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The effect of intellectual capital towards sustainability of business performance mediated by eco-product innovation & external learning: The Indonesian bottled drinking water industries

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A B S T R A C T

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This study developed and empirically corroborated a structure explicitly propositioning eco-product innovation and external learning, correspondingly bridging the link between intellectual capital and sustainability performance. The theory of dynamic capabilities and knowledge-based view proposed eco-product creation and external education as mediators that developed a new conceptual model. This study utilized the Partial Least Square-Structural Equation Modelling (PLS-SEM method) to examine one hundred sixty-two Indonesian bottled drinking industries, exposing their attentiveness to cooperate in the study. More essentially, the study unraveled new justifications by scrutinizing external learning's role as more influential than eco-product innovation. Based on the practical viewpoint, intellectual capital helped exchange knowledge and information with distributors, suppliers, and competitors. Thus, the complete assimilation and transformation of their understanding could improve business performance.

1. Introduction

The manufacturing industry in Indonesia was the most significant contributor to economic growth, contributing to the Gross Domestic Product (GDP) growth of 19.8% in 2020. The government optimized five industrial sub-sectors to support industrial growth in 2020: the food and beverage industry, machinery, textiles and apparel, leather, metal goods, computers, and electronics. The Indonesian Ministry of Industry projects that the growth of the food and beverage industry in 2020 would be 10.24%, the machine industry 7.34%, the garment industry 5.82%, the leather goods and footwear industry 5.63%, the metal industry, computers, and the electronics goods industry 4.14% (www.kemenperin.go.id). Based on data from AC Nielsen for the 2016-2020 period, the enormous contribution to sales from the Food and Beverage Industry sector came from bottled drinking water, around IDR 47 trillion per year, or around 32% of the total sales of all types of drinks (bottled tea, milk packaging, juice drinks, flavored water, and soda drinks). This industry was still the leading sector to increase industrial growth in Indonesia. The food and beverage industry had the most significant influence, with 6.12% of the National GDP in the fourth quarter of 2020. The demographics of Indonesia supported that it was the largest country based on population, ranking number 5 (five) in the world with around 250 million people. The increase in the consumption of primary needed of the Indonesian people was very high, especially in the form of basic needs in the form of food and beverages. Conversely, the condition of the performance of the BOTTLE-DRINKING industry in 2020 experienced a very significant decline from the average manufacturer's utility to 40%, where limiting community activities affected the decrease in demand for glass bottled water (Nurcaya, 2021). In addition, the bottled water industry supply chain was highly dependent on imports of raw materials

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for plastic pellets. The increase in raw material prices was influenced by crude oil prices and the US dollar exchange rate (Sugeng et al., 2010). According to Ariadi et al. (2020), US Dollar exchange rate volatility was the cause of the problems faced by bottled water producers. They needed help determining the selling price of bottled water products because packaging costs required high funds, which were 80% of bottled water production (Ariadi et al., 2020). It caused a significant decline in financial performance in the fourth quarter of 2020 in the BOTTLE-DRINKING industry in Indonesia because of increased production operational costs due to the increase in raw material prices (Ariadi et al., 2021).

Furthermore, the complexity of the problems faced by the bottled water industry was how to anticipate rising packaging costs, including PET bottles, labels, PP cups, gallons, cardboard boxes, and others. There was a tug-of-war between the weight of the packaging and the burden of costs. On the other hand, environmental issues forced companies to move towards lighter packaging while maintaining the quality of the final bottled water product. Economically, the greater the grammage, the price of glass packaging would increase significantly. There would be an increase in the use of production materials such as water volume and grammage and a decrease in consumer satisfaction because the cost of goods sold was not competitive (Zivkov et al., 2019). This caused problems with the sustainability performance of the bottled water industry, such as decreased profitability, wasteful use of auxiliary materials and water resources, and reduced consumer loyalty (Esfahbodi et al., 2017). In addition, some bottle-drinking industry employees would experience termination of employment and be subject to salary cuts, causing a decrease in employee welfare which would impact business performance from a social aspect (Zhu & Lai, 2019). Furthermore, the increased use of auxiliary material inputs (glass packaging) and increased energy consumption (water and electricity resources) affected environmental performance (Paulraj et al., 2017; Zhu et al., 2013; Hofmann et al., 2018).

Intellectual capital affects development that focuses on economic knowledge because it can significantly change company performance and increase quality development (Carrillo et al., 2009). Human resources have an essential role in a company because they have the knowledge and skills to develop, improve, and advance the company. Human resources must be able to organize, manage, and provide performance to a company. IC focuses on the ability to show the goals and benefits obtained by the company. That is why humans and IC are related to each other. IC consists of human skills, namely creativity, technological knowledge, and experience. According to Xu and Wang (2018), IC can develop company quality because of its various positive impacts on human resources to process appropriately. As stated by de Villiers and Sharma, (2017), IC is a valuable skill because although it is invisible, it affects the work quality of employees in the company. That is why this study provided an information about intellectual capital, which could improve sustainability performance.

According to Carrillo et al. (2010), IC can be used to develop knowledge for everyone. IC does not only focus on a few people but many people. It is because IC is a forum for information to many people who are expected to use this information appropriately and can give a positive impact (Del Giudice et al., 2019a). As stated by Natalicchio et al. (2019), that this information will continue to grow because IC allows many people to gather information through discussions between one person to others. In addition, knowledge is the main focus in all aspects of life, which aims to affect a brighter future (Carrillo et al., 2010). Currently, IC is dynamic and changes according to environmental conditions, so it has become the primary catalyst in increasing the company's capacity to be more competitive (González et al., 2017). Business focused on science, technology, and information because they are interrelated and affect one another because it affects a company's future development (Jordao et al., 2013). The result is human resources will be motivated to improve self-quality, develop business between producers and consumers, and affect life, especially in the economy.

The following are the study results with the same topic, intellectual capital's effect towards sustainability performance. The study had conducted by Villiers and Sharma (2017), Khan et al. (2019), Singh et al. (2019), Cillo et al., (2019), Dumay et al. (2016), Xu & Wang, (2018), Barth et al., (2017), Caldera et al., (2017), Evans et al., (2017), Liu, (2017), and Hassan et al. (2019) showed that intellectual capital significantly affected the sustainability performance. In contrast, studies that were conducted by Hsu and Wang, (2012), Hutahayan, (2020), Jordão and Novas (2013), Novas et al., (2017) and Tseng and Goo, (2005) showed that intellectual capital did not affect increasing sustainability performance. From these study results, the researchers of this study found a research gap. This study investigated the intellectual capital’s effect towards sustainability performance mediated by the eco-product innovation and the external learning in Indonesian bottled drinking water industry.

It is necessary to play the role of eco-product innovation in mediating the effect of intellectual capital towards the sustainability performance. Resource Based Value (RBV) focuses on human capital, relational capital, and structural capital for improving the company quality (Barney et al., 1991), and the Dynamic Capabilities View (DCV) focuses on the dynamic skill, which can help profitable companies to build and update resources, reconfigure related to what is needed to provide future business development and solutions to business problems (Pisano & Teece, 2007; Teece et al., 1997). High skills in business will support the company's development, especially in making products, marketing, and evaluating these products. One form of capability is the development of eco-product innovations by considering aspects of efficiency and efficacy. IC focuses on skills, character, knowledge, and experiences that cannot be seen but have dramatically affected life, especially in a company. IC is essential in improving product quality (Chahal & Bakshi, 2015). In addition, according to Zerenler et al. (2008), companies must have high creativity to provide developments in the products they sell to keep customers interested. This is supported by Dumay et al. (2013) that IC encourages companies to continue to improve and develop product quality so that

they are not outdated. Therefore, internal factors are also crucial in a company, namely encouragement from oneself which IC can utilize.

This study used the Knowledge-Based View (KBV) to minimize research gaps on the study topic, namely the effect of intellectual capital towards sustainability performance. According to Hsu and Sabherwal (2011), KBV focuses on knowledge implemented to develop the company. Therefore, human resources in a company must be cooperative and tolerant by sharing knowledge, experience, and opinions. So that the company will continue to grow. If a problem occurs within the company, they will seek a solution together. So that the company's performance will be of high quality and value. Hsu and Fang (2009) state that the application of knowledge exchange is part of external learning that can improve company performance through human resource development.

In addition, knowledge created from external learning through collaboration with suppliers, receiving input from consumers, and tolling production with competitors can improve company performance (Bao et al., 2012). This is an evaluation from customers that can motivate the company to continue to improve the quality of the company. So that customers will not give up but become loyal customers and disseminate the company's quality to others. This will have a positive impact on the development of the company.

That is why this study aimed to measure the effect of intellectual capital towards the sustainability performance of the bottled water industry by considering the eco-product innovation in terms of efficacy and efficiency as well as external learning involving the role of customers, suppliers, and competitors in bottled drinking water companies in Indonesia. It provided an overview of how intellectual capital affected sustainability performance from economic, social, and environmental aspects in a positive and significant way, as well as the role of eco-product innovation and external learning as a driver or mediator for IC concerning the sustainability performance in the bottle drinking industry in Indonesia.

2. Literature Review

2.1 Resource-Based View (RBV)

The resource-based view (RBV) explains how to achieve unique and sustainable competitive advantages by acquiring and controlling available resources, resulting in excellent and optimal long-term performance (Barney, 1991). RBV focuses on the organization's internal resources as a tool for managing processes and gaining a competitive advantage. Potential resources are a source of sustainable competitive advantage, which must be valuable, rare, imperfectly imitated, and cannot be substituted, now known as the Valuable Rare Inimitable Non-Substitutable (VRIN) criterion. RBV indicates that an organization/company must develop unique and specific core competencies so that the company will enable it to outperform other competitors by doing different things. Products sold to consumers must have high value and specifications compared to competitors.

Companies must have quality products with ingredients, tools, and manufacturing processes with hygienic and sophisticated standards. Products also do not only focus on one type. They are still diverse because customer needs differ, so companies must arrange these products to fulfill customer needs. The problem faced by the company is competitors who plagiarize products with a different quality which may have a lower selling price. Therefore, companies must pay attention to this problem by providing solutions so that there is no product plagiarism. The company must also make an effective and efficient strategy for marketing these products related to product quality, especially materials, tools, and hygienic product standards. This study was developed based on a framework for conceptualizing the relationship between study constructs of intellectual capital as a resource that can improve sustainability performance.

2.2 Dynamic Capabilities View (DCV)

The Dynamic Capabilities Views (DCV) explains that dynamic capabilities can help profitable companies build and update resources and reconfigure related to what is needed to provide company development and solutions to problems that occur in business (Pisano & Teece, 2007; Teece et al., 1997). This is the focus for the company to improve product quality regarding the feedback provided by customers. In addition, there are several aspects of dynamic capability, namely studying products based on customer needs which can provide opportunities to develop product quality, manage resources to be effective and efficient, and update existing systems within the company. So, companies must have high dynamic capabilities to provide maximum value and quality (Hulten & Hao, 2008).

This study used DCV supported by the RBV, which aimed to update the quality of product packaging because it was based on problems that occurred in the market that companies must pay attention to packaging made of plastic because it evaporated so companies must give solution to this problem. For this reason, this study was developed based on a framework for conceptualizing the relationship between intellectual capital study construction as a resource and eco-product innovation as a dynamic capability that could sustainably improve business performance. This study was developed based on a framework

for conceptualizing the relationship between eco-product innovation study constructs that mediated the relationship of intellectual capital in improving the sustainability performance.

2.3 Knowledge-Based View (KBV)

The Knowledge-Based View (KBV) focuses on understanding the importance of knowledge for a company because this knowledge consists of skills, understanding, and experience in improving the company's quality (Hsu & Wang, 2012; Bao et al., 2012). This knowledge does not only focus on one person but collaboration from one person to another. So that human resources must have a cooperative nature and share knowledge, understanding, opinions, experiences, and ways to improve the company's quality. This is supported by Hsu and Fang (2009) that the cooperative nature possessed by human resources will affect many people because they learn a lot from other people. Knowledge is not only from oneself but from other people who can impact oneself and the company so that the company will progress and be successful with quality human resources. The practice of sharing explicit knowledge in the workplace can be easily captured, codified, and transmitted. Management mechanisms, such as procedures, formal languages, handbooks, and information systems, will encourage employees' willingness to share their explicit knowledge. On the other hand, tacit knowledge cannot be expressed verbally, symbolically, and in writing, face-to-face interaction is the principal means of external learning in kindergarten. The key to tacit external learning is the willingness and capacity of individuals to share what they know and use what they learn (Holste & Fields, 2010). The human experience is the basis of kindergarten because individuals can only use new knowledge if they already have social software (Nonaka & Takeuchi, 1995). This study was developed based on a framework for conceptualizing the relationship between external learning constructs that mediated the relationship of intellectual capital in improving sustainability performance.

2.4 Effect of Intellectual Capital towards Sustainability performance

Intellectual capital significantly affects the company because it can help achieve company goals, namely quality and value. Companies must assess human resources based on business-focused knowledge, skills, and experience to manage the business properly, administratively, cooperatively, and related to company quality. This is because the company must have a strategy and design for the business to develop in the future. According to Subramaniam and Youndt, (2005), aspects companies must possess are human resources, interaction and communication with the community, and cooperation with other companies to carry out cooperation that can benefit both companies. Social capital is an opportunity derived from business knowledge that can improve the quality of human resources. According to Hsu and Wang (2012), human resources with social interaction and communication greatly affect capabilities. In addition, experience in marketing skills is also essential for human resources who are company employees. This is because this experience can identify phenomena in the market, update company quality, collect information provided by human resources based on their knowledge, cooperate in achieving common goals, and take advantage of opportunities that arise in current business. So that human resources can learn from experience and knowledge provided by others. Not only that, but human resources can also update their understanding because there will be many new things that they will get through sharing sessions while working in the company. Human resources will be increasingly motivated to keep learning because focusing on self-quality will impact company performance. Intellectual capital can also train human resources to manage financial administration. This is because they are required to learn about financial administration in the company. Science and technology also play an essential role in human resources. Human resources can use technological developments such as establishing good relations and cooperation with other companies, storing essential company data, improving organizational structures, and developing company strategies and designs to make them more structured. So that human resources will be able to achieve company goals, namely quality, professionalism, and high value. Company development can be assessed based on social knowledge, communication, and relationships with other companies (Hsu & Wang, 2012). Knowledge and experience are also a company's benchmark for achieving its goals. In addition, some developments and improvements arise for the company when these assessments or benchmarks are well realized. This focuses on capital organizations that can become a place for learning, motivate every human resource to develop, and share knowledge, understanding, and experience. This is supported by Anand and Khanna (2000), that companies with business experience can provide meaningful learning for human resources to provide awareness about the importance of self-quality in business. This makes human resources more motivated to keep learning. From this explanation, the researchers formulated Hypothesis 1 as follows:

H_1: *Intellectual capital positively affects sustainability performance.*

2.5 Indirect Effect of Intellectual Capital towards Sustainability Performance with Eco-Product Innovation as Mediating Variable

Intellectual capital consists of knowledge, character, and experience that impact a company, especially on product quality and the relationship between producers and consumers. This is the company's main point because it can develop the company through capabilities that follow the field of the company. This is supported by Zerenler et al. (2008) that intellectual capital can create new things so that products are always up to date and value for customers. This is why companies can create new things for products within the company so that customers remain loyal to buying, using, and using these products (Chahal &

Bakshi, 2015). This is supported by study conducted by Narverkar and Jain (2006), showing that many companies are making new marketing strategies to attract more customers. As a result, many companies benefit from this. In addition, companies will understand more about the importance of intellectual capital for the development of companies in producing their products (Dumay et al., 2013). The essential thing in product development within a company is the internal and external motivation that focuses on social interaction to improve marketing strategies by utilizing current technological developments (Ibrahim & Fallah, 2005; Mahmoudi Maymand et al., 2016).

Intellectual capital significantly affects companies because it focuses on knowledge about financial and economic administration (St-Pierre & Audet, 2011). So, companies compete to provide the best quality. Technology can be used to support the company's production system, evaluate customer feedback, and provide solutions to problems that occur in the marketing production process. In addition, companies must also pay attention to product development strategies by adjusting customer needs and desires (Zerenler et al., 2008). There is a case in the company that wants to update its performance system. They must make the design and structure of the company with the implementation of intellectual capital knowledge. So that the negative impact of the case can be minimized appropriately. The product of the company will grow if it focuses on future impact. It is expected that the products produced by the company must be environmentally friendly and not cause significant problems when producers use them. In addition, companies can also start making more refined products, such as products that focus on customer needs, attractive designs, copyrights for the use of technology, and establishing cooperation with other companies. Companies must make changes to live with environmentally friendly product production systems. The company will be known for products that positively impact customers, the environment, and the future. This has a positive impact on the company and also on product quality. In addition, many companies are starting to pay attention to health standards for the products they produce because the more environmentally friendly the product, the more customers will be interested in using it.

In the context of the bottled water industry, eco-product innovation is an effort to make improvements in packaging, including the creation of lightweight packaging (bottle cups with a light grammage). It labels with a lower thickness or thickness concerning aspects of application accuracy. Product (efficacy) and saving resources (efficiency) are which, in turn, will lead to achieving the desired sustainability performance. On the other hand, economically, product innovation is related to competitive market strategies, such as new products, new services, or new programs. According to Lin et al. (2014), companies are expected to produce environmentally friendly products because this aims to reduce problems from the surrounding environment that can negatively impact life. As stated by Zhu and Lai (2019), the environmentally friendly automotive industry in China can minimize the problems in life, especially in the surrounding environment. In addition, companies that use environmentally friendly materials could minimize the negative impact of the materials used to produce the company's products.

Eco-product innovation can be used by reusing product packaging, recycling, repairing, expressing creativity in the form of handicrafts, and so on. Eco-design products significantly impact companies, such as customers being interested in buying these products, minimizing environmental problems, and helping to preserve the environment properly (Lin et al., 2014). In addition, studies conducted by different authors such as Lin et al. (2014) show that companies have a significant effect, especially on performance and the environment. This is supported by Zailani et al., (2012) that eco-friendly products make companies increase competitiveness among other companies, the quality of companies that are well known because they have a superior reputation. Finally, eco-friendly products can benefit companies in producing products, from materials and packaging to marketing (Winn et al., 2012). From the results of these studies, the researchers could formulate Hypothesis 2 as follows:

H_2: *Intellectual capital indirectly affects sustainability performance by mediating eco-product innovation.*

2.6 Indirect Effect of Intellectual Capital Towards Sustainability Performance with External Learning as Mediating Variable

Intellectual capital provides new knowledge and experience for companies because of evaluations in the form of customer feedback on products within the company. In addition, the human resources in the company also learn a lot from the role of other people outside the company, such as cooperation between companies. Knowledge is the basis of the improvement and development of a company because it can help companies to continue to create new things that can have a good impact on customers. Human resources are the main factor for companies. This is because they can implement knowledge and experience to achieve company goals. According to Pfeffer (1994), companies must assess and provide learning about the importance of knowledge about the company's superior quality because it is a competitive advantage over other companies. According to Kogut and Zander (1992), human resources must be cooperative within the company, especially in sharing knowledge, experience, and opinions related to problems that occur in the company and the strategies developed to improve product quality. This is because human resources have an essential role in the company. After all, they will characterize an advanced and superior company if they have the knowledge, relevant information, meaningful experiences, and constructive opinions. This is known as organizational learning, which every human resource in the company must possess. One way to increase employee cooperativeness is by providing a forum for gathering information, knowledge, and experience so that there are discussions between one person and another, which can produce new knowledge beneficial for the quality of employees.

Therefore, employees who are human resources in companies must pay attention to intellectual capital and organizational learning to make the company more advanced and superior in the future.

Orientation to structural capital in the form of data banks will enhance enterprise organizations' learning capabilities, reduce decision-making costs, and reduce misjudgments due to insufficient information. Human resources in a company that can cooperate with other companies are capital to achieve company goals because many relationships will affect the company. Beneficial experience for companies because when companies do marketing, cooperate, and look for great product opportunities, they can quickly achieve their goals. In addition, with this relationship, the company can develop the quality of its products due to sharing experiences and knowledge about business. This is a highly valued professional company. In addition, companies can conduct study from the results of collaboration with other companies to continue developing companies to be superior and of high quality. Companies that focus on the bottled water industry have three aspects: evaluations from consumers, suppliers, and other companies that focus on product design, packaging, and product quality.

According to Hsu and Sabherwal (2012), Intellectual Capital is the main focus that can support the external learning process. This is due to the solution formulated by human resources that implements it well so that the problems can be minimized. The effect of learning is considerable on the knowledge and competence of human resources in the company because of the various knowledge, information, experience, and abilities that are one step to developing the company (Herremans et al., 2011; Xu & Wang, 2018; Akhavan & Khosravian, 2016). Human resources are known as human capital, which consists of skill in solving the company's problems. This focuses on company leaders who have a good leadership style and accept the opinions of members based on their obstacles and experiences. As a result, the company will have a strategy to facilitate the company's performance well (Bloodgood & Chilton, 2012). In addition, there is a structural capital with several components that affect the company, namely company rules and the structure of ones, data, and information administration. Knowledge and information obtained from cooperation with other companies can help the structure of one. This is due to new learning related to how to regulate the company's organizational structure to be better. It is challenging for the company to have a relationship, it must prepare a strategy to receive new knowledge from other companies by making a performance design to get good relationships between companies.

Based on Tippins and Sohi (2003), there are several parts in improving company performance based on organizational learning, namely making cooperation related to new information, sharing information, understanding information, declarative information storage, and procedure memory storage. In this case, cooperation is essential in a company because it changes its performance. Companies must pay attention to the phenomena in the market, especially customers, competitors, and suppliers. So that there is an opportunity for the company to continue to develop the quality of the products produced. In addition, the problem faced by the companies is the existence of less competitive competitiveness that affects the company's performance. Therefore, companies must understand business knowledge which means they must sort out good or bad. This is because it will have an impact on the company. From this explanation, the researchers could formulate hypothesis 3 as follows:

H_3: *Intellectual capital indirectly affects the sustainability performance through external learning.*

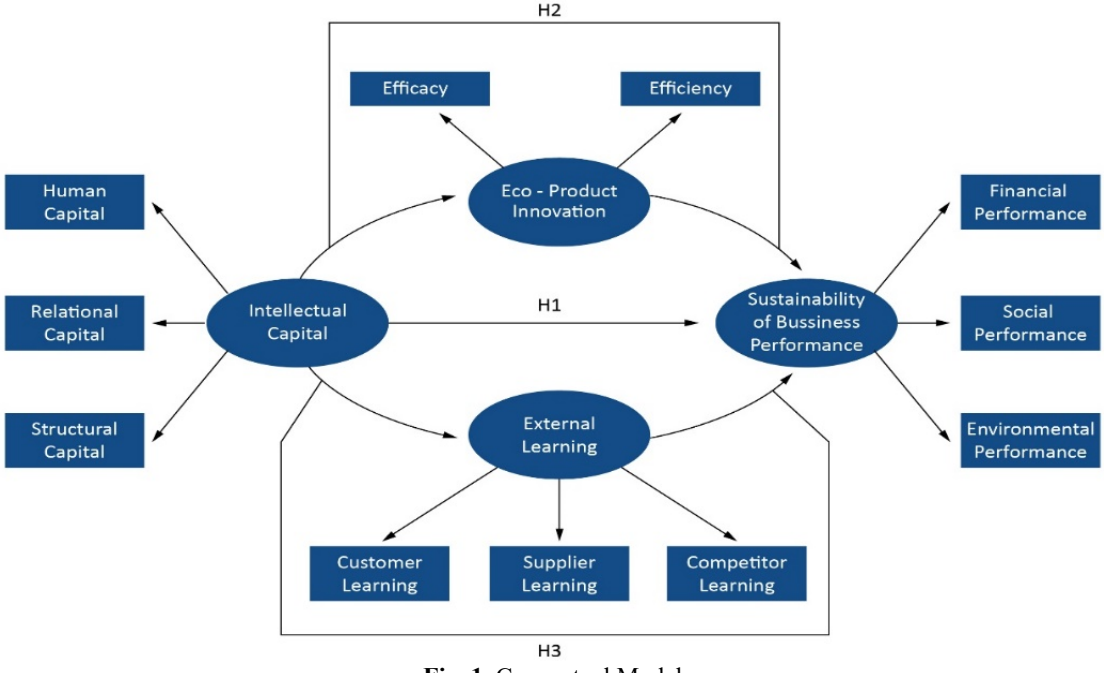

Fig. 1. Conceptual Model

3. Method

3.1 Sample and Data Collection

The researchers examined propositioned research hypotheses by applying primary survey-constructed data from senior managers, directors, and CEOs in the bottled water industry. In the first step, we made a list of industries joined by the Indonesian bottled water industry association and acquired information like the email and phone numbers of the companies. The scholar first set a listing of 270 companies with the assistance of information gathered representing databases of the Indonesian bottled water industry association. We primarily communicated with 270 industries and described to the appropriate individual the research aims and to observe if they were captivated in contributing to the task by completing the questionnaire. One hundred sixty-two industries exposed their attentiveness to cooperate in the study. Thus, we emailed the attentive industries a manuscript of the questionnaire and a cover note that clarified the study's goal. The fundamental approach implemented for the quantitative study was a survey study. We ultimately accumulated the survey data from 162 manufacturing industries (60 %).

3.2 Measurement Items

This study used intellectual capital, namely human capital has two aspects, namely social capital and structural capital; eco-product innovation has two aspects, namely efficacy and efficiency; external learning has three aspects, namely customer, supplier, and competitor; and sustainability performance has three aspects namely financial performance, social performance, and financial performance. Respondents were inquired to state their level of understanding with each declaration. Five-point Likert scales were applied with “strongly disagree” and “strongly agree” as the foundation. Three items determined human capital: adequate competence of company employees; company employees' adaptation to change; and company employees accustomed to innovation (Cua et al., 2001). Relational capital focuses on the relationship between customers, suppliers, and bottled water companies (Cua et al., 2001). Three items determine structural capital: the company uses advanced production machine technology, quality assurance certification related to product assurance like ISO9001, and a dynamic organizational structure (Cua et al., 2001). Eco-product innovation efficacy was determined in four items the replacement of lightweight packaging (low grammage) such as bottles, cups, and labels; expansion of the range of products in the product range such as cups; expansion of the product range beyond the main product such as making products in unique/new packaging; development of environmentally friendly products, such as replacing carton boxes with a wrapping system for bottled drinking water. Eco-Product Innovation Efficiency was determined in four items as a decrease in time (duration) required in production due to decreased thickness of product packaging, decreased time of work, decreased product costs, and decreased water volume. Customer learning was determined by four items: feedback about quality; feedback on design/speed of innovation; feedback about service; feedback about prices related to packaging. Four items determined supplier learning, namely feedback for quality, design, packaging, and product price.

Four items determined competitor learning: learning to adopt the quality of bottle products, adopting product design, adopting production efficiency, learning to adopt competitors about quality management (ISO FSSC 22000, ISO 14001). Four items determined financial performance: increased sales; increased profits; increase in market share; cost reduction operational. Four items determined environmental performance: reduction of plastic waste (bottles, labels); improvement of the company's work environment after implementing ISO; Efficient use of energy (electricity, fuel); Reducing the use of water volume. Social performance was determined by four items: welfare improvements for employees; Repair worker health; Repair worker safety; Improved respect for human rights.

4. Data Analysis and Results

Researchers used the PLS-SEM (Partial Least Square-Structural Equation Modelling) method to measure the direct and indirect effects of intellectual capital on sustainability performance using Eco-Product Innovation and External Learning on Bottled Water Industries in Indonesia.

4.1 Measurement Model

The researchers had measured convergent validity using loading factors that must exceed 0.7 and composite reliability green than 0.8. In addition, the Average Extracted Variance (AVE) should be greater than all constructs (Fornell & Larcker, 1981). Researchers had also verified the assessment outcomes of convergent validity; all loading factors fulfilled the necessities for the trial models in the study. By Cronbach α, the researchers showed the gauges of internal reliability. Table 1 Exposes the loading factor, AVE, and CR of Variables.

Table 1
Convergent Validity

Constructs and Items	Factor Loadings	Composite Reliability	AVE
Human Capital (HC)			
HC1:	0.824	0.789	0.741
HC2:	0.751		
HC3:	0.716		
Relational Capital (RC)		0.719	0.642
RC1:	0.805		
RC2:	0.859		
RC3:	0.769		
Structural Capital (SC)		0.756	0.712
SC1:	0.713		
SC2:	0.704		
SC3:	0.740		
Eco-product Innovation Efficacy (PIEcacy)		0.889	0.698
PIEcacy1:	0.854		
PIEcacy2:	0.815		
PIEcacy3:	0.735		
PIEcacy4:	0.801		
Eco-product Innovation Efficacy (PIEciency)		0.715	0.834
PIEciency1:	0.735		
PIEciency2:	0.727		
PIEciency3:	0.869		
PIEciency4:	0.725		
Customer Learning (CL)		0.711	0.789
CL1:	0.888		
SD2:	0.715		
SD3:	0.783		
SD4:	0.871		
Supplier Learning (SL)		0.754	0.792
SL1:	0.800		
SL2:	0.784		
SL3:	0.889		
SL4:	0.806		
Competitor Learning (CL)		0.743	0.656
CL1:	0.849		
CL2:	0.853		
CL3:	0.846		
CL4:	0.748		
Financial Performance (FP)		0.825	0.781
FP1:	0.824		
FP2:	0.840		
FP3:	0.791		
FP4:	0.783		
Environmental Performance (EP)		0.745	0.689
EP1:	0.818		
EP2:	0.784		
EP3:	0.844		
EP4:	0.806		
Social Performance (SP)		0.712	0.689
SP1:	0.860		
SP2:	0.839		
SP3:	0.775		
SP4:	0.785		

This latest propositioned technique was applied to scrutinize the discriminant validity across the Heterotrait-Monotrait ratio of correlations (HTMT), whereas the HTMT should be smaller than 0.90 (Gold et al., 2001). All variables in this model were established to be tolerable or discriminant valid, as depicted in Table 2. The capacity of the goodness-of-fit model was displayed to be acceptable (Standardized Root Mean Square Residual [SRMR]=0.068, and Normal Fit Index [NFI]=0.932) and corroborated the formulated model because SRMR < 0.08 and NFI > 0.9 (Henseler et al., 2015). Convincingly, we propose which structure fits acceptable data and is suitable for scrutinizing the study's hypotheses.

Table 2
Discriminant Validity

	External learning	Intellectual capital	Eco-Product Innovation	Sustainability Performance
External Learning				
Intellectual Capital	0.295			
Eco-Product Innovation	0.182	0.372		
Sustainability Performance	0.196	0.146	0.175	

4.2 Hypothesis Testing

This study analysed the relationship between constructs and mediator effects in measuring hypotheses, especially in theoretical models. The study depicted in Table 3 describes the coefficients of the hypotheses. Table 3 and Fig. 2 show the path coefficients by intellectual capital towards sustainability performance were positive and non-significant (ß= 0.02; p-value> 0.1). Then, H1 was not supported. Moreover, the indirect relationship of intellectual capital towards sustainability performance through eco-product innovation as a mediator was positive and significant (ß = 0.094, p < 0.05), and H2 was supported. Thus, the indirect relationship of intellectual capital towards sustainability performance through external learning as a mediator was positive and significant (ß = 0.096, p < 0.05), and H3 was supported. Presented above, we can determine that eco-product innovation and external learning fully mediate the relationship between intellectual capital and sustainability performance.

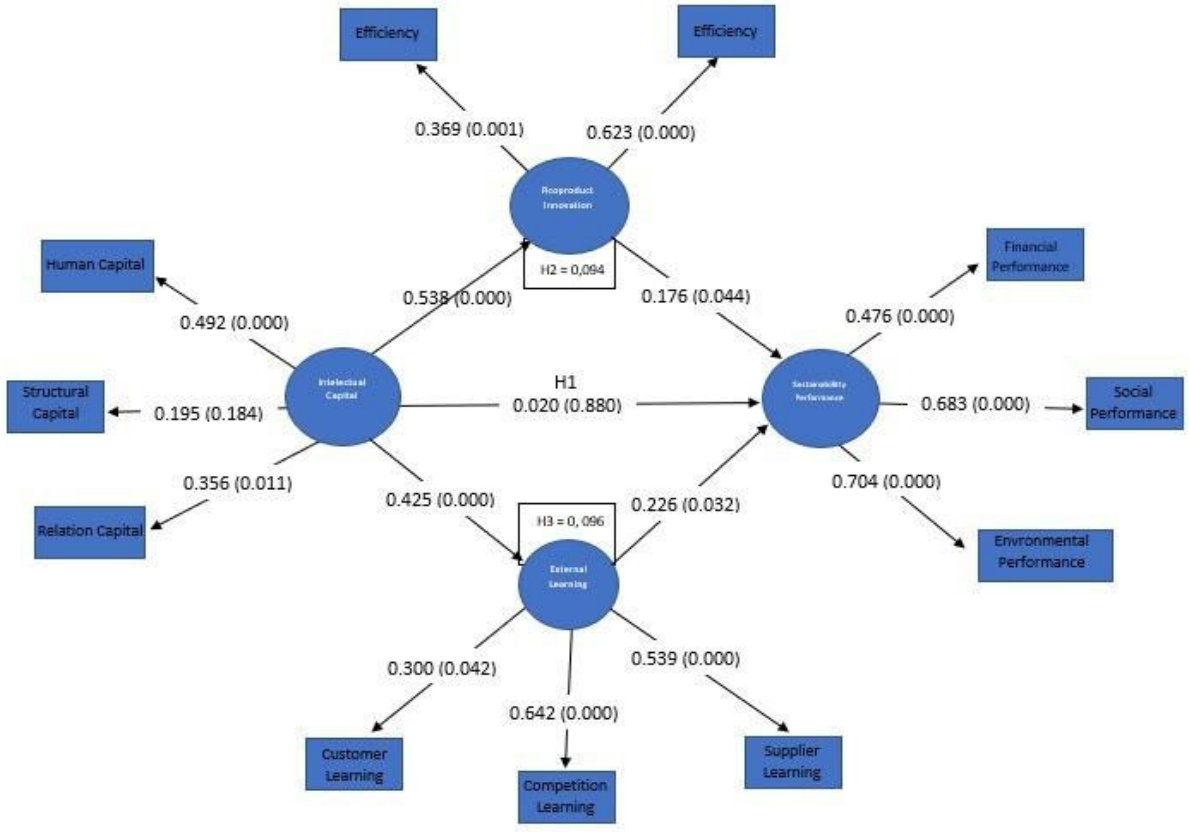

Fig. 2. Analysis Results (**p value* < 0,01; ***p value* < 0,05)

Table 3
Hypotheses Testing

Hypothesis	Relationship	Standard Coefficients	Test Result
H_1	Intellectual Capital ➔ Sustainability Performance	0,020	Non-Significant
H_2	Intellectual Capital ➔ Eco-product Innovation ➔ Sustainability Performance	0,094 **	Significant
H_3	Intellectual Capital ➔ External Learning ➔ Sustainability Performance	0,096 **	Significant

Note: Significant at *1%, and **5% levels

5. Discussion

Based on the study results of the empirical data from the hypothesis showed that intellectual capital did not affect the sustainability performance of the bottled water industry in Indonesia. Structural capital could not directly affect the business

performance on an ongoing basis. Talented human resources and a network of supplier and consumer relationships improved business processes. However, aspects of the dimensions of structural capital, such as bottled drinking factory machine technology and standard operating procedures based on ISO certification, still needed to be improved and adjusted to the needs of existing regulations. It occurred in most of the middle segments of this industry; they rarely performed regular machine maintenance, resulting in frequent downtime in production activities. Generally, the middle segment of the BOTTLE-DRINKING industry did not have a rigid and complete standard operating procedure, such as a machine maintenance schedule and preventive management if a machine was overhauled by providing factory machine parts. Irregular maintenance management could cause financial performance to decrease due to the cost of replacing more expensive machine parts, such as being late to change the oil on the engine and damage to one of the spare parts. So, they had no replacement or have been discontinued (Khalfallah & Lakhal, 2021; Han & Li, 2015).

Furthermore, the production target had decreased, which had caused the availability of finished bottled water products in the distribution network to experience delays and decreased consumer satisfaction. It indirectly affected the decrease in operating income, which was in line with the decline in sales levels (Hutahayan, 2020). This is supported by the study result from Hutahayan (2020); Khalfallah & Lakhal (2021), which showed that intellectual capital did not affect improving business performance in a sustainable manner in the bottled water industry. Empirical data showed that a company with a dynamic organizational structure was an indicator that was prioritized according to respondents' assessment of the structural capital dimension on the intellectual capital variable. In contrast, the environmental performance dimension, which was part of the sustainability performance variable, which was prioritized, was the reduction of plastic and cardboard packaging waste.

Based on the study results of the empirical data from the hypothesis showed that Intellectual capital (IC) indirectly increased sustainability performance through the development of eco-product innovation in Indonesian bottled drinking water industry. IC was used to take advantage of technological developments and improve business capabilities so that products could be produced at low prices but had high quality (Roadmap et al., 2015). Human resources with business capabilities could affect companies to produce products by updating materials and marketing the products (Prahalad & Mashelkar, 2010). In addition, the company's existing facilities that played an essential role in human resources were knowledge that could be implemented to make the production of these products successful. The existence of product standardization and reducing the various types of products could positively impact the development of these products to make them more effective (Roadmap et al., 2015). Natural resources focused on the manual way of developing products based on customer evaluations. Cooperation also played an essential role in improving the company's quality because a project benefits both companies (Nahapiet & Ghoshal, 1998). By collaborating with other companies, human resources would also improve their quality because they communicated and discussed product innovation, solutions to problems in products and other companies, and product selling prices, uses, and effects on customers in life. All of that must be considered properly so that problems in product production could be appropriately minimized. Therefore, companies with high IC would be able to coordinate the market dynamically and disseminate the latest products, especially in volumes of glass or gallons.

In addition, the competence of employees in the drinking water industry developed new products by combining existing knowledge or new knowledge from related parties through acquisition, communication, acceptance, and assimilation of knowledge within the company (Jolly & Therin, 2007). Furthermore, when employees could transfer their knowledge to benefit bottled drinking water product development, the company had a very high product innovation performance, especially in product innovation efficiency. Companies with employee orientation that have higher capabilities enable radical innovation to increase the rate of change within the company. For example, the BOTTLE-DRINKING company previously used a 2.8-gram gramatur cup with a water volume capacity of 220 ml. The time needed in the production process activities was relatively extended, and the number of workers needed in one shift of production activities was relatively large.

Conversely, input from quality assurance employees to reduce the grammage of the cup weighs 2.6 grams. It had a water volume capacity of 220 ml with a new moulding design that impacted the duration of the production process activity period to be faster. The number of workers needed in one Shift production activities had decreased. So, eco-product innovation efficacy showed that a decrease in the cup did not cause a decrease in water volume capacity. The eco-product innovation efficiency aspect showed that production activities' time became shorter than before. The labour cost burden had decreased due to a decrease in the number of personnel energies required for production activities. It supported the human capital dimension as a constructed part of IC in increasing eco-product innovation efficacy and efficiency.

Eco-product innovation was essential for company performance in bottle drinking (Piyathanavong et al., 2019). It occurred due to continuous improvement in work processes to improve environmentally friendly packaging products. Efficiency in product innovation could increase the company's financial performance by creating new eco-products, such as a significant reduction in the grammage thickness of the glass where indirectly the volume of product water used remains the same. It was affected by reduced thickness, which affected the price of glass or plastic bottle packaging to be more efficient, directly reducing packaging costs so that the company could increase its net profit performance. In addition, efficiency in product innovation could improve environmental performance by reducing plastic packaging raw materials; this was due to a decrease in the grammage of cup packaging so that the disposal of plastic waste becomes more managed. Other aspects impact electricity usage bills which have decreased because product innovations could accelerate machine productivity from lower

power usage due to a decrease in grammage cup. Thus, eco-product innovation could improve environmental performance through reduction initiatives to reduce air emissions, wastewater, solid waste, hazardous or toxic materials, and the frequency of environmental accidents.

The next aspect was efficiency in product innovation which could minimize cycle time by choosing activities that could be more useful for human resources in the company, especially at production sites. It could meet the targets set by production planning inventory controlling (PPIC) because the cup packaging product design was compatible with cup-filling machines. It affected the speed of cup production, and indirectly, the packing department employees could accelerate the productivity of the finished product. So employees felt that they could go home earlier than the set schedule because targets had been met, and they get additional incentives if they exceed the production target daily. Thus, eco-product innovation could improve social performance because employees felt comfortable carrying out production activities. After all, auxiliary materials were effective with circular production machines. In addition, eco-product innovation efficiency affects intellectual capital toward sustainability performance. It had a more significant contribution than the mediation of eco-product innovation efficacy in the bottle-drinking industry in Indonesia.

Based on study results of empirical data, the hypothesis showed that the application of intellectual capital (IC) indirectly increased sustainability performance through solid support from external learning in the bottle-drinking industry in Indonesia. IC had a significant effect on the company because it could not be seen but could provide quality and significant development for the company in the future. In addition, BOTTLE-DRINKING companies focused on evaluations given by consumers, suppliers, and competitors because of the feedback, suggestions, and criticisms given for the company's development. So that the company could update the product to make it more useful for them. This is supported by Zahra and George, (2002), that companies can formulate, design, and revise their knowledge to achieve goals with this evaluation. So that the company also learned a lot about the importance of product quality. In addition, knowledge transformation allowed organizations to absorb new knowledge from consumers or suppliers, which was then elaborated with knowledge in building new cognitive structures. Relational Capital (RC) represented the quality of relationships with consumers, suppliers, and other competitors where the companies had interpersonal relationships. So its employees own with suppliers and customers in helping to exchange real-time information regarding the availability of raw materials and also improve coordination with related consumers-finished goods inventory. It helped companies build resilience in their supply chain suppliers by ensuring raw material production schedules from suppliers. This aimed for the company to arrange the time to prepare the materials needed to produce the product so that there were no delays that are likely to have a negative impact on the company (Ariadi et al., 2021). Furthermore, collaboration with suppliers could provide opportunities for producers to respond quickly to force majeure events, such as machine disruptions from suppliers, so bottled drinking water producers could anticipate production activities by configuring other product schedules. As a result, bottled drinking water producers with extensive relational capital could positively impact companies because they could improve the quality of product production better due to cooperation between companies. In addition, a high level of RC could improve the learning process with the consumer. For example, bottled drinking water producers could increase their production capacity to be optimal even though their storage warehouses were very limited. Distributors could assist it in absorbing excess production from producers through strategic integration with consumers (Ariadi et al., 2021). There was intensive communication between bottled drinking water producers and distributors, so there was a more accurate and fast response regarding finished products' availability and projected needs.

Furthermore, a high level of RC could improve the learning process with competitors (competitors). It could be seen from producers effectively identifying and absorbing valuable knowledge sources through cognitive and social capital where there was a knowledge acquisition process by contributing to increasing the identification of knowledge from other competitors. For example, bottled drinking water producers had an association organized for the bottled drinking water industry throughout Indonesia called ASPADIN, where information and knowledge were exchanged regarding the quality of each bottled drinking water product. It could help other bottled drinking water producers with limited information to develop better from the aspect of learning together through employee training on ISO or other food product safety. Thus, close relationships with other bottled drinking water producers could facilitate absorbing knowledge possessed by competitors and then transforming the results of the assimilation of knowledge into developing better product quality standards.

External learning was learning from consumers, suppliers, and competitors that could sustainably improve business performance through collaboration between producers and partner companies (buyers and suppliers) to achieve competitive advantage. Coordination and collaboration between bottled drinking water producers and suppliers through knowledge and information exchange could develop resources that lead to better environmental performance (Tippins & Sohi, 2003). The development of the moulding cup design from grammar and accuracy in the bucket of the glass water filling machine could reduce production costs of finished goods, indirectly saving water resources. Furthermore, companies could update the performance system based on environmentally friendly products that were highly valued by many people. This is supported by Aikenhead et al. (2015) that companies would have uniqueness and characteristics that were known by many people because they were aware that the company was concerned about the importance of environmentally friendly products. So the company could increase its competitiveness by having high quality. Product innovation, which results from learning between producers, suppliers, and consumers, could reduce pollution and energy consumption.

Thus, the stronger the assimilation and transformation of knowledge obtained from suppliers and consumers could sustainably improve environmental performance. Furthermore, external learning improved social performance by training employees to maintain work safety to avoid accidents. In addition, a collaboration that led to increased social performance where collaboration had a direct impact on the social performance of bottled water producers through providing training to employees and direct involvement from suppliers in helping producers improve their performance (Sancha et al., 2016). Thus, the stronger the assimilation and transformation of knowledge obtained from suppliers and consumers could sustainably improve social performance. Another aspect of collaboration and knowledge exchange between producers, suppliers, and consumers pays attention to how the product is processed from the beginning until finally, the product is in waste disposal (Ceschin & Gaziylusoy, 2016). There are processes of reducing emissions, using and designing products so that manufacturing process activities can reduce the consumption of large amounts of energy and the various wastes that threaten ecological systems. Effective energy management in production activities could reduce manufacturing costs, increase production flexibility, and improve product quality to increase net profit due to efficiency in production costs. Thus, pollution prevention practices led to lower production costs which ultimately increased the competitive advantage in the bottled drinking water industry. This aimed to minimize the emergence of environmental problems and provide benefits for companies to manage waste from these products. As a result, the Indonesian bottled drinking water industry was more developed due to outside learning related to the importance of intellectual capital and sustainable performance, which significantly affected a company.

6. Implications

Eco-product innovation and external learning were positioned as mediators. This study provided novelty, especially in model construction, that could provide solutions to research gaps related to the effect of intellectual capital towards sustainability performance. In addition, the novelty of this study was the renewal of eco-product innovation and external learning which did not directly mediate intellectual capital on sustainability performance with the theory of dynamic capabilities and knowledge-based views. In addition, a new eco-product innovation construct is developed into two dimensions: efficacy and efficiency. These two dimensions reflected a significant influence on the eco-product innovation variable. Eco-product innovation with the efficiency dimension significantly improved company performance from the financial, social, and environmental dimensions compared to the role of eco-product innovation with the efficacy dimension. Furthermore, a new construct from external learning was developed into three dimensions: consumers, suppliers, and competitors. These three dimensions reflected a significant influence on external learning variables. Finally, external learning with the competitor dimension significantly improved company performance from the financial, social, and environmental dimensions compared to the role of external learning with the consumer and supplier dimensions.

From a practical viewpoint, intellectual capital helped exchange knowledge and information with distributors, suppliers, and competitors. The way managers created a team atmosphere and social influence to assist employees in assimilating knowledge obtained from consumers or suppliers and then integrating it into the organization, then transforming it into developing a new product. For example, developing a molding cup design from the aspect of grammar and accuracy in the bucket of a glass water filling machine results in a reduction in the production costs of finished goods, which indirectly saves the use of water resources and reduces packaging costs. In addition, the ethical standards of the company's commitment to environmental conservation affected the integration of new product designs and processes into the bottled drinking water producer structure. It was reflected in redesigning the company's products and production processes by environmental and social regulations, ultimately resulting in a competitive advantage. Product innovation results from learning between producers and suppliers, and consumers can reduce pollution and energy consumption. Thus, the complete assimilation and transformation of knowledge obtained from suppliers, consumers, and competitors could improve business performance continuously.

7. Conclusions and Limitations

The study outcomes evolved the understanding of intellectual capital and delivered corroboration concerning the function of eco-product innovation and external learning as mediators of sustainability performance. We embraced the theory of dynamic capability view and theory of knowledge based-view to scrutinize collaborative impacts among intellectual capital, eco-product innovation, external learning, environmental performance, social performance, and financial performance. The researchers provided empirical evidence of eco-product innovation and external learning as the main drivers for bridging the linkage between intellectual capital and sustainability performance. Intellectual capital and sustainability performance were not related to each other. The empirical findings reveal which external learning was more influential than eco-product innovation when bridging the relationship between intellectual capital and sustainability performance. It proposed that external learning was essential for amplifying the influences of accomplishment of intellectual capital towards sustainability performance.

This study had constraints that served as a guide for future studies on the same topic. The scrutiny employs a cross-sectional method which would allocate longitudinal experimentation for the next study by investigating the effect of intellectual capital towards eco-product innovation and external learning, which enhanced sustainability performance. Conclusively, this study was conducted by a sole industry bottle-drinking company. Compiling data by variant industry areas was appealing and valuable to stipulate more evidence of results.

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