Strengthening Innovation Strategy through Intellectual Capital and Technological Strategy

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Abstract

This study aimed to determine the effect of Intellectual Capital and Technology Strategy on the Innovation Strategy. The innovation strategy is a strategy to create added value and serve customers as needed. Quantitative and associative research methods are used to determine the effect between variables Questionnaires were delivered to 48 logistics service provider employees from June to August 2021, composed of staff, managers, senior managers, and directors). This study uses four dimensions for the innovation strategy: innovation expenditures, internal research and development, innovation cooperation, and emphasis. The intellectual capital variable uses two dimensions: Internal Intellectual Capital and External Intellectual Capital. Meanwhile, the technology strategy variable uses six dimensions: pioneering, product portfolio breadth, process portfolio breadth, external technology sources, foresight, and organizational mechanism—this study uses SPSS 26 to analyze the data with the regression method. The study found that the Intellectual Capital and Technology Strategy positively and significantly influenced the Innovation Strategy.

Keywords
Intellectual Capital, Technology Strategy, Innovation Strategy, Logistics Service Providers

1. Introduction

The term outsourcing itself has a close relationship with the process of supply chain management, and this is because companies generally delegate or transfer to third parties the process of taking goods from suppliers and delivering goods to consumers (Newswire, 2017). This outsourcing trend can also be seen in the number of companies that provide logistics services locally and globally, commonly referred to as Logistics Service Providers (LPS). LPS is a business that provides one or more logistics-related services used by consumers that can facilitate the movement of parts and materials from suppliers to manufacturers, end products from manufacturing, and finished goods from manufacturing to delivery. Distribution to retail stores (Gurcan et al., 2016). It can be concluded that these LPS companies are third-party companies that accept the delegation of responsibility from a company to carry out part or all of the logistics activities of a company by transferring the logistics activities to the LPS company. There are many benefits that companies can gain, such as focusing on the company's core competencies, reducing risk, and making the company's logistics process more effective and efficient. LPS provides ordinary and various logistics services, including transportation, warehousing, distribution, and consolidation (Batarliene & Jarasuniene, 2017).

According to Negara and Kristinae (2018), innovation is a process of creating, sharing, and using the knowledge that develops organizational performance and learning, modifies, uses, and accesses knowledge. The innovation strategy is an LPS company strategy to create added value and serve customers as needed. This condition is due to client companies competing to implement strategies by making all business processes work efficiently, focusing more on the company's core competencies.

In carrying out an innovation strategy, intellectual capital plays an essential role for the company. Good intellectual capital management can help improve the company's performance (Asmalidar, 2016). intellectual capital is an asset that does not have the form of information resources or knowledge whose function is to increase the competitive capacity and improve the company's performance. (Dost et al., 2016).

In addition to intellectual capital, the technological strategy supports the design of the innovation strategy of the LPS company. Technology strategy leads to the identification of specific technology domains that are critical to the business. Technology strategy is essential for big tech companies and all companies. (Minghini et al., 2017)
According to (Cammarano et al., 2020), the development of technological strategies is also needed to help the crisis caused by the neglect of the development of the technological base. It also takes courage to assess the advantages or disadvantages of technology compared to competitors' proprietary technology.

1.1 Objectives

Based on the above information, the purpose of this study is to examine the effect of intellectual capital and technology strategy on the innovation strategy of a logistics provider company.

2. Literature Review

2.1 Innovation Strategy

According to (Gao et al., 2018), The innovation strategy is a strategy related to the company's strategic response to the adoption of innovation, where the company tries to predict and anticipate environmental changes. The innovation strategy is related to radical changes in the business model that is carried out or the business strategy that is implemented. (Karlsson & Tavassoli, 2016). According to (Rodriguez et al., 2016), the innovation strategy is the determination of how to carry out the company's strategy in the face of the uncertainty of the future. It can be concluded that the innovation strategy is an important strategy for the company because it can meet changing demands. The innovation strategy is carried out to anticipate changes in the environment and business model within the company. Based to the author (Dodgson et al., 2015) entitled "Innovation strategy in a new transportation system: The case of Crossrail.", there are dimensions and indicators in the innovation strategy as follows: To seek is to receive all information, guidance, or suggestions on possible future developments in science, technology and engineering; select is The selection of a new technology that is the core of a project; configure is to acquire new technological resources and coordinate all the activities involved in innovation; implement is deliver internally generated and procured innovations on time and within budget and protect and evaluate innovations; learning is improving the performance of the innovation process through experimentation and experience. In this study, the dimensions and indicators of the innovation strategy, according to Rodriguez et al. (2016) and Cai et al. (2017), are Expenditures on Innovation, Innovation Cooperation, and Emphasis.

2.2. Relationship between intellectual capital and innovation strategy

The innovation strategy is characterized by the importance of fundamental and applied research and the direction of the product or process of the innovation activity, which considers technological innovation. Before examining the relationship between intellectual capital and a company's innovation strategy, it is essential to determine the essential component of intellectual capital because the value of the intellectual capital component varies between organizations (Firer & Mitchell Williams, 2003). As Porter (1991) emphasizes, all actions must be directed by a defined strategy; Therefore, intellectual capital must also be designed systematically. One of the main objectives of this strategy is to harness, develop and expand the company's innovative capabilities (Goh, 2005). The development of internal competencies must be the main objective of the technological strategy. In particular, technological innovation strategies can generate discontinuities that enhance or weaken the existing skills. Internal resources must be defined based on key strategies and skills. According to Raymond et al. (2010), management must conceptualize a well-structured innovative strategy and develop an organized implementation method. When the organizational structure, technology, and R&D skills match the chosen strategy, better performance results will be achieved (Raymond & St-Pierre, 2010).

After considering this rationale, the following hypothesis for this investigation is $H1$: Intellectual capital has a positive influence on innovation strategy

2.3. Relationship Between Pengaruh Technological Strategy and Innovation Strategy

The terms "innovation" and "technology" can be used interchangeably. Innovation and technology can be viewed as a dynamic network of agents working together within a particular industry or economy under a particular institutional infrastructure. The need for strategic talent is of utmost importance for the survival of companies that aspire to prosper and achieve great heights in a dynamic environment that is inherently hostile (Schiederig et al., 2012). In this volatile climate, companies must adopt strategies to prosper and perform well to advance technological advancement and innovation. The innovation and technology strategy can be defined as investment in research and design, its acquisition, study, and implementation of innovations and new technologies, and incorporating these elements in its organizational and operational procedures. LPS companies must adapt economic models to benefit from IT now and in the coming years. Something that needs to be done so they can use IT. Strategic corporate executives do not have to use computer tools that take advantage of individual productivity margins; instead, they are interested in significant cost reductions and service improvements at the LPS company (Frehe et al., 2017).
After considering this rationale, the following hypothesis for this investigation is H2: technological strategy has a positive influence on innovation strategy

3. Methods

According to Sekaran and Bougie (2016), a research design is a plan for data collection, measurement, and analysis based on the research statement of the study. With a research design designed in such a way, it will be easier for researchers to collect and analyze data. A researcher uses the research method to conduct or systematically find solutions to specific problems in research. The research method applied in this study is quantitative. The quantitative research method is a research method that uses structured questions to collect data in the form of numbers (Sekaran & Bougie, 2016). Afterwards, the researchers use the information from these data as a guide to make decisions or solve problems. The type of research used in this study is associative. Associative research determines the relationship between two or more variables, which describes the effect of variable X on variable Y (Sekaran & Bougie, 2016). This research design uses data collection techniques through questionnaires. The data will be obtained from quantitative data with primary data sources. In general, this study aims to explain the phenomena that occur in the form of relationships between variables. The variables referred to include Innovation Strategy (Y), Intellectual Capital (X1), and Technology Strategy (X2) in Figure 1.

This study uses four dimensions for innovation strategies based on (Rodriguez et al., 2016) and (Cai et al., 2017): expenditure on innovation, internal R&D, innovation cooperation, and emphasis. Two dimensions are used for the intellectual capital variable, according to (Chen et al., 2015): Internal Intellectual Capital and External Intellectual Capital. Meanwhile, the Technological Strategy variable uses seven dimensions based on(Zahra 1996) and (Zahra et al. 1994): pioneering, product portfolio, process portfolio, internal R&D, external technology sources, forecast, and organizational mechanism.

4. Data Collection

In this study, the researchers used data collection techniques using questionnaires through electronic questionnaires or g forms. According to (Sekaran & Bougie, 2016), a questionnaire is a list of previously formulated written questions in which the respondents will record their answers, generally in clearly defined alternatives. In this study, questionnaires were distributed using a questionnaire to obtain a high response. Questionnaires were given to 48 LPS employees from June to August 2021, consisting of staff, managers, senior managers, and directors). This study uses SPSS 26 to analyze the data with the regression method

5. Results and Discussion

Regression analysis is a development of simple regression analysis. In the multiple regression test, more than one independent variable is used to explain the variance of the dependent variable. Using SPSS version 26.0 statistical analysis software, the results of the regression test are found in Table 1:

Based on the output of SPSS, the value of R2 is 0.702. Thus, it can be concluded that 70.2% of the variation in the Innovation Strategy variable is explained by the variables Intellectual Capital, Technological Strategy, and Conflict Management Style. Then, the remaining 29.8% is explained by other variables. The results of the t-test are as follows: $t_{count\ 1}$ of 1,782 shows that the Intellectual Capital variable has a significant positive effect on the Innovation Strategy

variable. From the analysis results, the results obtained are sig 0.000 <0.05. Thus, the analysis results indicate a partially significant effect between the Intellectual Capital and Innovation Strategy variables.

t_{count2} of 2958 indicates that the Technological Strategy variable has a significant positive effect on the Innovation Strategy variable; from the analysis, the results obtained are sig 0.000 > 0.05. The results of the analysis show a partially significant effect between the variables of the Technological Strategy on the variables of the Innovation Strategy.

Theoretical implications are based on previous studies' results from another source. Of course, this research is the author's reference in conducting this research. The theoretical implications of this research are as follows: It is shown that the Intellectual Capital variable (X1) has a significant effect on the Innovation Strategy variable (Y), and the result has similarities with the results of previous studies studied by (Chen et al., 2015) and (Dost et al., 2016). however, it differs from the results of previous studies (Oktari et al., 2016). Therefore, it can be said that there is a significant influence between the Intellectual Capital variable on the Innovation Strategy variable in this study.

In addition, it is shown that the Technological Strategy variable (X2) has a significant effect on the Innovation Strategy variable (Y). and has similarities with the results of previous studies studied by (Zahra, 1996) and (Cammarano et al., 2020). However, it has differences from the results of previous studies studied; therefore, it can be said that there is a significant influence between the variables of the Technological Strategy on the variables of the Innovation Strategy in this study. (Figure 1)

5.1 Numerical Results

Table 1. Regression analysis test

Variable	Sig	t count	Regression coefficient	Remark
X1 to Y	0,000	1,782	0,482	Significant
X2 to Y	0,000	2,958	0,258	Significant
Constanta = 24, 205				
Adjusted R^2 = 0,702				
F count = 12,587				
Sig = 0,000				

5.2 Graphical Results

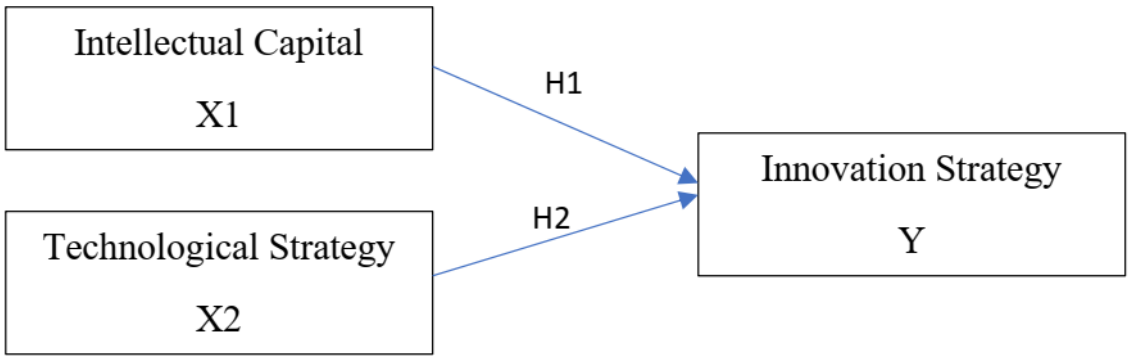

Figure 1. Research Framework

5.3 Proposed Improvements

In this study, several issues require attention based on the data processing results recapitulated from the respondents' answers. It was found that the question with the highest average value of the variable Intellectual Capital (X1) in the questionnaire was the indicator X1. 1, namely "I feel I have mastered enough knowledge about the company I work for," indicating that the majority of respondents agree that LPS company is always trying to find out about the company. Seeing this, it is perfect that the company consistently maintains and does something that can make the activities of the employees in the company more efficient. Of course, this can improve the innovation strategy with company-owned indicators. On the other hand, it was also found that the question with the lowest average value was indicator X1.I3, namely "I feel that the company's relationship with its customers and suppliers is quite good," which means that the respondents in the company they pay more attention to employee relations compared to competitors.
Furthermore, in the questionnaire, the Technological Strategy variable (X2) was the indicator X2.2, namely "Is your company leading the development of technology in your industry?" indicating that most respondents agree that LPS company is a leader in deep technology development. Seeing this, it is perfect that the company always performs maintenance to maintain communication services. On the other hand, the question with the lowest average score is indicator X2.11, namely "Is it your company's policy to wait for other companies to introduce new technology and copy it quickly?" which means that Respondents tend to assume that the latest technology strategy is not used, so in this case, the company should pay better attention.

5.4 Validation

The validity test is a step to test the accuracy level of an instrument in a specific concept (Uma Sekaran & Roger Bougie, 2016:220). By performing a validity test, the researchers can verify that the measurement instrument is indeed adequate. In this study, the results of the validity test of the instrument for the variables Intellectual Capital (X1), Technological Strategy (X2), and Innovation Strategy (Y) show the appropriate level of precision, namely $r_{count} > r_{table}$ 0.15. When using the statistical analysis software SPSS version 26.0, the results of the reliability test of the Innovation Strategy variable are 0.906; Intellectual Capital is 0.856; Technology Strategy is 0.825

6. Conclusion

Based on the results of the research and data processing that has been carried out, that is, to see the influence of intellectual capital and the technological strategy on the innovation strategy, it can be concluded that: intellectual capital has a positive and significant influence on the innovation strategy. It shows that the better the intellectual capital the company implements, the better the innovation strategy. The technological strategy positively and significantly influences the innovation strategy. It shows that the better the technological strategy implemented by the company, the better the innovation strategy.

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