-end fields such as digital economy, which have already played a decisive role in the world. However, although the local enterprises in our country have realized the upgrading and development of the value chain, the developed countries have "captured" the OEM enterprises in the developing countries and restricted the development of the small, medium and micro-sized enterprises in the developing China countries

Received: 4 April 2023; Accepted: 24 April 2023.

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due to the natural gap between themselves and the status of the world value chain, taking advantage of their own technology and market advantages. Recently, the China government issued the document "Overall Layout Plan for the Construction of Digital China", which clarifies the role of the digital economy in promoting China's modernization and the digital development goals. According to the plan, by 2025, digital China will basically form an integrated propulsion pattern with horizontal connectivity, vertical connectivity and strong coordination. By 2035, the level of digital development will enter the forefront of the world. In addition, the Plan also clarifies the overall framework and important changes of the Digital China, including consolidating the digital foundation, further improving the data resource system and promoting the high integration of Digital Technology with the construction of economic, political, cultural, social and ecological civilization, strengthening the innovative capability and safety barrier of Digital Technology, expanding the development of Digital Technology at home and abroad, enhancing the development of the digital economy from the overall layout, and promoting the deep integration of digital economy, digital technology and real economy, deepening the transformation of digital drive in production, life and governance.

However, there are still many challenges in the digital transformation of small and medium-sized micro-enterprises in Guangxi. Among them, the lack of digital technology capability, information asymmetry and financing difficulties are the main factors that restrict the digital transformation of small, medium and micro-sized enterprises in Guangxi. As an important window connecting "the belt and road initiative" and an important link of two-way opening, exchange and cooperation between "China and ASEAN", Guangxi urgently needs small and medium-sized enterprises to take their unique advantages, take the opportunity of digital transformation, and cross-border integration driven by the Internet effect to explore new value growth points. This topic takes the huge impact of digital economy on the traditional way of trade as a clue, analyzes the current situation and predicament of the value chain of Guangxi's small and medium-sized enterprises in the post-epidemic era, and puts forward some policy suggestions on how to promote the value chain of Guangxi's small and medium-sized enterprises in the digital economy, which provides support for the high-quality development of Guangxi's small and medium-sized enterprises and has certain academic characteristics [3].

## 2. The Basic Situation of Small and Medium-Sized Enterprises in Guangxi

### *2.1. The Category, Quantity and Scale of Small and Medium-Sized Enterprises in Guangxi*

The main categories of SMEs in Guangxi include manufacturing, construction, business, information technology and software, cultural and creative industries and modern service industries. Among them, the production categories of small, medium and micro-sized enterprises are mostly concentrated in the low-end zone of the value industry chain, lacking high-quality and high-tech high-tech industries. Their category structure is not reasonable enough, lagging behind the level of industrial category structure in developed countries. By the end of 2020, there were 2.194 million SMEs in Guangxi, up 3.9% year-on-year. Among them, there were 1.826 million micro-enterprises, accounting for 83.2%. There were 307,000 small enterprises, accounting for 13.9%. There were 61,000 medium-sized enterprises, accounting for 2.8%. It can be seen that in recent years, small and medium-sized enterprises in Guangxi have continued to develop, accounting for a large proportion of the enterprise scale structure in Guangxi, and they are an important driving force for Guangxi's economic development that cannot be ignored. According to statistics, there are 6.063 million registered enterprises in Guangxi province. The year 2020 was the year with the highest growth rate of enterprises in Guangxi Province, when the growth rate of enterprises reached 44.43%, and the year with the highest growth rate was also 2020, when the number of registered enterprises reached 825, 000. In the past decade, the number of registered enterprises in Guangxi Province accounted for 66.31% of the total number of registered enterprises in history [4] (Figure 1). From the information, we can see that the pace of enterprise transformation in Guangxi Province is very fast, and the emerging enterprises are very dynamic, but at the same time they are also facing the challenge of increasingly fierce market competition.

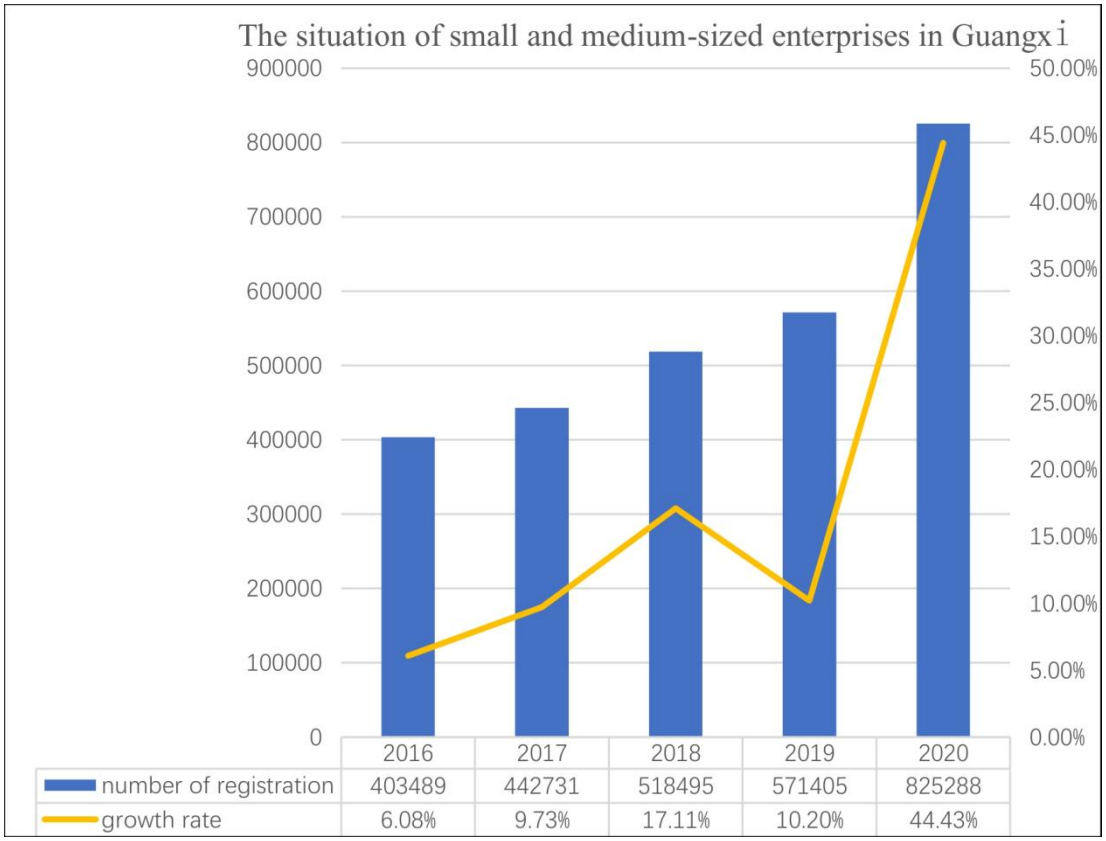


**Figure 1.** Corporate Registrations and Growth Rate in Recent Ten Years. Source: Enterprise Insight Enterprise Edition (2021/11/18).

*2.2. The Production and Operation of Small and Medium-Sized Enterprises in Guangxi*

Small and medium-sized enterprises in Guangxi were born and developed in the process of reform and opening up. However, due to the reasons of the economic system transition period and the influence of various factors, the development of small and medium-sized enterprises is very difficult. The development of small and medium-sized enterprises in Guangxi has experienced a change from scratch, from weak to strong, from scattered to centralized, from extensive to intensive, from small to large, from manual workshop production to mechanized production. After years of efforts, small and medium-sized enterprises in Guangxi have established a relatively perfect production and operation management system and a high level of enterprise management, which have played an important role in absorbing the employment of rural surplus labor force, solving the employment of surplus labor force and stimulating rural economic growth. As shown in Table 1, by the end of 2021, the total number of small and medium-sized enterprises in Guangxi had reached 1,179,000, representing a year-on-year increase of 8.7%. Among them, the number of small and micro enterprises reached 1.098 million, accounting for 93.1% of the total number of small and medium-sized enterprises. The existence and development of small and medium-sized enterprises in Guangxi have shown a positive trend, which mainly benefits from two aspects: on the one hand, government support: Guangxi has issued a series of policies to support the development of small and medium-sized enterprises, such as financial support, tax incentives, financing support, etc., which provide a good development environment and policy guarantee for small and medium-sized enterprises. On the other hand, it has benefited from the rapid economic growth. Guangxi is an important economic center in the southwest of China, and its total economic volume and growth rate are among the highest in the country. The rapid economic development in Guangxi has provided a vast market and development opportunities for small and medium-sized enterprises. From the above data, we can see that the number of small and medium-sized enterprises in Guangxi, the number of employees and economic indicators have shown a year-on-year growth trend.

**Table 1.** Growth and economic indicators of the number of SMEs in Guangxi.

| Year | Number of SMEs | Average annual value added of small and medium-sized enterprises (RMB100million) | Average annual profit of small and medium-sized enterprises (RMB100 million) |
|---|---|---|---|
| 2016 | 287,637 | 134.2 | 17.6 |
| 2017 | 306,454 | 145.6 | 19.8 |
| 2018 | 325,086 | 158.9 | 21.9 |
| 2019 | 344,143 | 173.5 | 23.8 |
| 2020 | 365,290 | 189.3 | 26.1 |

Data source: Guangxi Zhuang Autonomous Region Bureau of Statistics, economic indicators of small and medium-sized enterprises in Guangxi.

### *2.3. The Financial Situation of SMEs in Guangxi*

According to the Report on the Development of Small and Medium-sized Enterprises in Guangxi Zhuang Autonomous Region in 2020, the scale of total assets of small and medium-sized enterprises in Guangxi has continued to expand. By the end of 2019, the total assets of small and medium-sized enterprises in Guangxi had reached RMB1.88 trillion, representing a year-on-year increase of 9.5%. In terms of liabilities, the major sources of liabilities of Guangxi's small and medium-sized enterprises are bank loans and accounts payable. At the end of 2019, the total liabilities of Guangxi's small and medium-sized enterprises reached RMB1.12 trillion, representing a year-on-year increase of 11.3%. In terms of owner's equity, at the end of 2019, the total owner's equity of small and medium-sized enterprises in Guangxi amounted to RMB764.8 billion, representing a year-on-year increase of 3.2%. (See Table 2) From the data, it can be seen that the total assets, total liabilities and total owner's equity of small and medium-sized enterprises in Guangxi have increased in the past five years. Among them, total assets increased by 57.1% from RMB1.19 trillion in 2015 to RMB1.88 trillion in 2019; Total liabilities increased by 47.4% from RMB0.76 trillion in 2015 to RMB1.12 trillion in 2019; Total owner's equity increased by 76.7% from RMB0.43 trillion in 2015 to RMB0.76 trillion in 2019. In addition, judging from the year-on-year growth rate, the total assets of small and medium-sized enterprises in Guangxi increased by 9.5%, total liabilities increased by 11.3% and total owner's equity increased by 3.2% in 2019. Generally speaking, the balance sheet and owner's equity of small and medium-sized enterprises in Guangxi show an overall growth trend, but the debt growth rate is relatively fast, which requires strengthening the management of enterprise balance sheet and risk control.

**Table 2.** Major financial data of Guangxi SMEs from 2015 to 2019 (Billion).

| age | total assets | total liability | Total owner's equity |
|---|---|---|---|
| **2015** | 1.19 | 0.76 | 0.43 |
| **2016** | 1.38 | 0.89 | 0.49 |
| **2017** | 1.61 | 1.01 | 0.60 |
| **2018** | 1.72 | 1.00 | 0.72 |
| **2019** | 1.88 | 1.12 | 0.76 |

Source: Guangxi Zhuang Autonomous Region Bureau of Statistics.

### *2.4. Guangxi SME Employees*

The number of employees in small and medium-sized enterprises has been increasing year by year (See Table 3), from 2.293 million in 2015 to 2.874 million in 2019, representing an increase of 25.3%. The

proportion of employees with college degree or above in small and medium-sized enterprises increased year by year, from 31.2% in 2015 to 36.5% in 2019, representing an increase of 17.9%. On the whole, the talent structure of small and medium-sized enterprises has been gradually optimized, and the proportion of highly educated employees has increased year by year. At the same time, the growth rate of the number of employees in small and medium-sized enterprises is higher than that of the proportion of highly educated employees, indicating that small and medium-sized enterprises in Guangxi are experiencing certain pressure of talent shortage and need to further strengthen talent introduction and training. Based on the above analysis, it can be concluded that there are still some problems and challenges in the talent of small and medium-sized enterprises in Guangxi. It is necessary to strengthen the talent management, training and introduction, and enhance the core competitiveness and sustainable development of small and medium-sized enterprises.

**Table 3.** Number of employees of small and medium-sized enterprises in Guangxi and proportion of highly educated talents.

| age | Number of employees (10,000) | Number of new jobs in small and medium-sized enterprises | Proportion of employees with college degree or above |
|---|---|---|---|
| 2015 | 229.3 | -- | 31.2% |
| 2016 | 244.5 | 200,000 | 32.5% |
| 2017 | 260.7 | 220,000 | 33.8% |
| 2018 | 274.5 | 240,000 | 34.7% |
| 2019 | 287.4 | 260,000 | 36.5% |
| 2020 | -- | 280,000 | -- |

Source: China government statistics, Guangxi small and medium-sized enterprises bureau.

## 3. Difficulties in Promoting the Value Chain of Guangxi's Small and Medium-sized Enterprises by Digital Economy

### *3.1. SMEs Are Facing "Low-End Lock-in" of Global Value Chains*

China's small and medium-sized enterprises are an important part of the national economy, but on the whole they are still at the low end of the global value chain. With the increase in the technological content and added value of products, due to the intensification of global technological competition and the imposition of control and restriction on some technological exports from developed countries to China, some enterprises have been "locked down at the low end" and gradually lost their market, especially the vast number of labor-intensive industries are facing the risks of "locked down at the low end" and "hollowing out" [5]. In recent years, although the development momentum of small and medium-sized enterprises in Guangxi is strong, due to the lack of independent innovation ability, lack of brand advantages, lack of independent intellectual property rights, lack of core technology and talents and other issues, the development of small and medium-sized enterprises in Guangxi has been in the low-end industrial chain. According to the Implementation Opinions of the Guangxi Zhuang Autonomous Region Department of Industry and Information Technology on Accelerating the Upgrading of Processing Trade of Guangxi's Small and Medium-sized Enterprises, at present, most of Guangxi's small and medium-sized enterprises are mainly engaged in processing trade, mainly concentrated in hardware, furniture, building materials, textiles, toys, electronics and other industries. With the development of international industrial division of labor, more and more multinational enterprises have moved their production bases abroad. As large enterprises are in the leading position in digital technology, they can restrict the digital connection of small and medium-sized enterprises or monopolize innovative digital systems to strengthen their exclusive interests. Such monopolies have resulted in small businesses likely to be stuck at the bottom of the digital-based production network as large businesses move deeper into the value chain. Guangxi's existing industries such as electronic information and new materials are dominated by low-end value chains such as processing and

manufacturing [6], the number of market players participating in the high-end segment of the value chain is small, and the potential for development is insufficient. It is difficult to form and release the momentum of sustainable digital economic cooperation for ASEAN.

### *3.2. SMEs Can Not Afford to Participate in the Value Chain of High Fixed Costs*

In the global value chain, although most enterprises' main profits come from value-added links in the value chain, there are also a few enterprises that obtain higher added value through low-cost inputs of production factors, and in these links with higher added value, small and medium-sized enterprises often lack corresponding advantages. When participating in the global value chain, small and medium-sized enterprises in Guangxi are facing opportunities brought by the transfer of international production division on the one hand, and higher cost pressure from domestic producers on the other. Due to the small scale, relatively low technology level, relatively low management level and relatively high cost of capital, labor and other factors of SMEs, it is difficult for SMEs to move up the value chain in the global value chain. Although the Guangxi government has issued a lot of support and preferential policies for the regional SMEs in recent years, SMEs are still facing many difficulties in entering the upstream of the value chain. From the perspective of cost, due to the relatively low concentration of manufacturing industry in China, small and medium-sized micro-enterprises are often difficult to enter some key technological links. In addition, some leading enterprises in the industry are generally located at the top of the value chain due to their strong financing and technological innovation capabilities, and they monopolize and block small, medium and micro-sized enterprises, which greatly hinder small and medium-sized enterprises in Guangxi from entering the high-end field.

### *3.3. Guangxi SMEs Are Facing Financing Difficulties*

Guangxi is a relatively backward region in the west. Most of the small, medium and micro-sized enterprises have a low starting point, a weak foundation and limited funds. This has greatly increased the operational difficulty and operational risks of the small, medium and micro-sized enterprises' foreign investment. In addition, the problem of inefficient supply chains has led large investors to concentrate their funds in regions with better economic development. At the same time, banks are usually more inclined to provide loans to large-scale enterprises or enterprises with existing assets pledged. Small and medium-sized enterprises often lack credit guarantee and may not be able to provide sufficient guarantee or credit background. In particular, high-tech enterprises may not have established a stable credit record in the initial stage of their business, which makes banks and other financial institutions treat their loan applications more cautiously. This has further led to problems such as financing difficulties and shortage of funds for small and medium-sized enterprises in Guangxi, and further restricted small and medium-sized enterprises from moving to "high-end areas".

### *3.4. Guangxi SMEs Lack of Technical and Management Personnel*

In Guangxi's small and medium-sized enterprises, many enterprises' core technology or management talents are imported from universities and scientific research institutes, and some enterprises have imported many high-level technical talents from universities and scientific research institutes by means of high salaries. However, the majority of small and medium-sized enterprises, especially labor-intensive enterprises, have problems such as the shortage and mobility of high-level talents and the lack of personnel training opportunities, and many small and medium-sized enterprises are even unable to pay higher salaries. These phenomena reflect that the overall quality of Guangxi's small and medium-sized enterprise talent team is not high, and the phenomenon of high mobility, strong mobility and no retention of technical personnel is more prominent. According to the survey report on talent flow in China, the net outflow rate of senior talents from Guangxi enterprises in major domestic cities in 2020 was 29.31%, ranking second in the country, and the net inflow rate of talents in Guangxi was 7.37%, ranking second from bottom in the country. It can be seen from this that due to the restriction of factors such as business environment and staff treatment, there are problems such as too much labor mobility and too little total human resources in Guangxi, especially the shortage of professional and managerial talents. At

present, the structure of knowledge and skills of the talent team is not reasonable, and the brain drain is very serious, which not only has a great impact on the business performance of the enterprise, but also has a certain restriction on its future development.

## 4. Countermeasure and Suggestion

### *4.1. Providing Policy Support for the Digital Transformation of Small and Medium-Sized Enterprises and Creating a Good Market Environment*

First, the government should strengthen the planning and reduce the barriers to the digital transformation of small and medium-sized enterprises. Create a good market environment for the digital transformation and upgrading of small and medium-sized enterprises in Guangxi, and further standardize the benign operation of the digital economy [7]. Second, strengthen the supervision and management of the digital economy, strengthen the transparency of supervision and management, and improve the competitiveness of small and medium-sized enterprises in the digital economy. By encouraging the platform companies to improve the operation system, maintain their competitive market structure, and reduce the efficiency reduction and welfare loss caused by the monopoly of the platform companies. Third, the government advocates the accommodation of large, medium and small enterprises to maximize the benefits of the industrial chain. Cooperation between small and medium-sized enterprises can share important information, knowledge and skills. Specific measures for economic and technological cooperation include holding small and medium-sized enterprise technology exchange exhibitions, publicizing the innovative practical experience of small and medium-sized enterprises, and establishing a regional enterprise database [8].

### *4.2. The Establishment of a Platform Cooperation Mechanism to Reduce the Difficulty of Value Chain Connectivity of Small and Medium-Sized Enterprises in Guangxi*

In the aspect of internal environment, corporate executives should actively guide, build technological innovation platforms, make full use of enterprise technology centers and engineering technology research centers at all levels, and promote embedded cooperation among large, medium, small and micro enterprises to coordinate innovation. In key areas, equipment sharing, production capacity docking and production coordination will be realized, and the pattern of deep coordination, mutual support and coordinated development of large, medium and small and micro enterprises will finally be realized [8]. The government should strongly support and encourage universities, research institutions and enterprises in China and ASEAN countries to jointly build a platform for digital science and technology innovation, enhance China's research and development level in emerging information technology fields such as the Internet, artificial intelligence, big data, cloud computing and block chains, and make breakthroughs in key core technologies. In the external environment, we will build a cross-regional exchange and cooperation platform and improve the existing dialogue and exchange mechanism between China and ASEAN. Reduce the difficulty of value chain connection of small and medium-sized enterprises in Guangxi, and reduce the loss of benefits and welfare caused by platform monopoly. Guangxi, as a land and sea adjacent region to ASEAN, has gradually become a pioneer in the cooperation between China and ASEAN, and has built an important bridge between China and ASEAN countries.

### *4.3. To Provide Financing Support for Small and Medium-Sized Enterprises, and Vigorously Promote the Digital Transformation of Small and Medium-Sized Enterprises*

First, as the main body of macro-control, the government should strengthen its support to small and medium-sized enterprises, reduce their financing costs and digital transformation costs by formulating preferential policies and providing financial support, and provide loans and venture capital support for small and medium-sized enterprises by establishing special funds. The government can provide certain guarantee, formulate relevant policies to promote banks and other financial institutions to actively participate in the financing of small and medium-sized enterprises and the digital transformation, provide appropriate financing products and

services, and create better financing conditions for small and medium-sized enterprises. Secondly, we should strengthen the construction of credit rating system for small and medium-sized enterprises and establish a reliable credit guarantee system. The government can encourage financial institutions to participate in the construction of SME credit rating system through financial support or tax incentives, and provide credit record guarantee for SMEs [9]. Then, we will further promote the digital transformation of small and medium-sized enterprises to enhance their market competitiveness and financing capabilities. The government can promote the digital transformation of small and medium-sized enterprises by supporting digital technology, research and development, promotion of digital applications and other ways, and improve their credibility in the eyes of financial institutions. As the main body of the market, small and medium-sized enterprises should actively promote the digital transformation and improve the management level, so as to achieve more efficient production, marketing and management, and improve the profit margin and market competitiveness. In addition, small and medium-sized enterprises should actively carry out marketing activities through channels such as the Internet and social media in order to attract more customers and users, and thus improve brand awareness and market share.

### *4.4. For Small and Medium-Sized Enterprises to Import Talent, Provide Talent Support*

One is to strengthen the training and introduction of digital economy talents. The government can formulate relevant policies to encourage enterprises to increase investment in staff training and improve staff skills; At the same time, strengthen cooperation with institutions such as universities and scientific research institutes, and introduce talents to improve the technological innovation ability and competitiveness of enterprises. The second is to improve the remuneration package and staff welfare. The government can formulate corresponding policies to encourage enterprises to give employees reasonable remuneration and benefits in order to improve the sense of belonging and stability of employees and reduce brain drain [10]. The third is to establish a talent sharing platform and a Industry-University-Research cooperation mechanism. The government can strengthen its cooperation with institutions such as universities and research institutes, and establish a Industry-University-Research cooperation mechanism to promote the transformation and application of scientific and technological achievements. We will strengthen the construction of small and medium-sized enterprise incubators, provide small and medium-sized enterprises with entrepreneurship training, technical advice, marketing and other services, and encourage venture capital institutions to participate in small and medium-sized enterprise investment.

## 5. Conclusion

This paper focuses on the small and medium-sized enterprises in Guangxi, and objectively analyzes the current situation and difficulties of the value chain upward movement of small and medium-sized enterprises in Guangxi in the post-epidemic period through specific data, and puts forward relevant solutions. However, in reality, small and medium-sized enterprises have a large number and wide coverage, and it is relatively difficult to collect and sort out data. Meanwhile, the value chain upward movement of small and medium-sized enterprises in Guangxi is a complex process, which involves many aspects, including organizational structure, management process, personnel training, etc. Considering the above factors, this study has certain limitations.

For the countermeasures of future research, researchers can cooperate with local governments, chambers of commerce and other institutions to obtain relevant data of small and medium-sized enterprises through surveys, questionnaires and other means, and at the same time establish a perfect database to strengthen the integration and analysis of data; On the other hand, it deeply analyzes the influencing factors of the value chain rise of small and medium-sized enterprises in Guangxi. Combining with the actual situation, it deeply studies the factors of policy environment, market demand, personnel training and other aspects, as well as the characteristics and differences of digital transformation in various industries. The transformation and upgrading of small and medium-sized enterprises in Guangxi need certain personnel support. Therefore, future research needs to pay attention to personnel training and popularization in the process of small and medium-sized enterprises' value chain climbing, how to train the personnel needed for digital transformation and upgrading, how to popularize

digital technology knowledge and other issues.

**Funding**

Guangxi University Students' Innovation and Entrepreneurship Training Project (No.:202211548046).

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Not applicable.

**Conflicts of Interest**

The author declares no conflict of interest.

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https://doi.org/10.58195/emi.v2i1.70

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Article

# Scaling Digital Innovation's Generativity to Re-Invent Organisational Capabilities

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**Abstract:** As firms in the Schumpeterian environment of creative destruction seek to creatively edge out each other, frequent organisational capabilities' re-invention tends to be a critical prerequisite for unlocking new capabilities to catalyse a business' sustainability. Given the growing importance of self-disruption as an antecedent for organisational re-invention, this empirical research explores whether improved level of the optimisation of digital innovation's generativity would leverage organisational capabilities' re-invention to counter threats in the constantly changing Schumpeterian environment of creative destruction. Using a qualitative research method, the empirical research explored the opinions of twenty-five personnel that constituted of IT and electronics engineering personnel from five innovative IT and digitally abreast organisations in Glasgow-Scotland. The Delphi method that was accomplished in five sequential focus group discussions explored the impact of the emerging digital innovation technologies not only on new digital product or service innovations, but also on organisational capabilities' re-invention. Although novel service and retail models as well as novel marketing approaches were found to emerge from the utilisation of different digital innovation technologies, major inhibitors of the optimisation of digital innovation's generativity were still found to arise from deeply embedded analog business systems or the paradox of having to digitize and respond to the needs of the yet largely analog-skewed market. To address such a challenge, this study proposes a digital organisational capabilities' re-invention model to agitate the need for most businesses to adopt digital business approaches as antecedents for leveraging the optimisation of digital innovation's generativity. This will not only aid the creation of new products or services, but also re-invention of new capabilities to bolster a firm's competitive edge. However, future research can still explore skills and competencies that are critical for digital innovation's optimisation.

**Keywords:** digital product innovations; digital service innovations; organisational capabilities; optimising digital innovation's generativity; organisational capabilities' re-invention

## 1. Introduction

As firms in the Schumpeterian environment of creative destruction scamper to engage in creative destructive activities to reshape the existing business landscape to their favour, the use of digital innovation is often one of the pivotal innovative antecedents for capabilities' reinvention. It is such capabilities' re-invention that enables firms to create new differential values to counter rivals' volatile competitive activities. Digital innovation's generativity replenishes and recreates a firm's new specific heterogeneous resources to enable it gain new

Received: 16 April 2023; Accepted: 24 April 2023.

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competitive edge over rivals (Dougherty & Dunne, 2012:1467) [1]. Digital innovation connotes the process of conceptualising and applying a combination of new digital and physical inputs to extract and create novel products or services, processes, business models and structures (Iansiti & Lakhani, 2014:91) [2]. Organisational capabilities constitute of a bundle of inter-related unique and idiosyncratic approaches that exhibit the uniqueness of how a business combines and applies a combination of its tangible and intangible strategic value creating resources to achieve the intended results in the context of the unfolding industry and market conditions (Kock & Gemunden, 2016:670) [3].

In contrast, organisational capabilities' re-invention entails analysis, re-thinking and recreating how a combination of such resources, strategies, structures, processes, business models and defined practices can be applied to aid effective response to the emerging changes. It aids the recreation, modifications and replenishment of the existing strategic value creating resources, processes and business models to create the desired bundles of superior value offerings (Prescott, 2014:573) [4]. Quite often, it is during such quests that digital innovation's generativity may enhance not only the extraction of new products or services, but also novel processes and business discourses to reshape the overall level of a firm's market performance. Digital innovation's generativity aids intense analysis of the unfolding uses of digital technologies not only by customers, but also suppliers, business customers, distributors, product developers as well as the general communities of companies in a particular industry.

Through such analysis, it enhances the executives' capabilities to discern the overall unfolding patterns of digital technologies' application and usage in organisations as well as by customers (Grover & Kohli, 2013:655) [5]. This leverages the extraction and invention of novel business discourses, practices, services, products, platforms, customer experience and principles. This offers not only new differential values, but also new capabilities that induce new sources of competitive advantage. That signifies even if Teece's (2007:1319) [6] notion of "Explicating Dynamic Capabilities" seems to offer interesting insights on organisational capabilities' recreation, it still seems it is often through such processes of digital analysis and extraction of novel business concepts that digital innovation catalyses capabilities' re-invention. This enables a firm create and deliver relatively superior products/services to attain superior market performance and the desired competitive edge.

Organisational capabilities' re-invention is often instigated by the emergence of the changes and turbulence in the Schumpeterian environment of creative destruction that renders it difficult for firms to survive without recreating or modifying their existing capabilities. That signifies diagonal diagnosis of the unfolding external trends vis-à-vis a firm's internal capabilities to withstand such trends is critical for discerning the capabilities' re-invention initiatives that can be undertaken. To accomplish that, capabilities' re-invention may require the review of the exiting business approaches, models, processes, systems and resources to introduce new ones that are more responsive to the changing environment (Yoo, Boland, Lyytinen & Majchrzak, 2012:1398) [7]. It is often through such diagonal diagnosis that the application of relevant digital innovation technologies enhances relevant capabilities' re-invention to respond to the emerging turbulence. Unfortunately, with the concept of digital innovation being yet a largely novel phenomenon, its literature and theories seem to have not yet been significantly enriched to aid discerning how it leverages capabilities' re-invention. It is such epistemological gap that this research seeks to explore by evaluating how digital innovation can be optimised to aid organisational capabilities' re-invention.

## 2. Literature Review

High level of digital innovation technologies' optimisation leverages capabilities' re-invention to enable a business respond more effectively to the dynamics in the unfolding market changes (Bharadwaj, Sawy & Pavlou, 2013:633 [8]; Hui, 2014:5 [9]; Wirtz, Schilke & Ullrich, 2010:272 [10]).

### *2.1. Digital Innovation*

Digital innovation utilises a combination of science, technology and business paradigms to aid the extraction and creation of new value offerings as well as new business discourses from the emerging different digital technologies' uses that are unfolding from a firm's digital technologies' ecosystem (Nambisan, Lyytinen,

Majchrzak & Song. 2017: 223) [11]. Digital innovation also influences process innovation. But the focus of digital innovation is often to leverage the extraction and development of novel product concepts or components from the existing digital data. Digital innovation strongly relies on digitisation to improve the programmability, addressability, sensibility, communicability, memorability, traceability and associability of physical products. Digital innovation is also often aided by the reprogrammability, data homogeneity and self-inferential capabilities of digital technologies (Svahn, Mathiassen & Lindgren, 2017:239) [12]. It is the reprogrammability aspect of digital technologies that edifies the effectiveness of digital innovation. Reprogrammability leverages the flexibility of the digital technology to receive and execute coded instructions to perform all forms of data analytics to achieve the desired outcomes. Reprogrammability is the epicentre of digital innovation. It permits flexibility for new coded instructions to be issued several times to perform different analysis of the same data to extract different novel concepts or ideas from the same product (Lyytinen, Yoo & Boland, 2016:47) [13]. Such capabilities are often catalysed by the digital technologies' capabilities to execute data homogenisation.

In the accomplishment of different data analytics, digital technologies leverage data homogenisation by converting all forms of analog signals or data into bits or binary numbers. It is during such a process that data homogenisation decouples analog data from its special devices to spawn the storage, transmission, processing and accessibility of digital data across all digital devices as well as platforms (Lee & Berente, 2012:1428) [14]. This renders it possible for different partners and product developers in the digital innovation's ecosystem to engage in the analysis and the development ofdifferent product layers or components from the same sets of data. It also enhances the amalgamation of data from different sources to create the desired superior value offerings. The self-inferential aspect of digital technologies constitutes of a bundle of relevant digital devices and software which are critical for accomplishing different digital innovation processes.

The notion that digital innovation's generativity edifies capabilities' re-invention is also echoed in Yoo, Henfridsson and Lyytinen's (2010:724) "Layered-Modular Architecture" [15]. To modify or to extract different components or layers from the same product, Yoo et al.'s (2010:724) "Layered-Modular Architecture" offers new insights on the types of product architectures that can be easily modified and the ones that cannot. Such two types of product architectures constitute of the integral and layered modular product architectures. Products with integral architectures cannot easily be decomposed into different components and recombined to create an integrated single product.

Such products are often associated with certain specific meanings that cannot easily be interpreted and modified to create additional components. Products with integral architectures are often stringently nested in an integral design hierarchy with overlapping specific product components. In effect, decomposition of such components may easily unpredictably affect the rest of the product's specific components (Barrett, Davidson, Prabhu & Vargo, 2015:135) [16]. In contrast, products with modular architectures are often easily modifiable. Due to their ambiguous boundaries and meanings, digital innovation can easily be undertaken to attribute additional new meanings from which new components or concepts are extracted and created.

Layered modular product architectures constitute of loose components that can easily be decomposed and recombined to create additional new features or functions. Such decomposability also renders it possible for new services or products to be integrated in the layered modular product architectures. It comprises not only of multi-layered components that are developed by different partners in the digital innovation's ecosystem, but also agnostic components that are attached to an array of meanings for further future modifications (Yoo et al. 2010: 724) [15]. As compared to the components in the integral product architectures that are often developed and manufactured by firms with specific product knowledge, in layered modular product architectures, different firms tend to hold skills and competencies that are specific for the production of each of the different layers and components. Such layers and components are often coupled and interwoven together by certain shared standards and protocols.

Despite the fact that there are certain product architectures that cannot easily be modified, the generativity of digital innovation still aids the analysis and understanding of the different product structures and layers (Marion, Meyer & Barczak, 2015:98) [17]. This enhances discerning the additional services or products that can be added as part of such a product's components. It is through such initiatives that digital innovation often unlocks a

product's new potential as well as the re-invention of a business' capabilities to reshape the existing industry and market boundaries. Digital innovation's generativity creates a new business model. It also aids the review and change of the existing new processes, structures and systems to create new capabilities that can reposition a firm to effectively maximise the emerging new opportunities.

Yet, as the business cooperates with competitors in the development of other product layers, it also leverages the acquisition of new capabilities that can be used to spawn a firm's overall effective market performance. Such a view is echoed in the fact that the use of multiple partners that are involved in the development of a product's components bolsters a firm's marketing and promotion prowess as well as distribution capabilities (Bharadway & Noble, 2016: 560) [18]. Although it emphasises the utilisation of digitisation in the quests to achieve such outcomes, in some of the cases, some of the results of digital innovations are often not necessarily also digital.

Digital innovation can influence the creation or modifications of tangible products that are not necessarily digital products. Through such initiatives, it influences the enrichment of a firm's existing portfolios of products (Simmons, Palmer & Yann, 2013: 744) [19]. Yet, as it tracks and captures the unfolding new digital technologies' usage, digital innovation may also aid proactive analysis and creation of business concepts as well as value offerings that can enable a business respond to the unfolding customer needs. It influences frequent capabilities' modifications to re-invent new capabilities that reposition the business to tap new opportunities in new ways that the competitors may not be able to easily replicate (Porter & Heppelmann, 2014: 64) [20]. It bolsters a firm's first-mover advantages into the digital space or market.

Digital innovation uses a combination of digital methodologies, infrastructure and software such as 3D printing, cloud computing, data analytics and mobile computing. In the application of such techniques, infrastructure and software, it collects and extracts valuable data and information about customers, products, services as well as the evolving digital industry practices to discern new digital values that can be created to enable a firm respond to the unfolding industry and market trends (Gagliardi, 2013: 891) [21]. Sources of such data and information often constitutes of information on the unfolding product searches, e-commerce sites, opinions from product review sites, news media, internal transactions, business websites and the emerging new usage of digital technologies (Mithas, Tafti & Mitchell, 2013:511) [22].

As it collects an array of structured and unstructured data such as images, text, GPS, RFID, metadata and event logs, digital innovation utilises big data analytics to analyse the unfolding heterogeneous and high velocity data to understand the dynamics surrounding a firm's products, services, customers, competitors, business partners and the unfolding industry and market dynamics (Prescott, 2016: 92) [23]. It is often through the analysis and extraction of such new insights that digital innovation utilises big data to aid the re-invention of the existing organisational capabilities to perform more effectively. The argument that digital innovation's generativity is not only accentuated in Yoo et al.'s (2010:724) "Layered-Modular Architecture" [15], but also in Nylen and Holmstrom's (2015:57) "Digital Innovation Strategy" [24].

To extract and create new products, services and business models from data unfolding from different sources, Nylen and Holmstrom's (2015: 57) [24]. "Digital Innovation Strategy" offers critical insights on the framework that can be used to enhance the overall effectiveness of a firm's digital innovation strategy. The model offers holistic insights on the three dimensions and five areas that are linked to such three dimensions to influence the overall effective management of digital product and service innovation. The three dimensions of digital innovation refer to a firm's product, environment and its properties.

The five areas constitute of user experience, value proposition, digital evolution scanning, skills and improvisation. The dimension of a firm's digital products is explained by the areas of user experience and value proposition. User experience emphasises the need for the extraction and creation of factors that offer significantly distinguishable level of a firm's digital products and services' usability, aesthetics and engagement. It is such high levels of the digital products and services' functionality, its attractiveness and meanings that set a firm's digital products and services apart from those of rivals (Bharadwaj, El Sawy & Pavlou, 2013:471) [25]. This leverages a firm's overall effective market performance.

Value proposition enhances the analysis and understanding of the customer base to discern the pricing

strategy that can be adopted as well as how digital products and services can be innovatively bundled to respond to the identified needs of the target market. It diagnoses how value can be created, captured and integrated in the designated digital products and services to catalyse their overall effective market performance. In contrast, the dimension of a firm's digital environment emphasises the need for constant digital evolution scanning. Constant digital evolution scanning aids the identification, extraction and utilisation of the new unfolding information on the emerging new digital devices, channels and changes in digital users' behaviours(Grover & Kohli, 2013: 655) [5].

It is through such analysis that a business is often able to stay ahead of competitors by identifying and extracting new digital products and services to respond to the changes that are unfolding in its digital markets. However, whereas the dimension of a firm's digital environment focuses on digital evolution scanning, the dimension of a firm's properties emphasises the need for the existence of the appropriate skills and competencies as well as improvisation. For a firm to successfully implement its digital innovation strategy, the properties of skills and competencies emphasise the need for the acquisition of the internal and external competencies (Grover & Kohli, 2013:655) [5].

The properties of skills and competencies also agitate for the continuous learning of the unfolding new unique properties of digital innovation technologies to not only create, but also to continuously improvethe developed digital products and services. It is also such initiatives that often leverage the improvisation and malleability of the digital innovation technologies to create significantly differentiatable value offerings. However, as Nylen and Holmstrom's (2015: 57) [24] "Digital Innovation Strategy" focuses on how digital innovation can be used to invent and re-invent product and service offerings, Prescott's (2016:92) "Concepts of Digital Data Genesis and the Knowledge Staircase" offers insights on how digital innovation can be used to modify and re-create an organisation's capabilities [23]. Using the knowledge staircase model, Prescott (2016: 92) [23] argues that digital innovation offers the sequential processes through which data is acquired and converted into information which is also subsequently transformed into knowledge that in turn gets replicated in the organisation's improved capabilities. It is such improved organisational capabilities that bolster its prowess to discern new capabilities that can be created as well as the existing capabilities that must be re-created to unlock new capabilities that offer new competitive edge.

However, to create and re-create such capabilities to unlock new capabilities that offer new competitive edge, firms have to base their decisions on accurate, complete and accessible information on its internal operations, rivals, suppliers and business partners and networks. That explains why Prescott (2016: 92) [23] emphasises that in addition to using the knowledge staircase, it is also critical for a firm to exhibit the desired superior level of digital data genesis capabilities. Digital data genesis capabilities uses "born digital" approach to measure how relevant information technologies and systems are integrated in all critical business processes at all levels and in all divisions, departments and units to aid the axiomatic acquisition and utilisation of data. As compared to the semi-automatic analog data entry processes, digital data genesis capabilities leverage the accuracy, completeness and accessibility of the gathered information as well as the accuracy of the business decisions that are drawn from such data and information. Digital data genesis capabilities do not only entail the use of technologies in data acquisition and utilisation, but also a process of creating new knowledge. Through such new knowledge, businesses are often able to invent new organisational capabilities or to re-invent the existing capabilities to bolster a firm's overall capabilities to respond to the unfolding industry and market trends (Piccoli & Ives, 2005:747 [26]; Van Der Aalst, 2011:5 [27]).

### *2.2. Organisational Capabilities' Re-Invention*

Organisational capabilities connote a bundle of inter-related unique and idiosyncratic approaches that explains the uniqueness of how a business combines and applies a combination of its tangible and intangible resources to influence the achievement of the intended outcomes within the given unfolding industry and market conditions (Helfat, Finkelstein, Mitchel, Peteraf, Singh, Teece & Winter, 2007: 9) [28]. Capabilities reside in a firm's specific non-transferrable resources. Such resources often emerge from how a business utilises a combination of its strategic value creating resources to create the desired value offerings that can enable it

achieve its strategic motive of delivering superior market performance (Prahalad & Hamel, 1990:79) [29].

Capabilities are influenced by a firm's bundle of competencies and skills, technology as well as the underlying defined know-how, practices and culture that explain how a firm's approaches different business situations. As firms utilise a combination of such resources, capabilities often emerge from how a firm is able to apply carefully planned and designed bundle of such resources to withstand all the unfolding industry and market turbulence to achieve the desired outcomes. A firm's capabilities are also measured by the extent to which a business is able to read the unfolding industry and market trends and undertake necessary adjustments of how its strategic value creating resources are applied to avoid turbulence (Peteraf, 1993:179) [30].

The view that a firm's capabilities are derived from how it is able to apply its strategic value creating resources to achieve the desired ends is echoed in the resource-based theory. It is the fundamental argument in the resource-based theory that a firm's capabilities to achieve sustained competitive advantage reside in how it combines and applies a combination of its tangible and intangible resources. Such tangible resources may constitute of machineries, raw-materials, equipments, business infrastructure and physical locations (Piccoli & Watson, 2008:113) [31]. Intangible resources may comprise of a firm's skills, competencies, intellectual output, product formulas, established networks and technologies. Depending on the kinds of resources that a firm uses, it is often the heterogeneity and immobility of such resources that sustains a firm's competitive advantage (Barney, 1986:656) [32]. High levels of heterogeneity and immobility render such resources not only valuable, but also rare, in-imitable and non-substitutable by rivals. It is the emergence of such conditions that influences a business' capabilities to sustain its competitive advantage over rivals.

As the resources turn valueable, it also spawns a firm's capabilities to continuously conceptualise and apply its value creating strategies to achieve the intended outcomes. Degree of resources' valuability is often easily discernible in the extent to which the rents accruing from such value creating strategies significantly exceed the costs of investment in such resources (Barney, 1986:656) [32]. To sustain a firm's competitive advantage, such resources must also be rare, heterogeneous as well as non-transferrable. Whereas in-imitability measures the resources' irreplicability by rivals, non-substitutability explores rival's inability to find alternative resources that can be used to create values that are relatively similar to a firm's value offerings. Certainly, such strategic value creating resources may initially influence a firm's capabilities to sustain its competitive advantage. However, with time, intense research and innovation coupled with pragmatic industry practices' evolution and improvement may still cause the erosion ofthe competitive advantages that were derived from such resources' in-imitability and non-substitutability. Intense research and innovation in perfect market conditions tend to with time weaken the strengths of the previously heterogeneous resources (O'Reilly & Tushman, 2008:185) [33].

As the emergence of such situations threaten a firm's capabilities to sustain its competitive advantage, it therefore implies constant capabilities' replenishment and re-invention are critical for unlocking new capabilities to spawn a firm's sustainable competitiveness during all seasons of turbulence. That implies a firm's capabilities is not only measured by how it applies a bundle of the required strategic value creating resources, but also by how it constantly reads and undertakes adjustments to leverage a firm's sustainability in the midst of all the unfolding discontinuities and uncertainties (Eaterby-Smith & Prieto, 2008:235) [34]. It also measures a firm's capabilities to constantly re-invent new capabilities to bolster its overall sustainability. Organisational capabilities' re-invention connotes the process of reviewing, modifying and introducing additional business approaches that unlock new capabilities to enable a firm respond to the changing market conditions. It is a dynamic approach that focuses on analysing and tracking the unfolding market changes to discern how the existing capabilities can be modified to respond to the unfolding new market needs.

Organisational capabilities' re-invention is the process of conducting relevant trends' analysis and re-thinking how a combination of its existing resources, strategies, structures, processes, business models and defined practices can be modified to aid effective response to the emerging changes (Dosi, Nelson, & Winter, 2000: 10) [35]. Certainly, organisational capabilities' re-invention is a concept that is widely emphasised by most industry practitioners and academics. However, it seems to have not received much attention in most of the contemporary strategic management studies. In such limited research on organisational capabilities' re-invention, it is Teece's (2007:1319) notion of "Explicating Dynamic Capabilities" that came closer to exploring

how organisational capabilities' re-invention can be undertaken [6].

It is the fundamental argument in Teece's (2007:1319) notion of "Explicating Dynamic Capabilities" that constant analysis and modification of a firm's capabilities leverages its dynamic capabilities to respond to the unfolding new market and industry changes [6]. To undertake such analysis to reconfigure the existing capabilities, intense analysis of the existing data is critical for understanding the existing state of a firm's performance as well as the prevailing industry and market trends. It is during the accomplishment of such analysis that digital innovation that emphasises a strong culture of data optimisation tends to play a significant role (Pavlou & El Sawy, 2006: 198) [36]. In such initiatives, digital innovation edifies not only product innovation, but also review and modification of a business' processes and operational models to re-invent new capabilities that are critical for leveraging a firm's overall market performance. However, as firms strive to match their capabilities to the unfolding market changes, dynamic capabilities' approach emphasises the need for analysis and identification of the capabilities, routines and processes that have turned valueless that must be modified and recombined to create new sources of capabilities. This causes the invention of new capabilities that leverage a firm's overall effective responsiveness to the unfolding market changes. In such initiatives, capabilities to sense, learn and undertake the necessary reconfigurations to adapt to the emerging changes are often supported by certain three sets of foundational variables.

In the context of Teece's (2007:1319) [6] explanations, the three sets of foundational variables encompass the analytical systems that aid a firm's capabilities to learn, sense, filter, shape and calibrate the opportunities that are emerging from the unfolding market trends. Quite often, it is the investment in technologies such as business digitisation and digital innovation technologies that often catalyse such capabilities. The second set of foundational variables constitute of enterprise structures, procedures, designs and incentives for seizing opportunities. The other set of the foundational variables of dynamic capabilities constitute of the capabilities to undertake frequent alignment and re-alignment of the specific tangible and intangible assets to influence the achievement of the desired outcomes. As a firm seeks to extract and create new capabilities from such analysis, it is often such foundational variables that influence a firm's dynamic capabilities of sensing, seizing, transforming using relevant organisational and managerial processes of learning, coordinating or integrating and reconfiguration (Prescott, 2014:573) [4].

Sensing uses business intelligence system to enhance effective analysis of the internal and external environment for relevant timely responses to be undertaken to mitigate risks of turbulence that are most likely to emerge. Learning aids the acquisition and utilisation of new information to create new capabilities that spawn a firm's overall improved responsiveness to the unfolding changes. Whereas integration spurs the combining and the introduction of the undertaken structural, process and model changes into the overall organisation's operational architecture, coordination facilitates the cascading of the newly acquired knowledge through all the levels as well as divisions, departments and units of the organisation.

Routinising is the process of normalising the newly introduced changes into the daily processes of organisational activities' accomplishment. Certainly, all these imply the use of Teece's (2007:1319) [6] notion of "Explicating Dynamic Capabilities" influences analysis and organisational capabilities' re-invention to reposition the organisation to effectively respond to the unfolding market changes. However, the fact that Teece's (2007:1319) [6] notion of "Explicating Dynamic Capabilities" relies on a more analog based processes implies the accuracy of the emerging information may also cause accuracy related issues on the undertaken decisions.

Even if Teece (2007:1319) [6] emphasises the use of business intelligence system to sense the emerging threats, it seems its effectiveness can be further edified by the use of the digital innovation technologies and methodologies such as big data analytics, artificial intelligence and machine learning tools (Taxal, 2018:2) [37]. In such initiatives, digital innovation systems seem to offer more accurate holistic analysis that can act as the preface for the application of Teece's (2007:1319) [6] notion of "Explicating Dynamic Capabilities" to discern the areas of organisational capabilities that must be re-invented to reposition the business to effectively respond to the emerging changes. It isagainst that backdrop that this research explores how digital innovation technologies and methodologies can be integrated as part of the approaches for undertaking organisational

capabilities' re-invention. However, since theories on digital innovation have not yet been enriched to aid discerning how it leverages not only new product development, but also process and business model reviews and modifications, this research seeks to fill such a gap by exploring how digital innovation can be optimised to aid organisational capabilities' re-invention.

## 3. Methodology

Empirical research was based on a case study research design. A case study research design refers to the ontological and epistemological process of inquiry that bases the study on only a few samples against which necessary generalisations are drawn about the phenomenon being researched (Avella, 2016:305) [38].

### *3.1. Case Study*

Since digital innovation is a relatively novel phenomenon, a case study research design was considered critical for aiding the study to focus only on the businesses that have gone significantly digital. Through such analysis, it was deciphered that the study would be able to reach relevant logical conclusions on whether digital innovation enhances organisational capabilities' re-invention. To accomplish this, the use of the case study research design was accompanied by the application of the qualitative research method. A qualitative research method often applies techniques such as observation, content analysis and interviews to aid eliciting of detailed underlying insights on the phenomenon being researched (Christensen, Johnson & Turner, 2013:13) [39].

Qualitative research method contrasts with the approach in the quantitative research method that focuses on eliciting summarised numerical information on the phenomenon being researched. Since the quantitative research method only focuses on exploring the relationship between different variables or constructs and not the underlying facets of facts that explain or describe the why and how of such relationships, this research opted for the application of the qualitative research method. This is attributable to the fact that this research seeks to explore how and why and not whether digital innovation enhances organisational capabilities' re-invention. Since the concept of digital innovation is still a novel phenomenon, the understanding of how and why digital innovation enhances organisational capabilities' re-invention is critical for determining the key steps as well as hindrances that must be addressed to leverage the optimisation of digital innovation as part of the methodologies that spawn organisational capabilities' invention.

Certainly, the literature and theories on digital innovation as well as organisational capabilities' re-invention are also still underdeveloped. Given such a gap, the application of the qualitative research method was considered to be of significant importance for accessing detailed insights that would enrich the existing theories to offer new scholarly insights on how businesses can undertake digital organisational capabilities' re-invention to gain the desired competitive edge. To accomplish this, the application of the qualitative research method used the focus group discussions and interviews as the main qualitative research technique to seek answers to the research questions that entailed the evaluation of what instigates the use of digital innovation technologies, the types of digital innovations as well as the methodologies that businesses use. It also explored how such methodologies induce values that do not only influence product or service development, but also organisational capabilities' re-invention. To seek answers to these research questions, the study used focus group discussions to extract only the opinions of about twenty-five electronics engineering experts from five organisations in Glasgow-Scotland that have gone largely digital (Vernon, 2009:69) [40].

### *3.2. Sampling*

Basing the study on the opinions of only the electronics engineering experts was also considered critical for gaining new insights on how digital innovation cannot only be utilised by the businesses to influence product and service innovations, but also to offer other values such as organisational capabilities' re-invention. The application of focus group discussions was influenced not only by the fact that digital innovation is still a novel concept that has not been widely adopted by most of the businesses, but also by the fact that this research emerged as part of the consultancy research work that was being done on digital marketing for about five

organisations in the period between 2021 and March 2022. It was during the discussions of the trends on digital marketing that the notion of digital innovation also emerged.

Hence, such a study created a framework for field analysis on the trends as well as the depth of digital innovations by the businesses in Glasgow-Scotland. This is attributable to the fact that they were also interested in exploring how the use of digital innovation can also be improved in their organisations. Using such a framework, the focus group discussions was used to have the discussions take place using five setups and five phases that engaged five employees who were not only electronics engineering experts (Sekayi & Kennedy, 2017:2755) [41], but also deeply knowledgeable about the concept of digital business applications.

Since, five employees were drawn from each of the five businesses; this meant that the study used about twenty-five electronics engineering experts as the sample population for the study. Each of the five sets of interviews and discussions with the five employees took place in the workplaces of each of the five groups of electronics engineering experts. In each of the five sets of interviews and discussions, the interviews were largely semi-structured on the basis that a question would be asked and the audience of the five employees would be requested to respond and invoke discussions.

### *3.3. Interviews*

The interview questions explored trends on digital innovation's adoption by the businesses, the reasons why some of the businesses are doing so while others are not. The discussions also examined the types of digital innovations as well as the methodologies that businesses use. It also explored how such methodologies induce values that do not only influence product or service development, but also organisational capabilities' re-invention. Subsequently, the questions and discussions focused on evaluating the challenges that limit most businesses' capabilities to adopt digital innovations.

Following agreement on the principles of anonymity and confidentiality, the five different groups had agreed on sharing opinions that emerged from the discussions in each group. Hence, during the discussions, the responses from the previous groups were also put forward to invoke further discussions. Although brief notes that constituted main points of the discussions were undertaken as the interviews and the discussions unfolded, most of the discussions were mainly tape recorded even by the participants themselves. This is attributable to the fact that they were also interested in exploring how the use of digital innovation can also be improved in their organisations.

### *3.4. Data Analysis*

On completion of data collection in March 2022, the tape recorded data were transcribed into written form. Thereafter using transcribed information while also listening and re-listening to the tape recorded discussions to leverage the accuracy of the extracted information, the analysis was accomplished using inductive-thematic analysis. This entailed extracting key themes and thereafter subthemes as well as the accompanying narratives that explained each of such mainthemes. Comparison and contrasting of each of themes from each script indicated not only digital product innovations, but also some other forms of digital innovations like digital retail outlets and digital marketing strategies.

Common meanings of such themes were imputed to not only refer to more of digitised business approaches, and enhance, it influenced the extraction of the discourse of digitised business approaches. The second set of themes were interpreted to refer to the discourse of analog-based business approaches because it mainly constituted of themes like deeply entrenched analog-business system as well as the largely analog market. It was from such analysis that the study explored whether or not digital innovation edifies capabilities' re-invention to catalyse a firm's overall sustainability. Yet, as such analysis as well as the entire study was being undertaken, measures were also undertaken to enhance the credibility, dependability and reliability of the study.

### *3.5. Validity*

In such initiatives, basing the study only on experts' opinions that understood how digital innovation works

as well as whether it edifies capabilities' re-invention improved the overall content validity and reliability of the study (Creswell, 2014: 10) [42]. As it also improved the veracity and credibility of the findings, the other measures for improving the credibility and reliability of the findings encompassed audit trail, fact-checking and soliciting of the opinions of experts and other personnel with detail understandings of the trends in the digital industry to check and confirm the veracity and credibility of the findings.

Such initiatives were accompanied by comparing and contrasting different experts' opinions during the interpretation of the findings. This improved the assessment of the areas of similarities that could be corroborated to leverage the validity and reliability of the findings. Combined with triangulation of the findings with theories, such analysis also enhanced the identification of new insights that were not easily discernible in the theories. It is such initiatives that improved the overall comprehensiveness of the findings to spawn the overall credibility, dependability and transferability of the study. The details of the findings are as presented and discussed in the next sections.

## 4. Findings

Deriving from discourse analysis and extraction, findings are presented according to two discourses that encompass digitised business approaches and analog-based business approaches. The details are as follows.

### *4.1. Digitised Business Approaches*

Findings indicated some of the digitised business approaches that some of the businesses have undertaken to have not necessarily entailed digital product innovations, but some other forms of digital innovations. Such digital innovations either fell in the domains of the innovations leading to the establishment of different digital retail outlets or the conceptualisation and application of different digital marketing strategies. The details of the findings are as follows.

#### 4.1.1. Digital Retail

Most trends of digital innovations among most of the businesses were reiterated to have entailed only the development of different digital retail concepts. Digital retail outlets were found to be easier to establish as compared to the establishment of the digital manufacturing entities. Most narratives attributed such trends to the fact that the technologies, equipments and software for the establishment of the digital retail outlets are often less costly. This contrasts with the technologies, equipments and the software for the establishment of the digital manufacturing plants that are often quite expensive. Even if there is increasing trends of the utilisation of the emerging digital technologies to establish different digital retail concepts, findings still indicated that there is often a greater preponderance of most of the businesses to replicate e-commerce models. With e-commerce models already developed; most of the businesses were reiterated to often feel comfortable to commit the necessary required resources on the replication of such concepts rather than on the innovation and development of new digital retail concepts. Increment in the rate of the emergence of different digital retail concepts were found to be instigated by the constantly increasing digital population. Such a view is accentuated in the opinions of one of the electronics engineering consultant who stated that:

"It is the retail sector where I think tremendous achievements have been made in as far as trends on digital innovation are concerned."

However, even in the midst of such increasing rates of the emergence of new digital retail outlets, some of the participants still highlighted that trends on digital innovation have not been about digital product innovations, but instead more about digital service innovations. Ranging from the sectors such as finance, tourism, insurance, real estate services and energy, most of the participants shared similar views that as contrasted to the quests for digital product innovations, most of the businesses have often been more engaged in the development of digital service business models. Discussions on the emergence of digital service models in the domains like finance, tourism, insurance, real estate services and energy linked sucha trend to the fact that it quite easier to establish digital service business models. This contrasts with digital product innovation and

development that often require hefty costs and more complex technologies. Such a view was found to corroborate the opinions of one of the participants who argued that it's more cost-effective and easier to establish the digital retail outlet as compared to the digitisation of the manufacturing plants. However, in the quests for the establishment of such digital service business models, most narratives indicated most of the businesses to be driven by the need for the re-invention of new capabilities to counter the emerging market dynamics. Instead, findings revealed most of the businesses to engage in the development and establishment of relevant digital service business models as a cost minimisation of strategy. With most of the customers now available online, some of the participants argued that some of the businesses in thefinance, tourism, insurance, real estate services and energy are increasingly opting for digitisation to minimise overheads. Such a view was echoed in the opinions of one of the IT consultant from the tourism sector who argued that:

"Almost everyone is now reachable through the internet or some mobile device. If the business is in the sectors such as real estate, insurance or even tourism, why must you waste a lot of funds on hiring several foot sales agents to hunt for customers? That can easily be done on line."

Quests for the minimisation of overheads as compared to the essence to re-invent the existing capabilities to counter competition were found to be a major driver of most of the businesses to engage in the development of different retail concepts. As the competition intensifies among the retailers in the finance, snacks and food retailers, insurance and the appliances and the grocery retail, most reiterations indicated most of the retailers to engage in different digital retail innovations. Through such innovations, most of the retailers often strive to discern how the existing digital technologies can be effectively optimised to reach different consumers. It also aids the analysis and identification of the alternative different models through which different services can be delivered in a way that delights customers. Such quests were not only found to be a major driver for the establishment of different retail outlets, but also as explanatory factors that lure most of the businessesto innovate and adopt different digital marketing models.

#### 4.1.2. Digital Marketing

Digital marketing emerged from the findings as part of the digital innovation phenomenon which is being largely undertaken by most of the businesses. As compared to the other forms of digital innovations, findings revealed that it is digital marketing which was commonly undertaken by several businesses. Whether large or small, findings indicated most of the businesses to significantly value the importance of digital marketing. However, as contrasted with the trends in most of the big businesses that tend to innovate and develop own digital marketing models; most narratives indicated most of the businesses not to engage in the research and development of their own digital marketing strategies. Instead, findings indicated a greater preponderance of the mainly small and medium size enterprises to engage in the replication of the emerging digital marketing concepts rather than in the development of their own. However, whether it is copied or developed by a business on its own, one of the IT consultants and a digital marketing manager still argued that most businesses still recognise digital marketing as critical for bolstering their marketing capabilities. In such initiatives, she explained that:

"Digital marketing is important for enhancing real-time interactions with customers. Through such real-time interactions with customers, one can take the opportunities to directly engage and convince customers into making purchase. Yet, as sales, revenues and profitability improve, it also enhances the reduction of the cost of marketing."

Even if the costs of the establishment of some of the digital marketing technologies were reiterated to be hefty, some of the participants still argued that it is often the quests for the increment of sales, revenues and profitability that drive most of the businesses to invest in different marketing technologies. Digital marketing was also noted to lower the overall cost of marketing. It was such quests to lower costs and leverage profitability that were also found to drive most of the businesses to innovatively use different digital marketing methodologies such as the internet, social media and mobile digital marketing. However, such approach was found to be mainly common among the small and medium size entities, as compared to most of the large businesses. In most of the large businesses, most reiterations indicated a greater preference for the use of digital

marketing due to the fact that it aids innovation on how to augment the marketing of their different products and services. Such a view was accentuated in the narratives of one of the IT specialists who stated that:

"These days, most of the businesses prefer to use digital marketing innovations whether for television or internet marketing because it enables the use of different animation methodologies to create and develop marketing images and pictures as well as the communication strategies that the business wants."

It appears in such quests, businesses are often not driven by the need to lower the costs of marketing, but more by digital marketing's capabilities to leverage the innovation of different marketing communication strategies. In such initiatives, some of the businesses were found to engage in digital marketing innovations to innovate, develop and animate their marketing communication images and pictures in different ways. In such initiatives, one of the participants explained that the results of such innovative digital marketing have often been reflected in the development of more attractive digitised and electronic billboards. Other positive results were also reiterated to be accentuated in the development of more attractive television advertisement images and pictures as well as social media videos. In otherwords, as large businesses strive to out-compete each other, the values of digital marketing innovations were found to be critical for positioning and repositioning a business differently from their rivals.

Certainly, despite lack of evidence of digital product innovation, it seems findings imply that innovations leading to the establishment of different digital retail outlets as well as the application of different digital marketing approaches seem to unlock new capabilities of some of the businesses to perform differently. However, as some of the businesses have gone digital in such endeavours, it was still highly discernible from the findings that even though some of the businesses tend to engage in capabilities' modifications and re-inventions, they often tend only do it in more analog-based approaches.

### *4.2. Analog-Based Business Approaches*

Most narratives indicated major constraints of most businesses' initiatives to commit significant investments on relevant digital technologies to leverage innovative capabilities to often arise from the use of deeply entrenched analog-business system as well as the largely analog market that still prefer to use analog approaches in most business transactions.

#### 4.2.1. Analog-Business Systems

It emerged from the findings that the use of deeply entrenched analog business systems has affected digitisation to leverage a business' capabilities to engage in different digital innovation initiatives. Even for businesses that use some of the digital methodologies such as digital retail and marketing, most of the participants reiterated that they still tend to use more analog-based processes and systems. Thematic analysis attributed such business approach to the costs of establishing different digital technologies. Costs of relevant equipments, software as well as the costs of installation and maintenance of such a system were noted to be quite deterring. In effect, most of the businesses were found to mainly adopt more analog-based processes, business systems and work methods. To leverage operational efficiency and capabilities to respond to the unfolding market dynamics, most of the businesses were found rely mainly on their corporate IT investments. As compared to digitisation, findings indicated most of the businesses to intensely use IT to leverage the operational efficiency in areas such as supply chain management, accounts and sales management, marketing and production management. However, some of the participants argued that such intense usage of IT applications implies most of the businesses are increasingly shifting towards digitisation and the utilisation of different digital technologies. Such a view is corroborated in the narratives of one of the IT managers from Delphi discussion groups who argued that:

"Digitisation is not an event, but a process. It starts gradually with significant investment in the required heavy corporate IT system and it moves gradually to digitisation. I think, we are moving towards that direction with time."

Such evidence of the increasing adoption of business digitisation was also echoed in the consensus in most of the discussions. In such responses, some of the participants argued that whereas in the retail sector, there is

increasing development and usage of digital retail outlets and digital marketing, in the manufacturing sector, there is increasing utilisation of digitally enabled automated processes. In such explanations, some of the participants revealed that most of the manufacturing businesses are increasingly integratingsemi-automated sensors and business intelligence systems in their manufacturing businesses. However, even in the midst of such changes, findings still indicated the level of digitisation to be quite low. Such a view was corroborated in the opinions of some of the IT managers who stated that most of the businesses still operate partially digitised and semi-automated businesses. The implications are latent in the fact that whereas some of the manufacturing processes are semi-automated and digitised, activities such as trends' analysis, forecasting and strategic planning are still often accomplished using mainly analog-based processes.

Even if in the event of the changes that are affecting a business' performance, some of the businesses were reiterated to use sophisticated IT systems such as enterprise resource planning systems to undertake relevant diagnosis, most of the IT managers still indicated that such reviews are often still analog-based. In most of the businesses, findings indicated that in case the business aims to revitalise its performance by lowering costs or improving quality, the analysis is often undertaken using analog-based methodologies such as sigma analysis and statistical analysis and quality controls. In such analog-based initiatives, most of the businesses were still found to use performance targets and evaluation charts that are pinned on the walls for employees to discern the business' expectations from them. As it emerged from the findings, this was attributable not only to the undigitisedorganisational culture, but also the fact that changing and transforming from analog to digitisation was found to be feared by some of the executives. Such fears were noted to arise from the fact that such change and transformation would certainly render most of the valuable analog heavy machineries redundant. Such a view was further corroborated in the opinions of one of the IT managers who stated that:

"It is not just a matter of digitising the manufacturing processes or the business. In heavy manufacturing plants, there are compatibility issues that can arise. Digitisation has just come recently. Hence, as the manufacturing equipment's manufacturers keep on phasing out the old one and introducing new ones, so, only then, we shall be able to get ditigised."

Even if that is not the challenge, some of the participants argued that the business thinking and approach may influence whether or not a business will digitised. In their explanations, they cited that there are mainly start-up businesses that focus on purchasing and using old machineries as a strategy for minimising start-up costs. In such situations, poor level of business digitisation is often a deliberate strategy in the beginning phase of the business' establishment. Yet, as some of the businesses adopt such approaches to business management, findings indicated other businesses to deliberately avoid digitisation because of the largely undigitised market.

#### 4.2.2. Analog-Market

Even if some of the businesses were found to have the capabilities to digitise, the level of digitisation of the market was found to be quite low. In such analysis, some of the participants explained that the more digitised the market is, the more the business may also get more digitised. Such a finding corroborated the opinions of some of the IT managers who noted that most of the businesses tend to get digitised selectively by choosing and digitising in the areas where customers are digitised. As it emerged from the findings, this causes a duality where some of the areas such as marketing and distribution are digitised, as others such as the manufacturing processes tend to be less digitised. Most narratives indicated that although there is a general consensus that the population is increasingly getting connected to the internet or different mobile applications, in most of the cases, the extent to which the connectivity to such different mobile technologies are used for accomplishing serious business activities has been quite low. As most of the population tend to use such mobile communication technologies for leisure and social activities such as charting on social media, the initiatives to translate such social usage into serious commercial usage is yet a challenge that most of the businesses are facing. In respond to such a situation, one of the electronics engineers noted in the discussions that:

"It is difficult to digitise when it is quite clear that the market will not respond. Most of the customers are on social medial and internet, but they don't use them for serious business purposes."

Findings indicated a strong culture of the use of the face-to-face initiatives in the accomplishment of

different serious commercial transactions. This is latent in the fact that even after viewing advertisements from the internet or websites, most of the customers still often go physically to the physical retail outlets even if there are options for ordering the same products on line. Besides fear of the online security related issues, some of the participants noted other issues to arise from lack of trust and confidence that the general market has in the businesses to deliver the required quantities and quality. The implications are latent in the fact that the increasing population's usage of the internet has only rendered it easy for businesses to undertake digital marketing rather than intense digitisation to induce other values of business digitisation. In contrast, one of the IT managers noted that especially in the manufacturing sector it is difficult to digitise when the other business partners have not digitised. Some of the manufacturing businesses are supplied by small scale businesses that do not possess the necessary financial capabilities to digitise. In such situations, some of the participants argued that even if a business was to digitise, it would still not induce enormous values. Such a view is accentuated in the opinions of one of the IT consultants who stated that:

"It is easy to digitise and get results on improved value chain efficiency if the other networks of businesses have also digitised. But in most of the cases, apart from the institutions such as banks that may have digitised, the others may still be using analog approaches. So what is the value of digitisation? Digitisation is a complex thing."

Certainly, it seems evident from the findings that despite the increasing recognition of the values of digitisation as a critical antecedent for leveraging a business' capabilities, deeply entrenched analog-based business systems as well as largely analog market seem yet to be the major hindrances. The implications are latent in the fact that even if the motive of digital innovation is usually to leverage the development and modifications of the existing product components, evidence of most businesses' engagement in such initiatives was not easily discernible from the findings.

## 5. Discussion

Digital innovation's generativity edifies organisational capabilities' re-invention. Even if it is not entailing new product development, digital innovation still catalyses the review and the extraction of novel business models from the existing business practices (Nambisan, 2017:1029) [43]. As it involves intense use of business intelligence and big data analytics, digital innovation enhances the executives' understanding of their existing capabilities vis-à-vis the unfolding environmental trends. In the event of internal capabilities' deficiencies, it is through such analysis that digital innovations enhance the review of how the existing business approaches and models can be reconstructed to unlock new capabilities. It is often through such capabilities' re-invention that digital innovation aids the creation of a state of equilibrium or disequilibrium in which a firm gains an advantage through its leveraged capabilities. Such a view is at tandem with Teece's (2007:1319) [6] notion of "Explicating Dynamic Capabilities" that imply a firm'sinformation technology catalyses its capabilities to constantly analyse and modify its capabilities to respond to the unfolding new market and industry changes.

Even if digital innovation does enhance the extraction and the creation of novel business concepts, it can still instigate intense process diagnosis to unlock cost, efficiency and quality enhancement advantages. As firms engage in more creative destructive activities in the Schumpeterian environment of creative destruction, it is often the re-invention of such new cost, efficiency and quality enhancement capabilities that bolster a firm's capabilities to respond to the proliferation of an array disruptive innovations (Hui, 2014:5) [9].

Yet, if the re-invention of such superior cost, efficiency and quality enhancement capabilities is not able to induce the desired outcomes, digital innovation's generativity may still offer superior product development capabilities. Using an array of customer data as well as critical information that offer significant insights on the overall market dynamics, digital innovationspawns precision of new product innovation and development (Lee & Ho, 2010:37) [44]. It is often such precision of new product innovation and development that catalysethe improvement of a firm's capabilities to create new differential values to respond to the unfolding customer needs and demands in the way that rivals are unable to match.

In the situations where product modifications and not new product development is necessary to respond to the unfolding market trends, digital innovationleverages a firm's capabilities to analyse and create new

components or layers from the existing products. This spawns the enrichment of the existing product's features, attributes and functionality to re-create a firm's new capabilities to deliver a bundle of new superior value offerings to respond to the unfolding market dynamics (Wirtz, Schilke & Ullrich, 2010:272) [10]. That implies in the constantly changing business environment, digital innovation is certainly a critical prerequisite for reshaping such unfolding business terrain to a firm's advantages. It enables businesses stay ahead of competitors to gain first-mover advantages by taping new opportunities in the relatively new global digital markets before competitors are able to do so.

Even if it does not catalyse the creation of new products or the enrichment of the existing product's components, digital innovation can still enable businesses extract and develop superior business approaches for delivering superior quality customer services. Combined with superior product offerings, this leverages the re-invention of new capabilities for a business to attain the desired level of competitive edge even in the midst of intense industry competition (Kalyanam, Lal & Wolfram, 2010:5) [45]. Yet, as the business confronts rivals with such superior bundles of value offerings, digital innovation still catalyses the re-invention and application of superior marketing capabilities. It augments not only the quality of marketing communications, but also strategies to reposition a business quite differently from its rivals. It is often through such initiatives that a firm's gains new capabilities to re-invent its brand image to tackle the emerging new market dynamics in a relatively new way.

In the context of such findings, it is quite discernible that the study was able to respond to its fundamental research question which was to explore whether the generativity of digital innovation instigates organisational capabilities' re-invention. However, as most of the businesses are still constrained by the use of deeply entrenched analog-business system as well as a largely analog-based market andmanagement ideologies, it is unlikely that most of the businesses will be able to gain from such enormous digital innovation values in as the nearest future as possible. Certainly, that also implies this research raises a number of managerial implication issues on how the contemporary managers can consider adopting digital innovation technologies to not only create differential values that reposition them differently, but also to extract and re-invent new capabilities that would minimise risks of vulnerability in the midst of the increasingly volatile Schumpeterian environment of creative destruction.

Cost related challenges also emerged from the findings as one of the factors explaining the low level of business digitisation as well as digital innovation's optimisation to influence the achievement of the desired values. However, to respond to generally low level of digital technologies' optimisation, this research offers the digital organisational capabilities' re-invention model. The replication of such a model will not only spawn capabilities' re-invention, but also improved level of product as well as service digital innovations.

## 6. Managerial Implications

To accomplish that, it is argued in the digital organisational capabilities' re-invention model that businesses must consider using four processes that encompass optimisation of corporate IT and investment in digital technologies, business digitisation, the use of incentives and rewards to digitise the analog market, and optimisation of digital innovations. The details of how this can be applied are as follows.

### *6.1. Optimisation of Corporate IT and Investment in Digital Technologies*

Businesses will have to engage in the improvement of the overall level of corporate IT optimisation. This can be accomplished by introducing advanced information technologies such as cloud computing and enterprise resource planning systems. The introduction of such advanced information technologies must be accompanied by the integration of information technology usage in all the business' internal key functions as well as the linkage with the partners in the business' ecosystem such as suppliers, distributors, business customers and industry collaborators. As the business introduces a strong culture of information technologies' usage, it must also encourage the development of a culture for the optimisation of the existing data from different information technologies to undertake relevant analysis and make relevant decisions. It is the introduction of such organisational system and culture that will create the foundation for the business to digitise. Intense usage of

relevant IT technologies will render most of the business' IT systems more compatible and supportive of the digital technologies that are to be introduced later. To accomplish that, the business will have to invest in the establishment of relevant digital technologies such as 3D printing, cloud computing, data analytics and mobile computing. The costs of the investment and establishment of relevant digital technologies will certainly be enormous. However, once established, the values will certainly exceed the incurred costs. Completion of the establishment of relevant digital technologies must be accompanied by business digitisation.

### *6.2. Business Digitisation*

Business digitisation will require the digitisation of all the internal key processes such as sourcing, inventory management, operations, marketing, finance and sales management, planning, maintenance, management and executive decision making as well as distribution. It must also be undertaken in conjunction with the initiatives forthedigitisation of the transactions with the external partners such as advertisers and marketers, consultants, product developers, financial institutions and other networks of industry collaborators. The establishment of such a digital business system must also be accompanied by the evaluation of how it would aid automatic acquisition and processing of structured and unstructured data such as images, text, GPS, RFID, metadata and event logs. Sources of such data and information may constitute of information on the unfolding product searches, e-commerce sites, opinions from product review sites, news media, internal transactions, business websites and the emerging new usage of digital technologies. As the business digitises, it must also take the initiatives to get the market transformed from analog to digital transactions.

### *6.3. Use Incentives and Rewards to Digitise the Analog Market*

Transformation of the market from analog to digital is critical for the business to gain the desired values from its business digitisation process. To accomplish that, the business will have to develop and use incentives and rewards for customers that use digital channels to accomplish different transactions. Such rewards and incentives may comprise of price discounts, the use of coupons and loyalty programmes for digital customers. As such incentives and rewards are being undertaken, the business must also develop a system for addressing and resolving all complaints from digital customers quite promptly. In case the digitally ordered product is not liked by customers, they must be allowed to easily return the product and take replacements or even seek for refunds. Such benefits must be offered to only digital customers that are using digital transactions. To build trust and confidence in the digital business system, the business will also have to ensure that it is only products of the right quantity and quality that are delivered to the customers. Such initiatives would lure more digital customers to have trust and confidence in the digital business system. Combined with the development of the mechanisms for minimising online security risks, it is such values of digital transactions that will lure most of the customers to change from analog to digital transactions. Even if such initiatives catalyse a business' competitiveness, it is still often critical that the emerging data are optimised to undertake relevant capabilities' re-invention to respond to the changes in market and industry trends.

### *6.4. Optimisation of Digital Innovation*

It is through the optimisation of big data analytics that the business will be able to optimise its digital innovation systems to achieve the desired outcomes. As it collects an array of structured and unstructured data such as images, text, GPS, RFID, metadata and event logs, digital innovation utilises big data analytics to analyse the unfolding heterogeneous and high velocity data to understand the dynamics surrounding a firm's products, services, customers, competitors, business partners and the unfolding industry and market dynamics. This will improve decisions on the strategies that can be undertaken to counter the unfolding industry trends. Digital innovations will also enable the business optimise digital product innovations to extract new components that enrich the features and functionality of the existing products. It will also enhance process analysis and diagnosis to unlock new cost, efficiency and quality advantages that would spawn a firm's performance. It also through digital innovations that the business would be able to extract and use new advertisement and marketing

concepts to reposition the business differently. Combined with the capabilities to develop new business models that can easily disrupt the existing industry boundaries, it is such arguments that illustrate how digital innovations would spawn capabilities' re-invention to catalyse a firm's effective response to the unfolding market trends.

## 7. Area for Future Research

It is implicitly discernible from the findings that the study was able to respond to its fundamental research question which was to explore whether the generativity of digital innovation instigates organisational capabilities' re-invention. It was evident so far that digital innovation has influenced the emergence of different digital retail business models as well as marketing approaches. However, it was also still easily discernible that through the introduction of such new business models as well as marketing and advertisement approaches, most of the businesses have been able to re-invent new capabilities to tackle the emerging market challenges inways that create new differential values. Given time, it is also apparent that most businesses will certainly be utilising an array of digital innovation technologies to not only engage in different digital product and service innovations, but also process diagnosis.

As businesses seek to optimise their digital innovation technologies to develop new digital products or services to survive in the Schumpeterian environment of intense volatilities, it also lures businesses to adopt better data management and optimisation approaches. It is in the diagnosis of such data that a firm may also be able to identify other process, structural or equipments' inhibitors of its performance. As such analysis instigates the need for exploration and adoption of new business practices; it also tends to unlock new capabilities for a business to counter the emerging market dynamics. It is during such situations that digital innovation not only aids digital product or service innovations, but also organisational capabilities' re-invention.

Organisational capabilities' re-invention introduces new capabilities that influence how a firm organises, combines and applies a bundle of its strategic value creating resources to create a bundle of new differential values that offer new competitive edge. However, given the fact that there is still a greater preponderance of most of the businesses to use mainly analog-based business approaches, it is unlikely that such values will be realised by most of the businesses in as the nearest future as possible. To address such a challenge, this study uses the digital organisational capabilities' re-invention model to agitate the need for most businesses to adopt digital business approaches as antecedents for leveraging the optimisation of digital innovation's generativity to not only create new products or services, but also to re-invent new capabilities. However, future research can still explore skills and competencies that are critical for digital innovation's optimisation.

**Funding**

Not applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding author.

**Conflicts of Interest**

The author declares no conflict of interest.

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https://doi.org/10.58195/emi.v1i1.71

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Article

# Business Digitization's Edifying Effects on a Firm's Ambidexterity

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**Abstract:** Improving a firm's simultaneous capabilities to exploit the existing opportunities whilst also exploring future opportunities is critical for catalysing a firm's ambidexterity and sustainability. In that context, this research evaluates how business digitisation edifies a firm's ambidexterity in the increasingly more discontinuous modern business environment. Using a qualitative-Delphi Method, the study diagnoses the perceptions of about twenty expert panelists from a cross-section of twenty enterprises in Aberdeen-Scotland on how digitised enterprise systems are often utilised to discern how the existing as well as future trends can be maximised to leverage a firm's ambidexterity and sustainability. Findings indicated some of the businesses to take the initiatives to leverage their exploitation and exploration capabilities. However, it was still highly evident from most of the narratives that as most of the businesses focused on leveraging their existing state of performance, cost savings or the use of rational plans that only aim to achieve short-term business quests, it tends to undermine data optimisation in the simultaneous improvement of a firm's exploitation and exploration capabilities. This is because most quests for optimising the digitised business systems or to undertake the required changes to leverage ambidexterity are often constrained by a combination of different heterogeneous internal business conditions that either cause low investments in digitisation or inflexibility that constrains change. It is not only the level of digitisation's optimisation which is low, but also most businesses' greater preponderance to focus on exploitation at the expense of exploration. Such business approach was found to undermine most quests for bolstering a firm's ambidexterity. Considering that this area had not been explored by most of the previous studies, the study concludes with certain propositions that can enrich the existing ambidexterity theories by offering new insights on how digitisation highlights a new paradigm that can be optimised to bolster a firm's ambidexterity.

**Keywords:** a firm's ambidexterity; business digitisation; exploitation and exploration capabilities

## 1. Introduction

As the world is increasingly getting engulfed by "born digital" generations of customers and businesses, most of the sources of opportunities as well as threats are also increasingly getting ditigised (Prescott 2016:92) [1]. That signifies the use of more digitised approaches is critical for not only extracting such opportunities, but also for discerning how the unfolding threats can be countered. Digitised opportunities and threats require digitised business approaches. It is often through such quests that digitisation spawns a firm's capabilities to survive in the midst of the existing as well as the emerging future unpredictabilities and uncertainties (Gagliardi

Received: 16 April 2023; Accepted: 30 April 2023.

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2013:891) [2]. Yet, as it catalyses a firm's survival in the midst of such discontinuities, business digitisation's generativity also edifies a firm's ambidexterity.

A firm's ambidexterity connotes the executives' constant strategic quests to leverage a business' dual and simultaneous capabilities to exploit the existing opportunities whilst also balancing with the conceptualisation and application of the strategies for exploring future opportunities (O'Reilly & Tushman 2013:1) [3]. It is in such quests that business digitisation offers novel business discourses that spur a business' simultaneous capabilities to respond to the present as well as future trends. Business digitisation is a transformational process that seeks to create business structures, systems and processes that aid the optimisation of the existing digital technologies to create bundles of value offerings that reposition a business to respond to the existing and the emerging market trends (Mithas, Tafti & Mitchell 2013:511) [4].

Business digitisation spawns a firm's capabilities to undertake relevant trends' analysis to exploit the unfolding opportunities whilst also exploring how the opportunities that are most likely to unfold in the future can be maximised. It is often through such initiatives that it catalyses a firm's ambidexterity. Using the generativity of predictive big data analytics in conjunction with relevant business intelligence technologies, most digitised businesses are often able to easily compare past trends with the present to predict the future (Wolfgang & Schmid 2020:985) [5].

Whether it is threats or opportunities that are identified, business digitisation still enables a business develop novel business models and capabilities to counter such threats or even to gain from such opportunities. Yet, as a business gains such advantages, the edifying effects of the generativity of business digitisation technologies are often not only latent in the repositioning of a business to respond to future trends, but also in the catalysation of a firm's existing market performance (Nambisan 2017:1029) [6].

In the quests to leverage a firm's existing marketing performance, business digitisation leverages cost minimisation, operational efficiency and the use of a more flexible, agile and lean approach that bolster a firm's capabilities to respond to the unfolding market dynamics (Schumpeter 1934:1) [7]. Certainly, it is through such discourses that the generativity of business digitisation often spawns a firm's ambidexterity. However, as most of the studies focus on exploring the strategies for catalysing a business' digital transformation, this research seeks to offer new critical insights on why the adoption of the appropriate business digitisation strategy is a prerequisite for a firm's long term future survival and sustainability.

## 2. Literature Review

The notion that the generativity of business digitisation edifies a firm's ambidexterity is implicitly echoed in most of the theories on business digitisation as well as in the theories and literature on a firm's ambidexterity (Andriopoulos & Lewis 2009:696 [8]; Grover & Kohli 2013:655 [9]; Porter & Heppelmann 2014:64 [10]).

### *2.1. Business Digitisation*

Business digitisation is the process of changing and transforming all the organisational critical structures, processes and systems to aid efficient and effective acquisition, preservation and utilisation of digital resources to create differential values that leverage a firm's overall effective market performance (Nambisan, Lyytinen, Majchrzak & Song 2017:223) [11]. Digitisation does not only entail the integration of information technologies in the accomplishment of different activities. Instead, it is also a process that requires in-depth change and transformation of the business approaches, models and practices to enhance the utilisation of different digital technologies to achieve the desired strategic outcomes.

Digitisation refers to an integral approach that requires the utilisation of the enabling digital technologies such as internet embedded technologies, addictive manufacturing, big data analytics and artificial intelligence to respond to the increasingly changing dynamics of the digital world (Nambisan et al., 2017: 223) [11]. As businesses seek to respond to the opportunities and the demands created by the emergence of the concept of the new digital paradigm, digitisation may also entail the use of automated sensors, cloud computing, augmented and virtual reality as well as block chain technologies. The increasing emphasis of business digitisation is instigated by the increasing digitisation of the world. As the world becomes increasingly engulfed by more

"born digital" generations of customers and businesses, business digitisation is critical for responding to the needs in the unfilled digital global markets (Porter & Heppelmann 2014:64) [10].

In such quests, the generativity of business digitisation enables a business respond to the competitive threats from rivals that are using different digital technologies to reshape both the digital and physical markets to their advantages. To achieve such advantages, business digitisation may not only require the digitisation of the operational systems, but also products, services, innovations and business models. Such a view is accentuated in Iansiti and Lakhani's (2014:91) notion of "Digital Ubiquity" that emphasises the need for businesses to adopt the appropriate digital transformation approach. It suggests the essence for digitisation of the existing products and services [12].

Digitisation of the existing products and services would require digitisation of how the existing products are developed, manufactured, stored and distributed to the final consumers. Such digitisation initiatives must also encompass the digitisation of processes, business models and systems to create lean, agile and cost-effective digital business system (Wirtz, Schilke & Ullrich 2010:272) [13]. It may also require digitisation of the synergy between the existing assets and those in the external business networks such as customers, product developers, suppliers and distributors.

The effects of such digitisation initiatives will not only leverage the improvement of the collaboration between different parties, but also information exchange and sharing. It will also edify the acquisition of new insights on the unfolding trends as well as new capabilities from the partners in the existing ecosystem on how to respond to such changes. Iansiti and Lakhani (2014: 91) notion of "Digital Ubiquity" also agitates for the diagnosis and extraction of new value creation modes, as well as capturing and integration of new values [12].

Even if such initiatives induce the achievement of the desired values, it also still critical that relevant big data analytics' methodologies as well as digital innovation technologies must be optimised to extract and create new product or service components. Quite often, it is also through such initiatives that businesses may have to re-invent their existing capabilities to unlock new potential that would disrupt the existing models to create new values before rivals are able to do so (Barrett, Davidson, Prabhu & Vargo 2015: 135) [14]. Depending on the objectives that the business aims to achieve, investment in relevant complementary software and technologies such as the internet embedded technologies, 3D printing, robotics and artificial intelligence is also a critical prerequisite for a business to achieve such outcomes.

As such initiatives are being undertaken, other theories emphasise the need for prototyping a business' strategy to ensure that it is adaptive and supportive of the digitisation quests (Kalyanam, Lal & Wolfram 2010:5 [15]; Lee & Ho 2010: 37 [16]). Prototyping a business' strategy would also require the abandonment of the conventional process of strategic planning in favour of digital strategic planning. Digital strategic planning encourages the use of emergent strategies to leverage a business' capabilities to respond to the changing business environment as such trends unfold (Grover & Kohli 2013: 655) [9]. However, as the firm adopts the appropriate transformational approach to leverage its digitisation, its capabilities to utilise the integrated networks of digital technologies to aid value creation depends on the adopted digital business strategy.

A digital business strategy is a firm-level strategy and not a functional level strategy that seeks to set the course for the optimisation of the linkage between a firm's bundle of IT technologies as well as digital technologies with its core business strategy (Bharadwaj, El Sawy & Pavlou 2013: 471) [17]. It is the digital business strategy that influences the analysis of the unfolding changes in the external business environment and the utilisation of the existing digital technologies and business concepts to reposition a business to tap such opportunities.

Digital business strategy also enables a business build new capabilities to tackle new threats. Considering the constantly changing needs of the largely digitised market, it is through the digital business strategy that the business is able to easily understand the unfolding dynamics in the digital market (Bharadwaj & Pavlou 2013: 633) [18]. Understanding such dynamics influences the determining of the digital as well as physical value propositions that can be undertaken to respond to such needs. It is through improved understanding of such digital market dynamics that firms are able to identify the segments to target. Yet, as "born digital" firms continue to utilise different digital technologies to invent new business models that destroy the traditional

business concepts, it is also through the digital business strategy that the executives are able to identify their weaknesses and the new areas that need to be improved (Bharadway & Noble 2016:560) [19].

Improvement in such capabilities may require the utilisation of their digital technologies to create novel business models that not only disrupt their own traditional business models, but also rivals' business models. Certainly, that implies through digitisation, firms are able to engage in creative destruction that destroy their own existing business models to invent new capabilities to tackle the emerging market challenges (Lyytinen, Yoo & Boland 2016:47) [20]. Using big data analytics, business digitalisation not only aids the development of new value propositions, but also the invention of the novel ways through which the business can get connected to the customers. It leverages a firm's capabilities to evolve from multi-channel approach to the omni-channel of having different services delivered to its customers (Hui 2014:3) [21].

Yet, as the business engages in the application of such digitised approach, it is not only its market reach that tends to be extensive, but also the returns on investment. This is attributable to the fact that as the business digitises; it tends to become quite lean. This influences cost minimisation, efficiency and the effective application of the methodologies such as customisation and JIT production systems (Marion, Meyer & Barczak 2015: 98) [22]. It also spawns improvement of a firm's flexibility and agility to analyse and sense using their existing data analytics technologies to identify the emerging future threats or opportunities. This influences a business' capabilities to reposition itself to tackle such threats or to maximise such opportunities. Quite often, it is through a combination of such actions that business digitisation edifies a firm's ambidexterity.

### *2.2. A Firm's Ambidexterity*

A firm's ambidexterity connotes the executives' constant strategic quests to leverage a business' dual capabilities to exploit the existing opportunities whilst also balancing with the conceptualisation and application of the strategies for exploring future opportunities (Andriopoulos & Lewis 2009: 696) [8]. Organisational ambidexterity leverages a business' continuity and sustainability. It edifies a business' survival in the midst of the unfolding environmental uncertainties and unpredictabilities. Derived from March's (1991: 71) notion of "Exploration and Exploitation in Organisational Learning" [23], the concept of organisational ambidexterity emphasises the importance for analysis, sensing and forecasting to discern the existing and the emerging future opportunities as well as threats. Such analysis influences the alignment of a business' capabilities to exploit the existing opportunities as well as exploration of how it can maximise the opportunities that are most likely to emerge in the future (Kock & Gemunden2016: 670) [24]. It is through such business approach that the application of the concept of organisational ambidexterity eliminates the constraints of executives' complacence as one of the major causes of the organisational failure.

Executives' complacence often emerges from the executives' stronger contentment with the existing good performance (Lubatkin, Simsek, Ling & Veiga 2006:646) [25]. As the executives get contented with a business' existing good performance, it tends to affect the undertaking of the initiatives to discern the emerging future trends as well as the initiatives that can be undertaken to explore how such future opportunities can be maximised to leverage a business' overall continuity and sustainability. This is attributable to the fact that due to the constant changes in market and industry trends, most of the businesses tend to adopt emergent rather than planned strategies.

Emergent strategies tend to arise from the strategic actions undertaken to respond to the unfolding market and industry trends (Mintzberg & Quinn 1992:5) [26]. This contrasts with the planned strategies that are often the result of forecasting and predicting future changes to determine the strategies that will be applied to respond to such changes. However, due to the constantly changing business environment, flexibility and agility are often integrated in the strategic planning process to enhance change and modifications of strategies as the dynamics in the unfolding market and industry trends unfold.

Even though it is such flexibility and agility that often edify a business' capabilities to exploit the existing opportunities whilst also exploring how the emerging future opportunities can be maximised, it is often still the executives' stronger preponderance to focus on exploiting the existing opportunities that affects the emphasise of organisational ambidexterity. In line with March's (1991: 71) notion of "Exploration and Exploitation in

Organisational Learning" [23], exploitation requires the highest level of operational efficiency, control, certainty and variance reduction, as exploration emphasises the need for search, discovery, autonomy and innovation. Organisational ambidexterity can be achieved through sequential, structural and contextual ambidexterity. Sequential ambidexterity emphasises the importance of shifting and realignment of structures, processes and strategies as the trends in environmental change shift from one form to another. To accomplish that, Burns and Stalker's (1961) "Management of Innovation" emphasises the need for the development and adoption of less formal structures, tasks and processes [27]. It also agitates for reliance on lateral coordination and less emphasis of formalisation and specialisation.

For firms that are operating in less stable and more turbulent environment, the adoption of such flexible and agile business approaches enhances ease of change, shifting and realignment of the business' structures, processes and business models to the changing environmental trends. Such approach contrasts with the situations where a business is operating in more stable markets.Businesses that are operating in relatively stable markets are often characterised by mechanistic management systems, hierarchical structures, as well as well-defined roles and responsibilities and business processes (Lubatkin et al. 2006:646) [25].

In the event of the changes in industry and market trends, it is such more mechanistic business systems that constraint a business' flexibility and agility to shift and realign its business approaches to the unfolding changes in market and industry trends. Even if an organisation is able to develop the appropriate level of sequential ambidexterity to shift and realign its business approaches from state of industry and market trends to another, its capabilities to do so are still often edified by its overall level of structural ambidexterity (O'Reilly &Tushman 2008: 185) [28]. Structural ambidexterity requires a business to create simultaneous parallel or spatial departments or units of which one set of structures pursue the goal of exploitation, as the other pursues the motives of exploration.

Such approach would spawn a business' capabilities to simultaneously pursue exploitation and exploration. However, it is still critical that the creation of such parallel structures is also accompanied by the development and application of parallel competencies, systems, incentives, processes and business cultures. It is such shared corporate culture, vision, strategies and cross-functional teams that edify a business' capabilities to pursue exploitation and exploration within the same business organisation(O'Reilly &Tushman 2008:185) [28]. It is the establishment of such a business system that also subsequently influences the creation of contextual ambidexterity.

Contextual ambidexterity constitutes of the internal business conditions that support the strategic balance between exploration and exploitation. It enhances effective utilisation of sequential and structural ambidexterity to spawn the simultaneous achievement of both exploitative and exploration outcomes. Contextual ambidexterity arises from a business' capabilities to combine and utilise all the structures and resources to create values that spawn a firm's overall exploitative and exploration capabilities.

Contextual ambidexterity as well as the overall organisational ambidexterity are often further influenced by the leadership style adopted by the organisation(Choi 2014:127) [29]. Quite often, transformational as well as transactional leadership approaches have been considered as critical for leveraging organisational ambidexterity. Transformational leadership influences the change and transformation of the organisation's business approaches to support the simultaneous adoption of exploitation and exploration business philosophies. Just like the transactional leadership approach, it would also instigate the change in behaviours. However, increasingly, the concept of adaptive leadership is emerging as critical for bolstering organisational ambidexterity (Choi 2014: 127) [29].

Adaptive leadership refers to the ability of leaders to cognitively sense turbulence, innovatively develop solutions, experiment and apply solutions to respond to the emerging volatile unfolding industry and market changes (Martin & Deimler 2011: 5) [30]. Adaptive leadership edifies a firm's overall continuity and sustainability in the increasingly discontinuous and unpredictable contemporary business landscapes. Adaptive leadership refers to the leaders' capabilities to constantly remain flexible and agile to cognitively sense, recognise situations, act, adapt and change a business' approach, models, thinking, philosophy and the overall nature of operation to ensure that a firm survives and remains sustainable in the midst of all discontinuities and

unpredictabilities(Sacramento, Fay & West 2013:141) [31].

Adaptive leaders are constantly alert and reading all trends as they unfold to identify signs or symptoms of the likely turbulence to emerge that may undermine a firm's performance. This enables executives undertake more precautionary rather than reactionary measures to develop strategies that render it possible for firms to adjust and adapt to changes even before they occur. As the enterprise prepares itself to change and adapt, critical actions undertaken to foster change and transformation often do not only entail change and transformation of a business' approach, models, thinking, philosophy, but also its operational capabilities (Teece 2007:1319) [32]. Although increasingly it is emerging as a leadership style, the notion of adaptive leadership is still largely regarded as a leadership skill rather than a leadership style. Adaptive leadership is a skill rather than a leadership style. It is a skill that leaders acquire from enormous experience gained from managing and leading activities through different periods of industry stability and instabilities (Heifetz & Linsky 2011:26) [33].

It is such crucible experience that provides leaders with the capabilities to combine the learnt leadership experience with leadership skills gained through formal process of leadership education and training to initiate business activities that improve a firm's adaptive capabilities (O'Connell, McNeeley & Hall 2008:248) [34]. Although adaptive leadership is largely influenced by leaders, its effectiveness is still often defined by certain inbuilt traits in leaders' personalities. Such traits are often linked to the inbuilt mental agility and flexibility of the leaders to sense situations requiring change to act to effect such changes.

It requires shrewdness of the leaders to undertake new changes just on the identification of symptoms to act and re-evaluate actions after the changes have been effected (Heifetz, Linsky & Groshow 2009:3) [35]. Adaptive leaders often use only sketchy strategic business plans, thereby implying as much as a formal business plan is critical for defining the course of activities that must be accomplished to achieve the desired business outcomes, maintenance of significant level of flexibility and agility to respond and adapt to new circumstances is often highly prioritized (Lahcen & Yachou 2012:71) [36].

It is often through such improved flexibility and agility that adaptive leadership catalyses improvement of a firm's ambidexterity. However, since the world is increasingly getting digitised with the effect that most opportunities and threats are also often digitised, it is not adaptive leadership that may leverage a firm's ambidexterity. It is instead a combination of adaptive leadership combined with business digitisation that would leverage a firm's ambidexterity. Business digitisation catalyses a business' capabilities to simultaneously exploit the existing opportunities while also at the sametime exploring how to thwart future threats or to gain from the emerging future opportunities. It encourages the emergence of more fluid and flexible operational approaches that encourages acquisition and absorption of new knowledge and organisational learning (Eaterby-Smith & Prieto 2008:235 [37]; Yoo, Boland, Lyytinen & Majchrzak 2012:1398 [38]). Subsequently, these spawn a firm's agility as well as dynamic adaptive and innovative capabilities to respond to the emerging changes in the external business environment.

Against that backdrop, it is implicitly evident from theories that business digitisation would edify a firm's ambidexterity. However, considering the limited attention that such area has received in most of the contemporary studies, this empirical research sought to fill such epistemological gap by exploring how business digitisation can be optimised to leverage a firm's ambidexterity.

## 3. Problem Statement

Even if the world is increasingly getting engulfed by the "born digital" generations of customers and businesses, discerning how digitisation can be undertaken to bolster a firm's capabilities to respond to the existing as well as the emerging opportunities or threats is a phenomenon that has not yet been evaluated by most of the contemporary studies.

## 4. Purpose of the Research

The purpose of this empirical research is to evaluate how business digitisation can be optimised to edify a firm's ambidexterity.

## 5. Methodology

Conventionally, a Delphi research process may be qualitatively or quantitatively skewed. A qualitative-Delphi research process often commences with the use of open-ended questions against which participants with the requisite level of expertise or knowledge are expected to respond for further statements to be generated and put back to the participants for a general consensus to be reached on the phenomenon being researched (Sekayi & Kennedy 2017:2755) [39]. In contrast, the quantitative-Delphi method uses a set of survey questionnaire to elicit experts' opinions against which highly scoring items are extracted and put back to the expert respondents for rating to reach consensus on the items that predict the phenomenon being research (Christensen, Johnson & Turner 2013:26) [40]. To access relevant information and reach logical conclusions on how business digitisation can be optimised to leverage a firm's ambidexterity, empirical research entailed the use of the qualitative-Delphi method. Attributable to such a decision is the fact that the motive of the empirical research was not to elicit numerical facts, but rich in-depth insights on how business digitisation can be optimised to leverage a firm's ambidexterity.

### *5.1. Delphi Method*

Certainly, a Delphi method is a research technique that aids the eliciting of the opinions and consensus from the experts or persons with detailed knowledge about the subject being research (Avella 2016: 305) [41]. It entails not only the selection and use of the participants with detailed subject knowledge, but also a series of the iterative processes of rounds to aid reaching of consensus among the participants as well as logical conclusions about the subject being researched. Delphi method is often used for evaluating more complex subjects of which not so many people are expected to have detailed knowledge and understanding.

In this empirical research, the application of the Delphi-method was motivated by the fact that the notion of how business digitisation leverages a firm's ambidexterity is not only complex, but also a subject that only the senior managers are expected to be knowledgeable about. To accomplish this, the study was only based on the perceptions of about twenty managers from a cross-section of twenty enterprises that are operating in Aberdeen-Scotland. Basing the study on such relatively knowledgeable participants was construed to be critical for reaching a consensus as well as relevant logical conclusions on how business digitisation leverages a firm's ambidexterity as well as its inherent constraints and challenges.

#### 5.1.1. Experts' Selection

Selection and inclusion of relevant experts into the study was accomplished using purposive sampling (Gill, Johnson & Clark 2016:48) [42]. The study used the knowledge and a list of marketing and operational managers that were previously involved in a consultancy related work on digital marketing as well as in a workshop on digital innovation that took place in Aberdeen-Scotland. in June of 2021. It was from such a list that about twenty senior managers that constituted of senior operational and marketing managers from the private enterprises were contacted.

Since they had already demonstrated interests in the issues of digitisation, they were requested to participate in an online Delphi expert discussion on business digitisation and organisational ambidexterity which was also presumably construed to be useful for extracting new insights on how digitisation can be undertaken. Issues of business digitisation and improved ambidexterity require the complex interplay between data optimisation and strategy conceptualisation and application to respond to the emerging market challenges.

Hence, it was construed that it would only be the senior operational and marketing managers that would possess the appropriate knowledge and understanding of such interactive interplay between data optimisation and strategy application to leverage ambidexterity. Using a combination of e-mails and telephone calls, the iterative Delphi discussions were accomplished in the period between September of 2020 and April of 2021 using three main processes.

5.1.2. Iterative Discussions

Collection and analysis of the experts' opinions were accomplished according to three main processes that encompassed posing of open-ended questions and soliciting experts' opinions, thematic analysis to extract themes and subthemes, and seeking experts' endorsement or further arguments about the extracted themes and subthemes (Avella 2016:305) [41]. While using e-mails, the notions of business digitisation as well as a firm's ambidexterity were explained to the panelists. This aided the reaching of consensus on what such concepts are or not.

Thereafter, structured open-ended questions were developed and e-mailed to each of the twenty panelists. The open-ended questions explored the general trends of business digitisation as well as the approaches that they were undertaking to get their businesses digitised. The questions also examined whether businesses rely on such digitised business systems to make relevant decisions on how to respond to the existing as well as the emerging future trends. Finally, the questions evaluated the challenges or constraints that are often experienced during the undertaking of such initiatives.

After all the responses to these questions were received, thorough reading and re-reading of each script was undertaken to identify and extract common themes that explained how businesses utilise digitised business systems to make relevant decisions on how to respond to the existing and the emerging future trends as well as the constraints of undertaking such initiatives. The emerging themes were compared and contrasted with themes from each script to extract two discourses of themes that encompassed short-term business quests, and digitisation and change's inhibitors. In terms of the discourse of short-term business quests, a general summary was developed to imply that as most of the businesses focused on leveraging the existing state of performance, cost savings or the use strategic plans that only aim to achieve short-term business quests, it tends to undermine data optimisation to spawn the simultaneous improvement of exploitation and exploration capabilities.

In regard to digitisation and change's inhibitors, a general summary was extracted to read as most quests for optimising the digitised business systems or to undertake the required changes to leverage ambidexterity are often constrained by a combination of different heterogeneous internal business conditions that either cause low investments in digitisation or inflexibility that constrain change. In the second iterative process, these summaries of discourses and their associated themes were further sent to each panelist for comments (Vernon 2009:69) [43].

Due to time constraints, the comments were solicited through telephones and the summaries were modified again and sent to the panelists. However, in that final stage, most of the panelists did not have further comments. Although most of the narratives in the first process were integrated in the presentation of the findings, other later comments that introduced new insights on what the other participants had said were also integrated where necessary in the findings. Certainly, this influenced the credibility of the findings.

5.1.3. Credibility

The process influenced the improvement of credibility and reliability on the basis that as the themes were extracted, the panelists were still afforded the opportunities to comment on how their responses had been analysed and interpreted (Creswell 2014:17) [44]. This leveraged the veracity and credibility of the findings.

Reduction of the risks of the findings' distortion also arose from the fact that the process also offered the panelists with the opportunity to comment and respond to each other's comments in the second stage of the analysis. This not only reduced the risks of distortion, but also the credibility, dependability and transferability of the findings on the basis that if this research is to be conducted again, it is most likely that it is such similar findings that will be obtained. Other methods of enhancing credibility, dependability and transferability entailed triangulation of the findings with theories to discern whether such findings were supported or disputed in theories.

The details of the findings are as presented and evaluated in the sections that follow.

## 6. Results

Narratives from most of the managers indicated most of the businesses to only focus on short-term business

quests or to be constrained by certain digitisation and change's inhibitors. Basing on such narratives, the interpretation of the emerging themes influenced the extraction of two discourses and their associated themes that encompass:

· Short-term Business Quests

·Digitisation and Change's Inhibitors

The details of these two discourses and the associated themes, subthemes and narratives are evaluated as follows.

### *6.1. Short-Term Business quests*

Thematic analysis of the participants' narratives indicated that as most of the businesses focused on leveraging the existing state of performance, cost savings or the use rational plans that only aim to achieve short-term business quests, it tends to undermine data optimisation to spawn the simultaneous improvement of exploitation and exploration capabilities.

#### 6.1.1. Business Sustenance

Maintenance of the existing state of a business' performance was found to be more preferable as compared to searching for new unknown opportunities. In such instances, it was common in the narratives of most of the senior managers that even if most of the businesses are increasingly digitising, the motives of such digitisation are often not to leverage the capabilities to gain from the existing as well as future opportunities. Instead, findings indicated that rather than repositioning the business to tap new opportunities, most of the digitisation initiatives have often been more motivated by the quests to leverage the existing operational efficiency.

Some of the managers attributed this to the fact that even if some of the digitisation technologies and software are expensive, most of the executives are increasingly recognising the values of digitisation as an antecedent for leveraging operational efficiency. As they seek to leverage operational efficiency, findings indicated that the motives of such quests are often to catalyse the increment of the existing profitability margins rather than on the exploration of the emerging new trends.

Even if such initiatives spawn the improvement of a business' financial sustainability, some of the managers still emphasised that the motives of digitisation are often just to improve the management of cost, data, activities' integration and coordination. Such views were certainly common in most of the participants' narratives. However, some of the narratives indicated the quests that drive data utilisation to reposition the business to tap the existing and the future unfolding opportunities to depend on the type of the business that the firm is in.

In such instances, managers from the relatively stable industries such as telecommunication, energy and mining were found to often undertake less initiative to evaluate and identify the likely future prospects that the business must explore whilst also exploiting the existing opportunities. Even if threats of resource depletions are often major threats, findings still indicated that as such businesses get contented with the existing business' performance and less threatened by the risks of the emergence of any threats; they often focus on exploiting the existing opportunities as compared to exploring the emerging new opportunities. Such a view was corroborated in the opinions of one of the panelists who argued that:

"Performance of the business is measured by the annual returns of every year, and I think even every month. Hence, what the business gets now and not in the future is what determines its performance."

Certainly, such a finding signifies the expectations of the business of its managers and executives influence the emergence of the business approach that either favour only exploitation or the simultaneous use of exploitation and exploration. As the business focus on measuring the executives' performance by focusing not only on daily performance, but also on the yearly performance, such approach was also found to lure most of the executives to focus on exploiting the existing opportunities.

In such initiatives, they often aim to produce the desired results rather than on exploring how future opportunities can be exploited. Such approach also influences how the existing data is optimised on the basis that even if the existing data are used for relevant analysis, findings indicated such analysis is often only aimed

at evaluating the existing state of a business' performance in terms of the progress towards the achievement of the expected sales and profitability targets.

While such analysis is being undertaken, one of the operational managers noted that forecasting may also tend to be undertaken from such data. However, such forecastings are often only aimed at discerning the likely changes in the immediate future trends like two or five years in front. Even though in most of the high performing organisations, such initiatives influence the determining of the strategies that can be undertaken, some of the panelists still indicated that most of the businesses tend to focus on exploiting the opportunities as they unfold.

As it emerged from the findings, most of the businesses tend to perceive that as the best business management approach. Attributable to such a view was the argument that most of the senior executives tend to be sceptical about the likely values that the application of new strategies would induce when the changes in trends are not occurring. Such a view is accentuated in the opinions of one of the senior managers who argued that:

"Of course change to tap the arising new opportunities is important. But in practical business terms, it is difficult to change before change has occurred as it can disrupt business approaches and practices that are still relatively very valuable."

Instead, as some of the businesses adopt the approach of "wait and see", they tend to proactively to identify the emerging business models from the competitors and change before it is too late. In the context of the views from one of the managers, such initiative saves the business from incurring the costs of research as well as from experiencing anxiety that may arise from the uncertainties of conceptualising and applying untested business models. However, as most of the businesses adopt the approach of exploiting the emerging existing opportunities, others were found to engage in the conceptualisation and application of the initiatives that leverage cost savings and subsequently a firm's financial sustainability.

### 6.1.2. Cost Savings

Instead of focusing on utilising the existing data to read and identify trends that may never turn to be a reality, some of the businesses were found to just focus on cost savings to leverage financial sustainability. It was such quests that were also found to undermine investment in the initiatives that would illuminate a firm's capabilities to maximise the existing as well as the emerging future opportunities. From the experience of real industry practices, one of the senior managers argued that it is the finances and not data analytics that predict a business' capabilities to perform more effectively in the existing and the future markets. She explained that with sufficient finances, the business can easily make the necessary changes to respond to the emerging trends.

As businesses adopt such approaches, some of the managers argued that the utilisation of the existing business data has often not been directed towards the identification of some of the yet unknown opportunities, but more on discerning how to optimise the existing resources. Such initiatives have often entailed the utilisation of data from the existing business processes to undertake analysis and identify better operational practices that can be adopted to minimise wastes and costs. Such a finding was echoed in the opinions of one of the senior operational managers from the state-owned enterprise who noted that:

"It is cost savings. If the business saves enough funds, it is safe. It can tackle any eventualities. This thing of analysing data to identify where the business is going is important. But the focus is profitability, profitability and profitability. Because with sufficient funds, a business can easily be able to change as new changes arise."

In contrast, other managers reiterated considering investment in better technologies to improve efficiency and minimise operational costs. In contrast, most of the managers from the mining sector reiterated using more aggressive restructuring processes that entail downsizing to minimise costs and leverage financial sustainability. However, as some of the businesses use such approach to spawn cost savings and leverage financial sustainability, others were found to engage in some form of training and human resource development to improve the overall efficient performance of the organisation.

Through efficient performance, they argued that they can be able to gain from the improvement of the quality of customer services, better management practices and productivity. As it emerged from the findings,

such initiatives tend to unlock better business performance, competitiveness and capabilities that can enable a business gain the desired returns to counter the emerging trends. Yet, as some of the managers indicated a general consensus on the values of leveraging financial sustainability, others raised the issue of leadership development and succession planning as critical for a business' future sustainability. In such explanations, one of the senior operational managers argued that data analysis and trend forecasting and tracking are just part of the complementary strategies for enhancing a business' future sustainability.

As such analysis is being undertaken, he explained that the actual determinant resides in the consistency of leadership competencies and capabilities to steer the organisation from one state of industry performance to another. In effect, as some of the businesses seek to bolster their sustainability, major attentions at the strategic level have often been directed at proactively developing and nurturing future leaders through the development and application of the appropriate leadership succession planning. Such a view was also corroborated in the opinions of one of the managers who argued that:

"Data analysis is important for understanding and responding to new trends. But the whole thing lies on the leadership of the organisation. If the leadership does not understand the value of data, there is no way that either such data can be utilised or funds can be granted to finance the new strategies that are arising from the analysis and interpretation of such data."

Such a finding implies even if digitisation is undertaken, it is often the organisational leadership that creates the organisational conditions that influence the utilisation of such data. In the analysis of the merging themes, such a finding was also found to be strongly echoed in the opinions of some of the managers who argued that the level of the organisational data optimisation also impacts on a business' capabilities to respond to the existing as well as future opportunities.

In such narratives, some of the managers stated that even though some of the businesses often have enormous data as well as relevant technologies for accomplishing different data analysis, in most of the cases, such data is not utilised. Instead, some of the businesses were reiterated to only undertake data analysis if the performance of the business declines. In such cases, quick analysis is undertaken to discern and identify the causes of such declining business performance. However, in the periods of relative stability and good business performance, some of the narratives indicated most of the businesses to often not be much bothered about the essence for undertaking relevant analysis to proactively identify and mitigate any future eventualities. Yet, as some of the businesses were found to engage in such initiatives, findings indicated others to engage in the conceptualisation and implementation of rational plans.

#### 6.1.3. Rational Planning

Instead of relying on business digitisation to leverage a business' exploitation and exploration capabilities, most of the businesses were found to significantly rely on the rational strategic planning processes. As some of the businesses focus on utilising the strategic plans to exploit the existing opportunities, findings indicated other businesses to also utilise the strategic planning processes as part of the initiatives of discerning the likely future changes as well as the corresponding strategies that can be undertaken.

However, even if such analysis of future trends are undertaken, it was not easily discernible from the participants' narratives that any form of intense business digitisation as well as the application of superior data analytic technologies to discern patterns in the existing as well as the emerging future trends are used. Instead, findings revealed businesses to use the basic form of data evaluations. As on the otherhand, some of the businesses were found not to undertake thorough analysis and evaluation of the unfolding environmental trends.

This is attributable to the fact that as a result of the long period of industry experience, some of the senior managers often have readily available facts that inform different decisions during the strategic planning process. It is often such situations that affect not only investment in relevant business digitisation technologies, but also the optimisation of the existing data in the strategic planning process to discern how the emerging future opportunities can be maximised. Yet, while using the conventional strategic planning process, some of the managers still reiterated that strategic planning aids thorough analysis and interpretation of the present and future trends.

It is often through such analysis that some of the businesses are often able to create the linkage between the present and future trends. It is such linkage that leverages the continuity of a business even in the midst of the emerging new future changes. Such a view was accentuated in the opinions of one of the managers who argued that:

"It is our strategic business plan which is used as part of the initiatives that have been undertaken to enhance tapping of the existing opportunities and future opportunities. It is done yearly, but during its formulation, it enhances the analysis and change of strategies to respond to the likely future changes."

Certainly, the adoption of such approach would spawn a firm's exploitation and exploration capabilities. However, further interpretation of the themes from the participants' narratives suggested the extent to which strategic planning is able to bolster a firm's exploitation and exploration capabilities to depend on whether it is undertaken as part of the process for achieving short term or long term objectives. Attributable to such a view was the participants' narratives that suggested some of the businesses to only use strategic planning to achieve yearly short-term objectives.

In such initiatives, most of the managers reiterated strategic planning to be part of the conventional business management process which is undertaken yearly to set new targets and direction. In effect, they explained that even if such approach aids the linking of the past with the present to discern the likely future changes, the motives of such strategic planning processes are often just to aid determining how the existing opportunities can be exploited. Such a view was substantiated in the opinions of one of the managers who argued that the notion that strategic planning is usually aimed at exploiting the existing opportunities is reflected in the fact that strategic planning is undertaken yearly. It is also linked to the yearly annual budgets that are evaluated quarterly to determine the extent to which the business is progressing towards the achievement of the desired objectives.

Participants' narratives indicated not only such strategic planning processes to be aimed at exploiting the existing opportunities, but also mainly supported by data analytics that focus on discerning how such strategic plans can be utilised to aid the exploitation of the existing opportunities. Such a finding seems to echo most of the narratives under the theme of sustenance of the existing state of performance in which it was noted that most of the businesses are often not that much bothered about the likely future opportunities, but instead more concerned about the exploitation of the existing opportunities. Yet, as the businesses focus on such short term objectives, it was also found to affect the commitment of sufficient investments in relevant business digitisation technologies. In otherwords, findings not only indicated most of the businesses to focus on exploitation, but also that most quests for optimising the digitised business systems or to undertake the required changes to leverage ambidexterity are often constrained by a combination of different heterogeneous internal business conditions.

### *6.2. Digitisation and Change Inhibitors*

It emerged from thematic analysis that most quests for optimising the digitised business systems or to undertake the required changes to leverage ambidexterity are often constrained by a combination of different heterogeneous internal business conditions that either cause low investments in digitisation or inflexibility that constrain change. The details are as follows.

#### 6.2.1. Digitisation's low Investment

Low investment in relevant business digitisation technologies was found to affect the acquisition and utilisation of data to make necessary conclusions on the strategies that can be undertaken to aid the exploitation of the existing opportunities as well as the exploration of future opportunities. In such situations, most of the businesses were found not to have invested in the necessary big data technologies.Instead, when asked how they use their digital technologies to improve the tapping of the existing as well as future opportunities, most of the managers responded that they had not invested much in business digitisation technologies.

In such analysis, some of the managers explained that the in-depth investment that had been undertaken had only entailed the investment in relevant IT infrastructure, technologies and software. This is attributable to the fact that given the prevailing industry and market conditions, some of the businesses perceive that it is yet too early to go digital. Such a view is echoed in the views of one of the senior managers who argued that:

"Every business is talking about digitisation. But I think it is yet too early to digitise."

Although such IT systems are used for managing customer data as well as for leveraging operational efficiency, most narratives indicated most businesses not to apply such data in relevant analysis of the existing and likely changes in future trends. As some of the businesses adopt such approach, findings indicated most of the businesses to only respond to changes once such changes have already taken place. Such situations were found to be further exacerbated by the fact that some of the businesses have not invested inthe other IT systems like enterprise resource planning system. Certainly, such situations affect the utilisation of relevant data to undertake relevant analysis and strategic actions.

Reasons for low investments in relevant business digitisation technologies such as big data analytics were associated with the fact that as businesses focus on cost minimisation; it also tends to affect investment in the often expensive required superior business digitisation technologies. Such a view was echoed in the opinions of one of the operational managers who argued that:

"Digitisation is a costly adventure. Presently, we are relying only on our ERP system after spending a lot of funds."

Even if cost is not the challenge, findings indicated some of the businesses that have undertaken significant strides to digitise not even to use such technologies. Most of the businesses were found not to apply more complex big data analytics. Certainly, such approach was found to undermine data optimisation to leverage discerning how the existing as well as the emerging future opportunities can be exploited.

Such a view was also corroborated in the opinions of some of the managers' reiteration that some of the businesses to find business digitisation less valueless and a waste of resources because they often do not rely on much data analysis in their operations. All such situations were found to affect investments in relevant business digitisation technologies. As on the otherhand, further analysis and interpretation of the findings indicated that whether data analysis are undertaken using mega big data analytic technologies or just using IT systems such as ERP, major challenges often still arise from inflexibility.

#### 6.2.2. Inflexibility

Inflexibility emerged from the findings as some of the constraints that undermine the application of relevant change management strategies to leverage a firm's capabilities to respond to the emerging future trends. The implications are latent in the fact that most of the managers indicated that in most of the cases it is often not the case that the changes that subsequently destabilize a business' performance are often not proactively identified early. Instead, most of the executives were reiterated to often identify the early symptoms of such changes. However, management flexibility to abandon the relatively still lucrative business models to undertake the required changes were noted to often be the major challenge. In effect, most of the executives were found to only undertake the required changes when it is already too late. Such a view is accentuated in the opinions of one of the managers who argued that:

"Change and transformation are critical for ensuring business continuity. However, before, change can be instigated, it is important to be sure because the costs of change in terms of investment in new machineries or introduction of new strategies can be enormous."

As it emerged from the findings, the implications are often latent in the fact that the results of the undertaken relevant data analytics tend to be of significant importance. This is attributable to the fact that as the results of such analysis signify that the application of the necessary proactive strategies is critical for either countering the emerging future threats or opportunities, failure to undertake such strategies render the essence of business digitisation to be of less significance.

Reasons for the application of such approach was found to arise from the overall costs that the executives consider to be required for undertaking such changes. In such analysis, findings indicated that if the executives find that change is required to respond to less serious threats such as declining sales and revenues that would require increment of advertisement and marketing budgets, deployment of more salespersonnel or the introduction of new distribution outlets in new geographical areas, the executives would tend not to be hesitant.

However, if the change requires investment in new heavy machineries, entry into another market or

diversification, then, the hefty costs involved would cause some of the executives to be hesitant. As it emerged from the findings, it is often such form of the required changes that tend to cause some of the businesses to undertake late interventions when it is already too late. Such a finding was also corroborated in one of the managers' narratives that stated that:

"Cost of change is usually enormous. If it requires simple changes like the introduction of new structures, there is usually no problem. But if it requires total change that includes structural change, new machineries or entry into new markets, there is usually a problem until when it is appears to be a must that something must be done for the business to survive."

Such a view indicates the extent to which even if some of the businesses are to digitise, it is often still difficult to proactively identify and respond to the emerging threats and leverage a firm's ambidexterity. In otherwords, despite the fact that some of the businesses were found to take the initiatives to leverage their exploitation and exploration capabilities, it was still evident from the findings that it is not only the level of digitisation's optimisation which is low, but also the greater preponderance of most of the businesses to focus on exploitation rather than exploration. As it emerged from the finding, such business approach seems to undermine most quests for bolstering a firm's ambidexterity.

## 7. Discussion

Survival and continuity in the constantly changing modern global markets require significant level of ambidexterity. It requires businesses to constantly be inquisitive on how to not only maximise the existing opportunities, but also the emerging unfolding future opportunities (O'Reilly & Tushman 2013: 1) [28]. Ambidextrous businesses are often able to easily achieve that by linking the past and the present with the future. It is such quests that often spawn their continuity.

However, as the world is increasingly getting digitised, trends that offer critical in-depth insights on the existing unfolding opportunities as well as the emerging future opportunities are no longer easily discernible in the physical world. Instead as businesses digitise and customers, business partners, suppliers and competitors also digitise; trends on how the existing as well as the future strategies must be modified are also increasingly digitized (Simmons, Palmer & Yann 2013:744) [45]. Capabilities to gain from such trends to leverage a firm's ambidexterity may not only require digitisation, but also significant investment in relevant digital technologies.

Digitised opportunities require digitised approaches to extract such opportunities. Business digitisation spawns improvement of a business' recognition of the value of data. It is often the recognition of the value of data that influences the streamlining and improvement of the efficiency and effectiveness of how data is acquired, processed and utilised to achieve the desired business outcomes. Yet, as the business digitises, it also tends to gain insights into enormous new data on the unfolding internal and external trends (Porter & Heppelmann 2014:64) [10]. Using relevant big data analytics technologies, it becomes easier for the executives to accurately discern the existing as well as the emerging future trends to determine the strategies that can be undertaken.

As digitisation bolsters acquisition, processing and utilisation of the existing and emerging future trends, it also leverages a firm's ambidexterity which is often not only to exploit the existing opportunities, but also to explore how the future opportunities can be maximised. Certainly, it is implicitly evident from theories that business digitisation spawns the simultaneous improvement of a firm's exploitation and exploration capabilities.

However, most of the businesses were found to only focus on either short-term business quests or to be constrained by certain digitisation and change's inhibitors. Short-term quests lure businesses to pursue short-term goals as well as profitability motives. It motivates businesses to focus on leveraging only the existing state of a business' performance so as to meet the designated targets. Combined with the fact that business performance is evaluated quarterly and yearly, such approach influences managers to focus on exploiting the existing opportunities.

Yet, as managers focus on exploiting the existing opportunities, it also tends to undermine exploration quests. It is such business approach that often renders most businesses vulnerable to the risks of the volatile changes in market trends (Smith, Binns & Tushma 2010: 448) [46]. As the internal business conditions and

management style emphasise exploitation, the inverse negative effects may tend to be reflected in the poor analysis, sensing, tracking and response to even the trends that could easily have been identified.

That implies even if digitisation spawns ambidexterity, it is often still such internal business conditions as well as the executives' leadership philosophy that affect not only investment in relevant digitisation capabilities, but also the level of data optimisation to achieve the desired outcomes. Combined with more inflexible and less agile system, all these were found to mar the utilisation of relevant business digitisation to bolster a firm's ambidextrous capabilities (Raisch & Birkinshaw 2008:375) [47].

However, despite such a finding, it was still implicitly evident that if businesses are to extend to the focus of their data analytics as well as strategic planning process from only focusing on assessing how to leverage the existing performance to evaluating how to respond to the emerging future trends, business digitisation would certainly spawn ambidexterity. In that context, it is certainly apparent that this research achieved its fundamental motive which was to evaluate how business digitisation catalyses a firm's ambidexterity. However, even if that is so, the findings of this research still raise a number of managerial implication issues for the contemporary business executives.

## 8. Managerial Implications

Findings imply most business' capabilities to undertake significant investment in relevant digital technologies as well as improved level of data optimisation will certainly depend on the executives' recognition of the values of combining and applying the simultaneous exploitation and exploration capabilities. The executives will have to recognise that a business' sustainability is not only predicted by its current performance, but also by the capabilities to sustain such good performance even in the future.

The constantly changing business landscapes render the demonstration of the prowess of the conceptualisation and the application of such simultaneous capabilities critical for bolstering a business continuity and sustainability. It is the recognition of the essence for such quests that will drive businesses not only to undertake relevant analysis of the present and future trends, but also to invest in the more efficient and superior digital technologies.

However, empirical research indicated not only low investment in relevant digital technologies, but also poor data optimisation. Certainly, without digitisation, it will be difficult for the executives to understand the significance of the magnitude of the unfolding trends on its existing and future performance. Even though findings indicated that investment in IT technologies such as enterprise resource planning system would edify efficiency of data acquisition and analysis, such initiatives will still have to be accompanied by the investment in the other superior business digitisation technologies and software such as cloud computing, internet embedded technologies, 3D printing, robotics and artificial intelligence.

The establishment of a combination of such business digitisation technologies will certainly bolster a business' capabilities to analyse, sense and respond to the existing as well as the unfolding future trends. It is such technologies that will also spawn a business' capabilities to accurate acquire, analyse and undertake necessary interpretation of how the emerging results can influence the executives' decisions on the strategies that can be applied. Quite often, it is such improvement in a business' digital capabilities that subsequently leverages a firm's ambidexterity.

However, to bolster ambidexterity, it is also critical that a strong culture of data optimisation is developed and nurtured to aid the effective utilisation of not only the existing digital technologies, but also the data and information that they produce. Such a view is attributable to the fact that findings indicated that despite having relevant digital technologies, some of the businesses still face the challenge of utilising such data in relevant strategic decision making processes.

Yet, even if that data optimisation is not the challenge, the executives will have to recognise the need of ensuring that the results of trends analysis are undertaken to counter not only threats, but also to tap the emerging opportunities. Such a suggestion is derived from the fact that it emerged from the empirical research that there are often agility and flexibility related challenges for some of the businesses to undertake the required actions to respond to the unfolding trends before competitors are able to do so. Such constraints also undermine

quests to take actions to counter threats before they turn to be quite devastating.

However, as it emerged from the findings, digitisation may not only require investment in relevant technologies, but also undertaking the necessary change and transformation. That implies digitisation of the existing products and services would require digitisation of how the existing products are developed, manufactured, stored and distributed to the final consumers. It will also require not only digitisation of business processes, structures and systems, but also change and transformation of the business culture, practices and approaches. As the world is increasingly getting engulfed with "born digital" generations of customers and businesses, it is through such initiatives that businesses will be able to create a digitised system to leverage their overall level of ambidexterity.

## 9. Conclusion

Conventional theories on strategic management imply leveraged exploitation and exploration capabilities spawn a firm's sustainability. Derived from March's (1991: 71) notion of "Exploration and Exploitation in Organisational Learning" [23], most theories and literature indicate a consensus that exploitation and exploration capabilities edify the simultaneous maximisation of the existing opportunities as well as the discerning of how the emerging future opportunities can also be maximised. Leverage of such simultaneous capabilities requires businesses to constantly analyse, sense, track and respond to the emerging trends.

However, following the invention of digital capabilities, it was also seemingly evident from theories that it seems most business' capabilities to easily analyse, sense and respond to such existing as well as future trends are also often edified by a firm's overall level of digitisation. The notions that business digitisation spawns the simultaneous improvement of a firm's exploitation and exploration capabilities was also implicitly echoed in the findings. However, even if it is so, most of the businesses were still found to only focus on either short-term business quests or to be constrained by certain digitisation and change's inhibitors. Certainly, that signifies a greater preponderance of most of the businesses to focus on exploitation rather than exploration.Yet, as most of the businesses focus on leveraging the existing state of performance, cost savings or the use of strategic plans that only aim to achieve short-term business quests, findings indicated such approachto also undermine data optimisation to spawn the simultaneous improvement of exploitation and exploration capabilities. Such inhibitors of exploitation and exploration capabilities were further found to be exacerbated by a combination of different heterogeneous internal business conditions that either cause low investments in digitisation or inflexibility that constrain change.

As these undermine quests for optimising the digitised business systems or to undertake the required changes to leverage ambidexterity, the study concludes with the argument that not only emphasises the need for exploitation and exploration, but also how more digitised business systems can be optimised to leverage such simultaneous endeavours. Considering that such a study had not been undertaken before, this research certainly contributes enormously to enriching the existing theories on a firm's ambidexterity. However, future research can still explore how data optimisation catalyses ambidexterity.

**Funding**

Not applicable.

**Institutional Review Board Statement**

Not applicable.

**Informed Consent Statement**

Not applicable.

**Data Availability Statement**

Data is available upon request from the corresponding author.

**Conflicts of Interest**

The authors declares no conflict of interest.

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