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BUSINESS INTELLIGENCE ON FIRM'S PERFORMANCE: THE MEDIATION EFFECTS OF OPEN INNOVATION AND FINANCIAL PERFORMANCE

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ABSTRACT

Purpose- In order to recognize and adapt to the changing demands and desires of their customers, businesses must become more inventive. This is made necessary by the quickly evolving multinational business environment and the extraordinary technological breakthroughs. Due to assure firm performance, these intelligence businesses must be able to respond to the complex dynamics in the global marketplace successfully, accurately, efficiently, and fast. Open innovation can be created to enhance performance by using knowledge learned about outside projects, rival businesses, clients, and new technologies. The purpose of this study is to ascertain the impact of business intelligence on a firm's performance with the mediation effect of open innovation on financial performance.

Methodology- The statistical population for this study consists of 200 managers from internet technology and software enterprises. There are 132 company managers in the sample. A questionnaire that was distributed and gathered using a non-probability sampling technique is the data collection tool in this study. The research data were also examined using Smart-PLS and SPSS software. In this study, both descriptive and inferential analyses were used.

Findings- Data analysis using PLS software and research findings demonstrate that business intelligence and open innovation have a positive influence on financial and firm performance. The findings also show that open innovation and financial performance play the roles of mediators.

Conclusion- The results demonstrate that higher business intelligence levels enhance firm performance. In today's fast-paced and competitive company world, managing and optimizing business performance is essential for maintaining viability as well as maximizing firm profitability. In order to access performance, effective business performance management will combine business analytics with open innovation. Business intelligence can therefore offer a foundation for comprehending which data is pertinent for open innovation and company business improvement.

Keywords: Business intelligence, firm performance, financial performance, open innovation

JEL Codes: M20, L25, O36

1. INTRODUCTION

The information age and globalization have ushered in the twenty-first century (Salehi et al., 2021). Due to the market rivalry the businesses must engage in inventive initiatives (Salehi and Asrar, 2022). Organizations and people are increasingly connected to one another and to other organizations (Orzan et al., 2020). To handle uncertainty, keep ahead of the crisis, and be ready for future issues, businesses must adopt new mindsets, approaches, and pragmatic solutions. Information that can be utilized as a foundation for intelligence practices is becoming more readily available through electronic means of collecting, processing, and communication, which is why business intelligence is gaining importance (Caseiro and Coelho, 2019). A new decision-support system called "business intelligence" is built on cutting-edge information technology and methodologies (Chen and Lin, 2019). In order to make effective decisions and increase economic value in the face of an ever-increasing abundance of data, businesses are increasingly turning to business intelligence (Božič and Dimovski, 2019). Business intelligence is crucial in today's organizations because it enables businesses to track market trends, rivals' moves, and customer behavior through delivering information (Huang et al., 2022). Although the word "business intelligence" is first

documented to have been used in 1865, the contemporary era of business intelligence began in the 1990s (Mariani et al., 2018). The development of computing and internet technologies has made it easier to continuously gather a significant volume of heterogeneous data from various sources, creating new opportunities and problems for business intelligence (Ram et al., 2016). In a business intelligence study, Choi et al. classified the suitability of social media data and compared that data to public government data and gray literature (Choi et al., 2020). Data is collected, stored, and evaluated by business intelligence, the procedural and technological infrastructure that enables a corporation to gather, store, and analyze data (Wang et al., 2022). There are new methods for assessing business intelligence data extraction tools and assisting users in creating well-organized, high-quality information for enterprises (Duque et al., 2022). Although business intelligence has been incorporated into firm plans, this field of study is still in its infancy. As a result, one of the objectives of this study was to examine how business intelligence affects performance while accounting for the effects of financial performance and innovation as mediators.

Due to globalization and increasing technical advancements, businesses now face more rivalry and market dynamism. Businesses must innovate to stay ahead of the competition (Božič and Dimovski, 2019). The idea of open innovations has made it possible to achieve and implement innovations for those organizations for which they were previously unattainable for a variety of reasons, as firms are continually seeking competitive advantage (Szromek et al., 2023). Open innovation refers to using a methodology for innovation that is susceptible to external contamination and involves the spreaders of new ideas (Bigliardi et al., 2023). The majority of innovative activities, such as enhancing internal invention processes and looking for outside commercialization opportunities, have been implemented by many businesses over many decades, therefore the origins of open innovation can be traced back a long way in time (Huizingh, 2011). Previous management studies have shown that open innovation at the business level aids in stimulating creativity by mixing expertise from various external partners, enriching a firm's internal knowledge base, and giving access to a wider range of technology opportunities (Bahemia and Roehrich, 2023). According to open innovation experts, companies can increase their resource base and become more innovative by interacting with actors outside of their organizational bounds and fusing their contributions with existing resources (Toroslu et al., 2023). Limitations of open innovation that are poorly documented in the literature lead to difficulties in open innovation implementation, complexity in open innovation governance, and ambiguity in open innovation outcomes (Abhari and McGuckin, 2023).

The firm has a duty to preserve sustainability and expansion in order to give investors hope of rewards. By carrying out activities in accordance with the wishes of investors, the company can continue to exist and investors can experience spectacular gains (Harahap et al., 2020). Marketing managers are under increasing pressure to defend their spending and demonstrate how it affects financial results practically (Narteh, 2018). Entrepreneurs can enhance financial performance, particularly when integrating resources in novel and distinctive ways to outperform rivals (Huang et al., 2022). While regularly assessing their wide range of operations and processes, many businesses employ financial performance measures. The attention must go beyond the confines of businesses when these procedures are connected to external organizations, creating an inter-organizational management and network accounting system (Seiler et al., 2020). Businesses need to be able to evaluate new circular offerings' financial performance, including the effects on costs, revenues, and cash flows (Kanzari et al., 2022). Financial statement analysis also makes it possible for financial markets to effectively allocate resources in accordance with the investor's wise choices (Mushtaq et al., 2022). Due to their complex structure and the lack of standardized research tools, few studies have examined the textual data from the financial statements to forecast the financial success of the companies.

A company's ability to improve business performance determines its success (Shanak et al., 2022). Consistently enhancing business procedures is crucial in the competitive and difficult business environment of today (Park and Song, 2020). Due to the limitations of traditional management of business performance based mostly on financial management, new non-traditional measures are now being advocated globally (Zamecnik and Rajnoha, 2015). The purpose of this study is to ascertain the impact of business intelligence on a firm's performance with the mediation effect of open innovation on financial performance. This issue demonstrates how business intelligence and open innovation can influence performance. In fact, nowadays, performance is brought and created by business intelligence through open innovation

The purpose of this research is to assess the impact of business intelligence on a firm's performance through the mediation effects of open innovation and financial performance. Research shows that business intelligence is the source of progress and growth in organizational performance that fosters open innovation. Also, the background of the research shows that the performance of the company relies on its financial performance, which is provided by achieving open innovation. The following section presents a review of key related literature, and hypotheses development.

2. LITERATURE REVIEW

2.1. Firm's Performance

According to Narteh (2018), a firm's performance is measured by its profitability, ability to lower investment risk, and ability to outperform its rivals. While retaining a dominant position in an industry, a corporation might spend in R&D operations, adopt new technologies, produce new goods, and other strategies to boost its firm performance (Tseng et al., 2023). Finding the factors that influence how well a corporation performs is a difficult undertaking (Chang and Li, 2019).

In order to innovate and run day-to-day operations more efficiently, managers must take on more complex hybrid ambidextrous tasks (Ali et al., 2020). Businesses that wish to perform better, expand, or gain a competitive advantage must innovate their business models (Bashir et al., 2023). It is thought that businesses can gain a competitive edge through learning and innovation processes, which eventually results in improved firm performance (Thoumrungroje and Racela, 2022).

Businesses must make an effort to obtain data to help management make better decisions that will enhance the success of the company (Caseiro and Coelho, 2019). Generally speaking, business intelligence systems are software programs that provide information to decision-makers to support the maintenance of business performance (Richards et al., 2019). Business intelligence plays an essential role in enhancing coordination among stakeholders and has a direct impact on operating efficiency and performance. It is an endogenous driving factor and an interactive force (Chen and Lin, 2021). Aspects of financial or non-financial nature may be covered by objective or subjective performance measurement (Kanzari et al., 2022). An important factor in determining a company's potential to thrive and expand is the analysis of its financial performance (Battisti et al., 2022).

2.2. Business Intelligence

The idea of business intelligence is not new, and many businesses and other organizations have used it (Suša Vugec et al., 2020). Throughout the last few decades, there has been a significant increase in the amount of information that is readily available, the speed at which business information is developing, and technological understanding (Salehi et al., 2013). Due to the inclusion of ideas like analytics, big data, and artificial intelligence—essential concepts for business executives in organizations of all sizes and industries, as well as in the public sector—it has recently gained even greater popularity (Suša Vugec et al., 2020). In order to help an organisation better understand its business and market and make timely business choices, business intelligence is the strategies, technologies, systems, practices, methodologies, and applications that analyze crucial business data (Božič and Dimovski, 2019). With the aim of assisting firms by facilitating knowledge and promoting better management decisions, business intelligence encompasses a variety of unique fields and technology (Moro et al., 2015). According to Huang et al. (2022), business intelligence is a priceless and irreplaceable internal resource that businesses use to increase their managers' knowledge bases (Huang et al., 2022). Business intelligence systems deal with and evaluate business data in a certain application field from a different industry using the data warehouse, online analysis, and data mining technologies (Zhang et al., 2022).

The amount of data that is gathered during an organization's everyday operations in its various departments and the information that managers need to know differs significantly (Xu et al., 2022). In order to make precise and wise business decisions as quickly as possible, business intelligence has been offered as a tool, product, and system, encompassing applications and analytics based on operational and analytical databases (Wang et al., 2022). Business intelligence, in its traditional sense, refers to a variety of organizational and technical tools that enable the conversion of massive amounts of real-time data into knowledge that can be used to decision-making processes.

It is asserted that business intelligence played a unique role when managers were required to perform the following tasks: (a) consider numerous data points in the decision-making process, frequently from different sources; (b) manage historical data; (c) manipulate synthetic data; (d) forecast the future and develop long-term plans; (f) conduct continuous control over the implementation of actions taken, both operational and strategic in nature; and (g) react quickly to changing circumstances (Olszak, 2022). Business intelligence aids a business in achieving its strategic objectives, responding to a variety of internal and external events that have an impact on daily operations, and planning for upcoming events (Binzafrah and Taleedi, 2022). Business intelligence can be used in a variety of ways, such as for product pricing determination, product placement, or sales forecasting (Nurdin et al., 2023). Success in business intelligence requires complexity, and complexity has a price. Business intelligence technology investments are costly since they require infrastructure, software, licenses, training, and wages for implementation (Gaardboe et al., 2017).

The business unit level is where business intelligence is thought to be most effective, and it is via improvements at the business unit level that overall organizational performance is improved (Peters et al., 2016). A thorough business intelligence system for marketing procedures needs precise and pertinent market data (Huang et al., 2022). Businesses can succeed in

building market value and enhancing financial performance, particularly when integrating resources in novel and unconventional ways to outperform rivals (Huang et al., 2022). As a result, the following hypotheses are proposed:

H₁: A higher level of business intelligence positively influences the development of open innovation.

H₂: A higher level of business intelligence positively influences the development of financial performance.

H₃: A higher level of business intelligence positively influences the development of a firm's performance.

2.3. Financial Performance

The company's financial performance, including its sales and profitability growth, stock status and growth rate, net profit margin, and operating profit margin (Huang et al., 2022). Financial performance includes both market returns and the accounting rate of return, which measures the business's profits in relation to its invested assets (Rao and Vinod, 2023). The utilization of technology-based science and technology supported by skilled human resources to enable enhanced business productivity and economic stability is intimately tied to the financial performance of a corporation (Menne et al., 2022). Organizational and environmental strategies, technological capability, capital structure, comprehensive quality management, social responsibility, and R&D investment, as well as social, institutional, and market actors, are all factors that affect financial success (Wu and Huang, 2022).

Decision-makers, including managers, can utilize the information from financial performance review to assess the past and set objectives for the future (Türegün, 2022). The companies' decision-makers may find the financial performance to be a valuable source of information on the effectiveness of money flow (Liu et al., 2023). Businesses that maintain a steady flow of consumers who use their services are businesses that are successful financially (Narteh, 2018). The capacity to make profits will also rise if the financial performance is improving. The profitability ratio, which demonstrates the company's great capacity to produce returns for investors, demonstrates this (Nafasati and Hilal, 2021).

Financial performance can be understood as the outcomes of numerous operations that have been carried out, and it serves as an example of the company's success (Manurung et al., 2019). Nonetheless, business intelligence is crucial in today's enterprises because it gives them the opportunity to track market trends, the moves of rivals, and the behavior of customers (Huang et al., 2022). It is crucial to research how business intelligence affects financial performance. As a result, the following hypotheses are proposed:

H₄: A higher level of financial performance positively influences the development of a firm's performance.

H₅: Financial performance mediates the effect between business intelligence and a firm's performance.

H₆: Financial performance mediates the effects between open innovation and a firm's performance.

2.4. Open Innovation

The competitive strategy of small, medium, and large firms must include innovation (Drucker, 2002; Salehi and Asrar, 2022). In keeping with the organization's business model, open innovation is a dispersed innovation process based on intentionally controlled knowledge flows across organizational boundaries (Lu and Chesbrough, 2022). The importance and relevance of collaboration between organizations and stakeholders in its many configurations in the process and development of innovation serves as the cornerstone of the aforementioned innovation category (Da Silva Meireles et al., 2022). The majority of research on open innovation have underlined the value of being broadly open to various outside sources of knowledge in enhancing innovation performance at the firm level (Bahemia and Roehrich, 2023).

The open innovation model's implementation necessitates a considerable organizational transformation within the business, affecting both current business procedures and its values or culture (Trzeciak et al., 2022). The closed innovation paradigm has been weakened by a number of variables, including the expanding mobility of skilled labor, the expansion of venture capital, and the increasing importance of outside knowledge suppliers (Ogink et al., 2022). Open innovation can be categorized into three main categories. IP in-licensing, concept and start-up competitions, and crowdsourcing are typical instances of inbound (outside-in) open innovation activities, whereas spin-offs and corporate business incubation are examples of outbound (inside-out) activities (Liu et al., 2022).

Inbound open innovation, also known as open innovation from the outside, is crucial for a firm's innovative performance as well as its financial success, according to the growing body of open innovation research (Cheah et al., 2021). Using their strong technical and economic capabilities, companies with plenty of resources can carry out their innovative internal actions (Moradi et al., 2021). It is possible to develop new goods or streamline processes by using the information learned about competitors, clients, and emerging technology. Hence, business intelligence fosters innovation inside the company (Eidzadeh et al., 2017). As a result, the following hypotheses are proposed:

H₇: A higher level of open innovation positively influences the development of financial performance.

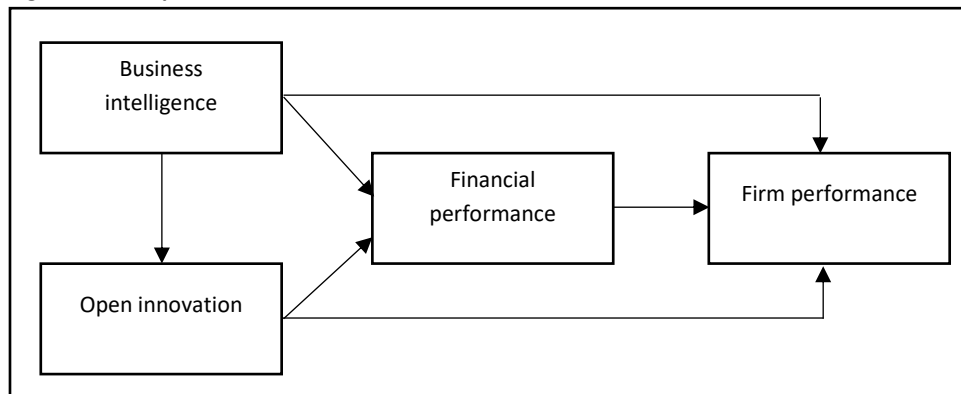
H₈: A higher level of open innovation positively influences the development of a firm's performance.

H₉: Open innovation mediates the effects of business intelligence on financial performance.

3. DATA AND METHODOLOGY

The statistical population of this research consists of 200 managers of internet technology and software companies. 132 firm managers have been chosen as the sample size using a non-probability sampling technique. The managers of these organizations evaluate the skills of the firms through the responses to the questionnaire. The conceptual model shown in Figure 1 is based on past research.

Figure 1: Conceptual Model



The statistical population of this research consists of 200 managers of internet technology and software companies. 132 firm managers have been chosen as the sample size in this regard using a non-probability sampling technique. The managers of these organizations were given and collected the study questionnaire in order to evaluate the skills of the firm and the responses.

The model's measurement indicators are given in this study. The measurement indices for the variables in the conceptual model are displayed in Table 1.

Table 1: Measurement Indicators

Variables	Measurement indicators	References
Business intelligence	Programs for business intelligence and analysis boost performance effectiveness and efficiency.	Bany Mohammad et al (2022)
	Programs for business intelligence and analysis are made to manage administrative and financial procedures and events.	
	With the utilization of the data kept in databases, business intelligence and analysis applications help firms make better decisions.	
	Programs for business intelligence and analysis assist in learning about the reality of databases stored in systems in areas that support the abilities of the organization's upper management.	
	Programs for business intelligence and analysis aim to improve the bank's capacity to complete all necessary objectives.	
	Programs for business intelligence and analysis display symbolic knowledge, such as graphs, semantic networks, and texts, in a straightforward manner.	
	Programs used for corporate intelligence and analysis can extract knowledge from complicated data.	
	Software for business intelligence and analysis enables quick and sufficient knowledge archiving.	
	The business intelligence and analysis programs represent the knowledge and inferences in accordance with the criteria established by the bank.	

Variables	Measurement indicators	References
	Programs for business intelligence and analysis use knowledge and inferences, which are kept secure to prevent manipulation.	
	Programs for business intelligence and analysis meet all the bank's information and data needs about banking operations.	
	The bank's business intelligence and software systems are aiming to update themselves regularly and automatically.	
	Systems and software for business intelligence and analysis handle logical and programming faults.	
	In the case of an unexpected outage in the bank's network, business intelligence and analysis software keep a copy of the data on hand automatically.	
	Periodic device maintenance is carried out by specialized organizations for the bank's business intelligence and analysis programs.	
	The programs connected to the bank's business intelligence and analytical tools are updated on a regular basis by specialized organizations.	
Firm performance		
Operational efficiency	Operating income, net	
	Margin of operations (Earnings before interest, taxes, depreciation, and amortization)	
	a profit-and-loss statement	
Market effectiveness		
	Sales Earnings	
	Market Shares	
	Asset Turnover	
	Integrated Reporting	
Financial resilience		
	Debt/ equity	
	Liquidity	
	Bankruptcy	
Financial performance		
	Increased profitability	
	Decrease in investment risk	
	Lowering of access barriers	
	Surpassing the competition	
	Reduction of costs	
	increased revenue	
Open innovation		
	Collaborated with a wide variety of external partners in industry in the last 3 years.	
	Collaborated very strongly with universities and research centers in the last 3 years.	
	Collaborated very strongly with technical and scientific service companies in the last 3 years.	
	Collaborated very strongly with governmental institutions in the last 3 years.	
	Collaborated very strongly with customers in the last 3 years.	
	Collaborated very strongly with firms operating in different sectors of activities in the last 3 years.	
	Collaborated very strongly with other competitors in the last 3 years.	
	Collaborated very strongly with suppliers in industry in the last 3 years.	
	A significant percent of sales of open innovation in the last 3 years.	
	Compared with major competitors, the introduced more open innovation offerings in the last 3 years.	

Mouzas and Bauer (2022)

Huang et al (2022); Gök and Peker (2017)

Gassmann et al. (2010); Lazzarotti et al. (2010)

Variables	Measurement indicators	References
	Even without using external technology, achievement market success in the last 3 years.	

The data in this study have been analyzed using descriptive and inferential tests. In the descriptive section, percentages, averages, and standard deviation were computed; in the inferential section, the study data were examined using SPSS and Smart PLS software. In two steps, the PLS model is evaluated and interpreted. two models: a structural model and a measurement model. By figuring out how the latent variables or sub-constructs are assessed in the form of a greater number of observable variables, the measurement model, which is a component of the confirmatory factor analysis, aids in addressing concerns about the validity and reliability of the measurement. The links between structures (latent variables) and their capacity for explanation are also displayed by the structural model.

4. FINDINGS AND DISCUSSIONS

4.1. Factor Loading Test

Table displays the weight values for the factor loadings in this questionnaire (2). The weight of factor loading for all questions is more than 0.7, as shown in the table below, which is the least value that can be used for factor loading. This leads to the conclusion that the questions chosen to assess each variable have the proper weight to assess that particular variable.

Table 2: Values of Factor Loads

Items	Business intelligence	Open innovation	Financial performance	Firm performance
Buln1	0.862217			
Buln2	0.806023			
Buln3	0.818976			
Buln4	0.841188			
Buln5	0.819507			
Buln6	0.806761			
Buln7	0.827478			
Buln8	0.908836			
Buln9	0.885312			
Buln10	0.834146			
Buln11	0.725922			
Buln12	0.976624			
Buln13	0.790273			
Buln14	0.775686			
Buln15	0.827246			
Buln16	0.755340			
FiPe1		0.966219		
FiPe2		0.805025		
FiPe3		0.814978		
FiPe4		0.844181		
FiPe5		0.816509		
FiPe6		0.807763		
FiPe7		0.824478		
FiPe8		0.803839		
FiPe9		0.985314		
FiPe10		0.838146		
FiPe1			0.763216	
FiPe2			0.804025	
FiPe3			0.814973	
FiPe4			0.846184	
FiPe5			0.815504	
FiPe6			0.803762	
OpIn1				0.666219
OpIn2				0.705025

Items	Business intelligence	Open innovation	Financial performance	Firm performance
Opln3				0.815978
Opln4				0.745181
Opln5				0.716509
Opln6				0.707763
Opln7				0.724476
Opln8				0.703838
Opln9				0.789314
Opln10				0.730148
Opln11				0.721924

4.2. Convergent Validity

The degree to which the questions designed for each variable have the proper convergence for measuring the important variable and are capable of assessing that variable is known as convergent validity. The average extracted variance value (AVE) is examined in the partial least squares (PLS) approach. The value of AVE must be more than 0.5 in order to meet the standard for satisfactory convergent validity. The convergent validity of the questionnaire questions to measure each variable is appropriate, as shown in Table (3) below, where all the estimated AVE values are greater than 0.5. Average Variance Extracted (AVE) is a metric for comparing the variation collected by a construct to the variance resulting from measurement error.

Table 3: AVE Mounts

Variables	Average Variance Extracted (AVE)
Business intelligence	0.87
Open innova	0.84
Financial performance	0.81
Firm performance	0.79

4.3. Divergent Validity

The meaning of divergent validity is that the questions related to the measurement of each variable do not overlap with other research variables. As can be seen, the values of the average root of the extracted variance (Table 4), which are placed in the matrix of the table, are larger than all the correlation values calculated in the same column.

Table 4: Divergent validity

Variables	Business intelligence	Open innovation	Financial performance	Firm performance
Business intelligence	0.85			
Open innovation	0.89	0.88		
Financial performance	0.86	0.79	0.73	
Firm performance	0.68	0.82	0.84	0.90

This leads to the conclusion that the research tool has an appropriate divergent validity, which means that the questions of each structure have a higher association with the linked structure than other structures.

4.4. Descriptive Statistics

Table (5) shows the statistical description of the data in this research. The business intelligence variable among the samples of this research was equal to 2.84 with a standard deviation of 1.07, and the minimum score for this variable was 1, and the maximum score was 4.35. The open innovation variable's average across the samples in this study is 2.67, with a standard deviation of 0.96. The minimum score for this variable is 1.03, and the maximum score is 4.46. The financial performance variable among the samples of this research was equal to 2.19 with a standard deviation of 0.98, and the minimum score for this variable was 1.10, and the maximum score was 5. The average of the firm performance variable among the samples of this research was 2.20 with a standard deviation of 0.93, and the minimum score for this variable was 1.07 and the maximum score was 4.85.

Table 5: Descriptive Statistics

Variables	Minimum	Maximum	Average	Standard Deviation
Business intelligence	1	4.35	2.84	1.07

Open innovation	1.03	4.46	2.67	0.96
Financial performance	1.10	5	2.19	0.98
Firm performance	1.07	4.85	2.20	0.93

The following information outline the confirmation or denial of the current research's hypothesis based on the model evaluated in the Smart-PLS software and the model test results.

4.5. Hypothesis Testing

Table (6) shows the model tested in the Smart-PLS software and the model test results. The result of hypothesis 1 shows the value of the obtained t statistic is equal to 9.107, which is greater than 1.96, so it can be concluded that the above-mentioned hypothesis is confirmed at the confidence level of 95%. It shows that business intelligence has a significant effect on open innovation, and the value of this effect is equal to $\beta=0.722$. The result of hypothesis 2 shows the value of the t statistic obtained from the test is almost equal to 2.095, which is greater than 1.96, so it can be concluded that the above hypothesis is confirmed at a confidence level of 95%. Therefore, business intelligence has a significant impact on financial performance, and the value of this effect is equal to $\beta=0.305$. The result of hypothesis 3 shows the value of the t statistic obtained is equal to 3.154, which is greater than 1.96, so it can be concluded that the hypothesis is accepted at the confidence level of 95%. Therefore, business intelligence has a significant effect on the firm's performance. The result of the hypothesis shows the value of the standard path coefficient for the influence of business intelligence on a firm's performance is equal to $\beta=0.415$. The result of hypothesis 4 shows the value of the t statistic obtained is equal to 3.154, which is greater than 1.96, so it can be concluded that the hypothesis is accepted at the confidence level of 95%. Therefore, financial performance has a significant effect on the firm's performance. The result of the hypothesis shows the value of the standard path coefficient for the influence of business intelligence on a firm's performance is equal to $\beta=0.443$. Based on these findings in hypothesis 5, it is possible to conclude that the financial performance variable serves as a partial mediator in the impact of the business intelligence on the firm's performance. The total path coefficient of the mediating variable equals 0.35 and 0.39, showing that for one unit of change in the firm's financial performance, the firm's performance variable has a change of 35%, and 39% of these changes are due to changes in business intelligence. In the results of hypothesis 6, it is possible to conclude that the financial performance variable serves as a partial mediator in the impact of open innovation on the firm's performance. The total path coefficient of the mediating variable equals 0.37 and 0.41, showing that for one unit of change in the firm's financial performance, the firm's performance variable has a change of 37%, and 41% of these changes are due to changes in open innovation. The result of hypothesis 7 shows the value of the t statistic obtained is equal to 2.188, which is greater than 1.96, so it can be concluded that the hypothesis is accepted at the confidence level of 95%. Therefore, open innovation has a significant effect on financial performance. The result of the hypothesis shows the value of the standard path coefficient for the influence of open innovation on financial performance is equal to $\beta=0.349$. The result of hypothesis 8 shows the value of the t statistic obtained is equal to 3.154, which is greater than 1.96, so it can be concluded that the hypothesis is accepted at the confidence level of 95%. Therefore, open innovation has a significant effect on the firm's performance. The result of the hypothesis shows the value of the standard path coefficient for the influence of open innovation on a firm's performance is equal to $\beta=0.413$. Based on these findings in hypothesis 5, it is possible to conclude that the open innovation variable serves as a partial mediator in the impact of business intelligence on financial performance. The total path coefficients of the mediating variable equal to 0.38 and 0.36 show that for one unit of change in the financial performance, the business intelligence variable has a change of 38%, and 36% of these changes are due to changes in open innovation.

Table 6: Test of Research Hypotheses

Hypotheses	Standard path coefficient	t statistic	Result
H ₁ : A higher level of business intelligence positively influences the development of open innovation.	0.722	9.107	Accepted
H ₂ : A higher level of business intelligence positively influences the development of financial performance.	0.305	2.095	Accepted
H ₃ : A higher level of business intelligence positively influences the development of a firm's performance.	0.415	3.154	Accepted
H ₄ : A higher level of financial performance positively influences the development of a firm's performance.	0.443	3.154	Accepted
H ₅ : Financial performance mediates the effect between business intelligence and a firm's performance.	Direct 0.35	Direct 3.05	Accepted
	Indirect 0.39	Indirect 2.88	
H ₆ : Financial performance mediates the effects between open innovation and a firm's performance.	Direct 0.37	Direct 2.10	Accepted
	Indirect 0.41	Indirect 2.67	

Hypotheses	Standard path coefficient	t statistic	Result
H ₇ : A higher level of open innovation positively influences the development of financial performance.	0.349	2.188	Accepted
H ₈ : A higher level of open innovation positively influences the development of a firm's performance.	0.413	3.154	Accepted
H ₉ : Open innovation mediates the effects of business intelligence on financial performance.	Direct 0.38	Direct 2.04	Accepted
	Indirect 0.36	Indirect 2.33	

5. CONCLUSION AND IMPLICATIONS

Businesses typically study and build business intelligence as a competence that can affect the information that is available. It is a potential internal organizational variable that could affect output (Caseiro and Coelho, 2019). Understanding business intelligence capabilities and how they work can help companies better integrate business intelligence into strategic management to boost company success (Chen and Lin, 2021). In order to successfully transfer the firm's usage of business intelligence and analytics into enhanced firm performance, practitioners must focus on increasing the firm's business intelligence and analytic-supported innovation capabilities (Božič and Dimovski, 2019). Financial effectiveness is positively and crucially impacted by business intelligence. Business intelligence, in particular, can enhance financial performance (Yang et al., 2022).

Managing and optimizing business performance is crucial for maintaining viability and achieving firm profitability in today's fast-paced and competitive business environment. Effective company performance management will integrate business analytics with open innovation to access performance. Hence, business intelligence can provide a framework for understanding which data is relevant for open innovation and business improvement within an organization.

REFERENCES

- Abhari, K., & McGuckin, S. (2023). Limiting factors of open innovation organizations: A case of social product development and research agenda. *Technovation*, 119, 102526. <https://doi.org/10.1016/j.technovation.2022.102526>
- Ali, F. H., Ali, M., Malik, S. Z., Hamza, M. A., & Ali, H. F. (2020). Managers' open innovation and business performance in SMEs: a moderated mediation model of job crafting and gender. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(3), 89. <https://doi.org/10.3390/joitmc6030089>
- Bahemia, H., & Roehrich, J. K. (2023). Governing open innovation projects: The relationship between the use of trust and legal bonds. *Industrial Marketing Management*, 110, 17-30. <https://doi.org/10.1016/j.indmarman.2023.02.008>
- Bashir, M., Alfalih, A., & Pradhan, S. (2023). Managerial ties, business model innovation & SME performance: Moderating role of environmental turbulence. *Journal of Innovation & Knowledge*, 8(1), 100329. <https://doi.org/10.1016/j.iik.2023.100329>
- Battisti, E., Alfiero, S., Quaglia, R., & Yahiaoui, D. (2022). Financial performance and global start-ups: the impact of knowledge management practices. *Journal of International Management*, 28(4), 100938. <https://doi.org/10.1016/j.intman.2022.100938>
- Bany Mohammad, A., Al-Okaily, M., Al-Majali, M., & Masa'deh, R. E. (2022). Business intelligence and analytics (BIA) usage in the banking industry sector: An application of the TOE framework. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 189. <https://doi.org/10.3390/joitmc8040189>
- Bigliardi, B., Dolci, V., Filippelli, S., Petroni, A., Pini, B., & Tagliente, L. (2023). The adoption of open innovation in manufacturing: a review. *Procedia Computer Science*, 217, 1765-1774. <https://doi.org/10.1016/j.procs.2022.12.376>
- Binzafrah, F., & Taleedi, F. (2022). The effect of business intelligence practices on job satisfaction in the Saudi Electricity Company in the Asir Region. *Journal of Money and Business*, (ahead-of-print). <https://doi.org/10.1108/JMB-03-2022-0011>
- Božič, K., & Dimovski, V. (2019). Business intelligence and analytics for value creation: The role of absorptive capacity. *International journal of information management*, 46, 93-103. <https://doi.org/10.1016/j.ijinfomgt.2018.11.020>
- Caseiro, N., & Coelho, A. (2019). The influence of Business Intelligence capacity, network learning and innovativeness on startups performance. *Journal of Innovation & Knowledge*, 4(3), 139-145. <https://doi.org/10.1016/j.iik.2018.03.009>
- Chang, X., & Li, J. (2019). Business performance prediction in location-based social commerce. *Expert Systems with Applications*, 126, 112-123. <https://doi.org/10.1016/j.eswa.2019.01.086>
- Cheah, S. L. Y., Ho, Y. P., & Li, S. (2021). Search strategy, innovation and financial performance of firms in process industries. *Technovation*, 105, 102257. <https://doi.org/10.1016/j.technovation.2021.102257>
- Chen, Y., & Lin, Z. (2021). Business intelligence capabilities and firm performance: A study in China. *International Journal of Information Management*, 57, 102232. <https://doi.org/10.1016/j.ijinfomgt.2020.102232>

- Chen, Y., & Lin, ZH. (2019). Business Intelligence Capabilities and Firm Performance: A Study in China. *International Journal of Information Management* volume 57 on page 102232. <https://doi.org/10.1016/j.ijinfomgt.2020.102232>
- Choi, J., Yoon, J., Chung, J., Coh, B. Y., & Lee, J. M. (2020). Social media analytics and business intelligence research: A systematic review. *Information Processing & Management*, 57(6), Article 102279. <https://doi.org/10.1016/j.ipm.2020.102279>
- Da Silva Meireles, F. R., Azevedo, A. C., & Boaventura, J. M. G. (2022). Open innovation and collaboration: A systematic literature review. *Journal of Engineering and Technology Management*, 65, 101702. <https://doi.org/10.1016/j.jengtecman.2022.101702>
- Drucker, P. F. (2002). The discipline of innovation. *Harvard business review*, 80(8), 95-102. <https://hbr.org/2002/08/the-discipline-of-innovation>
- Duque, J., Godinho, A., & Vasconcelos, J. (2022). Knowledge data extraction for business intelligence: A design science research approach. *Procedia Computer Science*, 204, 131-139. <https://doi.org/10.1016/j.procs.2022.08.016>
- Eidizadeh, R., Salehzadeh, R., & Chitsaz Esfahani, A. (2017). Analysing the role of business intelligence, knowledge sharing and organizational innovation on gaining competitive advantage. *Journal of Workplace Learning*, 29(4), 250-267. <https://doi.org/10.1108/JWL-07-2016-0070>
- Gaardboe, R., Nyvang, T., & Sandalgaard, N. (2017). Business Intelligence Success applied to Healthcare Information Systems. *Procedia Computer Science*, 121, 483-490. <https://doi.org/10.1016/j.procs.2017.11.065>
- Gassmann, O., Enkel, E., & Chesbrough, H. (2010). The future of open innovation. *R&D Management*, 40(3), 213-221. <https://doi.org/10.1111/j.1467-9310.2010.00605.x>
- Gök, O., & Peker, S. (2017). Understanding the links among innovation performance, market performance and financial performance. *Review of managerial science*, 11, 605-631. <https://doi.org/10.1007/s11846-016-0198-8>
- Harahap, I., Septiani, I., & Endri, E. (2020). Effect of financial performance on firms' value of cable companies in Indonesia. *Accounting*, 6(6), 1103-1110. <https://doi.org/10.5267/j.ac.2020.7.008>
- Huang, Z. X., Savita, K. S., Dan-yi, L., & Omar, A. H. (2022). The impact of business intelligence on the marketing with emphasis on cooperative learning: Case-study on the insurance companies. *Information Processing & Management*, 59(2), 102824. <https://doi.org/10.1016/j.ipm.2021.102824>
- Huang, Z. X., Savita, K. S., & Zhong-jie, J. (2022). The Business Intelligence impact on the financial performance of start-ups. *Information Processing & Management*, 59(1), 102761. <https://doi.org/10.1016/j.ipm.2021.102761>
- Huizingh, E. K. (2011). Open innovation: State of the art and future perspectives. *Technovation*, 31(1), 2-9. <https://doi.org/10.1016/j.technovation.2010.10.002>
- Kanzari, A., Rasmussen, J., Nehler, H., & Ingelsson, F. (2022). How financial performance is addressed in light of the transition to circular business models - A systematic literature review. *Journal of Cleaner Production*, 376, 134134. <https://doi.org/10.1016/j.jclepro.2022.134134>
- Lazzarotti, V., Manzini, R., & Pellegrini, L. (2010). Open innovation models adopted in practice: an extensive study in Italy. *Measuring business excellence*. <https://doi.org/10.1108/13683041011093721>
- Liu, H., Zhang, R., Zhou, L., & Li, A. (2023). Evaluating the financial performance of companies from the perspective of fund procurement and application: New strategy cross efficiency network data envelopment analysis models. *Energy*, 269, 126739. <https://doi.org/10.1016/j.energy.2023.126739>
- Liu, Z., Shi, Y., & Yang, B. (2022). Open innovation in times of crisis: An overview of the healthcare sector in response to the COVID-19 Pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 21. <https://doi.org/10.3390/joitmc8010021>
- Lu, Q., & Chesbrough, H. (2022). Measuring open innovation practices through topic modelling: Revisiting their impact on firm financial performance. *Technovation*, 114, 102434. <https://doi.org/10.1016/j.technovation.2021.102434>
- Manurung, E., Effrida, E., & Gondowonto, A. J. (2019). Effect of financial performance, good corporate governance and corporate size on corporate value in food and beverages. *International Journal of Economics and Financial Issues*, 9(6), 100. <https://doi.org/10.32479/ijefi.8828>
- Mariani, M., Baggio, R., Fuchs, M., & Höepken, W. (2018). Business intelligence and big data in hospitality and tourism: a systematic literature review. *International Journal of Contemporary Hospitality Management*. <https://doi.org/10.1108/ijchm-07-2017-0461>
- Menne, F., Surya, B., Yusuf, M., Suriani, S., Ruslan, M., & Iskandar, I. (2022). Optimizing the Financial Performance of SMEs Based on Sharia Economy: Perspective of Economic Business Sustainability and Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 18. <https://doi.org/10.3390/joitmc8010018>
- Moradi, E., Jafari, S. M., Doorbash, Z. M., & Mirzaei, A. (2021). Impact of organizational inertia on business model innovation, open innovation and corporate performance. *Asia Pacific Management Review*, 26(4), 171-179. <https://doi.org/10.1016/j.apmr.2021.01.003>
- Moro, S., Cortez, P., & Rita, P. (2015). Business intelligence in banking: A literature analysis from 2002 to 2013 using text mining and latent Dirichlet allocation. *Expert Systems with Applications*, 42(3), 1314-1324. <https://doi.org/10.1016/j.eswa.2014.09.024>
- Mouzas, S., & Bauer, F. (2022). Rethinking business performance in global value chains. *Journal of Business Research*, 144, 679-689. <https://doi.org/10.1016/j.ibusres.2022.02.012>

- Mushtaq, R., Gull, A. A., Shahab, Y., & Derouiche, I. (2022). Do financial performance indicators predict 10-K text sentiments? An application of artificial intelligence. *Research in International Business and Finance*, 101679. <https://doi.org/10.1016/j.ribaf.2022.101679>
- Nafasati, F., & Hilal, M. (2021). The effect of financial performance on firm value with corporate social responsibility as moderated variables. *Economics and Business Solutions Journal*, 5(1), 1-12. <http://dx.doi.org/10.26623/ebsj.v5i1.3327>
- Narteh, B. (2018). Brand equity and financial performance: The moderating role of brand likeability. *Marketing Intelligence & Planning*, 36(3), 381-395. <https://doi.org/10.1108/MIP-05-2017-0098>
- Nurdin, A. A., Salmi, G. N., Sentosa, K., Wijayanti, A. R., & Prasetya, A. (2023). Utilization of Business Intelligence in Sales Information Systems. *Journal of Information System Exploration and Research*, 1(1), 39-48. <https://doi.org/10.52465/joiser.v1i1.101>
- Ogink, R. H., Goossen, M. C., Romme, A. G. L., & Akkermans, H. (2022). Mechanisms in open innovation: A review and synthesis of the literature. *Technovation*, 102621. <https://doi.org/10.1016/j.technovation.2022.102621>
- Olszak, C. M. (2022). Business intelligence systems for innovative development of organizations. *Procedia Computer Science*, 207, 1754-1762. <https://doi.org/10.1016/j.procs.2022.09.233>
- Orzan, M. C., Burlacu, S., Florescu, M. S., Orzan, O. A., & Macovei, O. I. (2020). The effects of online marketing on financial performance in the textile industry. *Industria Textila*, 71(3), 288-293. <https://doi.org/10.35530/IT.071.03.1826>
- Park, G., & Song, M. (2020). Predicting performances in business processes using deep neural networks. *Decision Support Systems*, 129, 113191. <https://doi.org/10.1016/j.dss.2019.113191>
- Peters, M. D., Wieder, B., Sutton, S. G., & Wakefield, J. (2016). Business intelligence systems use in performance measurement capabilities: Implications for enhanced competitive advantage. *International Journal of Accounting Information Systems*, 21, 1-17. <https://doi.org/10.1016/j.accinf.2016.03.001>
- Ram, J., Zhang, C., & Koronios, A. (2016). The implications of big data analytics on business intelligence: A qualitative study in China. *Procedia Computer Science*, 87, 221-226. <https://doi.org/10.1016/j.procs.2016.05.152>
- Rao, P. M., & Vinod, H. D. (2023). Economic and financial performance of Indian IT services export firms. *Telecommunications Policy*, 102507. <https://doi.org/10.1016/j.telpol.2023.102507>
- Richards, G., Yeoh, W., Chong, A. Y. L., & Popovič, A. (2019). Business intelligence effectiveness and corporate performance management: an empirical analysis. *Journal of Computer Information Systems*, 59(2), 188-196. <https://doi.org/10.1080/08874417.2017.1334244>
- Salehi, N. (2022). How to properly apply new external knowledge: the waterfall model of absorptive capacity and innovation. *Journal on Innovation and Sustainability RISUS*, 13(2), 73-83. <https://doi.org/10.23925/2179-3565.2022v13i2p73-83>
- Salehi, N., & Asrar, M. M. The effect of open innovation mindset on absorptive capacity: The mediation role of entrepreneurial alertness. *Journal of Management Marketing and Logistics*, 9(4), 147-155. <https://dergipark.org.tr/en/pub/jimml/issue/75138/1232281>
- Seiler, A., Papanagnou, C., & Scarf, P. (2020). On the relationship between financial performance and position of businesses in supply chain networks. *International Journal of Production Economics*, 227, 107690. <https://doi.org/10.1016/j.ijpe.2020.107690>
- Shanak, H. S. H., & Abu-Alhaja, A. S. (2022). Does market performance mediates the nexus between production performance and financial performance in manufacturing companies?. *Journal of Islamic Marketing*, (ahead-of-print). <https://doi.org/10.1108/jima-11-2021-0370>
- Suša Vugec, D., Bosilj Vukšić, V., Pejić Bach, M., Jaklič, J., & Indihar Štemberger, M. (2020). Business intelligence and organizational performance: The role of alignment with business process management. *Business process management journal*, 26(6), 1709-1730. <https://doi.org/10.1108/BPMJ-08-2019-0342>
- Szromek, A. R., Kruczek, Z., Walas, B., & Polok, G. (2023). The method and scope of open innovation exchange in tourist destinations—Analysis of the opinions of tourism experts from Prague and Cracow. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(1), 100005. <https://doi.org/10.1016/j.joitmc.2023.02.002>
- Thoumrungroje, A., & Racela, O. C. (2022). Innovation and Performance Implications of Customer–Orientation across Different Business Strategy Types. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 178. <https://doi.org/10.3390/joitmc8040178>
- Toroslu, A., Herrmann, A. M., Chappin, M. M., Schemmann, B., & Castaldi, C. (2023). Open innovation in nascent ventures: Does openness influence the speed of reaching critical milestones?. *Technovation*, 124, 102732. <https://doi.org/10.1016/j.technovation.2023.102732>
- Trzeciak, M., Sienkiewicz, Ł. D., & Bukłaha, E. (2022). Enablers of Open Innovation in Software Development Micro-Organization. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 174. <https://doi.org/10.3390/joitmc8040174>
- Tseng, F. M., Liang, C. W., & Nguyen, N. B. (2023). Blockchain technology adoption and business performance in large enterprises: A comparison of the United States and China. *Technology in Society*, 102230. <https://doi.org/10.1016/j.techsoc.2023.102230>
- Türegün, N. (2022). Financial performance evaluation by multi-criteria decision-making techniques. *Heliyon*, 8(5), e09361. <https://doi.org/10.1016/j.heliyon.2022.e09361>

Wang, J., Omar, A. H., Alotaibi, F. M., Daradkeh, Y. I., & Althubiti, S. A. (2022). Business intelligence ability to enhance organizational performance and performance evaluation capabilities by improving data mining systems for competitive advantage. *Information Processing & Management*, 59(6), 103075. <https://doi.org/10.1016/j.ipm.2022.103075>

Wu, Y., & Huang, S. (2022). The effects of digital finance and financial constraint on financial performance: Firm-level evidence from China's new energy enterprises. *Energy Economics*, 112, 106158. <https://doi.org/10.1016/j.eneco.2022.106158>

Xu, Y., Li, X., bin Mustakim, F., Alotaibi, F. M., & Abdullah, N. N. (2022). Investigating the business intelligence capabilities' and network learning effect on the data mining for start-up's function. *Information Processing & Management*, 59(5), 103055. <https://doi.org/10.1016/j.ipm.2022.103055>

Yang, M., Sulaiman, R., Yin, Y., Mallamaci, V., & Alrabaiah, H. (2022). The effect of business intelligence, organizational learning and innovation on the financial performance of innovative companies located in Science Park. *Information Processing & Management*, 59(2), 102852. <https://doi.org/10.1016/j.ipm.2021.102852>

Zamecnik, R., & Rajnoha, R. (2015). Strategic business performance management on the base of controlling and managerial information support. *Procedia Economics and Finance*, 26, 769-776. [https://doi.org/10.1016/s2212-5671\(15\)00843-6](https://doi.org/10.1016/s2212-5671(15)00843-6)

Zhang, L., Qi, Z., & Meng, F. (2022). A review on the construction of business intelligence system based on unstructured image data. *Procedia Computer Science*, 199, 392-398. <https://doi.org/10.1016/j.procs.2022.01.048>

CRITICAL SUCCESS FACTORS FOR CYBERSECURITY JUST TECHNICAL? EXPLORING THE ROLE OF HUMAN FACTORS IN CYBERSECURITY MANAGEMENT

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ABSTRACT

Purpose- With the rapid advancement of information and communication technologies, businesses are facing growing security risks. The prevalence, intensity, and complexity of cyber attacks worsen these vulnerabilities, leading to a rising focus on cybersecurity. Enterprises exposed to such cyberattacks might not only face considerable financial losses but also experience data breaches, operational interruptions, harm to their reputation, regulatory penalties, legal expenses, reduced competitive standing, and increased insurance premiums. In this concept study discusses the importance of human factors in cybersecurity management. While organizations spend billions on information technology systems and software to detect and prevent cyber threats, individuals play a critical role in managing these risks.

Methodology- Through a review of literature and statistical data, study examines the factors contributing to cybersecurity breaches, the allocation of resources to address them, and proposes potential solutions.

Findings- In the workplace, most research on cybersecurity focuses on employees as the most important source of vulnerability. In the literature review, it is understood that an employee's carelessness and lack of awareness pose the greatest risk to cybersecurity. However, businesses often fail to show sufficient attention to human behavior in their efforts to keep organizational data secure and to plan security strategies. It is important to note that effective cybersecurity management requires not only technical controls but also the management of human factors. Meanwhile, security expenditures in enterprises are often disproportionately allocated to technology investments, with 97% being spent on technology investments, despite the fact that over 85% of breaches are attributable to human factors.

Conclusion- In the literature review, it is understood that cybersecurity management is not only related to technical controls, but also the management of human factors is of critical importance. The management of individuals is also an essential cybersecurity responsibility. It is important to adopt a holistic approach to cybersecurity management includes both technical and human perspectives. Cybersecurity awareness has significant benefits for businesses to effectively manage cybersecurity which can be achieved by developing appropriate training programs and foster a cybersecurity culture.

Keywords: Cybersecurity, cybersecurity management, cybersecurity awareness, technology investments, human factor

JEL Codes: M12, M15, L86

1. INTRODUCTION

With the rapid development of information and communication technologies, the security risks faced by enterprises are increasing. The frequency, severity, and sophistication of cyber attacks make businesses even more vulnerable, and the interest in cybersecurity is growing every day. Cybersecurity vulnerabilities have become immediate threats to government agencies and businesses, leading to public and private organizations investing billions of dollars in information technology systems and software to detect these threats.

Research indicates that executives and cybersecurity professionals heavily rely on technology to prevent cybersecurity incidents. While new technologies may have unintended consequences, executives continue to view technology as the key to improving security defenses. However, managing complex cybersecurity operations with increasing human factor challenges exceeds the expertise of most information security professionals. Nevertheless, managers seem hesitant to seek the assistance of human resources specialists and behavioral scientists to implement effective strategies and objectives to reduce human error in information security (Nobles, 2018). The management of individuals is also an essential cybersecurity

responsibility. Considering human factors in cybersecurity leadership is one of the factors that can affect the success of an organization and aims to reduce errors by focusing on human behavior (Pollini et al., 2021).

The question of whether the critical success factors of cybersecurity are limited to technical factors or if the human factor is also significant remains a subject of debate. To clarify this debate, the study examines cybersecurity management from both technical and human perspectives. Study contributes to the existing literature by providing a comprehensive analysis of the role of both technical and human factors in managing cybersecurity. By examining the ongoing debate and synthesizing research findings, it offers a valuable overview of the current understanding of cybersecurity success factors. Furthermore, by identifying common causes of cybersecurity breaches and suggesting potential solutions, provides practical guidance for businesses to improve their cybersecurity practices.

2. CYBERSECURITY

Cybersecurity is an important concept that emerged with the widespread use of computers, information technologies and the internet. The first computers were very large devices in a large room and were used by only a few people. However, with the development of technology, computers have become smaller and cheaper and are used in homes, businesses and even cell phones. These developments resulted in the greater prevalence of computers and the Internet. However, with these developments, cyber threats such as cyber crimes and cyber attacks have also started to increase. The concept of cybersecurity also emerged to combat these threats (Jones, 2015).

The concept of cybersecurity refers to the measures taken to ensure the security of computer systems, networks, software and other digital environments. The concept of cybersecurity is used to combat threats such as cyber crimes, cyber attacks, cyber terrorism and cyber espionage (Johnson, 2019).

Cybersecurity threats are increasing day by day and many large companies are exposed to cyber attacks. Some major cybersecurity breaches in recent years include:

- In 2013, the retail store chain Target suffered a cyberattack in which the personal information of 110 million customers was stolen (Goldman, 2017).
- As a result of the cyber attack in 2013, the information of 3 billion users was stolen (Hill, 2017).
- In 2017, credit reporting company Equifax suffered a cyberattack in which the personal information of 143 million people was stolen (Brown, 2017).

Due to this cost, loss of customers and reputation, cybersecurity has become an existential issue for businesses today. Cybersecurity threats continue to increase, and both large companies and small and medium-sized companies are affected by these threats. There are different types of attacks that threaten businesses. The types and characteristics of cyber attacks are:

1. Phishing attacks: In this type of attack, attackers try to capture users' personal information or identities by using tools such as fake websites or e-mails (Smith, 2021).
2. Data Breaches: In such attacks, attackers attempt to steal or disclose sensitive data by gaining unauthorized access to target systems (Baker, 2020).
3. DDoS attacks: In such attacks, attackers try to crash or render systems unusable by sending excessive traffic to target systems (Gupta, 2019).
4. Malware attacks: In such attacks, attackers try to control the system or steal data by infecting target systems with malware (Kumar, 2018).

In order to be protected from these attacks, companies need to take precautions about cybersecurity and ensure their security. In order to achieve this, businesses should focus on the causes of cybersecurity breaches and analyze and monitor how these breaches are distributed in percentage terms of technical and human factors. Some of these reasons for violations are:

- Weak or guessable passwords can allow attackers to easily access target systems (Patel, 2020).
- Out-of-date systems allow attackers to infiltrate systems and carry out their attacks (Kim, 2021).
- The fact that companies do not have enough security personnel, insufficient training of unconscious personnel, deliberate or unintentional personnel negligence and mistakes cause cybersecurity vulnerabilities (Ramakrishnan, 2019).

When these reasons are examined, it is important for businesses to pay attention to personal information security in order to be cautious against cyber attacks. In this context, the evaluation of cybersecurity together with the human factor comes to the fore.

3. CYBERSECURITY AND THE HUMAN FACTOR

Human knowledge, beliefs, values, behaviors, and expectations are critical to all aspects of businesses (Carpenter & Roer, 2022, p.21):

- People make decisions about which technologies to purchase.
- People review, adjust, design and develop business technologies.
- People prioritize, make visible and assess risks.
- People are responsible for operating and maintaining security technologies.
- People determine how to respond to suspicious activity.
- People consciously and unconsciously decide how they will interact with systems, networks and information.
- Every individual who is hired, contracted, interacted with, or sold to is a human being.
- Everything that is designed, sold, or developed by businesses ultimately serves people.

This illustrates that people's decisions, behaviors, and expectations have a significant impact on all assets and resources within businesses. However, research shows that business managers tend to focus their investments on technical infrastructure and expenditures, neglecting the human element. For instance, Carpenter and Roer's (2022) study found that less than 3% of security expenditures in enterprises are allocated to the human factor, while 97% is spent on technology investments, despite over 85% of breaches being attributable to human factors. Other studies supporting this have shown that humans are the weakest link in transmitting secure data, and certain unintentional behaviors stemming from employee ignorance (Triplett, 2022). Therefore, the fact that most security vulnerabilities are caused by human factors demonstrates that cybersecurity management is not solely a technological issue (Corradini, 2020). People's carelessness and lack of awareness pose the greatest risk to the security of digital tools (Metalidou et al., 2014). Thus, senior managers must prioritize human factors in their cybersecurity policies. Cybersecurity efforts should not solely focus on information technology systems, but also consider how people use information systems and the actions that lead to vulnerabilities.

Cybersecurity can be considered as a common combination of technology and human factors. Although technical controls have an important role in combating cyber attacks, the human factor is also a critical factor influencing cybersecurity success. Humans must also play a critical role in managing cybersecurity, as technical controls have limits in ensuring security. Therefore, it is important to adopt a holistic approach to cybersecurity management (KPMG Turkey, 2019; Solove, 2013).

4. CYBERSECURITY MANAGEMENT

Cybersecurity management is defined as directing cybersecurity activities in the most general sense. This management should have the capacity to direct the needs of a society or organization that carries out the technical, managerial, corporate and governance activities of cybersecurity (Kuusisto & Kuusisto, 2013).

Employees are frequently addressed as the most important source of vulnerability in the workplace (Ani, He & Tiwari, 2019). However, according to Klimoski (2016), cybersecurity problems belong not only to careless employees, but also to cybersecurity senior management who are inadequate in guiding individual performance in the digital environment. Therefore, cybersecurity management includes setting goals based on the protection of the digital business system, coordinating action plans, and managing comprehensive disruptions (Lehto & Limnell, 2020).

The scope of cybersecurity management in businesses can be summarized as follows:

- It includes the assessment of the cybersecurity risks of businesses, the development and implementation of cybersecurity strategies. However, cybersecurity management is not only about technological solutions, but also the management of human factors is important. Therefore, businesses should adopt a holistic approach to cybersecurity management. It should include elements such as developing and implementing cybersecurity strategies, preparing and implementing business continuity plans, preparing and testing cyber incident response plans, developing and implementing cybersecurity policies, implementing cybersecurity training and awareness programs, and developing a culture of internal communication and collaboration (CISA, 2021; Haynes & Klass, 2019; NIST, 2018).

- It includes the development and implementation of businesses' cybersecurity policies. Cybersecurity policies determine the cybersecurity goals and rules of businesses. These policies create the information security culture of enterprises and ensure that employees are trained and informed about cybersecurity issues. Cybersecurity policies enable businesses to determine their cybersecurity strategies and manage cybersecurity risks (Antonakakis et al., 2017; Williams, 2019; ISACA, 2019).
- It involves businesses preparing and testing cyber incident response plans. Cyber incident response plans define the processes of detection, analysis, prevention, response and remediation of cyber attacks. Businesses should form emergency teams and train these teams regularly to prepare response plans for cyber incidents. In addition, businesses are required to regularly test and update their cyber incident response plans (NIST, 2018; Ackerman & Volkman, 2019; SANS Institute, 2021).
- It involves businesses constantly monitoring and assessing their cybersecurity risks. Businesses must continually monitor and evaluate cybersecurity risks and stay up-to-date on new threats and defense mechanisms related to those risks. In addition, businesses are required to regularly report and assess their cybersecurity risks. This helps businesses continually improve their cybersecurity management (Solms & Solms, 2016; Khan & Khan, 2017).

As a summary, the scope of cybersecurity management in businesses encompasses various aspects. It involves assessing and managing cybersecurity risks, implementing strategies, and considering human factors. To ensure effective cybersecurity management, businesses should take a holistic approach, which includes developing and implementing strategies, continuity plans, and incident response plans. It also entails establishing cybersecurity policies, conducting training programs, fostering internal communication, and collaboration. Additionally, businesses need to regularly monitor, assess, and report on their cybersecurity risks to improve their overall security posture.

5. CYBERSECURITY AWARENESS IN BUSINESSES

Cybersecurity awareness enables employees to be informed about cybersecurity threats and develop their skills to deal with these threats. Cybersecurity awareness includes employees' understanding of cybersecurity concepts, threats, risks, attacks, protection methods and reporting procedures (Usta & Kurtuldu, 2020; Oktavianto & Prabowo, 2018).

Increasing cybersecurity awareness has significant benefits for businesses to effectively manage cybersecurity. These benefits can be listed as follows:

- Business employees to be better prepared against cyber attacks. As cybersecurity awareness increases, so does the ability of employees to detect and report cyber attacks. Therefore, raising cybersecurity awareness of businesses is an important step in cybersecurity management (Lambrinouidakis et al., 2020; González, 2018).
- It ensures the effective implementation of cybersecurity policies of enterprises. Cybersecurity policies of businesses include training and informing employees about cybersecurity. For this reason, employees' cybersecurity awareness should be increased in order to effectively implement cybersecurity policies of enterprises. Thus, businesses can implement cybersecurity policies more effectively (NIST, 2018; Solms & Solms, 2016).
- It reduces the cybersecurity risks of businesses. Employees' cybersecurity awareness helps businesses reduce their cybersecurity risks. While the carelessness or misbehavior of the employees increase the cybersecurity risks of the enterprises, conscious employees act in accordance with the cybersecurity policies of the enterprises to ensure cybersecurity. Therefore, it helps businesses to increase their employees' cybersecurity awareness and reduce cybersecurity risks (SANS Institute, 2021; KPMG Turkey, 2019).
- It allows businesses to trust their employees about cybersecurity. When employees are conscious about the cybersecurity of their businesses, they feel more confident about cybersecurity. For this reason, businesses increase employees' cybersecurity awareness, enable employees to spend more effort to ensure cybersecurity and learn more about the cybersecurity of their businesses (Blyth & Kovacich, 2013).
- Protects the reputation of businesses. When businesses are exposed to cyber attacks, they can lose the trust of their customers and business partners. For this reason, businesses increase cybersecurity awareness, enable them to be better prepared against cyber attacks and be less affected by attacks. In addition, raising cybersecurity awareness of businesses creates a reliable impression for customers and business partners about the cybersecurity of the business (Haynes & Klass, 2019).

As a summary, increasing cybersecurity awareness brings significant benefits to businesses. It helps employees detect and report cyber attacks, ensures the effective implementation of cybersecurity policies, reduces cybersecurity risks, fosters trust among employees, and protects the business's reputation.

5.1. CYBERSECURITY AWARENESS TRAINING PROGRAMS

Businesses need to train their employees on cybersecurity, as many cyber attacks occur due to employee carelessness or ignorance. Increasing cybersecurity awareness depends on businesses developing appropriate cybersecurity awareness training programs. Businesses' cybersecurity training programs are designed to make employees aware of cybersecurity. These programs enable employees to understand cybersecurity concepts, threats, risks, attacks, protection methods, and reporting procedures. In addition, training programs should be regularly renewed and updated by businesses. These programs enable employees to consciously prevent current cybersecurity threats and to be informed about methods of protection against attacks (ISACA, 2019).

5.2. A CULTURAL PERSPECTIVE ON CYBERSECURITY AWARENESS

Cybersecurity management aims to detect and prevent cyber attacks by adopting the strengthening of information security awareness of employees through training. However, in order to achieve this goal, it is not enough for the employees to be educated, at the same time, safe behaviors of the employees should be encouraged and spread throughout the organization. This occurs when businesses adopt a safety culture (Hashizume et al., 2013).

Adopting a security culture in businesses, increasing the awareness of employees on cybersecurity, providing training and information on cybersecurity, determining and implementing cybersecurity policies, constantly monitoring and evaluating the cybersecurity of information systems, preparing and implementing business continuity plans and response plans to cyber incidents, cybersecurity It is possible to integrate activities such as cooperating with all stakeholders on the issue and constantly monitoring cybersecurity risks into the organizational culture with the participation of all employees, especially the management (Khan & Khan, 2017; NIST, 2018).

6. CONCLUSION

Cybersecurity is a critical aspect of both societal and corporate security, and it plays an essential role in achieving an organization's strategic goals in an increasingly digital society. Cybersecurity management involves enabling businesses to operate on reliable and secure information networks, with the primary goal of ensuring the involvement of all stakeholders in establishing a robust cybersecurity system (Lehto & Limnell, 2016).

In the literature review, it is understood that cybersecurity management is not only related to technical controls, but also the management of human factors is of critical importance. In addition to ensuring the security of technical control systems, people must also play a critical role in cybersecurity management. Therefore, it is recommended to adopt a holistic approach to cybersecurity management (CISA, 2021; NIST, 2018; Haynes & Klass, 2019).

To ensure cybersecurity, it is imperative for businesses to increase their cybersecurity awareness. Cybersecurity awareness empowers employees to stay informed about potential cyber threats and develop their skills to deal with such risks. This, in turn, enhances their ability to detect and report cyber attacks. To increase the cybersecurity awareness of businesses, it is essential to develop appropriate training programs and foster a cybersecurity culture.

Therefore, cybersecurity management goes beyond technology and is closely intertwined with the management of individuals, organizational behavior, continuous learning, organizational culture, and change. It is not only about how people perceive cybersecurity but also about their priorities and actions, influenced by their beliefs, values, and attitudes, from the board of directors to every corner of the organization.

REFERENCES

- Ackerman, G., Volkman, D. (2019). Cybersecurity culture and training: A practitioner's perspective. *Journal of Business Continuity & Emergency Planning*, 12(1), 10-17.
- Ani, U.D. He, H., Tiwari, A. (2019). Human factor security: Evaluating the cybersecurity capacity of the industrial workforce. *J. Sys. Info. Technol.*, 21, 2-35.
- Antonakakis, N., April, T., Bailey, M., Bernhard, M., Bursztein, E., Cochran, J. A., Durumeric, Z., Halderman, J. A., Invernizzi, L., Kallitsis, M., Lever, C., Ma, J., Mason, J., Menscher, D., Seaman, C., Sullivan, N., Thomas, K., Zhou, Y., & Paxson, V. (2017). Understanding the Mirai botnet. In *Proceedings of the 26th USENIX Security Symposium* (pp. 1093-1110).
- Baker, A. (2020). Cybersecurity: The Most Important Tech Skill of the Future. *Forbes*. <https://www.forbes.com/sites/abdullahimammed/2020/01/08/cybersecurity-the-most-important-tech-skill-of-the-future/?sh=54d5db5b5>
- Blyth, M., Kovacich, G. (2013). *The Routledge Handbook of Computer Security*. Routledge.
- Brown, J. (2017). Equifax hack hit 143 million people, and it's just the first disaster to come. *The Guardian*. <https://www.theguardian.com/commentisfree/2017/sep/08/equifax-hack-hit-143-million-people-disaster-waiting-to-happen>

- Carpenter, P., Roer, K. (2022). *The Security Culture Playbook: An Executive Guide To Reducing Risk and Developing Your Human Defense Layer*, Wiley, NJ, USA.
- CISA. (2021). *Cybersecurity and Infrastructure Security Agency Strategic Plan 2021-2025*. CISA. <https://www.cisa.gov/sites/default/files/publications/2021-03/CISA-Strategic-Plan-2021-2025-Public-Final-508.pdf>
- Corradini, I. (2020). *Building a Cybersecurity Culture in Organizations: How to Bridge the Gap between People and Digital Technology*, Springer Nature, Berlin/Heidelberg, Germany.
- Goldman, D. (2017). Target data breach: 7 lessons learned. CIO. <https://www.cio.com/article/3242597/target-data-breach-7-lessons-learned.html>
- González, L. M. (2018). The role of employee awareness and training in cybersecurity. *Journal of International Management Studies*, 18(1), 55-60.
- Gupta, A. (2019). DDoS Attack Types and Tools: All You Need to Know. Cloudflare. <https://www.cloudflare.com/learning/ddos/ddos-attack-tools/>
- Hashizume, K., Rosado, D. G., Fernandez-Medina, E. (2013). An analysis of security issues for cloud computing. *Journal of Internet Services and Applications*, 4(1), 5. <https://doi.org/10.1186/1869-0238-4-5>
- Haynes, J. W., Klass, B. R. (2019). Managing cybersecurity risk: A governance approach. *Journal of Business Continuity & Emergency Planning*, 13(1), 30-42.
- Hill, K. (2017). Yahoo says all 3 billion user accounts were hacked in 2013 data theft. Reuters. <https://www.reuters.com/article/us-yahoo-cyber/yahoo-says-all-3-billion-user-accounts-were-hacked-in-2013-data-theft-idUSKBN1C9188>
- ISACA. (2019). *Cybersecurity: Understanding Cybersecurity Risk Management*. ISACA.
- Johnson, K. (2019). What Is Cybersecurity? Definition, Best Practices & More. Digital Guardian. <https://digitalguardian.com/blog/what-cybersecurity-definition-best-practices-more>
- Jones, S. (2015). A Brief History of Cybersecurity. Huffington Post. https://www.huffpost.com/entry/a-brief-history-of-cyber_b_11229522
- Khan, S., Khan, M. A. (2017). An overview of cyber security policy for organizations. *International Journal of Scientific & Engineering Research*, 8(11), 1815-1823.
- Kim, T. (2021). The Importance of Cybersecurity Updates and Patches. Security Intelligence. <https://securityintelligence.com/posts/importance-of-cybersecurity-updates-and-patches/>
- Klimoski, R. (2016). Critical success factors for cyber security leaders: Not just technical competence. *People Strategy*, 39, 14–18.
- KPMG Turkey. (2019). Türkiye Siber Güvenlik Raporu. KPMG Turkey. KPMG Turkey. <https://assets.kpmg/content/dam/kpmg/tr/pdf/2019/03/Siber%20Güvenlik%20Raporu%202019.pdf>
- Kumar, A. (2018). What is Malware? A Comprehensive Guide to Cyber Threats. Norton. <https://us.norton.com/internetsecurity-malware-what-is-malware.html>
- Kuusisto, R., Kuusisto, T. (2013). Strategic Communication for Cyber-security Leadership. *Journal of Information Warfare*, 12(3), 41–48. <https://www.jstor.org/stable/26486840>
- Lambrinouidakis, C., Kambourakis, G., Gritzalis, D. (2020). Enhancing cyber security awareness in organizations. *International Journal of Information Management*, 50, 280-291.
- Lehto, M., Limnell, J. (2016). Cyber Security Capability and Case Finland. In *Proceedings of the 15th European Conference on Cyber Warfare and Security (ECCWS)* (pp. 182–190).
- Lehto, M., Limnell, J. (2020). Strategic Leadership in Cyber Security, Case Finland. *Information Security Journal: A Global Perspective*, 30, 1-10. [10.1080/19393555.2020.1813851](https://doi.org/10.1080/19393555.2020.1813851).
- Metalidou, E., Marinagi, C., Trivellas, P., Eberhagen, N., Skourlas, C., Giannakopoulos, G. (2014). The Human Factor Of Information Security: Unintentional Damage Perspective. *Procedia Soc. Behav. Sci.*, 147, 424–428.
- National Institute of Standards and Technology (NIST) (2018). *Framework for Improving Critical Infrastructure Cybersecurity Version 1.1*. NIST. <https://www.nist.gov/publications/framework-improving-critical-infrastructure-cybersecurity-version-11>
- Nobles, C. (2018). Botching Human Factors in Cybersecurity in Business Organizations. *Holistica–Journal of Business and Public Administration*, 9(3), 71-88.
- Oktavianto, R. A., Prabowo, R. (2018). Cybersecurity awareness training using gamification approach: A literature review. *Procedia Computer Science*, 135, 313-320.
- Patel, N. (2020). The Top 10 Cybersecurity Risks of 2020. Security Boulevard. <https://securityboulevard.com/2020/02/the-top-10-cybersecurity-risks-of-2020/>

Pollini, A., Callari, T.C., Tedeschi, A., Ruscio, D., Save, L., Chiarugi, F., Guerri, D. (2021). Leveraging Human Factors in Cybersecurity: An Integrated Methodological Approach. *Cogn. Technol. Work*, 24, 371–390.

Ramakrishnan, R. (2019). Why Cybersecurity is Essential for Small and Medium-Sized Businesses. *Entrepreneur*. <https://www.entrepreneur.com/article/336329>

SANS Institute. (2021). What is Cybersecurity? SANS Institute. <https://www.sans.org/cybersecurity/>

Smith, C. (2021). Phishing. *Britannica*. Retrieved from <https://www.britannica.com/topic/phishing>

Solms, R. V., Solms, B. (2016). *Information security governance simplified: From the boardroom to the keyboard*. Apress.

Solove, D. J. (2013). *Privacy and the media*. Harvard University Press.

Triplett, W.J. (2022). Addressing Human Factors in Cybersecurity Leadership. *Journal of Cybersecurity and Privacy*, 2, 573–586. <https://doi.org/10.3390/jcp2030029>

Usta, H., Kurtuldu, H. (2020). Evaluation of information security awareness of healthcare workers. *Journal of Information Security and Applications*, 55, 102580.

Williams, P. A. (2019). *Cybersecurity: A comprehensive overview for directors and executives*. Wiley.



ACTIVATION TRIGGERS: RECONCEPTUALIZATION AND REVIEW

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ABSTRACT

Purpose- Businesses depend more on knowledge than other factors. Many academics have described the idea of absorptive capacity as a skill for handling outside knowledge. Since organizational phenomenon is a complex, the issue of absorptive capacity as a strategic and dynamic capability still merits further research consideration. Previous research shows that some of the variables are beyond the firm's control and moderate the effect of knowledge source and experience on absorptive capacity. The intensity of the triggers may have an impact on the firm's investment in absorptive capacity capability. The purpose of this study is to review and identify endogenous and exogenous contingencies that function as activation triggers on absorptive capacity based on the previous literature.

Methodology- The theoretical model, hypothesis, and measurement indicators for the study's variables are described in this paper.

Findings- The study of previous research shows that learning organization structure, business environment, organizational leadership, learning culture, management review, and competitive strategy play roles as moderator activation triggers in this study. According to the findings, businesses face complex and unpredictable business environment changes, as well as significant knowledge gaps. Decentralized and dynamic structures with participation in decision-making have a moderating effect on the capacity to absorb knowledge and make it easier for businesses to absorb new ideas. The results show that organizational culture fosters the development of fresh perspectives and encourages the integration of external knowledge to maximize the benefits of complementary knowledge sources. Also, the competitive strategy defines the scope and context of perception and learning. Other activation triggers that require more investigation include information technology, stakeholders, professional conduct, and research and development units.

Conclusion- Managers can explore a variety of strategic alternatives and forge competitive advantages for their companies by using activation triggers as a group of variables to upgrade existing talents and develop new capabilities of absorptive capacity.

Keywords: Absorptive capacity, activation triggers, endogenous and exogenous contingencies, knowledge.

JEL Codes: D83, L1, O32

1. INTRODUCTION

A crucial element affecting economic growth is knowledge (Qiao and Chen, 2010; Salehi, 2021), which has been and still is a contentious strategic issue (Barney, 1991; Salehi, 2021). Businesses depend more heavily than other factors on the level of knowledge (Druker, 1995; Davenport and Prusak, 1998; Murovec and Prodan, 2009; Salehi, 2021). New external knowledge is regarded as the essential component for surviving and competing in dynamic environments to which firms should adapt, improving the innovation of their products and sustaining competitive advantages (Cohen and Levinthal 1990; Hisnanick, 2016; Gray 2006; Salehi 2021). (Teece et al., 1997; Zahra and George, 2002; Chilton and Bloodgood, 2008; Wang and Wu, 2008; Camison and Fores, 2010; Salehi, 2021). As a result, the desired outcome needs a certain kind and degree of knowledge. Knowledge is a "justified true belief," according to Hisnanick (2016), which supports businesses' successful actions. According to his theory, knowledge has many sides because it can mean many different things. Hisnanick also referred to knowledge as a source that inevitably advances. Companies gain new knowledge through their internal experience and prior knowledge (Cohen and Levinthal, 1990; Salehi, 2021, Salehi, 2022).

Absorptive Capacity, a strategic capability sensitive to new information (Cohen and Levinthal, 1990; Zahra and George, 2002; Salehi, 2021) and opportunities in highly turbulent environments (Lane and Lubatkin, 1998; Zahra and George, 2002; Zhou and Wu, 2010; Camison and Fores, 2010; Martina and Javalgi, 2019; Salehi, 2021), and dynamic capability (Zahra and George, 2002; Camison and Fores, 2010; Martina and Javalgi, 2019; Salehi, 2021).

According to research trends, the topic of knowledge recruitment capacity in an organization is still important and merits further study because it helps organizations achieve innovation (Shane, 2000; Zahra and George, 2002; McKelvie et al., 2008; Salehi, 2021, Salehi, 2022); performance (Fiol and Lyle, 1985; Zahra and George, 2002; Liu et al., 2009; Harris and Liy, 2009; Salehi, 2021); and competitive advantage (Zahra and George, 2002; Andrawina et al., 2008; Liu et al., 2009; Salehi, 2021). Numerous studies on the capacity of absorptive capacity and its capacities for acquisition, assimilation, transformation, and exploitation have been published by researchers since Zahra and George.

Internal and external activation triggers were described by Zahra and George (2002) as endogenous and exogenous contingency factors that affect investment in absorptive capacity. The factors and variables that moderate the effect of knowledge resources on absorptive capacity as activation triggers are still largely unknown in this area of study (Salehi, 2021). In addition, the majority of absorptive capacity studies apply this capability as a whole and as a process of absorptive capacity while ignoring other important moderators and mechanisms that may play a significant role (Salehi, 2021). Re-reading the prior research is deemed necessary for the practical use of absorptive capacity because there is a substantial body of literature on the construct of adsorption capacity. Consequently, this paper aims to review the relevant literature on activation triggers and the factors that may have an impact on this theoretical model (Salehi, 2021).

The purpose of this study is to identify endogenous and exogenous contingencies that function as activation triggers on absorptive capacity based on the theoretical model of Zahra and George (2002) and prior literature. In order to lay the groundwork for activation triggers, the current study includes a review of the literature on knowledge, absorptive capacity, activation triggers, and their definitions (Salehi, 2021). Additionally, this piece advances the theoretical activation triggers model of (Salehi, 2021). At the end, there are conclusions with the researcher's key takeaways, implications, and suggestions for additional research (Salehi, 2021).

The following section presents a review of key related literature and the development of hypotheses. Following that, the theoretical framework was presented, and the variable criteria were explained. The findings are expounded, and finally, the discussion of the results is presented with directions for further research.

2. LITERATURE REVIEW

2.1. Knowledge Source and Complementary Experience

Businesses depend more on knowledge than other factors (Murovec and Prodan, 2009; Qiao and Chen, 2010; Salehi, 2022) to improve product innovation, maintain competitive advantages (Teece et al., 1997; Camison and Fores, 2010; Salehi, 2021), enhance service efficiency, optimize workflow, and government performance (Salehi, 2021). Knowledge, according to Hisnanick (2016), is "justified true belief," which supports businesses' effective actions. Information, according to Hisnanick, is a source that eventually advances knowledge. According to Salehi et al. (2012), new knowledge is generated through the following processes: identifying the needs of the citizenry and the broader society; identifying the broad organizational objectives; newspaper, magazine, television, and internet coverage; citizen interviews; stakeholder recommendations; surveys; group behavior; and experts or universities.

2.2. Absorptive Capacity

Many academics have described the idea of absorptive capacity as a skill for handling outside knowledge (Cohen and Levinthal, 1990; Barney, 1991; Van den Bosch et al., 1999; Hisnanick, 2016, Zahra and George, 2002; Gray, 2006; Todorova and Durisin, 2007; Zahra et al., 2009; Fabrizio, 2009; Harris and Liy, 2009; Schmidt, 2010; Camison and Fores, 2010; Zhixiong and Yuanjin, 2010; Salehi et al., 2012). It goes without saying that a company succeeds effectively when it can process and produce fresh external knowledge in challenging circumstances (Hisnanick, 2016; Salehi, 2022). The four abilities that many scholars have cited for absorptive capacity are knowledge acquisition, assimilation, transformation, and exploitation (Zahra and George, 2002). Individual learning comes first, followed by group learning, and lastly an organization learns (Cohen and Levinthal, 1990; Salehi and Asrar, 2022).

2.3. Activation Triggers

While some of the variables are beyond the firm's control, "triggers are events that encourage or compel a firm to respond to specific internal or external stimuli" (Walesh and Ungson, 1991; Zahra and George, 2002; Salehi, 2021). Activation triggers, according to Zahra and George (2002), moderate the effect of knowledge source and experience on absorptive capacity. On the other hand, Walesh and Ungson (1991); Zahra and George (2002) held that internal triggers could take the form of

organizational crises, failures, significant events, or performance issue(s) that might compel a firm to employ new strategies. However, these factors may have unfavorable consequences.

A crisis can increase a firm's efforts to realize and absorb new skills and develop new knowledge, despite having negative effects, as Kim (1998) demonstrated. Crises pose a threat to a company's viability, which is likely to spur learning and the realization of outside knowledge (Zahra and George, 2002; Salehi, 2021). Actions that could have an impact on a company's future and how it operates are known as external triggers (Zahra and George, 2002; Salehi, 2021). As a result, both internal and external triggers encourage or support a firm's efforts to look for new external knowledge. While triggers can occur in a firm's environment and range widely, they can have an impact on a firm's search for fresh external knowledge (Zahra and George, 2002; Salehi, 2021).

However, some triggers might need a different kind of knowledge that a company has never thought of, or they might be extremely challenging to understand. According to Zahra and George's hypothesis, firms plan to allocate more resources to bolstering the competencies and developing the capability of absorptive capacity as well as acquiring new external knowledge as trigger strength increases (Zahra and George, 2002; Salehi, 2021). Technology shifts are probably influenced by the basis of triggers. Additionally, it might increase spending on the acquisition of pertinent knowledge in particular fields. Therefore, a firm's investment in absorptive capacity capability may be impacted by the severity of the triggers. Additionally, it increases a company's desire to enhance performance and prevent a technological lockout (Zahra and George, 2002; Salehi, 2021).

2.2.1. Organizational Learning Structure

According to Fiol and Lyle (1985), organizational structure is a crucial factor that affects the learning process. Structure is defined as "stable role definitions that can clarify who is to perform what duties and are less precise about change" (Walesh and Ungson, 1991; Salehi, 2021). A multidimensional construct, organizational learning is distinguished by its foundational nature (Hult and Ferrell, 1997). Organizational structure is a "formal system of task and authority relationships that controls how people cooperate and use resources to achieve organizations' goals," according to Turi et al (2019). Foold (1998) made reference to openness and localness in organizational structures.

Moving decisions down the organizational hierarchy as much as possible so that local strategic business unit decision-makers deal with the full spectrum of issues is what is meant by "localness" (Hult and Ferrell, 1997). By allowing strategic business units the freedom to experiment, act on their own ideas, and take responsibility for the results, organizational learning in the global process is created, resulting in lower levels of bureaucracy and an organic organizational structure (Hult and Ferrell, 1997). Organizational learning theory contends that bureaucratization impedes learning by limiting creativity, responsiveness, timeliness, and innovativeness, whereas a lack of localness has been shown to positively influence performance outcomes of an organization under certain circumstances (Hult and Ferrell, 1997).

According to Fiol and Lyle (1985), the kind of organizational structure determines the necessary actions. While previous behaviors are reinforced in centralized and mechanistic structures, more decentralized dynamic structures tend to allow changes in beliefs and actions. Decentralized structures boost individual cognitive capacity as knowledge absorption rises, and businesses make it easier to assimilate new ideas (Fiol and Lyle, 1985). With the change in structure and form, low level formalization with democratic values encourages learning (Turi et al., 2019). However, in centralized organizations, where departments and divisions are tightly under control, decisions are made at a high managerial level (Turi et al., 2019).

When it comes to new external knowledge, openness depth and breadth both focus on how thoroughly a firm search. Customers, rivals, research institutions, regulatory bodies, higher education institutions, and governmental organizations can all be used as external search sources (Tian et al., 2020). Therefore, transparency increases a company's flexibility and knowledge base (Tian et al., 2020).

Participation is common in organizations with similar organizational structures. According to Foold (1998), this approach encourages participation in decision-making and gives people the freedom to speak and think. According to Cegarra-Navarro and Cepeda-Carrión (2008), this type of organizational structure accepts and evaluates novel and unconventional ideas. There is freedom of speech and thought, and ultimately, one viewpoint is chosen (Foold, 1998). Due to the closed organizational structure and lack of information and knowledge exchange with the external environment, this method involves the least amount of learning for the company (Foold, 1998). With this viewpoint, critical thinking and opinions develop (Foold, 1998).

Reflection is a cognitive process that aims to improve one's awareness of one's own experiences and, consequently, one's capacity to learn from them (Yang et al, 2017). Personal mastery, mental modeling, sharing visions, team learning, and systems thinking are crucial organizational learning disciplines, and all of them require reflective practice (Hilden and Tikkamäki, 2013). Understanding and reconstructing the meaning of what has been observed or accomplished are the main processes involved in reflection (Yang et al, 2017). Previous research in organizational, social, and medical psychology has suggested that reflection alters human behavior and enhances task performance, if not explicitly (Yang et al, 2017). It can also be seen that there is disagreement about the performance benefit of reflection in educational settings (Anseel et al.,

2009; Yang et al., 2017). In particular, some academics contend that in the absence of appropriate criticism or reflectional instruction, students are more likely to put forth serious thought into the wrong issues or to use the incorrect performance-improving techniques (Yang et al., 2017). One of the fundamental tenets of reflection is that it seeks to deepen the cognitive elaboration of experiential information, resulting in the necessary behavioral adjustments (Anseel et al., 2009). In his conclusion, Foold (1998) claimed that the reflective method has greater potential for knowledge acquisition.

By eschewing mechanistic structure, such dynamic organizations can foster reflective action-taking (Fiol and Lyle, 1985). Knowledge integrates and combines with various sources to advance organizational goals in a dynamic organization (Turi et al., 2019). This demonstrates that organizational structure is determined by the organization's goals and strategies (Turi et al., 2019).

In actuality, the organizational structure ought to offer frameworks for knowledge discovery, acquisition, interpretation, and application. An organization that learns can comprehend and adapt new information. The performance of knowledge acquisition and how to deal with it can be impacted by this procedure at the individual and organizational levels. Accordingly, it is hypothesized as follows.

H₁: Organizational learning structure as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

2.2.2. Business Environment

Businesses must decide whether to adapt to the dynamic and complex business environment or to give up and close their doors. According to Akpoviro and Owotutu (2018), organizations are under pressure from the business environment in which they operate. These pressures prompt various responses from the organizations, which then seek legitimacy in an effort to survive and thrive in the environment.

Environmental dynamism refers to the unpredictability of change in environmental conditions faced by firms, while environmental complexity refers to the heterogeneity and range of an organization's activities (Ward et al., 1995). Fiol and Lyle discussed the relationship between the environment and learning in 1985. They said that complexity and dynamic environments, whether internal or external, could lead to overload and prevent learning. Environmental factors are a major source of organizational contingencies, according to organizational theorists for a long time (Ward et al., 1995). Change and stability are both necessary for learning between students and their surroundings (Fiol and Lyle, 1985; Salehi, 2021). Inefficient organizations can result from having too much stability because there is little motivation to grow and adapt.

Even though ingrained behaviours never change, a lot of change and unsettling environments also make learning challenging (Fiol and Lyle, 1985). It is essential to create and make use of this tension between constancy and change for an effective learning process. In order for learning to occur, a certain amount of pressure is required (Fiol and Lyle, 1985; Salehi, 2021).

Organizations seeking to adapt must look for specific and new external knowledge because environmental change is complicated, unpredictable, and characterized by sudden, enormous interruptions (Walesh and Ungson, 1991). Accordingly, it is hypothesized as follows.

H₂: Business environment as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

2.2.3. Organizational Leadership

Every organization's success or failure is largely dependent on its level of leadership (Saeidi et al., 2021). Organizational leadership educates followers at the individual level with new rules, new perspectives, and new feelings, preparing them to meet all unforeseen challenges brought on by environmental change (Turi et al., 2019). Leadership in knowledge-based organizations fosters internal environments that are conducive to learning and encourages it (Turi et al., 2019). Through the use of effective leadership techniques, managers can encourage learning and enforce motivation. Additionally, leadership imparts crucial practical learning abilities like individual empowerment, decision-making authority, and support (Turi et al., 2019). Accordingly, it is hypothesized as follows.

H₃: Organizational leadership as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

2.2.4. Learning Culture

Both generative learning and adaptive learning are promoted by a company with a strong learning culture. It happens when business partners are willing to challenge the learning boundary as well as the ingrained notions about their goals, target audiences, state-of-the-art technologies, or strategies (Yao et al., 2013). The collective vision, presumptions, values, norms, and beliefs that guide organizational behavior and people make up culture (Turi et al., 2019). It is a way of thinking and

understanding that is applied to the level of the individual as a learned way of perceiving and feeling about issues (Turi et al., 2019). The behavior patterns of an individual determine the culture of an organization (Fiol and Lyle, 1985; Salehi, 2021). The collective vision, presumptions, values, norms, and beliefs that guide organizational behavior and people make up culture (Turi et al., 2019). Culture can be defined as "the shared ideologies, norms, and beliefs that guide organizational decision-making" (Fiol and Lyle, 1985; Salehi, 2021). An organizational learning culture encourages staff to question ingrained paradigms, existing beliefs, and routines that would otherwise obstruct knowledge creation in global strategic alliances (Yao et al., 2013). The organizational culture fosters the development of fresh perspectives and encourages the integration of outside knowledge to maximize the benefits of complementary knowledge sources (Yao et al., 2013). Theorists of cultural cognitivism asserted that organizations with strong cultures can achieve high performance (Turi et al., 2019). This performance focuses on the culture and knowledge workers who use data and technology to advance learning within an organization (Turi et al., 2019). Accordingly, it is hypothesized as follows.

H₄: Learning culture as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

2.2.5. Management Review

According to Zahra and George (2002), the managerial role is an uncertain factor. They advocated for the idea that broader managerial roles have an impact on knowledge seeking behaviors, activation triggers, and knowledge transformation. Unlike the conventional understanding of absorptive capacity, which limited managerial responsibilities to environmental analysis and R&D spending. Walesh and Ungson (1991) assert that since managerial decisions are used to create organizational structure, organizational memory may be impacted by that structure. The top management team of a company typically makes the most important and strategic decisions, which ultimately affect organizational performance (Saeidi et al., 2021). By offering guidelines for how project participants should interact and carry out the project, management review can also improve knowledge sharing (Wang et al., 2006). They proposed that management review boosts group dynamics and interdependence, which in turn enhances learning within an organization. Accordingly, it is hypothesized as follows.

H₅: Management review as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

2.2.6. Competitive Strategy

Organizational structure, function, and learning capacity are determined by an organization's objectives and strategy (Turi et al., 2019). (Fiol and Lyle, 1985; Turi et al., 2019; Salehi, 2021). Additionally, it clarifies a learning map by giving the perception and comprehension of the environment a limit and context (Fiol and Lyle, 1985; Salehi, 2021). They claimed that a company's strategic choice determines its capacity for learning. Fiol and Lyle mentioned that strategic design determines the pace of organizational learning. The approach has an impact on organizational learning, which fosters creativity and fresh perspectives (Fiol and Lyles, 1985; Serinkan et al., 2013).

In order to affect changes in the external environment, an organization learns from previous experiments by evaluating the results and modifying their goals or actions to achieve the targets. Learning is a prominent component of organizational strategy (Turi et al., 2019). Additionally, the strategy of learning itself is a crucial component where organizations learn from their previous or current strategies by analyzing the results. Based on changes in the external environment, they modify their goals or activities to achieve them (Turi et al., 2019). Strategy is therefore believed to be a subject that merits more research because it is "strongly linked with organizational learning and development" (Turi et al., 2019). Accordingly, it is hypothesized as follows.

H₆: Competitive strategy as activation triggers moderates the relationship between knowledge source and complementarity experience and absorptive capacity.

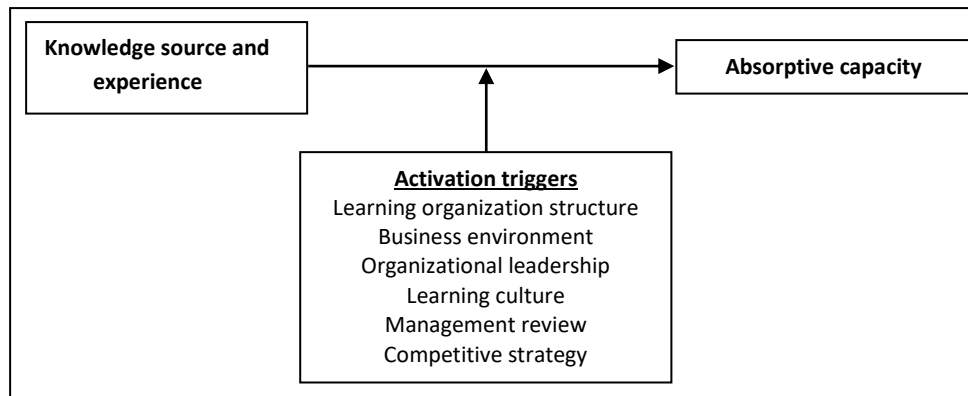
3. METHODOLOGY

This research is a review article and literature review that promotes the conceptualization of activation triggers based on previously published research on this topic. This paper gives an overview of current thinking on activation triggers and absorptive capacity. In this review article, a re-conceptualization is proposed, and the variables are identified as activation drivers based on the theoretical framework of Zahra and George (2002). According to this review article, activation triggers need for greater clarity about structure and domain.

3.1 Theoretical Model

The theoretical model of this research is based on the previous literature and the theoretical framework of Zahra and George (2002). In this research, it is expected that the variables as activation drivers moderate the effect of knowledge and experience on absorption capacity. After that, the scale items to measure each variable are presented in this section.

Figure 1: Theoretical Model



3.2. The Scale and Measurement Items

The scale items that were collected through previous research to measure the construction of activation triggers are justified in this section.

3.2.1. Learning Organization Structure

Table 1 provides a summary of the items used to measure learning organization structure. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Hult and Ferrell (1997).

Table 1: Scales Items- Learning Organization Structure

Scale		Scale Items
Openness	Participative openness	There is lots of room for casual "hall talk". No matter what rank or position they hold, speaking with the purchasing representatives is simple. When a need arises, we are at ease calling our purchasing representative. The purchasing agents are easily reachable. Meetings with our purchasing representative or the purchasing department can be easily scheduled by junior managers in our unit.
	Reflective openness	We are capable of influencing one another's opinions. We are dedicated to being open to having our opinions about the purchasing process change and to sharing our thoughts and feelings about it. We are always willing to challenge one another's viewpoints. We continuously assess the effectiveness of the choices we make and the actions we take over time. We are both critically evaluating each other's thoughts as well as our own regarding the purchasing process.
Localness	Centralization	Before almost anything, we have to consult with our purchasing representative. Until our purchasing representative approves a decision, not much can be done here. Our purchasing representative would quickly discourage us if we attempted to make our own decision. Even minor issues must be brought to our purchasing representative's attention for a decision. Our purchasing representative must give his or her approval before we make any decisions.
	Formalization	In most situations, we believe we are in charge. We are capable of taking independent actions without consulting anyone else. We are in charge of how things are carried out. We set our own rules and can pretty much do whatever we want.

In most situations, we believe we are in charge.

3.2.2. Business Environment

Table 2 provides a summary of the items used to measure business environment. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Ward et al (1995).

Table 2: Scales Items- Business Environment

Scale	Scale Items
Business costs	Growing cost of labour Elevated material costs Rising transportation costs Increasing cost of communications Increasing utility costs Increasing rent Rising costs for health care Strong dollar value
Labour availability	Lack of managerial and administrative personnel Technician shortage Lack of office and related personnel Shortage of qualified personnel Insufficient production personnel The inability to work third shift
Competitive hostility	A fierce market environment of competition Fierce rivalry in foreign markets A small profit margin Declining demand in local market Decreased demand in the international market Generating work that meets the necessary quality standards Poor quality from the vendor

3.2.3. Organizational Leadership

Table 3 provides a summary of the items used to measure organizational leadership. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Saeidi et al (2021).

Table 3: Scales Items- Organizational Leadership

Scale	Scale Items
Organizational leadership	Considering each person separately Optimistic Influence Motivating Inspiration Cognitive Stimulation Management of Conditional Rewards by Exception Considering each person separately

3.2.4. Learning Culture

Table 4 provides a summary of the items used to measure learning culture. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Yao et al (2013).

Table 4: Scales Items- Learning Culture

Scale	Scale Items
Learning culture	Our joint venture's senior management concur that learning is the key to gaining a competitive edge. Learning as a means of improvement is one of the joint venture's core principles.

In the joint venture, employee training is portrayed as an expense rather than an investment.
 In our joint venture, learning is regarded as a crucial resource required to ensure the survival of the company.

3.2.5. Management Review

Table 5 provides a summary of the items used to measure management review. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Wang et al (2006).

Table 5: Scales Items- Management Review

Scale	Scale Items
Management review	Before entering into contracts, management reviews each software development to what extent a formal procedure is used. How much do first-line managers of software development approve of their schedules and budgets? How well-equipped senior management is with a system for routinely reviewing the progress of software development projects.

3.2.6. Competitive Strategy

Table 6 provides a summary of the items used to measure competitive strategy. These measures are really addressing what one might consider the dependent variable. These variable measurement items and indicators have been investigated for measuring structure in previous studies. The scale items of this variable were suggested by Santos-Vijande et al (2013).

Table 6: Scales Items- Competitive Strategy

Scale	Scale Items
Differentiation strategy	Extensive services both before and after the sale Implementing novel marketing strategies Presenting products with differences Offering a wide range of products Highlighting the brands of the company Offering goods of excellent quality
Cost leadership strategy	Maximizing capacity usage Obtaining the best deal possible when purchasing raw materials Manufacturing modernization Enhancing the manufacturing system's productivity Reducing the cost of manufacturing

4. FINDINGS

In this paper, it is argued that attention to activation triggers is indispensable for threshold absorptive capacity and innovation. After Zahra and George's article, the issue of activation triggers in absorptive capacity has been neglected and has not been considered in research. Activation triggers as a group of variables are useful in revamping existing skills and building new capability of absorptive capacity, giving managers an opportunity to explore a wide range of strategic options and create a distinctive advantage for their firms.

The study of previous research shows that learning organization structure, business environment, organizational leadership, learning culture, management review, and competitive strategy play roles as moderator activation triggers in this study. According to the findings, businesses face complex and unpredictable business environment changes, as well as significant knowledge gaps. Decentralized and dynamic structures with participation in decision-making have a moderating effect on the capacity to absorb knowledge and make it easier for businesses to absorb new ideas. The results show that organizational culture fosters the development of fresh perspectives and encourages the integration of external knowledge to maximize the benefits of complementary knowledge sources. Also, the competitive strategy defines the scope and context of perception and learning.

5. CONCLUSION

New external knowledge is continuously cultivated in absorptive capacity. Twenty years after Zahra and Gorge, there is still a significant gap in the literature regarding research and evidence about the complex capabilities of absorptive capacity. There hasn't been much research done on the activation triggers and capability of absorptive capacity. Further research should be done on the entire model, including endogenous and exogenous contingencies. This is because the procedure and capability demand mechanisms. In this theoretical article, variables that play the role of activation triggers in the effect of absorptive capacity were identified and determined. The background of the research shows that with organizational leadership techniques and management reviews, learning and searching to absorb new external knowledge can be encouraged and strengthened. This article demonstrates that businesses face complex, unpredictable changes in the business environment as well as massive knowledge gaps. This study also shows that the type of organizational structure and participation in decision-making have a moderating effect on knowledge absorptive capacity. This means that more decentralized, dynamic structures tend to change beliefs and practices. Decentralized structures increase individual cognitive capacity by increasing knowledge absorptive capacity and making it easier for businesses to absorb new ideas. On the other hand, the organizational culture fosters the development of fresh perspectives and encourages the integration of external knowledge to maximize the benefits of complementary knowledge sources. Learning culture is a way of understanding and thinking about new discoveries and knowledge created at the individual level. This perspective shapes the presuppositions, values, norms, and beliefs of individuals and architectures the culture of learning in a firm. The competitive strategy defines the scope and context of perception and learning. In fact, the choice of strategy determines the learning capacity. Determining this scope will strengthen the firm's future creativity and innovation.

A company that wants to improve its performance and avoid further technical lockout needs to improve the absorptive capacity 's performance with new external knowledge to achieve innovation by increasing the power of the activation trigger. To stimulate and sustain innovative activities, firms need to acquire knowledge from external sources. Therefore, the firm's effectiveness in innovation is achieved through activation triggers. Effective mobilization and deployment of activation triggers are skills that executives must learn.

Numerous other factors besides activation triggers can have an impact on absorptive capacity. It is recommended that more data be gathered about these moderating variables from the extremely rich literature. Other activation triggers that require more investigation include information technology, stakeholders, professional conduct, and research and development units.

REFERENCES

- Akpoviro, K. S., et al. (2018). Impact of external business environment on organizational performance. *International Journal of Advance Research and Innovative Ideas in Education*, 4(3): 498-505. [16.0415/IJARIE-8444](https://doi.org/10.1015/IJARIE-8444)
- Andrawina, L., et al. (2008). Absorptive capacity moderates the relationship between knowledge sharing capability and innovation capability. 2008 IEEE International Conference on Industrial Engineering and Engineering Management. <https://doi.org/10.1109/IEEM.2008.4738009>
- Anseel, F., et al. (2009). Reflection as a strategy to enhance task performance after feedback. *Organizational Behavior and Human Decision Processes*, 110(1): 23-35. <https://doi.org/10.1016/j.obhdp.2009.05.003>
- Barney (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120. <https://doi.org/10.1177/014920639101700108>
- Camisón, C. and B. Forés (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement. *Journal of Business Research*, 63(7): 707-715. <https://doi.org/10.1016/j.ibusres.2009.04.022>
- Cegarra-Navarro, J. G. and G. Cepeda-Carrión (2008). Why open-mindedness needs time to explore and exploit knowledge. *Time & Society*, 17(2-3): 195-213. <https://doi.org/10.1177/0961463X08093422>
- Chilton, M. A., & Bloodgood, J. M. (2008). The dimensions of tacit & explicit knowledge: A description and measure. *International Journal of Knowledge Management (IJKM)*, 4(2), 75-91. <https://psycnet.apa.org/doi/10.4018/jkm.2008040106>
- Cohen, W. M. and D. A. Levinthal (1989). Innovation and learning: The two faces of R&D. *The Economic Journal*, 99(397): 569-596. <https://doi.org/10.2307/2233763>
- Davenport, T. H. and L. Prusak (1998). *Working knowledge: How organizations manage what they know*. Boston, Mass, Harvard Business School Press. <http://dx.doi.org/10.1145/348772.348775>
- Drucker, P. F. (1985). *Innovation and entrepreneurship: practice and principles* Harper & Row, Publishers, Inc. <https://ssrn.com/abstract=1496169>
- Fabrizio, K. R. (2009). Absorptive capacity and the search for innovation. *Research Policy*, 38(2): 255-267. <https://doi.org/10.1016/j.respol.2008.10.023>
- Fiol, C. M. and M. A. Lyles (1985). Organizational learning. *Academy of Management Review*, 10(4): 803-813. <https://doi.org/10.2307/258048>

- Flood, R. L. (1998). Fifth Discipline: Review and Discussion. *Systemic Practice and Action Research*, 11(3): 259-273. <http://dx.doi.org/10.1023/A:1022948013380>
- Gray, C. (2006). Absorptive capacity, knowledge management and innovation in entrepreneurial small firms. *International Journal of Entrepreneurial Behavior & Research*, 12(6): 345-360. <https://doi.org/10.1108/13552550610710144>
- Harris, R. and Q. C. Li (2008). Exporting, R&D, and absorptive capacity in UK establishments. *Oxford Economic Papers* 61(1): 74-103. <https://www.istor.org/stable/25167722>
- Hilden, S. and K. Tikkamäki (2013). Reflective practice as a fuel for organizational learning. *Administrative Sciences*, 3(3): 76-95. <https://doi.org/10.3390/admsci3030076>
- Hisnanick, J. J. (2002). Knowledge emergence: Social, technical, and evolutionary dimensions of knowledge creation. *Journal of Economic Issues*, 36(3): 819-821. <https://doi.org/10.1080/00213624.2002.11506518>
- Hult, G. T. M. and O. C. Ferrell (1997). A global learning organization structure and market information processing. *Journal of Business Research*, 40(2): 155-166. [https://doi.org/10.1016/S0148-2963\(97\)00006-4](https://doi.org/10.1016/S0148-2963(97)00006-4)
- Kim, L. (1998). Crisis construction and organizational learning: capability building in catching-up at Hyundai Motor. *Organizational Science*, 9: 506-521. <http://dx.doi.org/10.1287/orsc.9.4.506>
- Lane, P. J. and M. Lubatkin (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19: 461-477. [https://doi.org/10.1002/\(SICI\)1097-0266\(199805\)19:5%3C461::AID-SMJ953%3E3.0.CO;2-L](https://doi.org/10.1002/(SICI)1097-0266(199805)19:5%3C461::AID-SMJ953%3E3.0.CO;2-L)
- Liu, H., et al. (2009). Why absorptive capacity is more essential in some situations? *International Conference on Information Management, Innovation Management and Industrial Engineering*, IEEE Computer Society: 282-285. <https://doi.org/10.1109/ICII.2009.75>
- Martin, S. L. and R. G. Javalgi (2019). Explaining performance determinants: A knowledge-based view of international new ventures. *Journal of Business Research*, 101: 615-626. <https://doi.org/10.1016/j.ibusres.2019.02.041>
- McKelvie, A., et al. (2008). Modes of knowledge acquisition and innovation in different environments: an examination of new firms. *Frontiers of Entrepreneurship Research*, 28(19): 1-13. <https://dx.doi.org/10.2139/ssrn.1348157>
- Murovec, N. and I. Prodan (2009). Absorptive capacity, its determinants, and influence on innovation output: cross-cultural validation of the structural model. *Technovation*, 29: 859-872. <https://doi.org/10.1016/j.technovation.2009.05.010>
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1): 14-37. <https://www.istor.org/stable/2635068>
- Qiao, M. and D. Chen (2010). Growing though innovatively exploiting context-related knowledge- cases of entrepreneurial firms from China's information technology industry. 2010 International Conference on Management and Service Science. <https://doi.org/10.1016/j.ibusres.2022.113423>
- Saeidi, P., et al. (2021). How does organizational leadership contribute to the firm performance through social responsibility strategies? *Heliyon*, 7(7): 12-11. <https://doi.org/10.1016/j.heliyon.2021.e07672>
- Salehi, N., Omar, R., & Ismail, K. (2012). A Model of Absorptive Capacity in Public Sector: Based on Individual and Organizational Cognitive Process. Paper presented at the 2nd International Conference on Management (2nd ICM 2012), Langkawi Kedah, Malaysia. <https://www.semanticscholar.org/paper/A-model-of-absorptive-capacity-in-public-sector%3A-ON-Salehi/8f9848d362c91d770c2ab5cf0ce0d56228af7e2d>
- Salehi, N. (2021). Activation triggers as endogenous and exogenous contingencies on absorptive capacity. *International Business Management*, 15(8): 324-330. <https://dx.doi.org/10.36478/ibm.2021.324.330>
- Salehi, N. (2022). How to properly apply new external knowledge: the waterfall model of absorptive capacity and innovation. *Journal on Innovation and Sustainability*, 13(2): 73-83. <http://dx.doi.org/10.23925/2179-3565.2022v13i2p73-83>
- Salehi, N., & Asrar, M. M. (2022). The effect of open innovation mindset on absorptive capacity: The mediation role of entrepreneurial alertness. *Journal of Management Marketing and Logistics*, 9(4): 147-155. <https://dergipark.org.tr/en/pub/jmml/issue/75138/1232281>
- Santos-Vijande, M. L., et al. (2013). The brand management system and service firm competitiveness. *Journal of Business Research*, 66(2): 148-157. <https://doi.org/10.1016/j.ibusres.2012.07.007>
- Schmidt, T. (2010). Absorptive capacity—one size fits all? A firm-level analysis of absorptive capacity for different kinds of knowledge. *Managerial and Decision Economics*, 31(1): 1-18. <https://doi.org/10.1002/mde.1423>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7): 509-533. <https://www.istor.org/stable/3088148>
- Tian, H., et al. (2020). Organizational learning ambidexterity and openness, as determinants of SMEs' innovation performance. *European Journal of Innovation Management*, 24(2): 414-438. <https://doi.org/10.1108/EJIM-05-2019-0140>
- Todorova, G., & Durisin, B. (2007). Absorptive capacity: Valuing a reconceptualization. *Academy of Management Review*, 32(3): 774-786. <https://www.istor.org/stable/20159334>

- Turi, J. A., et al. (2019). Impact of the cognitive learning factors on sustainable organizational development. *Heliyon*, 5(9): 1-9. <https://doi.org/10.1016/j.heliyon.2019.e02398>
- Van den Bosch, Frans AJ, Henk W. Volberda, and Michiel De Boer. Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization Science*, 10.5 (1999): 551-568. <https://www.jstor.org/stable/2640317>
- Walesh, J. P. and G. R. Ungson (1991). Organizational memory. *Academy of Management Review*, 16(1): 57-91. https://doi.org/10.1057/978-1-137-00772-8_210
- Wang, D. and S. Chen (2009). Human resource practices and organizational innovation performance in the PRC: The mediating role of absorptive capacity. *Management and Service Science*, 2009., MASS '09. International Conference on, IEEE Conferences. <http://dx.doi.org/10.1109/ICMSS.2009.5302091>
- Wang, H. L., & Wu, C. N. (2008, October). A Study on Technological Knowledge Internalization of Enterprises. In 2008 4th International Conference on Wireless Communications, Networking and Mobile Computing (pp. 1-3). IEEE. <http://dx.doi.org/10.1109/WiCom.2008.2621>
- Ward, P. T., et al. (1995). Business environment, operations strategy, and performance: An empirical study of Singapore manufacturers. *Journal of Operations Management*, 13(2): 99-115. [https://doi.org/10.1016/0272-6963\(95\)00021-J](https://doi.org/10.1016/0272-6963(95)00021-J)
- Yang, M. M., et al. (2017). How a reflection intervention improves the effect of learning goals on performance outcomes in a complex decision-making task. *Journal of Business and Psychology*, 33(5): 579-593. <https://doi.org/10.1007/s10869-017-9510-0>
- Yao, Z., et al. (2013). Knowledge complementarity, knowledge absorption effectiveness, and new product performance: The exploration of international joint ventures in China. *International Business Review*, 22(1): 216-227. <http://www.corc.org.cn/handle/1471x/6497884>
- Zahra, S. A. and G. Geroge (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2): 185-203. <https://doi.org/10.2307/4134351>
- Zahra, S. A., Filatotchev, I., & Wright, M. (2009). How do threshold firms sustain corporate entrepreneurship? The role of boards and absorptive capacity. *Journal of Business Venturing*, 24(3): 248-260. <https://doi.org/10.1016/j.jbusvent.2008.09.001>
- Zhou, K. Z. and F. Wu (2010). Technological capability, strategic flexibility, and product innovation. *Strategic Management Journal*, 31: 547-561. <https://www.jstor.org/stable/40587598>



EFFECT OF SUSTAINABILITY PERCEPTION ON CONSUMER PURCHASING BEHAVIOUR

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ABSTRACT

Purpose- The aim of the study is to determine how sustainability perception affects electronic word-of-mouth communication and purchase intention. The perception of sustainability consists of waste utilisation and minimisation, climate change concerns, contributing to environmental protection and recycling. Consumer behaviour is addressed with the dimensions of electronic word-of-mouth communication and purchase intention.

Methodology- The data were collected from consumers who use white goods by online survey method and SPSS statistical programme was used to test the relationships. The population of the study consists of consumers who use white goods. Considering that it is not practically possible to reach the universe, sampling was used. Since it is not foreseen to make a generalisation about the population, convenience sampling method, one of the non-random sampling methods, was used. Accordingly, the participants of the study consisted of 517 people.

Findings- In the study, sustainability perception positively affects electronic word-of-mouth communication and purchase intention. Moreover, sustainability perception components together positively affect electronic word-of-mouth communication and purchase intention.

Conclusion- In recent years, negative impacts on natural ecosystems have increased the importance of the concept of sustainability. Consumers have an important role in ensuring sustainability. Consumers' increasing awareness of sustainability and parallel to this, increasing concerns affect their purchasing behaviour. Perceptions of sustainability strongly influence consumer purchase intentions, which in turn encourage positive online word-of-mouth marketing more effectively than traditional marketing tools.

Keywords: Sustainability perception, electronic word-of-mouth, purchase intention, consumer behavior, environmental sustainability

JEL Codes: M30, M31, M39

1. INTRODUCTION

The complexness of today's global economy is increasing the load on energy, food and natural resources. Increasing consumption has a significant impact on environmental stability, while consumers' consumption patterns and preferences lead to the production of large quantities of packaging. These materials create significant environmental problems. The use of plastics, which threatens ecosystems and creates risks to human health, also causes serious environmental problems. Governments, businesses and all individuals need to fulfil their responsibility for environmental problems. Environmental regulations, rules, legal acts aimed at solving problems and finding solutions, as well as sustainable or green strategies to be developed by businesses are among the things to be performed in this direction. It is an important point that the behaviour of the individuals who direct the change in the society should be in parallel with the sustainable perspective.

As the level of awareness of consumers about environmental problems increases, their environmental concerns increase at the same rate. Increasing concerns make it compulsory for consumers to act by giving importance to the concept of sustainability in their lifestyles and purchasing behaviours. Considering that the level of interconnectedness between businesses and consumers is constantly increasing, it is also important for businesses to develop strategies that match the values of consumers.

The basis of sustainability is to take into account the right to life of future generations; therefore, marketing should undertake a mission within this framework. This situation can be realised primarily through understanding and practices that lead

consumers towards sustainable consumption that will change their consumption patterns. Thus, while this change is beneficial for the consumer, it can also direct production and other business activities in this direction (Yükselen, 2020).

In the digital age, the integration of the concept of sustainability into marketing aims to gain the attention and favour of consumers. Consumers who think that products meet environmental needs tend to form positive purchase intentions. Brands that fulfil their responsibilities towards the environment and carry out activities in this direction can positively affect consumers' behavioural intentions and thus online word of mouth marketing communication. In this direction, determining the impact of consumers' perception of sustainability will contribute to the development of the right strategies as well as providing more efficient and effective marketing messages.

2. Conceptual Framework

2.1. Perception of Sustainability

Sustainable development has emerged as the new development paradigm to help the world overtake current and future environmental and social challenges such as climate change, energy resource and water scarceness. Sustainable development is one of the greatest challenges of the twenty-first century and is recognised as an absolute imperative for the survival of the planet (Khalil et al., 2013).

As environmental issues such as global warming, ozone depletion and loss of species become more apparent, sustainable consumption has emerged as an important social problem. To increase sustainable consumption, some research workers and policy-makers suggest that people should extend product life cycles by engaging in "slow consumption" or decelerating the rate at which goods are consumed (Scott and Weaver, 2018).

The concept of sustainability includes environmental, social and economic aspects; therefore, it has a multidimensional structure. Since the early 1990s, the concept of sustainability has been concerned with urban development issues, while it has now become more widely used in issues such as sustainable cities, urban sustainability and sustainable housing. According to the World Commission on Environment and Development, sustainability is "evolution that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." (AlQahtany, 2020). In order to comply with this view and make suitable decisions, society and its several stakeholders need quality data. In the last few years, companies have used sustainability reporting as a way to fulfil at any rate of some of these needs (Coulmont et al., 2022).

As sustainability becomes increasingly important to consumers, manufacturer and retailer merchants are responding with integrated sustainability enterprise, including the introduction of new products and brands with positive social and environmental features (Bezençon and Etemad-Sajadi, 2015).

In addition to international policies and actions to address environmental problems, governments have specific tasks at the national level. Governments have various functions in terms of the environment. Firstly, environmental protection is a public interest. Therefore, the public sector can intervene in the market through instruments such as taxes, subsidies and legal regulations, especially those aimed at limiting overproduction. Although common resources are scarce, there is no limit to their consumption, which increases the possibility of overconsumption. Because of these problems, governments must produce the most appropriate policies to maximise individual and social interests and, through coordination, achieve economic results and sustainable environmental goals (Caglar and Yavuz, 2023). Otherwise, an unsustainable consumption model brings serious environmental sustainability problems. Sustainable consumption is an important model that involves the consumption of environmentally friendly products to reduce the consumption of natural resources, change lifestyles and meet the current needs and wants of future generations (Nath and Agrawal, 2022).

Today the global economy complexness has led to unprecedented population growth. This has increased the burden on energy, food and natural resources. Increased consumption importantly affects the stability of environment; most modern consumers have become aware of the collective impacts on the planet. Concerns arising in this direction affect consumers' lifestyle choices, including purchasing patterns (Ottenbacher et al., 2019).

Although researchers have shown that humans consume goods and use services faster than the natural ecosystem can replenish, process or recycle them, most people still think that the economy is primarily linked to the production and consumption of physical goods (Saari et al., 2021). However, individuals, who directly affect the change of societies, have a very important role in the implementation of the principles of sustainable development. In addition to behaviours aimed at sustainable development, consumers can influence production in various sectors by consuming products and services offered by environmentally friendly or honest commercial organisations. Consumers can also contribute to increasing recycling rates by taking care not to waste water, electricity or petrol unnecessarily (for example, by walking or using public transport). Individuals' attitudes and routines are therefore related to sustainable development (Catenazzo et al., 2010).

Consumer action is crucial for sustainability because aspects of everyday life, such as the heating and cooling systems of homes and water use patterns, have an important impact on greenhouse gas emissions. Individuals' environmental concerns, which are a reflection of a range of factors, are often cited as one of the most significant influences on "reduction behaviour". Other determinants include contextual influences such as values and economic policies (Nauges and Wheeler, 2017).

Globally, everyone, including companies, is under pressure to play their part because of concern about climate change. Strict environmental regulations, aimed at solving problems and finding solutions, are becoming the norm in developed and developing economies alike. Researchers argue that such pressures, strict environmental regulations, sustainable or green strategies have an important role to play in helping firms succeed and are shaping a new competitive environment (Arslan et al., 2021). There is no doubt that among the greatest challenges facing humanity in the future are climate change and biodiversity loss. Climate change has an impact on natural and human systems on all continents and oceans, requiring humanity to adapt to a new reality (Helm et al., 2018).

Excessive use of natural resources, consumption far beyond what the world can sustainably provide, people's consumption patterns and preferences lead to the production of large quantities of packaging. These materials create serious environmental problems. Once the products reach the consumer, packaging is no longer necessary, which leads to the problem of waste. Packaging should be seen as more than just a method of delivering or presenting products safely to consumers. The environmental impact of the packaging produced by the designer should be taken into account. Individuals' decisions on how to purchase pre-consumer packaging, how to use it during consumption and how to dispose of it afterwards are crucial to effectively addressing the waste problem (Escario et al., 2020).

The perception of product sustainability should be considered when designing and developing new sustainable package materials. Consumers should be able to easily recognise sustainable packaging based on direct clues provided by the material itself, without the need for labels and claims (Schoubroeck et al., 2023).

Within the scope of sustainability in the literature, 3-R concepts have been developed, which include the joint action of producers and consumers and consciously managing resources (Kayıkçı et al., 2019):

- Reduce: Choosing the products used in a way that minimises the amount of waste after the consumption and production of the products.
- Reuse: Reuse of all or some parts of the products.
- Recycle: It is the transformation of waste into a new product.

The principle of "first reduce, then reuse and then recycle" can be thought of as an inverted pyramid. According to the pyramid, the more waste is reduced, the less reuse is required and the more waste is reused, the less recycling is required (Kayıkçı et al., 2019).

Recycling is a waste management strategy, but it can also be seen as a current example of the application of the concept of industrial ecology. However, in a natural ecosystem there is no waste, only products. Recycling of plastics is one of the methods used to reduce depletion and environmental impact of resources. Recycling can therefore reduce the energy use and materials per unit of output, thus enabling better eco-efficiency (Hopewell et al., 2009).

The 3Rs, symbolising "Reduce, Reuse, Recycle", have become a similar paradigm for waste management by consumers. Despite increasing the awareness of public of plastic pollution (European Commission-2020), plastic consumption patterns persist (Steinhorst and Beyerl, 2021).

Global environmental pollution caused by plastics not only threatens ecosystems around the world, but also poses a risk to human health. One of the main causes of this pollution is the uncontrolled use of single-use plastic packaging. Reducing the plastics crisis is the focus of both political measures and food industry businesses. Taking political measures into account, the Canadian government classifies manufactured plastics as toxic due to their harmful effects on the environment. The EU has banned the use of plastic cutlery and straws. In addition, many countries of the world have banned single-use plastic bags (Herrmann et al., 2022).

2.2. Consumer Behaviour

Consumers have tendency to prefer brands that are recognised for their sustainability activities. Perceptions of sustainability include perceptions of brand efforts, losses and gains in sustainability efforts. When green products arouse high trust and positive brand attitudes, consumers have tendency to form positive purchase intentions because they think that the products meet their environmental needs. Brands which have transparency and social responsibility efforts strongly influence consumer attitudes and behavioural intentions, which in turn encourage positive WOM and online WOM marketing more effective than traditional marketing tools (Kong et al., 2021).

2.2.1. E-WOM Communication

The rapid growth of electronic commerce has led thousands of businesses which have traditional stores to seek an on-line presence and develop mobile applications, among other strategies, in order to respond to market needs (Siqueira Jr et al., 2019). Through the rapid development of social media and the use of smart devices, e-WOM communication is ubiquitous. Unlike traditional-WOM, e-WOM enables customers to obtain real-time, real-life data from previously inaccessible sources. Social media networks accelerate the spread of e-WOM communication by enabling consumers to easily share and collect brand-related data in a well-timed and cost-effective manner (Sun et al., 2021).

Before the widespread of the internet, consumers shared out their experiences of product or service through personal verbal communication; however, the development of technological progress has provided many opportunities for consumers to interact with businesses and other consumers through multiple channels, such as social media, which helps them to create e-WOM. The e-WOM is described as "an active and continuing information exchange process between potential, current or former consumers about a product, service, brand or business that is made accessible to a large number of individuals and organisations over the internet" (Akbari et al., 2022).

The e-WOM is similar to offline WOM in that consumers share information about products and services directly and indirectly. In addition, since e-WOM marketing communication uses the Internet as an intermediary, it can convey information much more efficiently and quickly than offline WOM communication (Lee and Choi, 2019, 10). Although electronic WOM is an extension of offline WOM, it has a few more unique features that differentiate it. Some of these are speed of information dissemination, wider reach, multi-directional information exchange, availability at all times, greater reliability and greater measurability (Shankar et al., 2020).

The e-WOM is any informal communication to consumers, via Internet based technology, about the features or uses of particular products and services or their sellers. Consumers' evaluations of a product or service can be easily influenced by WOM communication (Kwok et al., 2019). The e-WOM communication is an advertising tool used to share other customers' perspectives with each other due to the customer's awareness of the products (Hussain et al., 2018).

The e-WOM enables consumers to compare alternatives for products or services after searching for information. Moreover, at the final stage of the purchase decision, which involves the choice of product or service, brand and retailer, e-WOM communication reduces the perception of risk, which has an important impact on the consumer decision. E-WOM constantly influences consumer behaviour. The e-WOM communication continuously influences consumer behaviour because the process continues after the purchase and includes the post-purchase stage regarding consumers' expectations and satisfaction (Hussain et al., 2018).

WOM communication in marketing is a consumer-oriented marketing communication channel in which the sender is independent from the market. Consumers tend to see WOM marketing communication as more credible, reliable, useful and therefore more persuasive than information generated by the marketer (Lim et al., 2022).

Online shoppers always consider the comments and experiences of other shoppers before purchasing products online. Millions of people have access to online comments; this is where the power of e-WOM marketing communication lies. Customers who have a good experience with a seller are more likely to engage in favourable WOM marketing communication. Since consumers trust user-generated content more than other forms of communication, they are more likely to be influenced by other consumers in their decision-making process (Duarte et al., 2018).

Studies have shown that people prefer to take into account the opinions of others online when making decisions online. In this respect, positive WOM communication refers to the sharing of positive valuation and satisfactory quality with others after consumption, while negative WOM communication refers to the consumer telling others about the unsatisfactory purchase and use experience and even suggesting not to consume such products (Shu and Wu, 2014).

In the digital age, the integration of the concept of sustainability into marketing directs to gain the prominence and favour of consumers. Sustainable marketing is not only to introduce the product and increase profits, but also to create positiveness in society in the sense of emotionally influencing the consumer to favour responsible brands. When trends in online promotion, consumer behaviour and digital communication are examined, it appears that both customers and the brands are becoming increasingly active on-line, particularly on social media. Previous studies have suggested that social networking can be a good platform for sustainability as it provides the data people aim to make wiser purchasing decisions and authorise customers to demand quality (Anastasiu and Dospinescu, 2019).

2.2.2. Purchase Intention

Intention is defined as "an individual's willingness or capacity to perform a certain behaviour". In marketing, purchase intention is a concept used for the long term prediction of purchasing behaviour as it is related to the willingness to purchase of potential customers (Nguyen et al., 2023).

Purchase intention is the predisposition of customers regarding their purchasing actions. Consumers' willingness to purchase a product can be defined through the extent of purchase intention. Purchase intention is the pre-planning of customers to purchase certain products in the future. Therefore, it explains the individual's preference for product purchase and categorisation of available options. Purchase intention is the consumer's willingness to purchase (Rakib et al., 2022).

Although customers' purchase intention is not the only factor to be considered in marketing, it is a measurement value for predicting future sales of a particular product. Understanding customer purchase intent is a critical part of planning for future sustainability, because achieving a sustainable consumption pattern means, in part, selling sustainable products to as many customers as possible around the world (Panuju et al., 2019).

Environmental anxiety, which has been accepted as a significant determinant of ecological behavioural aim, involves individuals' emotional reactions to ecological problems. Previous research has shown that individuals' feeling that they are more responsible for the environment and taking responsibility for preserving the environment are related to an increase in environmental concern; in addition, when individuals have environmental concerns, they adopt green products. Environmental concerns affect green purchase intention. Individuals with high environmental concern indicate a clear intention to preserve the environment, making it simple for individuals to adopt green products (Yeğin and Ikram, 2022).

Consumers' concern for green issues is a global issue that has led them to significantly change their lifestyles and become more environmentally responsible. As consumer awareness of the benefits of green products has increased, consumers' concerns about saving the world from global warming problems have also increased, leading to the development of green consumerism. Green awareness influences human behaviour in several ways (Lestari et al., 2021).

The buyer intention of consumers who consume green products or services is necessarily influenced by sustainable behaviours that care about the environment; therefore, these behaviours motivate the people to choose products that not harmful for the environment. Therefore, the aim to choose environmentally friendly product or service will result in a high impact on the consumer's sustainable consumption behaviour (Brandão and Miranda 2022).

Sustainable consumption behaviour refers to the extent to which individuals' choices and actions towards products and services reduce environmental impacts, the exchange of available materials or energy in the environment, or change the structure of ecosystems (Jung et al., 2020). The behaviour of sustainable consumption concerns consumers who attach a huge significance to sustainability and aim to meet their basic regular needs, significantly improving the life quality of consumers without menacing the demands and interests of future generations. These consumers accomplish their activities aimed at protecting the environment and preferring this lifestyle by keeping away from behaviours that harm the natural environment, living organisms and other people. Sustainable consumption behaviour takes into account the life cycle of products and services as well as issues such as production, transport, circulation, use, disposal and recycling. Sustainable consumption aims to reduce environmental concerns, increase safety, ensure an adequate distribution of natural resources, increase well-being, create a healthy life and embrace social responsibility (Brandão and Miranda, 2022).

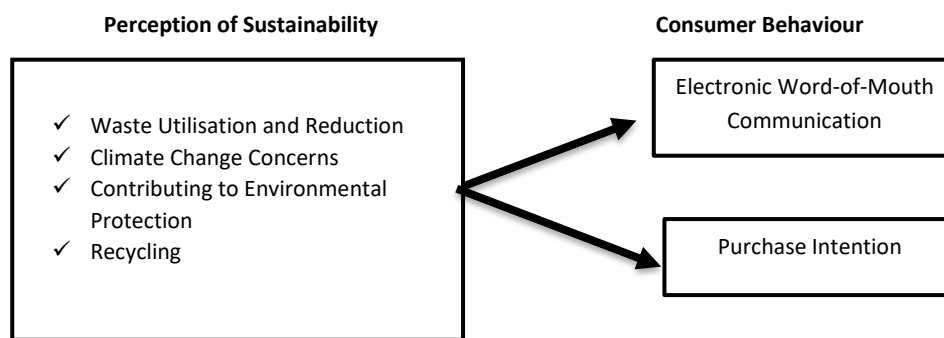
Consumers concerned about sustainability issues may be willing to pay for recycled products. They are therefore more likely to buy recycled products, especially when they are aware of the associated environmental benefits. Discreet consumers understand the environmental challenge facing society today and therefore act in an environmentally sensitive manner and prefer to buy environmentally sustainable products (Queiroz et al., 2021).

When environmentally friendly customers become conscious of environmental degradation and develop a more competent attitude towards ecological protection, their concerns will influence their purchasing choices and lead them to buy green products that have a significant impact on the environment (Wijekoon and Sabri, 2021). Consumers with more environmental knowledge are generally more likely to engage in environmentally friendly purchasing behaviours (Kim and Oh, 2020).

3. METHODOLOGY

3.1. Purpose, Conceptual Model and Scope of the Study

The aim of the research is to determine how sustainability perception affects e-WOM communication and purchase intention of consumers using white goods. The conceptual model of the study is shown in Figure 1. In the conceptual model of the study, sustainability perception consists of waste utilisation and reduction, climate change concerns, contributing to environmental protection and recycling components. Consumer behaviour is addressed with the dimensions of e-WOM communication and purchase intention.

Figure 1: Conceptual Model of the Study

The following sources were utilised for the scale questions related to the variables in the conceptual model of the research: Perception of sustainability, Aleixo et al., 2021; e-WOM communication, Siqueira Jr. et al., 2019; purchase intention, Ha et al., 2014.

The population of the study, which aims to determine how consumers' perception of sustainability affects e-WOM communication and purchase intention, consists of consumers using white goods. Considering that it is not practically possible to reach the universe, sampling was used. Since it is not foreseen to make a generalisation about the population, convenience sampling method, one of the non-random sampling methods, was used.

The sample size was determined as follows (Yükselen, 2017):

p: Ratio of consumers influenced by sustainability approach (0.5)

q: 1-p (0.5)

Z: Normal value at safety level (± 2 at 95.5%)

e: Tolerance level ($\pm 4\%$)

$n = p * q * (Z/e)^2 = 0.5 * 0.5 * (2/0.05)^2 = 400$

Online survey method was used as the data collection method and for this purpose, a questionnaire form was created with questions related to the variables that make up the model using a 5-point Likert scale.

3.2. Hypotheses

Individuals who are effective in the implementation of sustainable development can influence the production in different sectors by preferring environmentally friendly and responsible brands. In addition, it is important for the implementation of sustainable development that individuals do not spend resources unnecessarily in their routine actions in their daily lives and display an environmentally sensitive attitude.

Most consumers are concerned about the future as they are aware of the negative impacts on the ecosystem. Increasing concerns influence choices in consumers' lives, including purchasing patterns.

Online platforms, where consumers and brands become active and interact with each other every day, are effective in consumers' purchasing decision processes. Transparent and socially responsible brand efforts encourage online word-of-mouth marketing. Consumers tend to prefer brands that are recognised for their sustainability activities. Based on this point, the hypotheses of the research were determined as follows:

H1. Perception of sustainability positively affects e-WOM communication.

H2. The components of sustainability perception together positively affect e-WOM communication.

H3. Perception of sustainability positively affects purchase intention.

H4. The components of sustainability perception together positively affect purchase intention.

3.3. Data Analysis

3.3.1. Descriptive Information on Respondents and Brands

The distribution of white goods brand users who participated in the survey within the scope of the research according to demographic characteristics is shown in Table 1. The majority of the respondents were males between the ages of 18-30. The majority of the respondents use Samsung and Siemens white goods.

Table 1: Demographic Characteristics of Respondents

Demographic Characteristics		Number	Ratio
Gender	Female	238	46.0
	Male	279	54.0
Age	18-30	190	36.8
	31-40	160	30.9
	41-50	104	20.1
	51 +	63	12.2

Table 2: White Goods Brands Used

Brand	Number	Ratio
Samsung	131	25.3
Siemens	192	37.1
Bosh	62	12.0
Vestel	38	7.4
Huawei	58	11.2
Arçelik	36	7.0

3.3.1. Factor Analysis Results Regarding the Perception of Sustainability Variable

In the exploratory factor analysis, four components of sustainability perception were included in the exploratory factor analysis with 17 questions. The KMO value was 0.913, indicating that the sample size was suitable; the Bartlett's Test of Sphericity chi-square value was 4496.327, indicating that the distribution fit the multivariate normal distribution at 1% significance level. In the analysis, the quadruple structure in the model was found to be a triple structure (Table 3). The three-factor structure explains 60.842% of the total variance. Since the factor loading was below 50%, AQA1 was removed from the structure.

Table 3: Factor Structure After Exploratory Factor Analysis

Rotated Structure Matrix			
	Factor		
	1	2	3
AKA2		.598	
AKA3		.771	
AKA4		.762	
AKA5		.685	
AKA6		.612	
AKA7		.525	
IDE1			.732
IDE2			.741
IDE3	.572		
IDE4			.839
CKKB1	.704		
CKKB2	.818		
CKKB3	.778		
CKKB4	.636		
GD1			.509
GD2	.539		

Source: AKA: Waste Utilisation and Reduction, IDE: Climate Change Concerns, CKKB: Contribution to Environmental Protection, GD: Recycling.

As a result of the analysis, the three factors were named as follows:

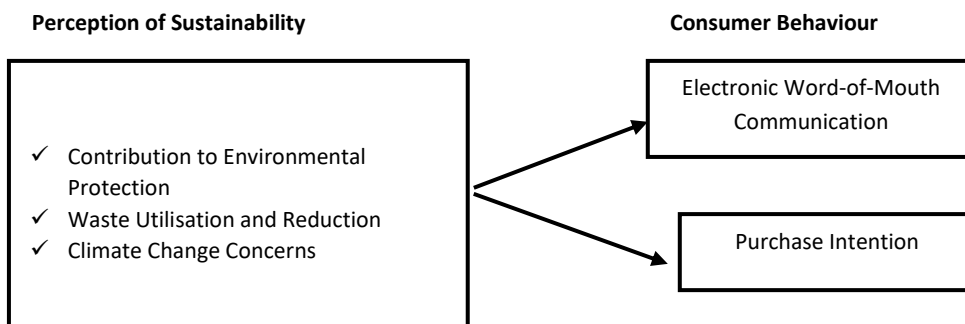
Factor 1: Contribution to Environmental Protection,

Factor 2: Waste Utilisation and Reduction,

Factor 3: Climate Change Concerns.

According to these results, the sustainability perception variables in the conceptual model have been changed and the conceptual model has been arranged as follows:

Figure 2: Conceptual Model after Exploratory Factor Analysis



3.3.2. Reliability Analysis of Scales Related to Model Variables

The reliability analysis of the scales related to the variables in the conceptual model of the research is shown in Table 4. As can be seen in Table 4, the reliability coefficient of the scales related to all variables is high and it can be said that the scales have high reliability.

Table 4: Reliability Analysis

Variables	Number of Questions	Cronbach's Alpha
Perception of Sustainability	16	0.917
Contribution to Environmental Protection	6	0.850
Waste Utilisation and Reduction	6	0.841
Climate Change Concerns	4	0.852
E-WOM Communication	3	0.867
Purchase Intention	3	0.771
Whole Scale	22	0.925

3.3.3. Analysing the Effect of the Perception of Sustainability on E-WOM Communication

The effect of the perception of sustainability on e-WOM communication was tested by simple regression analysis. The correlation coefficient showing the relationship between sustainability perception and e-WOM communication is 0.427 and the determination coefficient is 0.182. In other words, the relationship between the two variables is moderate and sustainability perception explains 18.2% of e-WOM communication. As seen in the table, the significance level of the model is significant at 1% significance level. According to these results, hypothesis H1 is supported; perception of sustainability has a positive effect on e-WOM communication.

Table 5: Relationship between Sustainability Perception and E-WOM Communication

F	p	R	R ²	Adjusted R ²			t	p	
114.573	0.000	0.427	0.182	0.180					
Model					Coefficients		Standardised Coefficients		
					B	Standard Error	Beta		
Fixed Perception of Sustainability					0.672	0.274	0.427	2.4491	.015
					0.701	0.066		10.704	.000

3.3.4. Analysing the Effect of Sustainability Perception Components on e-WOM Communication

The effect of sustainability perception components together on e-WOM communication was tested with multiple regression analysis. The correlation coefficient showing the relationship between sustainability perception components and e-WOM communication is 0.458 and the determination coefficient is 0.210. In other words, the three components of sustainability perception together explain 21% of e-WOM communication. According to these results, H2 hypothesis is accepted; sustainability perception components together positively affect e-WOM communication. In addition, as seen in the table, although the model is significant, when the regression coefficients are taken into account, this effect is largely due to the contribution to environmental protection and waste utilisation and reduction components.

Table 6: Analysing the Effect of Sustainability Perception Components on e-WOM Communication

F	p	R	R ²	Adjusted R ²			
45.514	.000	.458	.210	.206			
Model	Coefficients		Std. Coefficient	t	p	Co-linearity	
	B	Std. Error	Beta			Tolerance	VIF
Fixed	.620	.274		2.267	.024		
Contribution to Environmental Protection	.411	.072	.297	5.731	.000	.572	1.749
Waste Utilisation and Reduction	.385	.089	.248	4.330	.000	.469	2.134
Climate Change Concerns	-.065	.075	-.048	-.869	.385	.499	2.005

3.3.5. Analysing the Effect of Sustainability Perception on Purchase Intention

The effect of sustainability perception on purchase intention was tested with simple regression analysis. The correlation coefficient showing the relationship between sustainability perception and purchase intention is 0.570 and the coefficient of determination is 0.325. In other words, sustainability perception explains 32.5% of purchase intention. As seen in Table 7, the model is significant at 1% significance level. According to these results, hypothesis H3 is supported; sustainability perception positively affects purchase intention.

Table 7: Relationship between Sustainability Perception and Purchase Intention

F	p	R	R ²	Adjusted R ²			
247.364	.000	.570	.325	.324			
Model	Coefficients		Std. Coefficients	t	p		
	B	Std. Error	Beta				
Fixed	1.074	.181		5.926	.000		
Perception of Sustainability	.681	.043	.570	15.728	.000		

3.3.5. Analysing the Effect of Sustainability Perception Components on Purchase Intention

The effect of sustainability perception components together on e-WOM communication was tested with multiple regression analysis. The correlation coefficient showing the relationship between the components of sustainability perception and purchase intention is 0.607 and the determination coefficient is 0.368. In other words, the relationship between the three components of sustainability perception and purchase intention is strong and the components of sustainability perception together explain 36.4% of the purchase intention. According to these results, hypothesis H4 is accepted; the components of sustainability perception together positively affect purchase intention. In addition, as seen in Table 8, although the model is significant at 1% significance level, when the regression coefficients are taken into account, this effect is largely due to the contribution to environmental protection and waste utilisation and reduction components.

Table 8: Analysing the Effect of Sustainability Perception Components on Purchase Intention

F	p	R	R ²	Adjusted R ²					
99.216	.000	.607	.368	.364					
Model	Coefficients		Std. Coefficients	t	p	Co-linearity			
	B	Std. Error	Beta			Tolerance	VIF		
Fixed	1.079	.178		6.060	.000				
Contribution to Environmental Protection	.442	.047	.440	9.469	.000	.572	1.749		
Waste Utilisation and Reduction	.264	.058	.234	4.539	.000	.467	2.143		
Climate Change Concerns	-.008	.049	-.008	-.168	.866	.496	2.016		

4. CONCLUSION AND IMPLICATIONS

With globalisation, the consumption of natural resources, energy and food resources is increasing day by day. This leads to consumption faster than the ecosystem can replenish or recycle. Therefore, the realisation of much more consumption than the world can sustainably provide raises concerns about the future. The reasons for these concerns include problems such as climate change, plastic and air pollution, and loss of biodiversity.

Most consumers are concerned about environmental issues. Increasing concerns affect consumers' preferences. Consumers' conscious behaviour on this issue and doing their part will create pressure on various sectors and encourage them to be sensitive on this issue. Especially on online platforms that are effective in consumers' purchasing decision processes, transparent and socially responsible brand efforts direct consumers' word-of-mouth communication and purchase intentions.

In the study, it was found that sustainability perception positively affects e-WOM communication and purchase intention. In addition, contribution to protecting the environment, climate change concerns, waste utilisation and reduction, which are components of sustainability perception, together positively affect e-WOM communication and purchase intention.

It should be taken into consideration that the findings should be evaluated within the framework of the research sample. The sample size does not allow generalisation for the population. However, considering both the study conducted and previous studies, brands should give importance to the issue of sustainability and emphasise this issue at every point where they interact with their customers, especially in the online environment. They can raise awareness of brands by communicating their sustainability efforts and policies, their contributions to sustainable development to their customers. Considering the findings of the studies in general, it can be said that consumers' sustainability perceptions positively affect their purchase intentions and e-WOM communication.

It would be useful to examine whether the consumer behaviours towards the sustainability perceptions of consumers in white goods brands, which are discussed in the research, support the results obtained by applying them in other products or in different sectors. Applying the effect of sustainability perception on consumer behaviour to a larger sample size will increase the contribution to the validity of the results obtained.

REFERENCE

Akbari, M., Foroudi, P., Fashami, R. Z., Mahavarpour, N., Khodayari, M., (2022). Let us talk about something: The evolution of e-WOM from the past to the future. *Journal of Business Research* 149, 663-689. <https://doi.org/10.1016/j.ibusres.2022.05.061>

Aleixo, A.M., Leal, S., Azeiteiro, U.M., (2021). Higher education students' perceptions of sustainable development in Portugal. *Journal of Cleaner Production* 327, 1-15. <https://doi.org/10.1016/j.jclepro.2021.129429>

AlQahtany, A., (2020). People's perceptions of sustainable housing in developing countries: the case of Riyadh, Saudi Arabia. *Housing, Care and Support*, 23(3/4), 93-109.

Anastasiei, B., Dospinescu, N., (2019). Electronic word-of-mouth for online retailers: predictors of volume and valence. *Sustainability*, 11(3), 1-18.

Arslan, A., Haapanen, L., Hurmelinna-Laukkanen, P., Tarba, S.Y., Alon, I., (2021). Climate change, consumer lifestyles and legitimation strategies of sustainability-oriented firms. *European Management Journal*, 39(6), 720-730.

Bezençon, V., Etemad-Sajadi, R., (2015). The effect of a sustainable label portfolio on consumer perception of ethicality and retail patronage. *International Journal of Retail & Distribution Management*, 43(4/5), 314-328.

- Brandão, A., Miranda, C.C., (2022). Does Sustainable Consumption Behaviour Influence Luxury Services Purchase Intention? Sustainability, 14(13), 1-28.
- Caglar, A.E., Yavuz, E., (2023). The role of environmental protection expenditures and renewable energy consumption in the context of ecological challenges: Insights from the European Union with the novel panel econometric approach. Journal of Environmental Management 331, 1-8. <https://doi.org/10.1016/j.jenvman.2023.117317>
- Catenazzo, G., Epalle, A., Fragniere, E., Tuberosa, J., (2010). Testing the impact of sustainable development policies in Canton Geneva. Management of Environmental Quality: An International Journal, 21(6), 845-861.
- Coulmont, M., Berthelot, S., Gagné, V., (2022). Sustainability performance indicator trends: a Canadian industry-based analysis. International Journal of Corporate Social Responsibility, 7(2), 1-17.
- Duarte, P., Silva, S. C., Ferreira, M. B., (2018). How convenient is it? Delivering online shopping convenience to enhance customer satisfaction and encourage e-WOM. Journal of Retailing and Consumer Services 44, 161-169. <https://doi.org/10.1016/j.iretconser.2018.06.007>
- Escario, J.J., Rodriguez-Sanchez, C., Casalo, L.V., (2020). The influence of environmental attitudes and perceived effectiveness on recycling, reducing, and reusing packaging materials in Spain. Waste Management 113, 251-260. <https://doi.org/10.1016/j.wasman.2020.05.043>
- Ha, H.Y., Akamavi, R.K., Kitchen, P.J., Janda, S., (2014). Exploring key antecedents of purchase intentions within different services. Journal of Services Marketing, 28(7), 595-606.
- Helm, S.V., Pollitt, A., Barnett, M.A., Curran, M.A., Craig, Z.R., (2018). Differentiating environmental concern in the context of psychological adaption to climate change. Global Environmental Change 48, 158-167. <https://doi.org/10.1016/j.gloenvcha.2017.11.012>
- Herrmann, C., Rhein, S., Strater, K.F., (2022). Consumers' sustainability-related perception of and willingness-to-pay for food packaging alternatives. Resources, Conservation & Recycling 181, 1-13. <https://doi.org/10.1016/j.resconrec.2022.106219>
- Hopewell, J., Dvorak, R., Kosior, E., (2009). Plastics Recycling: Challenges and Opportunities. Royal Society, 364(1526), 2115-2126.
- Hussain, S., Guangju, W., Jafar, R. M. S., Ilyas, Z., Mustafa, G., Jianzhou, Y., (2018). Consumers' online information adoption behavior: Motives and antecedents of electronic word of mouth communications. Computers in Human Behavior 80, 22-32. <https://doi.org/10.1016/j.chb.2017.09.019>
- Jung, H. J., Choi, Y. J., Oh, K. W., (2020). Influencing factors of Chinese consumers' purchase intention to sustainable apparel products: exploring consumer "attitude-behavioral intention" gap. Sustainability, 12(5), 1-14.
- Kayıkcı, P., Armağan, K., Dal, N.E., (2019). Sürdürülebilir pazarlama: kavramsal bir çalışma. Journal of Bucak Faculty of Business, 2(1), 77-93.
- Khalil, D., Ramzy, O., Mostafa, R., (2013). Perception towards sustainable development concept: Egyptian students' perspective. Sustainability Accounting, Management and Policy Journal, 4(3), 307-327.
- Kim, Y., Oh, K. W., (2020). Effects of perceived sustainability level of sportswear product on purchase intention: exploring the roles of perceived skepticism and perceived brand reputation. Sustainability, 12(20), 1-16.
- Kong, H. M., Witmaier, A., Ko, E., (2021). Sustainability and social media communication: How consumers respond to marketing efforts of luxury and non-luxury fashion brands. Journal of Business Research 131, 640-651. <https://doi.org/10.1016/j.jbusres.2020.08.021>
- Kwok, L., Mao, Z. E., Huang, Y. K., (2019). Consumers' electronic word-of-mouth behavioral intentions on Facebook. Tourism and Hospitality Research, 19(3), 296-307.
- Lee, K. Y., Choi, H., (2019). Predictors of electronic word-of-mouth behavior on social networking sites in the United States and Korea: Cultural and social relationship variables. Computers in Human Behavior 94, 9-18. <https://doi.org/10.1016/j.chb.2018.12.025>
- Lestari, E., Septifani, R., Nisak, K., (2021). Green awareness and green purchase intention: The moderating role of corporate image, International Conference on Green Agro-industry and Bioeconomy, IOP Conf. Series: Earth and Environmental Science 924, 1-8. doi:10.1088/1755-1315/924/1/012051
- Lim, W. M., Ahmed, P. K., Ali, M. Y., (2022). Giving electronic word of mouth (eWOM) as a prepurchase behavior: The case of online group buying. Journal of Business Research 146, 582-604. <https://doi.org/10.1016/j.jbusres.2022.03.093>
- Nath, V., Agrawal, R., (2022). Barriers to consumer adoption of sustainable products – an empirical analysis. Social Responsibility Journal. DOI: 10.1108/SRJ-12-2020-0495
- Nauges, C., Wheeler, S.A., (2017). The complex relationship between households' climate change concerns and their water and energy mitigation behaviour. Ecological Economics 141, 87-94. <https://doi.org/10.1016/j.ecolecon.2017.05.026>
- Nguyen, N.H., Dao, T. K., Duong, T. T., Nguyen, T. T., Nguyen, V. K., Dao, T. L., (2023). Role of consumer ethnocentrism on purchase intention toward foreign products: Evidence from data of Vietnamese consumers with Chinese products. Journal Pre-Proof, 9(2), 1-25.
- Ottenbacher, M.C., Kuechle, G., Harrington, R.J., Kim, W.H., (2019). QSR customer sustainable behaviors and brand practice perceptions on willingness to pay a Premium. International Hospitality Review, 33(2), 106-125.

- Panuju, A., Ambarwati, D., Susila, M., (2019). Implications of automotive product sustainability on young customers' purchase intention in developing countries: an experimental approach. *IOP Conf. Series: Materials Science and Engineering* 857, 1-10.
- Queiroz, F. C. B. P., Lima, N. C., Silva, C. L., Queiroz, J. V., Souza, G. H. S., (2021). Purchase intentions for Brazilian recycled PET, products—circular economy opportunities. *Recycling*, 6(75), 1-18.
- Rakib, M. R. H. K., Pramanik, S. A. K., Amran, M. A., Islam, M.N., Sarker, M. O. F., (2022). Factors affecting young customers' smartphone purchase intention during Covid-19 pandemic. *Heliyon* 8(9), 1-11.
- Saari, U.A., Damberg, S., Frombling, L., Ringle, C.M., (2021). Sustainable consumption behavior of Europeans: The influence of environmental knowledge and risk perception on environmental concern and behavioral intention. *Ecological Economics*, 189, <https://doi.org/10.1016/j.ecolecon.2021.107155>.
- Schoubroeck, S.V., Chacon, L., Reynolds, A.M., Lavoine, N., Hakovirta, M., Gonzalez, R., Van Passel, S., Venditti, R.A., (2023). Environmental sustainability perception toward obvious recovered waste content in paper-based packaging: An online and in-person survey best-worst scaling experiment. *Resources, Conservation & Recycling*, 188, 1-13. <https://doi.org/10.1016/j.resconrec.2022.106682>
- Scott, K.A., Weaver, S.T., (2018). The intersection of sustainable consumption and anticonsumption: repurposing to extend product life spans. *Journal of Public Policy & Marketing*, 37(2), 291-305.
- Shankar, A., Jebarajakirthy, C., Ashaduzzaman, M., (2020). How do electronic word of mouth practices contribute to mobile banking adoption?. *Journal of Retailing and Consumer Services* 52, 1-14. <https://doi.org/10.1016/j.jretconser.2019.101920>
- Shu, M., Wu, F., (2014). Effects of electronic word-of-mouth on consumers' purchase decision in catering industry. *Akadémiai Kiadó*, 64(2), 199-211.
- Siqueira Jr, J.R., Pena, N. G., ter Horst, E., Molina, G. (2019). Spreading the word: how customer experience in a traditional retail setting influences consumer traditional and electronic word-of-mouth intention. *Electronic Commerce Research and Applications*, 37, 1-11. <https://doi.org/10.1016/j.elerap.2019.100870>
- Steinhorst, J., Beyerl, K., (2021). First reduce and reuse, then recycle! Enabling consumers to tackle the plastic crisis – Qualitative expert interviews in Germany. *Journal of Cleaner Production* 313, 1-12. <https://doi.org/10.1016/j.jclepro.2021.127782>
- Sun, Y., Gonzalez-Jimenez, H., Wang, S., (2021). Examining the relationships between e-WOM, consumer ethnocentrism and brand equity. *Journal of Business Research* 130, 564-573. <https://doi.org/10.1016/j.ibusres.2019.09.040>
- Wijekoon, R., Sabri, M. F., (2021). Determinants that influence green product purchase intention and behavior: a literature review and guiding framework. *Sustainability*, 13(11), 1-40.
- Yeğin, T., Ikram, M., (2022). Analysis of consumers' electric vehicle purchase intentions: an expansion of the theory of planned behavior. *Sustainability*, 14(19), 1-27.
- Yükselen, C., (2017). *Pazarlama Araştırmaları*. Detay Yayıncılık, Ankara, ISBN: 978-975-8326-14-7.
- Yükselen, C. (2020). *Pazarlamanın Yeni Paradigması- Sürdürülebilirlik*. Detay Yayıncılık, Ankara, ISBN: 978-605-254-282-8.