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RELATIONSHIPS BETWEEN DIGITALIZATION AND COMPETITIVE ADVANTAGE: AN APPLICATION IN MEDIUM AND LARGE-SIZED ENTERPRISES

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ABSTRACT

This study aims to examine the relationships between digitalization processes and competitiveness. The research is based on survey data from 385 managers and employees working in businesses affiliated with the Chamber of Industry and Commerce located in Istanbul and Kocaeli provinces. In this study conducted between November 2022 and June 2023, the Digital Business Strategies Scale and the Competitiveness Strategies Scale were used. The research results revealed a positive relationship between digitalization strategies and competitiveness. A positive relationship was found between operational efficiency and financial performance, and it was determined that this was an important component of competitiveness. The results of this study show that it is possible for businesses to achieve competitive advantage by adopting digitalization strategies.

Keywords: Digitalization, Competitive Advantage, Operational Efficiency, Financial Performance

INTRODUCTION

Today, businesses must reconsider their competitive strategies in light of the rapid advancement of technology and the spread of digitalization in every field. Digitalization increases automation and efficiency in internal processes and offers innovative solutions in customer relations and supply chain management. In this context, businesses that successfully manage the digital transformation process will gain a competitive advantage and rise to leading positions in the sector.

A competitive advantage is when a business outperforms its competitors and achieves long-term profitability. Traditional competitive strategies are based on elements such as cost leadership, differentiation, and focus. Digitalization has forced these strategies to be reshaped. Medium and large-scale businesses use digital technologies to increase their operational efficiency, improve customer experiences, and develop innovative business models.

This article examines the relationship between digitalization and competitive advantage, revealing how this process is implemented in medium and large-scale businesses. It analyzes the effects of digitalization on businesses and the reflections of these effects on competitive strategies. The research findings are clear: digitalization positively affects competitive advantage. Effective digitalization management gives businesses a stronger market position and sustainable competitive advantage.

Digitalization

The concept of digitalization has been one of the most prominent topics across all sectors in recent years. Digitalization significantly impacts business success. Brynjolfsson and McAfee (2014: 58) state that researchers are increasingly interested in the subject of digitalization. The successes achieved through the applications of Industry 4.0 and information technologies in businesses have driven companies to adopt digitalization in their management processes. Information technologies, as a driving force, have caused

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major changes and transformations in products and services across all sectors (Mert, 2020: 50). Digitalization involves converting information from physical or analog forms into digital data through electronic and computer-based systems (Rieger, 2008). The digitalization process encodes various analog data formats (such as texts, images, sounds) into bits consisting of zeros and ones, making them storable and processable (Ormanlı, 2012). Digitalization facilitates information access and enables data storage and analysis (Ritter and Pedersen, 2020).

While Coyle (2006) et al. define digitalization as the conversion of analog materials into digital formats, these definitions also emphasize how data can be processed, stored, and managed. The digitalization process in businesses occurs by transferring business processes and information flows to digital media. Digitalization reduces storage costs, facilitates corporate content management, and ensures archival preservation (Savić, 2019; Külcü, 2010).

The impact of digitalization on the economy and society manifests in the presentation or reshaping of business models, business processes, and services in digital environments. This process refers to the transformation of businesses and society through digital technologies (Aksu, 2019; Parviainen et al., 2017).

Digitalization creates fundamental value for businesses and societies to achieve sustainable development goals and plays an important role in increasing employment, labor productivity, and the quality of physical human capital (Henriette et al., 2016; Dobrolyubova, 2021). Despite the rapid progress of the digital process, the fact that corporate digitalization has not caught up with the expected growth rate reveals the need for national administrations and companies to adapt to digitalization processes more quickly (OECD, 2021).

Competitive Advantage

The sustainable competitive advantage of a company is determined by a set of strategies that allow the company to achieve and maintain a superior financial performance. These strategies are influenced by various factors such as the resources of a country, its geographical location, culture, workforce skills, pricing policies, as well as local and national management structures. Additionally, international agreements and restrictions imposed on foreign companies also impact the competitive advantage of a company. Küçükeşmen and Türkoğlu (2019) argue that sustainable competitive advantage is attained when companies develop unique and valuable strategies that are difficult for competitors to replicate. Efficiency, cost advantage, economies of scale, strategic partnerships, and the effective utilization of information and technology are key components of competitive advantage.

To achieve sustainable competitive advantage, companies must establish long-term objectives, align their activities to meet these objectives, and allocate resources effectively. The primary goal of competitive strategies is to ensure that the company complies with market regulations and utilizes them to its advantage. It is recommended that companies select one of the fundamental competitive strategies proposed by Porter (1985), such as "cost leadership," "differentiation," or "focus". Cost leadership strategy is centered on a company's ability to produce goods or services at lower costs compared to its competitors within the industry. This strategy aims to reduce costs without compromising on quality. On the other hand, the differentiation strategy involves offering products or services with unique features that set them apart from others in the market, allowing the company to establish a distinctive position. Lastly, with the focus strategy, companies concentrate on a specific product or service segment to gain a competitive edge in that particular area.

The Relationship Between Digitalization Strategies and Competitive Advantage

Digitalization refers to the transformation of an organization's resources into opportunities that foster growth, income, and value. Essentially, it involves adapting technology to these resources to create unique customer experiences, develop new business models, enable innovation in products and services, and optimize the organization's workforce, information, and technology resources for greater efficiency and effectiveness. Maintaining this competitive advantage requires the application of digitalization across all organizational processes and maximizing the benefits from established digital business models. As digital processes increase and technology rapidly evolves, data production is impacted, making data more

accessible. Enhanced information technologies and improved, more accessible internet enable organizations across various sectors to digitize parts of their operations (Mert, 2019: 220).

To achieve competitive advantage, companies must either significantly differentiate their products/services or adopt a low-cost strategy. However, competitive advantage can also be attained by implementing strategies that combine differentiation and cost leadership. Product differentiation through innovation involves the continuous improvement and development of products and the creation of new products from new ideas. This process benefits from digitalization, which enhances speed and product quality (Higgins, 1996). The proportional relationship between digitalization and innovation strategies with competitive advantage can be understood by evaluating cost leadership, differentiation, and focus approaches together. The utilization of technology and digital resources facilitates the use of digital tools in marketing, fostering direct and rapid company-customer interaction. By increasing output per unit time, optimizing labor use, and resource allocation, digitalization enables companies to minimize costs and secure a competitive edge in areas such as production planning, raw material use, human resources, and marketing.

Focusing on the current product and customer portfolio, developing these products, or monitoring the demands of a fixed customer base, digital databases and their analysis in computer environments guide companies in product improvements. When innovative ideas drive product developments, producing a prototype has been greatly simplified by digital technology resources like 3D printers. For desired differentiation, expedited and simplified digital production resources contribute positively by saving time, fostering innovation, and minimizing product development costs (İnan, 2022). Based on these insights, the following hypothesis is proposed:

H_1: There is a relationship between digitalization processes and competitive advantage.

METHOD

The research discusses the relationship between digitalization processes and competitive strategies of businesses, and utilizes a relational (correlational) research model.

Universe and Sample

The research universe includes managers, directors, assistant managers, and key personnel working in factories affiliated with the Chambers of Industry and Commerce in Istanbul and Kocaeli provinces in Turkey, within the manufacturing and service sectors. Due to the dynamic nature of the universe, the total number of individuals cannot be precisely determined.

The sample must accurately represent the universe it is drawn from. The determination of an appropriate sample size depends on the research objectives and current constraints (Arıkan, 2004). Calculating the sample size requires knowledge of the universe, the standard deviation of the relevant feature, and the acceptable margin of error (Sencer, 1989). Following the calculations, it was established that a sample size of at least 384 individuals was necessary. Consequently, a sample group of 385 individuals was studied between November 2022 and June 2023. Table 1 presents the demographic characteristics of the participants.

Table 1: General Information of Participants

Gender	N	%
Female	210	54,5
Male	175	45,5
Total	385	100,0
Age	N	%
18-25	153	39,7
26-35	145	37,7
36-45	59	15,3
46 and above	28	7,3
Total	385	100,0
Marital Status	N	%

Single	264	68,6
Married	121	31,4
Total	385	100,0
Educational Status	N	%
Associate degree and below	113	29,4
Bachelor's degree	211	54,8
Master's degree / doctorate	61	15,8
Total	385	100,0
Working Period in the Profession	N	%
Less than 1 year	84	21,8
1-5 years	153	39,7
6-10 years	88	22,9
11 years and above	60	15,6
Total	385	100,0
Working Period in the Institution	N	%
Less than 1 year	129	33,5
1-5 years	166	43,1
6-10 years	55	14,3
11 years and above	35	9,1
Total	385	100,0
Position in the Institution	N	%
Manager	85	22,1
Employee	300	77,9
Total	385	100,0
Company Status	N	%
Medium	155	40,3
Large	230	59,7
Total	385	100,0
Institution's Sector	N	%
Automotive	25	6,5
White goods	11	2,9
Energy	12	3,1
Textile	86	22,3
Construction	20	5,2
Food	45	11,7
Chemistry	12	3,1
Packaging	7	1,8
Other	167	43,4
Total	385	100,0

Data Gathering Instruments

The study utilized a survey methodology to gather data. The survey form, structured accordingly, comprised three sections. The initial section of the survey form encompassed 9 inquiries related to demographic information such as gender, age, marital status, educational background, tenure in the profession, tenure in the organization, position within the organization, company status, and the sector in which the organization operates, aiming to delineate the participants' demographic profile.

The subsequent section of the survey form featured the Digital Business Strategies Scale. This scale, originally developed by Nadeem (2018), was adapted to Turkish by Sağlam (2021). It consists of a 7-point Likert-type scale with a total of 6 items falling under a single dimension.

The third section of the survey form incorporated the Sustainable Competition Strategies Scale. Developed by Göktaş (2019), this scale comprises a 7-point Likert-type scale with a total of 9 items categorized into two dimensions: Operational Efficiency (OV) and Financial Performance (FP).

Data Collection and Analysis

Data collection was executed through face-to-face surveys. Subsequently, the collected data were imported into the SPSS software for analysis. The research was concluded by employing descriptive statistics, correlation analysis, and hypothesis testing.

FINDINGS

In this section of the study, the results obtained from data analysis are detailed. Initially, the validity and reliability analyses are presented.

The results of the explanatory factor analysis and reliability analysis conducted on the Digital Business Strategies Scale are displayed in Table 2. The KMO Sample Adequacy Test yielded a result of 0.898, indicating that the sample size for the research is adequate. Furthermore, the Bartlett Sphericity Test results (Chi-Square: 1297.199; sd: 15; p-value: 0.000) suggest that the Digital Business Strategies Scale is suitable for explanatory factor analysis.

Upon applying the explanatory factor analysis on the Digital Business Strategies Scale, it was observed that the scale exhibited a single-factor structure named Digital Business Strategies (DIS). This factor accounts for 66.496% of the scale variance. The factor loadings of the scale items range from 0.872 to 0.714. The reliability of the DIS factor is found to be high at 0.898.

Table 3 presents the results of the explanatory factor analysis and reliability analysis conducted on the Competition Strategies Scale. The KMO Sample Adequacy Test result of 0.904 indicates that the sample size for the research is sufficient. Additionally, the Bartlett Sphericity Test results (KMO: 0.904; Chi-Square: 1819.159; sd: 36; p-value: 0.000) suggest that the Sustainable Competition Strategies Scale is appropriate for explanatory factor analysis.

Upon conducting an explanatory factor analysis on the Competitive Strategies Scale, it was revealed that the scale exhibits a two-factor structure, with the factors being identified as Operational Efficiency (OV) and Financial Performance (FP). The OV factor accounts for 35.28% of the scale variance, while the FP factor accounts for 32.65% of the scale variance. In total, these factors explain 67.928% of the variance. The factor loadings for the OV factor items range from 0.777 to 0.666, and for the FP factor items, they range from 0.853 to 0.705.

Table 2: Exploratory Factor Analysis and Reliability Analysis of the Digital Business Strategies Scale

Items	DBS	Reliability
DBS3-In the enterprise, the restructuring and use of information technologies, digital technologies and business resources are provided for use in multiple corporate processes.	0,872	0,898
DBS2-The enterprise contributes to the integration of these technologies into the infrastructure of the enterprise by using information technology and digital technology application systems.	0,848	
DBS5-In the enterprise, superior digital capabilities are created and used in order to adapt to environmental changes.	0,843	
DBS4-In the enterprise, the role of managers in digitalization is reconsidered in the adaptation of information and digital technologies to the organization.	0,812	
DBS6-In the enterprise, it is ensured that it takes place in any information technology investment category by using digital technologies..	0,794	

DBS1-The enterprise benefits from the digitalization efforts of its business partners for complementary competencies aimed at providing value and sharing the income to be obtained.	0,714
Explained Variance	Total %66,496
KMO: 0,898; Chi-Square: 1297.199; sd: 15; p-value: 0.000	

When the reliability levels of the scale with OV and FP factors are examined, it is seen that the OV factor is highly reliable with 0.862, the FP factor is highly reliable with 0.859, and the scale is highly reliable with 0.901.

Table 3: Competitive Strategies Scale Exploratory Factor Analysis and Reliability Analysis

Items	OV	FP	Reliability	Scale Reliability
SRS4-The company has been meeting the different flexibility requirements for the last three years.	0,777		0,862	0,901
SRS2-The company has maintained its reputation for product quality for the last three years.	0,773			
SRS1-The company has been maintaining its cost competitiveness for the last three years.	0,769			
SRS3-The company has been demonstrating excellent delivery performance for the last three years.	0,731			
SRS5-The company has been providing customer satisfaction for the last three years.	0,666			
SRS8-The company has been experiencing steady sales growth for the last three years		0,853	0,859	
SRS9-The company has been achieving satisfactory ROA for the last three years.		0,835		
SRS6-The company has been achieving sustainable profitability for the last three years		0,718		
SRS7-The company has been enjoying competitive market share for the last three years.		0,705		
Variance Explained	35,28%	32,65%	Total %67,928	
KMO: 0,904; Chi-Square: 1819.159; sd: 36; p-value: 0.000				

Below, the correlation analysis findings are given in Table 4.

Table 4: Correlation Analysis

Variable	Correlation	OV	FP	DBS
OV	r- value	1		
	p- value			
FP	r- value	0,665**	1	
	p- value	0,000		
DİS	r- value	0,630**	0,595**	1
	p- value	0,000	0,000	

According to the data, the following findings were obtained regarding the relationships between the research variables, and the H1 hypothesis is supported:

- There is a moderate, significant and positive relationship between OV and FP (r=0.665; p=0.000).

- There is a moderate, significant and positive relationship between OV and DBS (r=0.630; p=0.000).
- There is a moderate, significant and positive relationship between FP and DBS (r=0.595; p=0.000).

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The study's primary objective is to investigate the correlation between digitalization processes and competitiveness by conducting a survey involving 385 managers and employees from businesses associated with the Chamber of Industry and Commerce in Istanbul and Kocaeli over a period from November 2022 to June 2023. The reliability and suitability of the Digital Business Strategies (DBS) Scale and the Sustainable Competitiveness Strategies (SRS) Scale were confirmed through exploratory factor analyses.

The findings of the research indicate a positive association between digitalization strategies and competitiveness, particularly in terms of operational efficiency and financial performance, which are crucial elements of competitiveness. Previous literature also supports the notion that digitalization strategies are instrumental in attaining sustainable competitive advantage, as evidenced by studies such as Knudsen et al. (2021) and Al-Omush et al. (2023).

While the study demonstrates the potential for businesses to enhance their competitive edge through the adoption of digitalization strategies, it acknowledges limitations in generalizing the results across various sectors and organizational frameworks. Consequently, further research is warranted to gain a more comprehensive understanding of the impacts of environmental factors and digital technologies.

Future research endeavors that comparatively analyze these impacts across diverse sectors and organizational structures can yield more holistic insights. Moreover, studies offering specific recommendations on the effective implementation of digital strategies by businesses are essential to guide practical applications in the field.

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