

Innovation, E-Commerce, and Business Performance in Consumer-Packaged Goods Companies

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Abstract

The success of the business is dependent on its performance, which in turn reveals how much money the business makes. Examining the relationship between organisational agility and innovation capabilities is the primary objective of this research, and distribution strategy transformation affect firm business performance mediated by e-commerce business adoption. The approach utilized in this study was quantitative approach. After data collection is complete, SEM-PLS analysis is performed. The findings demonstrated that (1) a company's bottom line was positively affected by increased organizational agility, innovation capacity, and distribution strategy transformation, and (2) e-commerce adoption moderated the connection between these three factors.

Keywords: *Organizational Agility, Innovation Capability, Distribution Strategy, E-commerce Business Adoption and Business Performance.*

Introduction

Consumer-Packaged Goods (CPG) are "non-durable" goods that are needed for everyday use; consequently, understanding their consumption patterns becomes crucial in assessing economic trends. In Indonesia, the third quarter of 2019 witnessed a robust overall economic growth of 5.02 percent, contributing to the cumulative annual growth of 5.04 percent. Moreover, within the CPG sector, the modern retail segment experienced a notable growth of 7.6 percent during the same period, with specific formats such as minimarkets expanding at 12 percent and supermarkets and hypermarkets at 5.8 percent. This data underscores the significance of monitoring CPG consumption trends as a key indicator of economic vitality, especially within the dynamic landscape of retail formats (Allaway et al., 2022).

CPG is "one of the fastest growing sectors and from time to time shows increasing growth." The significant contribution of CPG is not without obstacles. Producing solutions to problems caused by CPG quality is not always easy. Keeping production levels high is crucial for businesses like this when demand is high. It is more than just having access to equipment and workers that contribute to this production capacity. These capacity issues are often caused by fluctuations in the quality, quantity and reliability of raw material supply. Raw material supply is not limited to just key raw materials. The unavailability of necessary resources can delay production. In fact, problems with

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production or transportation to stores may arise if the necessary packaging materials are not available. This is an issue with the inbound logistics of the situation (Puelles et al., 2020).

Another area where factories experience difficulties is in outbound logistics. Demand fulfillment and the delivery of final products to retailers are prone to errors. The items ordered may be out of stock, the delivery fleet may be full, or a combination of these and other factors may prevent us from fulfilling your order. The existence of a significant contribution from CPG to the Indonesian economy is one indication that the CPG Company always maintains the quality of its performance. One way to look at a company's health and growth over a specific time period is by looking at its performance, as determined by the outcomes of its day-to-day operations and the efficacy with which it puts its resources to use (Boojihawon et al., 2021).

The performance of a company is crucial, where the performance of a company also provides an understanding that the company earns more profit (Fernandez, 2016). The future plans and strategies of the company are formulated in part based on past performance (Mohammed, H. K., & Knapkova, 2016). Profitability is a key indicator of a business' performance since it reflects the company's capacity to compete successfully in the marketplace. There has been a shift in the way society functions as a result of globalization and the subsequent proliferation of advanced technologies. E-Commerce is widely used across all industries today, and businesses are no exception.

Electronic commerce (or called e-commerce) refers to any business transaction that takes place entirely within the confines of the World Wide Web). E-commerce, or online purchasing and selling, can save consumers time and effort because it allows them to shop whenever and wherever they like. Finding of “ (Belwal et al., 2021); (Hwang & Jeong, 2016); (Noor Ardiansah et al., 2020); (Aljarbou, 2023); (Carvache-Franco et al., 2022)” state that the company's success can be influenced by e-commerce.

As the nature of business continues to shift, it is essential for firms to adopt and successfully implement IT strategies. Utilization of information technology is related to agility, where companies able to face challenges with good agility can help companies in decision-making, communication, and adapting to change if they practice business. Research by (Olan et al., 2022); (Ali Shah et al., 2021); (Alinsunod et al., 2019); (Azudin & Mansor, 2018) discovered that organizational agility is able to affect the company performance.

Information technology also supports and improves business strategies and work processes. Technology can improve a country's economic performance through increased productivity, innovation, and efficiency. However, like two sides of a coin, the wave of technological progress also creates a lot of disruptions. On the other hand, the company is still needed to maintain its existence during the disruption facing. The capacity for innovation is one of determinants of organizational performance. Simply put, an organization's innovation capability is its propensity to consistently apply new learnings and ideas to the improvement of useful items, services, and systems. Jimmy Gandhi et al., (2021) stated that a good ability to innovate will encourage the emergence of initiatives to produce more effective and efficient work methods. Innovation capability can boost workers' abilities to innovate to solve work problems so that employee performance becomes better. Adam & Alarifi, (2021) discovered that, One of the factors that may be used to forecast how well a firm will do is its capacity for innovation.

In addition to organizational agility and capability to innovate, another factor that also influences the company performance is the distribution strategy transformation. This result is found by (Al Taweel & Al-Hawary, 2021); (Yildiz & Aykanat, 2021); (Panda, 2022); (Clauss et al., 2021); and (Lungu, 2020) where the quality of distribution of goods effectively and efficiently can improve company performance. The change in

consumption style, communication, and interaction certainly provides a strategic point of change in business.

Therefore, a strategic change in new business fundamentals is urgently needed to capitalize on the expanding range of possibilities. For effective service to customers, several companies need to cooperate with certain distributor companies. Other strategies can also be exploited by companies using technology to automate the purchasing flow. Due to technological developments, paper-based goods distribution processes and manual processing will be eliminated. All forms of documents are no longer in paper form, such as invoices, purchase orders, advance delivery notices, etc. Considering the automation technology for the workflow, distribution business actors are no longer fixated on complicated operations because everything can be focused more easily, faster, more consistently, and with greater control. According to the explanation above, “the purpose of this research is to examine how organizational agility and innovation capabilities are impacted,” and distribution strategy transformation toward firm business performance mediated by e-commerce business adoption.

Literature review

Firm Business Performance

A company's quantitative and qualitative results in meeting its strategic and operational goals constitute its firm performance (Aydiner et al., 2019). The performance of a corporation is defined as its level of success over a given time frame. “What we mean when we talk about company performance” is how well an organization has done in relation to its stated goals and the resources it has available, in addition to its historical performance and the performance of comparable organizations used as benchmarks. Organizational performance and competitive capabilities are impacted by the efficiency and agility of their human resources, according to research by (Saha & Kumar, 2018). There is a favourable correlation between organizational agility and performance since it can help businesses adapt to new circumstances and provide customers with better goods and services (Liu et al., 2022). It has been hypothesized by previous researchers that organizational agility improves productivity (Pancić et al., 2023). The following table displays the company’s key performances metrics as reported by (Lailah & Soehari, 2020).

Table 1. Dimension and Indicator of Firm Business Performance

Dimension	Indicator
Effectiveness	Goal
	Aims and strategies
	Employee output in the workplace
	Total number of projects finished
Fundraising	Membership growth
Efficiency	Market share

E-Commerce Adoption

E-commerce adoption is a complex and dynamic process that refers to the integration and utilization of electronic platforms and technologies for conducting commercial transactions. According to (Hendricks & Mwapwele, 2023), e-Business is a technology for developing business processes which consist of internal organizational processes such as financial, human resources, and administrative systems, also external processes include

things like sales and marketing, product delivery, and communicating with costumers (Lestari, 2019).

E-commerce as a form of marketing innovation has been proven to influence company performance. “Making major adjustments to the design, placement, or pricing of the product as part of a new marketing tactics,” (OECD, 2005) is a definition of marketing innovation. As an effort to increase sales, the primary goal of marketing innovation is to better meet the demands of customers, to break into untapped markets, or to reposition existing products in the marketplace. The effect on marketing creativity in Jordan’s private commercial banks has been studied by (Sombultawee, 2020). To further propel revenue development, there should be ongoing comprehensive transformation of products or services, legacy systems, and business processes (Khoo et al., 2018).

Research results by (Hossain et al., 2023) shows that e-commerce that is able to provide the best service can improve trust effectively in building a positive mood among consumers. Positive mood is one of the factors that affect customer satisfaction. Conventional web applications have only had demand distribution mechanisms implemented at the web and application levels (Meer et al., 2012). Companies can better understand their clients’ desires and create novel products and services with the help of proposed or adopted IT advances. This paper introduces a new theoretical framework. It emphasizes the mediating function of the firms’ organizational agility in connecting IT advances to the company’s long-term success (Khoo et al., 2018). The indicators of E-commerce Business Adoption according to (Sombultawee, 2020) are as follows.

Table 2. Dimensions and Indicators of E-commerce Business Adoption

Dimension	Indicator
External Environment	Role of Government
	Technology Support Infrastructure
Organizational Context	CEOs Characteristics and Top Management
	Employees Knowledge and Attitude
Technological Context	E-commerce relative advantages
	E-commerce related Technologies

Organizational Agility

Organisational agility refers to a company's capacity to respond quickly and successfully to opportunities, risks, and changes in its external environment. Organizational learning and adaptability are essential in today's global marketplace (Elazhary et al., 2023). To be agile, one must be able to adapt quickly and operate with relative ease. Non-profits and government agencies, in particular, are under increased pressure to address new social challenges promptly and have shorter development cycles for new educational programs and services. Innovations in technology, new programs or services, extreme weather, government mandates, and public pressure can all set in motion these kinds of changes (Arsawan et al., 2022). In response to ever-shorter cycle times and major improvements often necessitate implementing novel work systems, streamlining work processes, or the capability to move more quickly from one process or location to another. Continuously improving current techniques and major innovations or modifications resulting in fresh objectives, methods, programs, services, and markets are all part of organizational learning. The Organization Agility indicators according to (Arsawan et al., 2022) is stated table below.

Table 3. Dimensions and Indicators of Organization Agility variables

Dimension	Indicator
Responsiveness	Sensing, perceiving and anticipating changes Recovery from change
Competency	Strategic vision Product/service quality
Flexibility	Product model/configuration flexible Organizational issues flexibility
Quickness	Quick new product time to market Fast operation time

Innovation Capability

One definition of an organization's innovation capabilities is its ability to generate and implement new ideas, procedures, goods, and services that add value and strengthen its position in the market. It involves the capacity to foster a culture of creativity, adaptability, and continuous improvement (Rajapathirana & Hui, 2018) The capacity of innovative is defined as the skill to create new goods and services in response to consumer demand while also adapting to new technologies and emerging business prospects. Implementing and developing innovation in an organization requires managerial support and all individuals in it, this aims to make it easier for companies to implement ideas and better ways of doing things. To start developing innovation in the workplace, you can start by developing the creativity of each individual, the results of this individual creativity will produce new ideas, and thoughts that can be applied by individuals in the workplace (Lam et al., 2021).

From what has been stated above, one can infer that the ability to innovate is the willingness to incorporate new concept into existing procedures and goods to help the company reach its objectives (Lam et al., 2021). The relationship that occurs between the proponents, beneficiaries, and end-users of innovation can be used as a dynamic mechanism by transferring value between innovation elements by feeding each other forward (feed forward) and feedback. (Rajapathirana & Hui, 2018) found that, the use of performance metrics has a beneficial effect on questions of innovative capacity. In addition, (Rajapathirana & Hui, 2018) noted that a company's performance is affected by innovation skills in three ways: via ideation and organising frameworks, through a participative leadership culture, and through the expansion of know-how. Financial performance was more affected by innovation capability variables than operational performance, which was a surprising finding. The indicators used to determine innovation capability are as follows (Mendoza-Silva, 2020) :

Table 4. Dimensions and indicators of Innovation Capability

Dimension	Indicator
Internal sources	Experience of the Founder/Manager in the Field Skills of workforce Internal efforts to improve technology
External sources	Intensity of networking' Networking benefits associated with proximity Acquire backing from outside sources

Distribution strategy

A distribution strategy, also known as a distribution channel strategy, is a plan that outlines how a company will make its products or services available to consumers (Jullien et al., 2023). Distribution is a crucial part of the production and consumption process because it transfers goods and services from manufacturers to end users (Janjevic & Winkenbach, 2020). Marketing functions that can materialize the use of form, place, time, and ownership in the distribution process can provide worth to goods and enable the movement of physical and virtual channels of marketing. Transporting products to where they're needed is the physical component of things, while the non-physical side requires both the vendor and the consumer to be well-informed about the products at hand.

Since product quality information is constantly updated during distribution, the distribution strategy has the ability to reflect the dynamics of logistics. Using RFI and sensor technologies, we can optimize distribution strategy for perishable commodities.

Journal of Business & Industrial Marketing (Jullien et al., 2023). Firms' sales, customer base, and financial performance are all influenced by their promotional price, distributional, and standardization and adaption efforts. The research indicates that the effect is mediated by the success of the marketing plan (Bacchetti et al., 2021). To get maximum profit, we need the right distribution strategy to distribute goods to consumers. The indicators used to measure the distribution strategy are as follows (B. Li et al., 2020).

Table 5. Dimensions and Indicators of Distribution Strategy

Dimension	Indicator
Internal operational complexity	Assortment wide Customer orders/week
Service level	Delivery time Products are always available
Distribution channel	Use of direct delivery Delivery area size

Research methods

Outer Model Analysis

Validity and Reliability Test

Prior to implementing a measurement, it is crucial to evaluate its validity and reliability. One way to observe validity and reliability testing is via: The hypotheses to be tested are taken from variables including: Organizational Agility, Innovation Capability, Distribution Strategy, Transformation, E-Commerce Business and Adoption Business Company Performance. Each indicator's convergent validity is explained by the specified loading factor, which also explains the strength of the correlation between component and construct scores and the constructs themselves. The correlation between two independent reflexive measures is considered high if it is more than 0.7.

Cross-loading of measures with constructs is the basis for the Discriminant Validity measurement model's evaluation of its own reflexive indicators, discriminant validity, or the ability to differentiate between groups by arithmetically contrasting the means square variance extracted (AVE) value. The coefficients of latent variables can be used as a proxy for the construct being measured by composite reliability. If the score obtained in this test is bigger than 0.70, so the construction is very reliable. Composite reliability tests can be improved by using Cronbach's alpha. For any given variable, its reliability is

assured if its Cronbach alpha is greater than 0.7. Within the framework of the Structural Model, or Inner Model Analysis, one may anticipate the nature of the link between the model's evaluated variables.

Table 6. Testing Instruments

Instrument Test	Test used
Validity test	Convergent Validity AVE
Reliability Test	Cronbach Alpha Composite Reliability

R-Square Test

The R² test assesses how well a model can account for observed differences in a dependent variable.

Inner Model Analysis

Smart PLS allows you to analyze your model's inner workings by putting your hypotheses to the test. To find out if the hypothesis is correct, you may use the t-statistic and the probability value. To statistically test the hypothesis, we use a t-statistic of 1.96 at the 5% alpha level and a beta score to find out which way the variables' connection is affecting things. When deciding whether to accept or reject the hypothesis, the following criteria are considered:

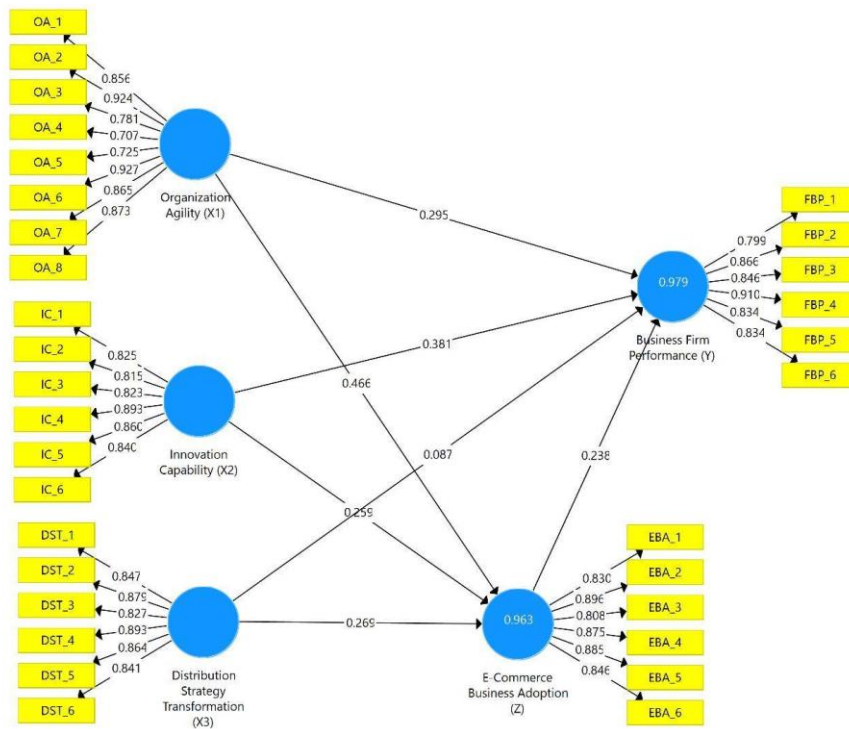
By using PLS, this research can overcome situations where there is a mismatch between the sample size and the complexity of the variable relationships that are the focus of the research.

Results

Data Description Analysis

From the analysis problem stage carried out that in public sector organizations when dealing with unwanted things that occur, such as disruption in information systems that support business processes, there is no segregation of duties, still limited knowledge related to security awareness among management and employees and a lack of documentation to handle the disturbances. Furthermore, a literature review was conducted to build a BCP framework in public sector organizations. The findings of the literature analysis also informed the selection of two benchmarks for this study: Federal information systems must adhere to the NIST SP 800-34 Rev.1 standard, which is a guideline for contingency plans, and the ISO 22301: 2019 standard, which is a standard for business continuity management systems.

Outer Model Analysis



“Figure 1. Outer Model Analysis”

Validity test

Using a validity test, one may determine how reliable a questionnaire is. To determine if the study is valid, convergent validity and AVE are used. In order for an instrument to be deemed suitable for usage in scientific research, its AVE “must be above 0.5 and its outer loading must be above 0.7.”

Table 7. Instrument Validity Test Results

Variable		Outer Loading	AVE	Information
Organization Agility (X1)	OA.1	0.856	0.699	Valid
	OA.2	0.924		Valid
	OA.3	0.781		Valid
	OA.4	0.707		Valid
	OA.5	0.725		Valid
	OA.6	0.927		Valid
	OA.7	0.865		Valid
	OA.8	0.873		Valid
Innovation Capability (X2)	IC,1	0.825	0.710	valid
	IC,2	0.815		valid
	IC,3	0.823		valid
	IC,4	0.893		valid
	IC,5	0.860		valid
	IC,6	0.840		valid
Distribution Strategy	DST.1	0.847	0.737	valid

Transformation (X3)	DST.2	0.879		valid
	DST.3	0.827		valid
	DST.4	0.893		valid
	DST.5	0.864		valid
	DST.6	0.841		valid
	E-Commerce Business Adoption (M)	EBA.1	0.830	0.735
EBA.2		0.896		Valid
EBA.3		0.808		Valid
EBA.4		0.875		Valid
EBA.5		0.885		Valid
EBA.6		0.846		Valid
Business Firm Performance (Y)	FBP.1	0.799	0.720	Valid
	FBP.2	0.866		Valid
	FBP.3	0.846		Valid
	FBP.4	0.910		Valid
	FBP.5	0.834		Valid
	FBP.6	0.834		Valid

Validity tests on the instrument revealed that, out of a total of 32 indicators, one indicator is declared invalid so that the indicator is omitted by the researcher.

Reliability Test

To find out how reliable this study was, researchers used the Cronbach Alpha and Composite Dependability tests. As a measure of lower-bound dependability, Cronbach's alpha is used. Data that has a Cronbach alpha higher than 0.7 is considered reliable. On the other hand, how reliable a variable actually is may be measured by its composite dependability. An extremely trustworthy data set is one with an overall dependability score above 0.7.

Table 8. Instrument Reliability Test Results

	“Cronbach's Alpha”	“Composite Reliability”	Information
Business Firm Performance (Y)	0.922	0.939	Reliable
Distribution Strategy Transformation (X3)	0.929	0.944	Reliable
E-Commerce Business Adoption (Z)	0.927	0.943	Reliable
Innovation Capability (X2)	0.918	0.936	Reliable
Organization Agility (X1)	0.937	0.948	Reliable

R-Square Test

The degree of impact exerted by exogenous variables on the endogenous variable is calculated using the coefficient determination (R-Square) method. The R-Square value is calculated using the smartPLS software, and the results are displayed in the table below:

Table 9. R-Square Test Results

	“R Square”	“R Square Adjusted”
Business Firm Performance (Y)	0.979	0.978
E-Commerce Business Adoption (M)	0.963	0.962

The test results indicated an R-Squared value of E-Commerce Business Adoption (M) is 0.546, that implies that E-Commerce Business Adoption is influenced by Organization Agility (X1), Innovation Capability (X2) and Distribution Strategy Transformation (X3) by 54.6% and the other 45.4% are affected by factors that were not taken into account in this analysis. The score of R-Square for Business Firm Performance is 0.977, meaning that Organization Agility (X1), Innovation Capability (X2), Distribution Strategy Transformation (X3) and E-Commerce Business Adoption (M) affect Business Firm Performance (Y) by 97.7% and the other 2.3% is affected by factors that were not investigated here.

Inner Model Analysis

Using these standards, we may decide whether to accept or reject the hypothesis:

$H_a = t\text{-statistic} > 1.96$ with $p\text{-values} < 0.05$

$H_0 = t\text{-statistic} < 1.96$ with $p\text{-values} > 0.05$

Table 10. Hypothesis Testing Results

	β	T Statistics	P Values	Result
Distribution Strategy Transformation (X3) -> Business Firm Performance (Y)	0.087	1.165	0.245	Significant Positive
Distribution Strategy Transformation (X3) -> E-Commerce Business Adoption (Z)	0.269	2.807	0.005	Significant Positive
E-Commerce Business Adoption (Z) -> Business Firm Performance (Y)	0.238	2.822	0.005	Significant Positive
Innovation Capability (X2) -> Business Firm Performance (Y)	0.381	4.327	0.000	Significant Positive
Innovation Capability (X2) -> E-Commerce Business Adoption (Z)	0.259	2.796	0.005	Significant Positive
Organization Agility (X1) -> Business Firm Performance (Y)	0.295	4.207	0.000	Significant Positive
Organization Agility (X1) -> E-Commerce Business Adoption (Z)	0.466	6.586	0.000	Significant Positive
Specific Indirect Effect				
Distribution Strategy Transformation (X3) -> E-Commerce Business Adoption (Z) -> Business Firm Performance (Y)	0.064	2.048	0.041	Partial mediation
Innovation Capability (X2) -> E-Commerce Business Adoption (Z) -> Business Firm Performance (Y)	0.062	2.150	0.032	Partial mediation
Organization Agility (X1) -> E-Commerce Business Adoption (Z) -> Business Firm Performance (Y)	0.111	2.212	0.027	Partial mediation

Discussion

Effect of Organizational Agility on Firm Business Performance

“The positive beta score ($p = 0.295$) with a t count > 1.96 ($4.207 > 1.96$) and p values of 0.000 ($p < 0.05$)” for the hypothesis that organizational agility positively affects a firm's business performance indicates that H_a is accepted, that organizational agility does influence firm business performance. A company is considered "organizationally agile" if it can swiftly respond to changing market conditions and seize new possibilities. How well a business can adjust to new circumstances, the entry of a new rival, or the introduction of revolutionary technology depends in large part on the degree to which its internal processes are flexible and adaptable. Agility is a new way for organizations to develop flexibility and organizational responsiveness so that they are able to face alterations in the business climate that are very fast, dynamic, and turbulent. Organizations that are able to adapt will have a greater opportunity to gain competitive advantage and achieve strategic goals. This agrees with the results of (Clauss et al., 2021); (Khan et al., 2022) and (Khalil et al., 2023) where organizational agility affects company performance.

Effect of Innovation Capability on Firm Business Performance

In testing the hypothesis that “Innovation Capability has an Effect on Firm Business Performance, we found a positive beta score ($p = 0.381$), a t -count > 1.96 ($4.327 > 1.96$), and p values 0.000 ($p < 0.05$). These results support the hypothesis that Innovation Capability does, in fact, have an effect on Firm Business Performance.” Companies with superior innovation are more successful in responding to customer demands and needs. Innovation Capability is seen as the best way to improve performance. The innovations that are successfully achieved by an organization are the result of the thoughts of the organization's management because behind every work program, the staff takes a crucial part in the process of planning, and conceiving to implement and making the work program a success. The ability to innovate helps businesses rapidly develop new goods and implement new processes. The ability to innovate is best understood as a set of resources and strengths. To thrive in today's dynamic setting, you'll need access to a wide variety of assets, resources, and skills (Mendoza-Silva, 2020).

Effect of Distribution Strategy on Firm Business Performance

The beta score is favorable ($p = 0.087$), t -count > 1.96 ($3.416 > 1.96$), and p values of 0.245 ($p < 0.05$) from testing the hypothesis that Distribution Strategy affects Firm Business

Performance show that the hypothesis is accepted, that there is an influence of Distribution Strategy on Firm Business Performance. Delivering products and services to end-users when and where they are required is what we call distribution. The right distribution with marketing agents in a wide market and one of the most important and basic things in the world of marketing is a matter of distribution strategy. A good distribution system will ensure that the product reaches the consumer more quickly, thereby reducing the risk of loss. The effectiveness and efficiency of product distribution is needed in a company to ensure smooth distribution to consumers. Gains in efficiency and effectiveness will, of course, affect happy customers. This outcome aligns with the conclusions (Wei & Chen, 2023); (Bui & Nguyen, 2021) where Distribution Strategy has an effect on Firm Business Performance.

Effect of E-Commerce business adoption on Firm Business Performance

Testing the null hypothesis yielded “a positive beta score ($p = 0.238$), a t -count > 1.96 ($2.822 > 1.96$),” and p values of 0.000 ($p < 0.05$) indicating that the influence of E-Commerce business adoption on Firm Business Performance is accepted. Users benefit greatly from e-commerce because it eliminates the need for them to physically go to a store to make a purchase. Complete and readily available information is provided through e-commerce

transactions, and so is the ability to make purchases whenever it is most convenient for customers. Purchasing and selling goods and services over the Internet, which eliminates geographical and temporal barriers for customers. People may find it less of a hassle to shop for products and services online because they may do so whenever and from wherever is most convenient for them. Online shopping is growing in popularity among Indonesians as a result of the convenience and range of options it provides. This finding agrees with the data (Marhraoui & El Manouar, 2017); (Qosasi et al., 2019).

Effect of Organizational Agility on E-Commerce business adoption

“The results of the hypothesis testing showed that there is an Effect of Organizational Agility on E-Commerce business adoption, as indicated by a positive beta score ($p = 0.466$), a t-count > 1.96 ($6.586 > 1.96$), and p values of 0.000 ($p < 0.05$).” Organizations that have high levels of organizational agility tend to be more responsive to market and technological changes. They can quickly identify new opportunities in e-commerce, respond to changing customer needs, and adjust their strategies rapidly. This enables them to be better prepared to adopt e-commerce initiatives and adapt to a constantly evolving environment. Effective adoption of e-commerce business allows organizations to improve operational efficiency. Organizations with high agility can utilize e-commerce to automate business processes, enhance supply chain visibility, optimize inventory management, and expedite transaction processes. This leads to increased productivity and efficiency in their operations. The results corroborate this conclusion (H. Li & Chen, 2018).

Effect of Innovation Capability on E-Commerce business adoption

Testing the hypothesis that an Effect of Innovation Capability on E-Commerce firm adoption exists yielded positive results: a beta score of 0.259 , “a t-count greater than 1.96 ($2.796 > 1.96$)”, and p values of 0.005 ($p < 0.05$). Therefore, the hypothesis is accepted. When it comes to e-commerce, innovation capability is king. Businesses who are good at coming up with fresh ideas are better able to take advantage of cutting-edge e-commerce solutions. They can identify emerging business opportunities, develop creative strategies to enhance the customer experience, and implement innovative solutions in their business processes. With a strong capacity for innovation, firms can stay ahead of the competition in the digital business landscape and provide the groundwork for a successful transition to e-commerce. The findings of (Nasution et al., 2021) are consistent with this outcome.

Effect of Distribution Strategy on E-Commerce business adoption

The beta score is favorable ($p = 0.269$), t count > 1.96 ($2.807 > 1.96$), and p values 0.05

from tests of the hypothesis that the Effect of Distribution Strategy Transformation on E-Commerce company adoption exists indicate that the hypothesis is accepted, there is an Effect of Distribution Strategy Transformation on E-Commerce business adoption, “an important factor in the success of e-commerce companies is their distribution strategy”. A well-defined distribution strategy enables organizations to effectively reach their target customers in the online marketplace. It involves determining the optimal channels, logistics, and fulfillment methods to ensure efficient product delivery and customer satisfaction. By carefully designing and implementing a distribution strategy, organizations can enhance their online presence, expand their market reach, and capitalize on the advantages offered by e-commerce platforms. This result agrees the findings (Nasution et al., 2021).

Effect of organizational agility on firm business performance is mediated by E-Commerce Business Adoption

The beta score is favorable ($p = 0.110$) and t count 1.96 ($2.212 < 1.96$) with p values of 0.027 ($p < 0.05$) were found when testing the hypothesis that organizational agility influences firm business performance through e-commerce business adoption. This

discovery provides more evidence that the adoption of e-commerce by businesses might moderate, at least in part, the relationship between organisational agility and firm commercial performance. In order to speed up and boost product sales, rapid advancements in information technology are essential. A group of interrelated services and products sold over the internet that, by liberalizing domestic service provision and speeding up connectivity with global manufacturing activities, might boost the health of the domestic economy. E-commerce has the potential to reduce distribution routes, increase market size, lower promotional expenses, and keep demand for products and services at a constant level. It has been demonstrated that the company's performance may be influenced in part by its effective implementation of agility and subsequent usage of e-commerce. This result agrees accordance with the findings of (Marhraoui & El Manouar, 2017); (Qosasi et al., 2019).

Effect of Innovation Capability on Firm Business Performance is mediated by E-Commerce Business Adoption

“A positive beta score ($p = 0.062$) with a t count < 1.96 ($2.150 < 1.96$) and p values of 0.032 ($p > 0.05$) indicates that e-commerce business adoption can partially mediate the relationship between Innovation Capability and the firm's business performance, according to the results of the hypothesis testing.” The capacity to innovate is the single most important factor in maintaining a competitive edge in markets where prices are constantly changing. A company's "innovation capability," which includes its tactics, procedures, and structures that foster innovation, drives the ongoing development of innovation in response to the ever-evolving market atmosphere. Businesses that anticipate rising productivity and effectiveness issues face a future fraught with challenges that will call for creative solutions. Fresh goods (or services), structures, connections, and even civilizations can all be considered forms of innovation. Seeing the potential risks that will be faced by business companies, then the application of e-commerce technology is one important aspect that can be developed in order to support the success of the product life cycle from the production process to how the product is marketed. To accelerate and increase sales, it is necessary to see the rapid development of information technology. Effective and efficient on-line services are one of the keys to winning the era of business competition in the future. This result is in accordance with the findings Effective and efficient on-line services are one of the keys to winning the era of business competition in the future. This result is in accordance with the findings Effective and efficient on-line services are one of the keys to winning the era of business

competition in the future. This result is in accordance with the findings of (Priambodo et al., 2021); (Wardoyo et al., 2018); and (Zheng et al., 2019).

Effect of Distribution Strategy Transformation on Business Firm Performance Mediated by E-Commerce Business Adoption

“A positive beta score ($p = 0.064$), t count < 1.96 ($2.048 < 1.96$), p values of 0.041 ($p > 0.05$), and other results from the hypothesis testing demonstrate that E-Commerce Business Adoption mediates the relationship between Innovation Capability and the firm's business performance through the transformation of its distribution strategy.” All consumer requests can be promptly attended to thanks to the availability of e-commerce services that can be immediately enjoyed by both customers and the company. E-commerce covers a wide range of activities, one of which is distribution. Many believe that e-commerce will significantly affect the company's long-term viability due to the fact that it will enable the business to provide customers with the best and fastest service possible while also streamlining all of its present activities. There is productivity in the use of e-commerce tools such fax machines, printers, data entry, and courier services. Costs and processing times/speeds will go down as a result of this efficiency (Juliet Orji et al., 2022); (Hussain et al., 2020) and (Jovanovic et al., 2020).

Conclusions

The study's main findings emphasize the positive impact of organizational agility, innovation capability, and distribution strategy transformation on firm business performance, with e-commerce adoption identified as a partial mediator. These insights hold strategic significance, highlighting the importance for businesses to prioritize and enhance these elements for improved performance. The acknowledgment of e-commerce as a mediator underscores the growing role of digital channels in shaping business strategies. The call for future research to explore additional variables and novel moderating factors opens avenues for a more comprehensive understanding of company performance dynamics. The practical implications include leveraging identified factors for strategic decision-making, recognizing the ongoing importance of digital transformation, and emphasizing organizational agility as key to long-term success in dynamic business landscapes. In conclusion, the study contributes valuable insights to the discourse on effective business strategies, providing practical implications for companies navigating a competitive and digitally-driven marketplace.

References

- Adam, N. A., & Alarifi, G. (2021). Innovation practices for survival of small and medium enterprises (SMEs) in the COVID-19 times: the role of external support. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-021-00156-6>
- Al Taweel, I. R., & Al-Hawary, S. I. (2021). The mediating role of innovation capability on the relationship between strategic agility and organizational performance. *Sustainability (Switzerland)*. <https://doi.org/10.3390/su13147564>
- Ali Shah, S. A., Longsheng, C., Solangi, Y. A., Ahmad, M., & Ali, S. (2021). Energy trilemma based prioritization of waste-to-energy technologies: Implications for post-COVID-19 green economic recovery in Pakistan. *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2020.124729>
- Alinsunod, J. P., Esponilla, F. D., Ignacio, H. T., de Guzman, H. C., Cruz, K. C. D., & Valenzuela, I. C. (2019). Best practices of technology business incubators in the Philippines. *International Journal of Advanced Trends in Computer Science and Engineering*. <https://doi.org/10.30534/ijatcse/2019/70852019>
- Aljarbou, A. A. (2023). The Impact of Electronic Commerce on Consumer Satisfaction and Consumer Preferences for Retail Stores in Saudi Arabia. *International Journal of Marketing Studies*. <https://doi.org/10.5539/ijms.v15n1p90>
- Allaway, A. W., McCullough, H., Kim, K., & McAmis, G. (2022). Segmenting customer adoption of new consumer packaged goods using latent growth curve modeling. *Journal of Marketing Theory and Practice*. <https://doi.org/10.1080/10696679.2022.2115383>
- Arsawan, I. W. E., Hariyanti, N. K. D., Atmaja, I. M. A. D. S., Suhartanto, D., & Koval, V. (2022). Developing Organizational Agility in SMEs: An Investigation of Innovation's Roles and Strategic Flexibility. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.3390/joitmc8030149>
- Aydiner, A. S., Tatoglu, E., Bayraktar, E., Zaim, S., & Delen, D. (2019). Business analytics and firm performance: The mediating role of business process performance. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2018.11.028>
- Azudin, A., & Mansor, N. (2018). Management accounting practices of SMEs: The impact of organizational DNA, business potential and operational technology. *Asia Pacific Management Review*. <https://doi.org/10.1016/j.apmr.2017.07.014>
- Bacchetti, A., Bertazzi, L., & Zanardini, M. (2021). Optimizing the distribution planning process in supply chains with distribution strategy choice. *Journal of the Operational Research Society*. <https://doi.org/10.1080/01605682.2020.1727785>

- Belwal, R., Al Shibli, R., & Belwal, S. (2021). Consumer protection and electronic commerce in the Sultanate of Oman. *Journal of Information, Communication and Ethics in Society*. <https://doi.org/10.1108/JICES-09-2019-0110>
- Boojihawon, D. K., Richeri, A., Liu, Y., & Chicksand, D. (2021). Agile route-to-market distribution strategies in emerging markets: The case of Paraguay. *Journal of International Management*. <https://doi.org/10.1016/j.intman.2020.100740>
- Bui, L. T. H., & Nguyen, D. N. (2021). The distribution channel, strategic factor and firm performance: Evidence from FDI enterprises. *Journal of Distribution Science*. <https://doi.org/10.15722/jds.19.10.202110.35>
- Carvache-Franco, O., Loaiza-Torres, J., Soto-Montenegro, C., Carvache-Franco, M., & Carvache-Franco, W. (2022). The risks perceived by the consumer in the acceptance of electronic commerce. A study of Bolivia. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0276853>
- Clauss, T., Abebe, M., Tangpong, C., & Hock, M. (2021). Strategic Agility, Business Model Innovation, and Firm Performance: An Empirical Investigation. *IEEE Transactions on Engineering Management*. <https://doi.org/10.1109/TEM.2019.2910381>
- Elazhary, M., Popovič, A., Henrique de Souza Bermejo, P., & Oliveira, T. (2023). How Information Technology Governance Influences Organizational Agility: The Role of Market Turbulence. *Information Systems Management*. <https://doi.org/10.1080/10580530.2022.2055813>
- Hendricks, S., & Mwapwele, S. D. (2023). A systematic literature review on the factors influencing e-commerce adoption in developing countries. *Data and Information Management*. <https://doi.org/10.1016/j.dim.2023.100045>
- Hossain, M. B., Dewan, N., Senin, A. A., & Illes, C. B. (2023). Evaluating the utilization of technological factors to promote e-commerce adoption in small and medium enterprises. *Electronic Commerce Research*. <https://doi.org/10.1007/s10660-023-09692-7>
- Hussain, A., Shahzad, A., & Hassan, R. (2020). Organizational and environmental factors with the mediating role of e-commerce and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.3390/joitmc6040196>
- Hwang, Y., & Jeong, J. (2016). Electronic commerce and online consumer behavior research: A literature review. In *Information Development*. <https://doi.org/10.1177/0266666914551071>
- Janjevic, M., & Winkenbach, M. (2020). Characterizing urban last-mile distribution strategies in mature and emerging e-commerce markets. *Transportation Research Part A: Policy and Practice*. <https://doi.org/10.1016/j.tra.2020.01.003>
- Jimmy Gandhi, S., Robb, C. C., & Lee, A. (2021). The entrepreneurial intrapreneur: A managerial approach to building entrepreneurial competencies. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/IJEIM.2021.115049>
- Jovanovic, J. Š., Vujadinovic, R., Mitreva, E., Fragassa, C., & Vujovic, A. (2020). The relationship between E-commerce and firm performance: The mediating role of internet sales channels. *Sustainability (Switzerland)*. <https://doi.org/10.3390/su12176993>
- Juliet Orji, I., Ojadi, F., & Kalu Okwara, U. (2022). The nexus between e-commerce adoption in a health pandemic and firm performance: The role of pandemic response strategies. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2022.03.034>
- Jullien, B., Reisinger, M., & Rey, P. (2023). Personalized Pricing and Distribution Strategies. *Management Science*. <https://doi.org/10.1287/mnsc.2022.4437>
- Khalil, M. L., Aziz, N. A., Long, F., & Zhang, H. (2023). What factors affect firm performance in the hotel industry post-Covid-19 pandemic? Examining the impacts of big data analytics capability, organizational agility and innovation. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.1016/j.joitmc.2023.100081>
- Khan, A., Talukder, M. S., Islam, Q. T., & Islam, A. K. M. N. (2022). The impact of business analytics capabilities on innovation, information quality, agility and firm performance: the moderating role of industry dynamism. *VINE Journal of Information and Knowledge Management Systems*. <https://doi.org/10.1108/VJIKMS-01-2022-0027>

- Khoo, V., Ahmi, A., & Saad, R. A. J. (2018). E-commerce adoption research: A review of literature. *Journal of Social Sciences Research*. <https://doi.org/10.32861/jssr.spi6.90.99>
- Lailah, F. A., & Soehari, T. D. (2020). THE EFFECT OF INNOVATION, INFORMATION TECHNOLOGY, AND ENTREPRENEURIAL ORIENTATION ON BUSINESS PERFORMANCE. *Akademika*. <https://doi.org/10.34005/akademika.v9i02.914>
- Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The relation among organizational culture, knowledge management, and innovation capability: Its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.3390/joitmc7010066>
- Lestari, D. (2019). Measuring e-commerce adoption behaviour among gen-Z in Jakarta, Indonesia. *Economic Analysis and Policy*. <https://doi.org/10.1016/j.eap.2019.08.004>
- Li, B., Wei, J., Liang, Y., & Chen, B. (2020). Optimal Placement of Fault Indicator and Sectionalizing Switch in Distribution Networks. *IEEE Access*. <https://doi.org/10.1109/ACCESS.2020.2968092>
- Li, H., & Chen, P. (2018). Board gender diversity and firm performance: The moderating role of firm size. *Business Ethics*. <https://doi.org/10.1111/beer.12188>
- Liu, Q., Qu, X., Wang, D., Abbas, J., & Mubeen, R. (2022). Product Market Competition and Firm Performance: Business Survival Through Innovation and Entrepreneurial Orientation Amid COVID-19 Financial Crisis. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2021.790923>
- Lungu, M. F. (2020). The influence of strategic agility on firm performance. *Proceedings of the International Conference on Business Excellence*. <https://doi.org/10.2478/picbe-2020-0011>
- Marhraoui, M. A., & El Manouar, A. (2017). IT innovation and firm's sustainable performance: The mediating role of organizational agility. *ACM International Conference Proceeding Series*. <https://doi.org/10.1145/3149572.3149578>
- Mendoza-Silva, A. (2020). Innovation capability: a systematic literature review. *European Journal of Innovation Management*. <https://doi.org/10.1108/EJIM-09-2019-0263>
- Nasution, M. D. T. P., Rafiki, A., Lubis, A., & Rossanty, Y. (2021). Entrepreneurial orientation, knowledge management, dynamic capabilities towards e-commerce adoption of SMEs in Indonesia. *Journal of Science and Technology Policy Management*. <https://doi.org/10.1108/JSTPM-03-2020-0060>
- Noor Ardiansah, M., Chariri, A., Rahardja, S., & Udin. (2020). The effect of electronic payments security on e-commerce consumer perception: An extended model of technology acceptance. *Management Science Letters*. <https://doi.org/10.5267/j.msl.2019.12.020>
- Olan, F., Ogiemwonyi Arakpogun, E., Suklan, J., Nakpodia, F., Damij, N., & Jayawickrama, U. (2022). Artificial intelligence and knowledge sharing: Contributing factors to organizational performance. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2022.03.008>
- Pancić, M., Čučić, D., & Serdarušić, H. (2023). Business Intelligence (BI) in Firm Performance: Role of Big Data Analytics and Blockchain Technology. *Economies*. <https://doi.org/10.3390/economies11030099>
- Panda, S. (2022). Strategic IT-business alignment capability and organizational performance: roles of organizational agility and environmental factors. *Journal of Asia Business Studies*. <https://doi.org/10.1108/JABS-09-2020-0371>
- Priambodo, I., Sasmoko, S., Abdinagoro, S., & Bandur, A. (2021). The Effect of E-Commerce Capabilities on Firm Performance: An Empirical Study in Indonesia. *Journal of Asian Finance*.
- Puelles, M., Warleta, G. M., & Moreno, M. (2020). Types of Retailers, Brand Choice and New Products Trial: Challenges for the E-commerce of Consumer Packaged Goods. *Springer Proceedings in Business and Economics*. https://doi.org/10.1007/978-3-030-47764-6_20
- Qosasi, A., Permana, E., Muftiadi, A., Purnomo, M., & Maulina, E. (2019). Building SMEs' competitive advantage and the organizational agility of apparel retailers in indonesia: The role

of ICT as an initial trigger. *Gadjah Mada International Journal of Business*. <https://doi.org/10.22146/gamaijb.39001>

Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation and Knowledge*. <https://doi.org/10.1016/j.jik.2017.06.002>

Saha, S., & Kumar, S. P. (2018). Organizational culture as a moderator between affective commitment and job satisfaction: Empirical evidence from Indian public sector enterprises. *International Journal of Public Sector Management*. <https://doi.org/10.1108/IJPSM-03-2017-0078>

Sombultawee, K. (2020). Antecedents and consequences of e-commerce adoption for SMEs. *Kasetsart Journal of Social Sciences*. <https://doi.org/10.34044/j.kjss.2020.41.2.05>

Wardoyo, D. T. W., Iriani, S. S., & Kautsar, A. (2018). Adoption of e-commerce, entrepreneurship orientation mediated by business strategy on the performance food industries. *International Journal of Civil Engineering and Technology*.

Wei, X., & Chen, L. (2023). Structural power distribution between family and non-family executives and innovation performance in family firms. *Journal of Innovation and Knowledge*. <https://doi.org/10.1016/j.jik.2022.100304>

Yildiz, T., & Aykanat, Z. (2021). The mediating role of organizational innovation on the impact of strategic agility on firm performance. *World Journal of Entrepreneurship, Management and Sustainable Development*. <https://doi.org/10.1108/WJEMSD-06-2020-0070>

Zheng, D., Yang, W., & Wang, D. (2019). E-commerce, Collaborative Innovation Capability and Performance: An Empirical Study of Shipping Companies. *Journal of Coastal Research*. <https://doi.org/10.2112/SI94-079.1>