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THE ROLE OF DIGITIZATION IN MANAGEMENT AND STRATEGIC DECISION-MAKING IN MODERN MANAGEMENT

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ABSTRACT

This research aims to assess the impact of digitization on management efficiency and strategic decision-making, a pivotal aspect in the contemporary business world. By integrating digital technologies with traditional mathematical models and analyzing survey data from 250 management professionals, the study provides a comprehensive understanding of the multifaceted effects of digitization.

The principal outcomes from the mathematical analyses, including Marginal Cost Analysis, Break-Even Analysis, and Linear Programming, indicate substantial improvements in operational efficiency following digitization. Specifically, Marginal Cost Analysis shows a significant decrease in the cost of production, and Break-Even Analysis reveals a reduction in the break-even point by approximately 15%, underscoring enhanced cost-effectiveness. Linear Programming results demonstrate a 20% improvement in resource allocation efficiency. The survey analysis complements these findings, revealing a positive perception of digitization in enhancing managerial adaptability, efficiency, and decision-making effectiveness, with average rating improvements of 0.3, 0.4, and 0.5 points, respectively, on a 5-point scale. Regression analysis further highlights the positive influence of technological affinity on decision-making effectiveness. However, ANOVA results suggest variability in the impact of digitization across different industry sectors, necessitating sector-specific digital strategies.

Digitization significantly elevates management efficiency and strategic decision-making capabilities. The integration of digital tools with traditional management techniques results in more informed, efficient, and strategic business decisions. However, the varied impact across sectors and the rapid pace of technological advancement calls for continuous adaptation and sector-specific strategies. These findings provide vital insights for businesses navigating the digital era, emphasizing the strategic integration of digital tools in management practices for sustained success and competitiveness.

Keywords: decision-making, digitization, industry, management efficiency, marginal cost, operational efficiency, strategic management, technological affinity

JEL Classification: M15, O33, C44

INTRODUCTION

In the rapidly evolving business landscape, the intersection of digitization and management has emerged as a pivotal area of study. The onset of the digital era has not only transformed the way businesses operate but also how they strategize and make decisions. This transformation is rooted in the integration of digital technologies—ranging from data analytics to artificial intelligence—into the core of management practices. The significance of this integration lies in its profound impact on the efficiency, agility, and foresight of businesses in a competitive and ever-changing market.

The introduction of digital tools into management signifies a radical shift from static, rule-based systems to more fluid, data-driven ones. Modern digital technologies and approaches are supplementing and even replacing traditional management practices that were previously focused on theoretical frameworks and findings. This change is a radical departure from the previous way of thinking about decision-making and opera-

tional procedures, rather than just an improvement of current methods. Thanks to digitization, managers can now access data in real time, use predictive analytics to get insights and make better choices. Its impact extends beyond optimizing supply chains, engaging customers, and allocating resources.

In addition, the standards for planning and execution have been rethought with the advent of digitalization in strategic decision-making processes. Now that they can examine mountains of data and see patterns, managers can better foresee shifts in the market and prepare for them. In today's fast-paced corporate world, when staying ahead of the competition in response to changing market conditions is key to success, this predictive skill is more important than ever.

This paper stands out because it investigates deeply how digitalization affects many parts of management and strategic decision-making. This study offers a comprehensive picture, including the depth and breadth of the influence of digitalization, in contrast to other studies that mainly concentrated on discrete parts of this integration. Using well-established mathematical methods (such as Marginal Cost Analysis, Break-Even Analysis, and Linear Planning Models) and a survey of management experts, it thoroughly investigates the efficacy of digital integration. By using a two-pronged approach, we may learn more about the qualitative and quantitative effects of digitalization on contemporary management techniques.

The overarching goal of this study is to add to what is already known about digital transformation in management. To help organisations make sense of the digital age's management and strategic decision-making challenges, it integrates theoretical models with empirical data to shed light on how digitization is changing the game.

LITERATURE REVIEW

In recent years, both academics and professionals have focused on how to best use digital tools in management practices. With a focus on the function of digital technology. This review surveys previous research to deduce how this integration has progressed and what it means for management practices. Management literature from the early 1900s tended to adhere to more conventional wisdom, emphasizing empirical and theoretical techniques. A paradigm change, however, has occurred due to the rise of digital technology. As an example, "The Second Machine Age" by Brynjolfsson and McAfee (2014) explains how digital technology is starting to surpass human capabilities and change economies and sectors. With this, a new age in management began one in which digitalization played a pivotal role in both strategic and operational decision-making. Management decision-making has been profoundly affected by the advancements in data processing capabilities made possible by digital technology. The impact of big data analytics on comprehending market trends and consumer behaviours was highlighted in the studies conducted by Erevelles et al. (2016) and Martínez-Peláez et al. (2023). In addition, Martinez et al. (2021) covered the topic of how data science approaches are now essential for helping managers with strategic decision-making by extracting useful insights from massive databases. Similar to our research on digital transformation in management, Prylypko (2023) explores the value of legal education for students from non-legal backgrounds. Our conclusions on the need to adapt classic models to modern digital environments are supported by the work's innovative ways of teaching legal subjects.

Numerous researchers have investigated how digital technology could improve operational management. Digitalization has allowed for more efficient allocation of resources and optimization of processes, as pointed out by Belli et al. (2019). Improvements in operational efficiency and competitive positioning were noted by Bharadwaj et al. (2013), who similarly evaluated the influence of digital business strategy on performance. When it comes to making decisions, managers have also relied on mathematical models. Strategic management was radically altered when Kaplan and Norton (1996) developed the Balanced Scorecard, a quantitative method for ensuring that a company's actions are in line with its goals and objectives. The analytical technique for studying competitiveness within an industry is provided by Porter's (1981) Five Forces framework. It is a major step forward for management to combine digital tools with well-established mathematical models. To improve the precision of financial planning and forecasting, Chen et al. (2021) addressed the incorporation of digital resources into financial models. Furthermore, by combining quantitative data with qualitative insights, Brynjolfsson and McAfee (2017) investigated how this interaction improves the quality of strategic choices. The technical achievements of the 21st century is examined by Sapiński (2022) as they pertain to the fourth generation of human rights. In this age of fast technological development, his research highlights the need for international organisations to adapt and safeguard new human rights.

Digital technology, especially artificial intelligence (AI), data processing, and machine learning, have come a long way in the last ten years. Bharadiya (2022) shows that AI is changing the way companies operate by making predictive analytics more effective and leading to smarter decisions. Elgendy et al. (2022) thoroughly discuss the possibilities of machine learning in analysing complicated data sets, demonstrating how these technologies provide previously unavailable strategic insights. The incorporation of digital resources into more conventional management frameworks is a prominent trend in

the most current research. As an example, Fountaine et al. (2019) showed how businesses might get an edge by combining AI with their current strategies. Decisions may be made with more knowledge and strategy because of this integration, which improves the efficiency of established models while also providing fresh insights. Machine learning and artificial intelligence (AI) have played a crucial role in the advancement of management methods. Research by Müller and Vostrom (2016) investigated AI's function in company forecasting, highlighting the advantages of AI above more conventional approaches. In addition, Richey et al. (2023) thoroughly examined the monetary effects of AI and ML, drawing attention to how these technologies may alter the foundations of markets and companies. The electric power sector in Kazakhstan is examined by Iskakova et al. (2017), who highlight the industry's critical role in the economic growth of the country. The report finds that a shared energy market among Eurasian Economic Union (EAEU) nations may greatly increase the efficiency of energy resource usage, which would benefit Kazakhstan's economy and the region, based on its evaluation of cross-country agreements under the EAEU.

Digital transformation's effect on top-level planning has been the subject of many recent academic investigations. A more dynamic and adaptable approach to strategic planning is offered by digitalization, according to research on the effects of digital technologies on corporate strategy by Iansiti and Lakhani (2020). They contend that businesses can better respond to shifting market conditions and new possibilities when they can handle and analyse data at a high rate. Management decision-making in real-time has been transformed by predictive analytics. Gupta et al. (2020) demonstrated how managers may successfully anticipate market shifts and customer wants with the use of predictive analytics solutions. Additionally, González-Padilla et al. (2023) added additional dimensions to strategic management by discussing the significance of social analytics in trend and behaviour prediction. An incisive study of the growing Ukrainian economy is presented by Buriak et al. (2022), who stress the role of digital transformation in company practices and management modernization. The research delves deep into the difficulties and potential gains encountered by Ukrainian businesses as they adjust to digital innovations, drawing attention to the critical importance of management innovation and reengineering practices. Offering vital insights for organisations navigating the fast-expanding digital world, it underscores the necessity of strategic decision-making in digitization, taking people risks and market circumstances into account. The study adds a lot to our knowledge of how the digital economy, management reform, and Ukraine's economic growth interact with one another.

There is an obvious tendency in the current literature towards the growing importance of digitalization in management. Both managerial practices and the method for making long-term strategic decisions have been greatly improved by combining digital technology with conventional mathematical models. This integration will probably get stronger and more important as companies keep navigating the digital era's challenges.

AIMS AND OBJECTIVES

The study aims to delineate the role of digitization in enhancing management and decision-making processes, with the following objectives:

- to apply Marginal Cost Analysis for evaluating the cost-related impacts of digitization on enterprise yield;
- to use Break-Even Analysis for assessing how digitization influences resource allocation and management efficacy;
- to implement Linear Planning Models to examine the role of digitization in optimizing profit and cost minimization strategies;
- to analyze perceptions of digitization among management professionals through a survey.

METHODS

Marginal Cost Analysis is employed to understand how incremental changes in production affect overall costs, which is crucial in assessing the efficiency of digitization in management processes. The marginal cost (MC) is calculated using the formula,

$$MC = \frac{\Delta TC}{\Delta Q}$$

where ΔTC is the change in the total cost and ΔQ is the change in quantity produced.

A study by Smith et al. (1999) provides comprehensive insights into the application of this model in business scenarios.

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Break-even analysis is used to determine the point at which cost or expenses and revenue are equal: there is no net loss or gain. The break-even point (BEP) is calculated as:

$$BEP = \frac{FixedCosts}{(SalesPriceperUnit - VariableCostperUnit)}$$

This model is particularly effective in evaluating how digital technologies influence cost structures and pricing strategies.

The Linear Planning Model helps in optimizing a particular outcome, such as maximizing profits or minimizing costs, subject to certain constraints. A general form of a linear programming problem is expressed as:

$$Maximize\ (or\ Minimize): Z = c_1x_1 + c_2x_2 + \ldots + c_nx_n$$

$$Subject\ to: a_{11}x_1 + a_{12}x_2 + \ldots + a_{1n}x_n \leq b_1$$

$$\ldots.$$

$$a_{m1}x_1 + a_{m2}x_2 + \ldots + a_{mn}x_n \leq b_m$$

where Z is the objective function, c_i are the coefficients of the objective function, x_i are the decision variables, a_{ij} are the coefficients of the constraints, and b_i are the constants in the constraints.

Survey Analysis

The survey was meticulously designed to gauge the impact of digitization on management practices. Conducted among 250 management professionals, it comprised a structured questionnaire focusing on the following variables:

Efficiency means that management experts have mastered the art of making the most of their time, energy, and resources in the digital era. It includes how digital technologies help to improve overall productivity by decreasing operational impediments. On a 5-point scale, where a higher score implies better efficiency, survey participants were asked to assess the effect of digitalization on their operational efficiency. Questions may have included topics such as the amount of time saved by digital tools, the ease of obtaining information, and the general smoothness of the business.

Adaptability to Digital Tools assesses the proficiency and efficiency with which management experts can adopt new digital technologies. We examined people's abilities to swiftly and easily incorporate digital technologies into their everyday jobs. To gauge how well people could adjust to digital tools, we asked them to score their familiarity with new technology, the steepness of the learning curve, and how easy it was to incorporate the tools into their current workflow.

Decision-making effectiveness assesses how digital resources affect the timing and accuracy of strategic choices. The degree to which digitalization facilitates faster, more data-driven decision-making is reflected. Ratings were given by respondents according to the extent to which digital technology affected their decision-making. Some examples of such inquiries are how quickly conclusions are reached, how well judgments are made utilising digital technologies, and what part data analytics plays in the decision-making process. Participants were asked to provide their ages to get this demographic information. The total number of years that the participants have had professional experience in their industry is referred to as Years of Experience. In the survey, we asked people to count the years they have been in the workforce.

Training Level gives an idea of the respondents' level of formal education and training, especially in the areas of digital technology and management. One way this was measured was by asking survey takers to rate their degree of formal education or training from 1 to 5. Technological affinity evaluates the degree to which a person is willing and able to use technology in their job. On a scale from 1 to 5, respondents indicated their level of affinity for technology, which may have included their curiosity about and ease with using new technological advancements. The aggregate effect of digitalization on management practises was understood by organising and analysing these characteristics. Several statistical analyses were performed on the survey's quantitative data to derive significant findings on the function of digitization in contemporary management.

Data Collection and Analysis

An online survey platform was used to gather data, guaranteeing a varied and accurate representation of management experts. The variance, standard deviation, and mean were the main statistical metrics considered. Table 1 below provides the descriptive statistics (mean, standard deviation, and variance) for all the variables included in the study.

Table 1. Descriptive Statistics.

Variable	Mean	Standard Deviation	Variance
Efficiency	4.23	0.80	0.64
Adaptability to Digital Tools	3.83	0.90	0.81
Decision-Making Effectiveness	3.94	1.01	1.03
Age	35.21	6.51	42.33
Years of Experience	10.45	4.65	21.61
Training Level	3.09	1.38	1.90
Technological Affinity	3.03	1.40	1.95

They provide information on the study's main trends and the range of responses from the participants. Efficiency, adaptation to digital technologies, and decision-making efficacy all have average ratings above the middle on a 5-point scale, suggesting that people usually see the influence of digitization in a good light. The standard deviations and variances demonstrate the variation in the responses, with age and years of experience exhibiting the most significant variation, indicating that the respondents had various experiences. This research used a comprehensive approach to examine survey responses, illuminating the many ways in which digitalization has altered management practises across different age groups and occupational specialisations. Descriptive statistics yield information on main trends and variability via the computation of variance, standard deviation, and mean for each variable. After that, we used a Pearson correlation analysis to look for links between digitalization measures. In the next step, we did a multiple regression analysis to determine the exact impact of demographic variables on important metrics including effectiveness in decision-making, flexibility, and efficiency. To further illuminate how the effects of digitization vary across various domains, an analysis of variance was used to identify answers that varied across various industries. Thematic analysis of free-form answers supplemented these quantitative methods by revealing trends in respondents' views on digital transformation in management and providing qualitative insights. This survey methodology's combination of quantitative and qualitative analysis provides useful insights, mirroring real-life situations and helping firms optimise their management strategies in the ever-changing digital age.

RESULTS

In the context of digitization in management, Marginal Cost Analysis was used to measure how digital tools affect the cost structure as production scales. The total cost function, $C(Q)$, includes fixed costs (FC) and variable costs (VC). Fixed costs, such as costs for digital infrastructure, remain constant regardless of the output level. Variable costs change with the production level and are expected to decrease with digitization due to increased efficiency.

The total cost $C(Q)$ for producing Q units can be expressed as:

$$C(Q) = FC + VC(Q)$$

where $VC(Q)$ *is a function representing variable costs depending on the quantity produced.*

Typically, $VC(Q)$ could be a linear function of Q, but it could also be more complex, reflecting economies of scale or other factors influenced by digitization. The Marginal Cost (MC) is the derivative of the total cost function to the quantity produced. It represents the cost of producing one additional unit of output.

$$MC = \frac{dC(Q)}{dQ}$$

Given $C(Q) = FC + VC(Q)$, and since FC is a constant,

$$MC = \frac{d}{dQ}(FC + VC(Q))$$

$$MC = 0 + \frac{dVC(Q)}{d(Q)}$$

$$MC = \frac{dVC(Q)}{d(Q)}$$

Digitization is expected to make production processes more efficient, thus reducing the variable costs per unit. If we consider a simple linear variable cost function, such as $VC(Q) = vQ$ where v is the variable cost per unit, the impact of

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digitization might be reflected in a reduced value of v. For instance, in pre-digitization, let $v = v_0$. While in Post-digitization, due to efficiencies, $v = v_1$ where $v_1 < v_0$. Marginal Cost pre- and post-digitization is presented as,

$$MC_{pre} = \frac{dv_0 Q}{dQ} = v_0$$

$$MC_{post} = \frac{dv_1 Q}{dQ} = v_1$$

Since $v_1 < v_0$, we have $MC_{post} < MC_{pre}$

The derivation shows that with the implementation of digital tools, the variable cost per unit decreases, leading to a lower marginal cost of production. This reduction in marginal cost reflects the cost-saving benefits of digitization in management, particularly in operational aspects like production. This analysis provides a quantifiable rationale for why businesses may pursue digital transformations to achieve cost efficiency and scalability.

Break-even analysis is utilized to determine the level of output at which the introduction of digital technologies becomes cost-effective. We have assumed that the introduction of digital technologies affects either the fixed costs (FC), the variable cost per unit (VC), or both. Fixed costs (FC) include investments in digital infrastructure and technologies. Variable costs (VC) are costs that vary with the level of output and are expected to decrease with digitization due to enhanced operational efficiencies. The selling price per unit (P) remains constant for simplicity.

The Break-Even Point is the production level at which total revenue equals total costs, resulting in neither profit nor loss. Total Revenue (TR) for producing Q units is given by $TR = P \times Q$. The total cost (TC) for producing Q units is $TC = FC + VC \times Q$. Moreover, at the Break-Even Point, $TR = TC$,

$$P \times Q_{BEP} = FC + VC \times Q_{BEP}$$

$$Q_{BEP} \times (P - VC) = FC$$

$$Q_{BEP} = \frac{FC}{P - VC}$$

This equation gives us the Break-Even Quantity (Q_{BEP}). Digitization can reduce both FC (through more efficient digital systems reducing the need for physical infrastructure) and VC (through automation and process optimization). The pre-digitization state is assumed as $FC = FC_0$ and $VC = VC_0$ represent a post-digitization state with $FC_1 \leq FC_0$ and $VC_1 \leq VC_0$

Break-Even Point Pre and Post Digitization:

$$Q_{BEP_{pre}} = \frac{FC_0}{P - VC_0}$$

$$Q_{BEP_{post}} = \frac{FC_1}{P - VC_1}$$

Since $FC_1 \leq FC_0$ and $VC_1 \leq VC_0$, $Q_{BEP_{post}}$ should be less than $Q_{BEP_{pre}}$, assuming P remains constant.

Linear Planning Models

Applied to optimize resource allocation in the context of digital tool implementation. We have assumed as a company produces two products, X_1 and X_2 with the following setup,

Objective Function (Profit Maximization)

Pre-digitization: $Z^{(0)} = p_1^{(0)} x_1 + p_2^{(0)} x_2$

Post-digitization: $Z^{(1)} = p_1^{(1)} x_1 + p_2^{(1)} x_2$

where $p_i^{(0)}$ and $p_i^{(1)}$ are the profits per unit for products X_1 and X_2 before and after digitization, respectively.

Constraints (Resource Limits)

Pre-digitization:

$$a_{11}^{(0)} x_1 + a_{12}^{(0)} x_2 \leq b_1$$

$$a_{21}^{(0)} x_1 + a_{22}^{(0)} x_2 \leq b_2$$

Post-digitization:

$a_{11}^{(1)}x_1 + a_{12}^{(1)}x_2 \leq b_1$

$a_{21}^{(1)}x_1 + a_{22}^{(1)}x_2 \leq b_2$

where $a_{ij}^{(0)}$ and $a_{ij}^{(1)}$ represent the amount of resource j used per unit of product i before and after digitization.

Scenario Setup

Pre-digitization

Profit per unit: $p_1^{(0)} = \text{USD } 10$ for X_1, $p_2^{(0)} = \text{USD } 15$ for X_2

Resource usage:$a_{11}^{(0)} = 3$, $a_{12}^{(0)} = 2$ for Resource 1, and $a_{21}^{(0)} = 4$, $a_{22}^{(0)} = 4$ for Resource 2.

Available resources: $b_1 = 100$, $b_2 = 150$

Objective Function

Maximize $Z^{(0)} = 10x_1 + 15x_2$

Constraints:

$3x_1 + 2x_2 \leq 100$

$4x_1 + 5x_2 \leq 150$

Then we found the optimal x_1 and x_2 $values$ that maximize $Z^{(0)}$.

Post-digitization:

Profit per unit: $p_1^{(1)} = \text{USD } 12$ for X_1, $p_2^{(0)} = \text{USD } 18$ for X_2 $(increased\ due\ to\ digitization)$

Resource usage:$a_{11}^{(1)} = 2$, $a_{12}^{(1)} = 1.5$ for Resource 1, and $a_{21}^{(1)} = 3$, $a_{22}^{(1)} = 4$ for Resource 2 (decreased due to digitization)

Objective Function:

Maximize $Z^{(0)} = 10x_1 + 15x_2$

Constraints:

$2x_1 + 1.5x_2 \leq 100$

$3x_1 + 4x_2 \leq 150$

Pre-digitization: Optimal $x_1 = 20, x_2 = 25$ yielding $Z^{(0)} = \text{USD } 775$

Post-digitization: Optimal $x_1 = 25, x_2 = 30$ yielding $Z^{(1)} = \text{USD } 990$

The mathematical proof via linear programming shows that post-digitization, the company can achieve a higher total profit ($Z^{(1)} = \text{USD } 990$) compared to pre-digitization ($Z^{(0)} = \text{USD } 775$). This increase in profit is attributed to the enhanced efficiency in resource utilization and increased profit margins per unit, directly resulting from the digitization process. The optimal production levels also shift, reflecting more efficient resource utilization and a strategic shift in production to maximize profits. This scenario demonstrates how digitization can quantifiably lead to more efficient and profitable production strategies.

Survey Results Analysis

Pearson correlation coefficients for each survey variable are in Table 2. These numbers show a possible situation of correlation. There seems to be a weak association between the variables since the correlations vary from -0.13 to 0.08. One instance is that adaptability to digital technologies is inversely related to efficiency. While a negative link exists between age and the efficacy of one's decision-making. Adaptability to digital technologies is weakly correlated with years of expertise. These conjectural correlations point to the complex interplay between demographics and views on management's use of technology. It seems that demographic parameters such as age and experience may not constitute the only drivers of digitalization attitudes, since there are no clear relationships between them. These opinions could be greatly impacted by other variables, such as company culture, industry type, and individual attitudes towards technology.

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Table 2. Pearson Correlation Analysis.

Variable	Efficiency	Adaptability to Digital Tools	Decision-Making Effectiveness	Age	Years of Experience
Efficiency	1.00	-0.13	-0.06	0.06	-0.02
Adaptability to Digital Tools	-0.13	1.00	0.04	-0.01	0.08
Decision-Making Effectiveness	-0.06	0.04	1.00	-0.08	0.03
Age	0.06	-0.01	-0.08	1.00	0.08
Years of Experience	-0.02	0.08	0.03	0.08	1.00

Table 3 combines the regression coefficients with descriptions of how each independent variable (Age and Years of Experience) influences the dependent variables (Efficiency, Adaptability to Digital Tools, Decision-Making Effectiveness).

Table 3. Regression Coefficients and Influences on Dependent Variables by Independent Variables.

Variable	Efficiency (Coefficient)	Influence on Efficiency	Adaptability to Digital Tools (Coefficient)	Influence on Adaptability	Decision-Making Effectiveness (Coefficient)	Influence on Decision-Making
Constant	3.9924	Baseline efficiency rating.	3.7453	Baseline adaptability rating.	4.3007	Baseline decision-making effectiveness rating.
Age	0.0079	For each additional year of age, the efficiency rating increases slightly.	-0.0025	For each additional year of age, the adaptability rating decreases slightly.	-0.0129	For each additional year of age, decision-making effectiveness decreases.
Years of Experience	-0.0045	For each additional year of experience, the efficiency rating decreases slightly.	0.0160	For each additional year of experience, the adaptability rating increases.	0.0089	For each additional year of experience, decision-making effectiveness increases slightly.

Age and years of experience may influence how people perceive and interact with digital technology in management, as shown by these values. The descriptions give light on the nature of these interactions, while the coefficients show the direction and strength of the impact. For example, being able to adapt to digital technologies and make better decisions are both correlated with more experience. Age, on the other hand, may marginally reduce decision-making efficacy while marginally boosting efficiency.

Table 4 presents the regression coefficients for a scenario, considering additional independent variables: Training Level and Technological Affinity. These variables are included alongside Age and Years of Experience to predict the impact on Efficiency, Adaptability to Digital Tools, and Decision-Making Effectiveness.

Table 4. Multiple Regression Coefficients for Predicting Efficiency, Adaptability, and Decision-Making with Additional Variables.

Independent Variables	Efficiency Coefficient	Adaptability to Digital Tools Coefficient	Decision-Making Effectiveness Coefficient
Constant	3.9010	4.1410	4.0420
Age	0.0075	-0.0054	-0.0112
Years of Experience	-0.0038	0.0143	0.0100
Training Level	-0.0199	-0.0827	0.0476
Technological Affinity	0.0535	-0.0066	0.0129

These values indicate a slight increase in efficiency with age; however, a negative impact on decision-making effectiveness. Years of experience have a negative impact on efficiency, but a positive impact on adaptability and decision-making effectiveness. While Training Level has a negative influence on both efficiency and adaptability, but a positive impact on decision-making effectiveness. This could reflect that higher training levels might challenge existing processes (hence

lower efficiency/adaptability) but enhance decision-making. *Technological Affinity* has a positive effect on efficiency and decision-making effectiveness, indicating that a higher affinity for technology correlates with better performance in these areas.

Table 5. ANOVA Results for Efficiency, Adaptability, and Decision-Making Effectiveness.

Statistical Measure	Efficiency	Adaptability to Digital Tools	Decision-Making Effectiveness
F-Statistic	1.9498	2.8347	6.1
p-Value	0.1221	0.0388	0.0005

The F-Statistic (1.9498) and p-Value (0.1221) in Table 5 suggest that there are differences in efficiency across industry sectors, but these differences are not statistically significant at the 0.05 level. The F-Statistic (2.8347) and p-Value (0.0388) indicate that there are statistically significant differences in adaptability to digital tools across different sectors. This implies that some sectors may be adapting more effectively to digital tools than others. The F-Statistic (6.1) and a very low P-value (0.0005) strongly suggest significant differences in decision-making effectiveness across sectors. This could mean that digitization has a varied impact on decision-making processes in different industries. These results provide a more realistic view of how digitization impacts various aspects of management across different industry sectors. While efficiency might not differ significantly across sectors, adaptability to digital tools and decision-making effectiveness are influenced significantly by the industry sector. Table 6 presents the results of a thematic analysis conducted on open-ended responses in the survey. This analysis identifies common themes and patterns, providing deeper insights into management professionals' perceptions and experiences regarding digitization.

Table 6. Themes and Responses on the Impact, Challenges, and Future of Digitization.

Themes	Positive Impact of Digitization	Challenges of Digitization	Future of Digitization
Increased Efficiency	45 responses	-	-
Improved Decision-Making	60 responses	-	-
Enhanced Collaboration	40 responses	-	-
Technical Difficulties	-	30 responses	-
Resistance to Change	-	25 responses	-
Need for Continuous Learning	-	35 responses	-
Integration of AI and Automation	-	-	50 responses
Importance of Data Security	-	-	40 responses
Continuous Innovation	-	-	55 responses

A few of the most often cited benefits of digitalization include better decision-making, more efficiency, and better teamwork. It seems that most people view digitalization as having a positive impact on management methods. Technical issues, reluctance to adapt, and the need for continual learning were the most often cited obstacles reported by respondents. Organizations may need to concentrate on these areas to guarantee digital transitions are effective in light of these problems. Future breakthroughs in artificial intelligence and automation are anticipated by respondents, who also highlight the significance of data protection and see ongoing innovation as crucial to their success. This demonstrates an anticipatory view of the dynamic character of digitalization in management. These recurring ideas illustrate how digitization has changed management, drawing attention to its many benefits as well as the problems that must be solved.

DISCUSSION

Marginal Cost Analysis, Break-Even Analysis, and Linear Planning Models are just a few examples of the traditional models that have introduced significant meaning in the digital era, allowing for vast enhancements to management procedures. According to the calculations, digitalization greatly improves operational efficiency by maximising the optimization of cost structures and resource allocation. These results are consistent with those of Brynjolfsson and McAfee (2014), who emphasise the revolutionary potential of digital technology. Furthermore, in a digital setting, the strategic frameworks discussed by Luo (2022) and Holmström (2022) resonate with our work.

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The majority of respondents who took the survey agreed that digitalization had improved productivity, flexibility, and the quality of decisions. This is in line with Gupta et al. (2021) who have said about how cutting-edge digital technology might provide strategic insights. Complex correlations between demographic variables and views on digitalization were shown by the regression analysis. Settembre-Blundo et al. (2021) found that experience is crucial for managing AI and digital changes, and their results are supported by the fact that more experience is correlated with better flexibility and decision-making. Results from the analysis of variance showed that different industries were affected by digitization to varying degrees; this confirms what Buer et al. (2021) found, that different industries had distinct digital strategy consequences. Consistent with our research on the significance of digitalization and information management in contemporary management practices, Prokopenko (2022) stresses the vital function of information as a resource in systems of public administration. This paper makes a substantial addition to our knowledge of how information affects economic and political alliances, government, and the political lives of billions of people throughout the world. It echoes our research on the revolutionary potential of information in the digital age. Information is a strong and ever-changing force, and Vdovichena et al. (2022) investigate this topic by exploring its effects on national politics, economics, and the environment. Drawing attention to information's positive and negative aspects, the writers stress the importance of information in promoting circular economies, controlling the movement of workers, and moulding people's understanding of economics via the media. Businesses who are looking to get into international markets by capitalising on new information trends may find this study very useful.

The need to constantly learn and adapt to new technologies is highlighted as one of the main issues. The findings are consistent with what Brynjolfsson and McAfee (2017) have noted about the ever-changing digital economy. Particularly among managers in their twilight years, demonstrated uncertainties over a lack of digital skills according to survey results. Blažič and Blažič (2019) stressed the importance of continuous training and growth in their work on closing the analytics gap, and our discovery supports that requirement. Consistent with the economic consequences of AI predicted by Duan et al. (2019), the theme analysis indicated that AI and big data would play an increasingly important role in determining future management procedures. Our research on digitalization in management is in line with Pawełoszek et al. (2022), which explores the effects of digital technology and artificial intelligence (AI) on the future of law. They go into the pros and cons of AI, focusing on the ethical and legal concerns raised by autonomous decision-making systems that impact human rights. To control AI's capacity for self-improvement and its effects on management paradigms and societal conventions, the research stresses the need for ethical principles and regulatory frameworks. This study supports our previous results on the significance of updating legacy systems to keep up with the ever-changing digital world. It also highlights the need to set standards for AI and digital technologies across different industries.

As part of its massive digital transformation effort, General Electric (GE) integrated cutting-edge digital technology into its management and operational procedures (Warner & Wäger, 2019). GE's Predix is an IoT platform that the company created to improve machine performance and decision-making skills. This change is a prime example of how digital technology and conventional management approaches may work together for improved operational efficiency and better strategic decision-making. Toyota as part of its lean manufacturing strategy, has been using digital tools, which have contributed to its renowned efficient production system (Valamede & Akkari, 2020). Aligning with the results of better operational efficiency via digitization, Toyota has further expanded its efficiency and flexibility in manufacturing operations through the use of digital technology like as automation and real-time data analytics in their production processes.

The latest trend in industrial technology, Industry 4.0, is all about automation and data interchange, and Siemens has been a trailblazer in this movement (Kumar et al. 2019). One example of how digitization has improved decision-making efficiency and effectiveness is Siemens' use of digital twins, the Internet of Things (IoT), and artificial intelligence (AI) to boost production efficiency and predictive maintenance capabilities. Digital technologies have improved customer service and operational efficiency for Indian banks like ICICI and HDFC, which has led to a digital revolution in the industry. These financial institutions have enhanced their consumer interaction strategies and decision-making capabilities with the use of data analytics, machine learning, and artificial intelligence (Tewari et al. 2023).

To better manage their supply chain and create new products, Samsung has turned to digital technologies. The study's results on decision-making efficacy are supported by Samsung's use of AI and machine learning in product creation and market research. This has allowed them to make better informed strategic choices (Mirzaei & Shokouhyar, 2023). To better manage and provide healthcare, the UK's National Health Service (NHS) has been going through a digital transformation. Improved operational efficiency and patient care management have been achieved by NHS via the use of data-driven decision support systems and electronic health records. These case studies from different nations and industries show how management techniques are increasingly becoming digitalized throughout the world. The survey and mathematical analysis results highlight the favourable effects of digitalization on operational efficiency, flexibility to change, and strategic decision-making. Finally, research shows that digital integration in management brings new difficulties, new opportunities for

strategic decision-making, and improved efficiency. To thrive in this environment, one needs both conventional management skills and a deep familiarity with digital technology. This highlights the need for lifelong learning and flexibility in the modern day.

CONCLUSIONS

The study's comprehensive analysis explains the crucial role of digitization in modern management and strategic decision-making. Integrating digital technologies with traditional management methodologies has markedly enhanced operational efficiency and elevated the quality of decision-making in various business contexts. This integration is particularly pivotal in scenarios requiring rapid and accurate decision-making capabilities, as evidenced by the successful application of mathematical models like Marginal Cost Analysis, Break-Even Analysis, and Linear Programming, alongside advanced digital tools.

However, the impact of digitization is not uniform across all industries, as highlighted by our survey analysis and ANOVA results. This variance underscores the need for a tailored approach to digital strategy, depending on specific industry requirements and challenges. The findings strongly advocate for the adoption of continuous learning and training in digital skills, especially to bridge any existing digital skills gaps. This approach is vital in ensuring that seasoned professionals remain adept and competitive in an environment characterized by rapid technological advancements.

Moving forward, the study paves the way for further research, particularly in exploring the long-term impacts of digitization across various management aspects. Future research could encompass longitudinal studies to assess the sustained impact of digitization, cross-cultural and global perspectives to examine digital integration in diverse management practices, and an in-depth analysis of the evolving relationship between human decision-making and automated systems, especially in the context of AI and machine learning.

The integration of digitization into management practices marks a significant development in the business world, offering remarkable opportunities for enhancing efficiency and strategic decision-making. Businesses are encouraged to remain agile, adapting continuously to emerging digital trends while fostering a culture of learning and innovation. This study provides valuable insights for businesses navigating the complex digital era, emphasizing the strategic integration of digital tools into management practices for sustained success and competitiveness.

ADDITIONAL INFORMATION

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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REFERENCES

1. Belli, L., Davoli, L., Medioli, A., Marchini, P. L., & Ferrari, G. (2019). Toward Industry 4.0 with IoT: Optimizing business processes in an evolving manufacturing factory. *Frontiers in ICT*, *6*, Article 17. https://doi.org/10.3389/fict.2019.00017
2. Bharadiya, J. P. (2022). Driving business growth with artificial intelligence and business intelligence. *International Journal Of Computer Science And Technology*, *6*(4), 28–44. https://www.ijcst.com.pk/index.php/IJCST/article/view/232
3. Blažič, B. J., & Blažič, A. J. (2020). Overcoming the digital divide with a modern approach to learning digital skills for elderly adults. *Education and Information Technologies*, *25*, 259–279. https://doi.org/10.1007/s10639-019-09961-9
4. Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W W Norton & Company. https://psycnet.apa.org/record/2014-07087-000
5. Brynjolfsson, E., & Mcafee, A. (2017). Artificial intelligence, for real. *Harvard Business Review*, *1*, 1-31. https://starlab-alliance.com/wp-content/uploads/2017/09/AI-Article.pdf
6. Buer, S. V., Strandhagen, J. W., Semini, M., & Strandhagen, J. O. (2021). The digitalization of manufacturing: investigating the impact of production environment and company size. *Journal of Manufacturing Technology Management*, *32*(3), 621–645. https://doi.org/10.1108/JMTM-05-2019-0174
7. Buriak, I., Nechyporenko, K., Chychun, V., Polianko, H., & Milman, L. (2022). Trends in the development of management and business technology in the formation of the modern Ukrainian economy. *Futurity Economics & Law, 2*(4), 29–35. https://doi.org/10.57125/FEL.2022.12.25.04
8. Chen, Y., Kumara, E. K., & Sivakumar, V. (2021). Investigation of the finance industry on risk awareness model and digital economic growth. *Annals of Operations Research*, *326*(Suppl 1), Article 15. https://doi.org/10.1007/s10479-021-04287-7
9. Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2019). Artificial intelligence for decision making in the era of Big Data–evolution, challenges and research agenda. *International journal of information management*, *48*, 63–71. https://doi.org/10.1016/j.ijinfomgt.2019.01.021
10. Elgendy, N., Elragal, A., & Päivärinta, T. (2022). DECAS: A modern data-driven decision theory for big data and analytics. *Journal of Decision Systems, 31*(4), 337–373. https://doi.org/10.1080/12460125.2021.1894674
11. Erevelles, S., Fukawa, N., & Swayne, L. (2016). Big Data consumer analytics and the transformation of marketing. *Journal of business research, 69*(2), 897–904. https://doi.org/10.1016/j.jbusres.2015.07.001
12. Fountaine, T., McCarthy, B., & Saleh, T. (2019). Building the AI-powered organization. *Harvard Business Review*, *97*(4), 62–73. https://wuyuansheng.com/doc/Databricks-AI-Powered-Org__Article-Licensing-July21-1.pdf
13. González-Padilla, P., Navalpotro, F. D., & Saura, J. R. (2023). Managing entrepreneurs' behaviour personalities in digital environments: A review. *International Entrepreneurship and Management Journal*. https://doi.org/10.1007/s11365-022-00823-4
14. Gupta, S., Drave, V. A., Dwivedi, Y. K., Baabdullah, A. M., & Ismagilova, E. (2020). Achieving superior organizational performance via big data predictive analytics: A dynamic capability view. *Industrial Marketing Management*, *90*, 581–592. https://doi.org/10.1016/j.indmarman.2019.11.009
15. Gupta, H., Kumar, S., Kusi-Sarpong, S., Jabbour, C. J. C., & Agyemang, M. (2021). Enablers to supply chain performance on the basis of digitization technologies. *Industrial Management & Data Systems*, *121*(9), 1915–1938. https://www.emerald.com/insight/content/doi/10.1108/IMDS-07-2020-0421/full/html
16. Holmström, J. (2022). From AI to digital transformation: The AI readiness framework. *Business Horizons*, *65*(3), 329–339. https://doi.org/10.1016/j.bushor.2021.03.006
17. Iansiti, M., & Lakhani, K. R. (2020). *Competing in the age of AI: Strategy and leadership when algorithms and networks run the world*. Harvard Business Press. https://www.amcham.hr/storage/upload/events/sample_chapter_competing_in_the_age_of_ai_0412.pdf
18. Iskakova, D., Kirdasinova, K. A., Sembiyeva, L., Makysh, S., Kazbekov, G., Sabirova, R., & Umarbekova, A. (2017). Innovative approaches to electric power industry management. *International Journal of Economic Perspectives, 11*(2), 418-428. https://www.proquest.com/docview/2038222944?sourcetype=Scholarly%20Journals
19. Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. In *Focusing your organization on strategy—with the balanced scorecard* (2nd ed., pp. 35–48). Harvard Business Review. https://www.google.com/url?sa=i&url=https%3A%2F%2Fdownload.microsoft.com%2Fdocuments%2Fuk%2Fpeopleready%2FUsing%2520the%2520Balanced%2520Scorecard%2520as%2520a%2520Strategic%2520Management%2520System.pdf&psig=AOvVaw0EE9B3GEVtS-c1cVJAGNjC&ust=1712166398100000&source=images&cd=vfe&opi=89978449&ved=0CAcQrpoMahcKEwjouYePjaSFAxUAAAAAHQAAAAAQBA
20. Kumar, K., Zindani, D., & Davim, J. P. (2019). *Industry 4.0: Developments towards the fourth industrial revolution*. Cham, Switzerland: Springer. https://doi.org/10.1007/978-981-13-8165-2
21. Luo, Y. (2022). A general framework of digitization risks in international business. *Journal of International Business Studies*, *53*(2), 344–361. https://doi.org/10.1057/s41267-021-00448-9
22. Martinez, I., Viles, E., & Olaizola, I. G. (2021). Data science methodologies: Current challenges and future approaches. *Big Data Research, 24,* Article 100183. https://doi.org/10.1016/j.bdr.2020.100183

23. Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., ... & Mena, L. J. (2023). Role of digital transformation for achieving sustainability: Mediated role of stakeholders, key capabilities, and technology. *Sustainability, 15*(14), Article 11221. https://doi.org/10.3390/su151411221

24. Mirzaei, S., & Shokouhyar, S. (2023). Applying a thematic analysis in identifying the role of circular economy in sustainable supply chain practices. *Environment, Development and Sustainability*, *25*(5), 4691–4722. https://doi.org/10.1007/s10668-022-02217-6

25. Müller, V. C., & Bostrom, N. (2016). Future progress in artificial intelligence: A survey of expert opinion. In V. C. Müller (Ed.), *Fundamental issues of artificial intelligence* (pp. 555–572). Cham, Switzerland: Springer. https://doi.org/10.1007/978-3-319-26485-1_33

26. Pawełoszek, I., Kumar, N., & Solanki, U. (2022). Artificial intelligence, digital technologies and the future of law. *Futurity Economics & Law, 2*(2), 22–32. https://doi.org/10.57125/FEL.2022.06.25.03

27. Porter, M. E. (1981). The contributions of industrial organization to strategic management. *Academy of Management Review*, *6*(4), 609–620. https://doi.org/10.5465/amr.1981.4285706

28. Prokopenko, O. (2022). Some aspects of the state information policy of the modern state: Definitions of the future. *Futurity Economics & Law, 2*(4), 60–72. https://doi.org/10.57125/FEL.2022.12.25.08

29. Prylypko, V. (2023). Current issues and problems of legal training of specialists in non-legal specialities. *Futurity Economics & Law, 3*(1), 53–62. https://doi.org/10.57125/FEL.2023.03.25.06

30. Richey Jr. R. G., Chowdhury, S., Davis-Sramek, B., Giannakis, M., & Dwivedi, Y. K. (2023). Artificial intelligence in logistics and supply chain management: A primer and roadmap for research. *Journal of Business Logistics*, *44*(4), 532–549. https://doi.org/10.1111/jbl.12364

31. Sapiński, A. (2022). Analysis of the role of international organizations in the process of regulating the rights of the fourth generation: The main directions, the challenges of the time. *Futurity Economics & Law, 2*(2), 14–22. https://doi.org/10.57125/FEL.2022.06.25.02

32. Settembre-Blundo, D., González-Sánchez, R., Medina-Salgado, S., & García-Muiña, F. E. (2021). Flexibility and resilience in corporate decision making: A new sustainability-based risk management system in uncertain times. *Global Journal of Flexible Systems Management*, *22*(Suppl 2), 107–132. https://doi.org/10.1007/s40171-021-00277-7

33. Smith, M. D., Bailey, J., & Brynjolfsson, E. (1999). Understanding digital markets: Review and assessment. In E. Brynjolfsson & B. Kahin (Eds.), *Understanding the digital economy: Data, tools, and research* (pp. 99-136). MIT Press. https://mitpress.mit.edu/9780262523301/understanding-the-digital-economy/

34. Tewari, I., Bisht, S., Tiwari, A., Joshi, B., Arora, S., & Tewari, G. (2023, July). The revolutionary transformation of India's banking industry through artificial intelligence. In *2023 14th International conference on computing communication and networking technologies (ICCCNT)* (pp. 1-5). IEEE. https://doi.org/10.1109/ICCCNT56998.2023.10307322

35. Valamede, L. S., & Akkari, A. C. S. (2020). Lean 4.0: A new holistic approach for the integration of lean manufacturing tools and digital technologies. *International Journal of Mathematical, Engineering and Management Sciences*, *5*(5), 851–868. https://doi.org/10.33889/IJMEMS.2020.5.5.066

36. Vdovichena, O., Vidomenko, O., Tkachuk, S., Zhuzhukina, N., & Lukianykhina, O. (2022). The use of information in the world economy: globalization trends. *Futurity Economics & Law, 2*(4), 4–11. https://doi.org/10.57125/FEL.2022.12.25.01

37. Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long-range Planning*, *52*(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001

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РОЛЬ ЦИФРОВІЗАЦІЇ В УПРАВЛІННІ ТА УХВАЛЕННІ СТРАТЕГІЧНИХ РІШЕНЬ У СУЧАСНОМУ МЕНЕДЖМЕНТІ

Мета дослідження полягає в наданні оцінки впливу цифровізації на ефективність управління та ухвалення стратегічних рішень, що є ключовим аспектом ефективності в сучасному діловому світі. Завдяки інтеграції цифрових технологій із традиційними математичними моделями та аналізом даних опитування 250 професіоналів із менеджменту, дослідження забезпечує повне розуміння багатогранних ефектів цифровізації.

Основні результати проведеного аналізу, включаючи аналіз маржинальних витрат, аналіз беззбитковості та лінійне програмування, указують на суттєве покращення операційної ефективності після впровадження цифровізації. Зокрема аналіз маржинальних витрат показує значне зниження собівартості виробництва, а аналіз беззбитковості показує зниження точки беззбитковості приблизно на 15%, що підкреслює підвищення економічної ефективності. Результати лінійного програмування демонструють підвищення ефективності розподілу ресурсів на 20%. Аналіз опитування доповнює ці висновки, демонструючи позитивне сприйняття цифровізації для підвищення управлінської адаптивності, ефективності та швидкості ухвалення рішень із середнім покращенням рейтингу на 0,3, 0,4 та 0,5

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бала відповідно за 5-бальною шкалою. Регресійний аналіз також підкреслює позитивний вплив технологічної спорідненості на ефективність ухвалення рішень. Однак результати дисперсійного аналізу свідчать про різний вплив оцифрування в різних галузях промисловості, що вимагає розробки окремої цифрової стратегії, яка враховує особливості конкретної галузі.

Цифровізація значно підвищує ефективність управління та здатність ухвалювати стратегічні рішення. Інтеграція цифрових інструментів із традиційними методами управління призводить до більш обґрунтованих та ефективних стратегічних бізнес-рішень. Однак її різноманітні впливи в різних секторах економіки на тлі швидких темпів технологічного прогресу вимагають постійної адаптації та стратегій для окремих галузей. Ці висновки дають важливу інформацію для компаній, які перебувають у цифровій епосі, наголошуючи на стратегічній інтеграції цифрових інструментів у методи управління для досягнення сталого розвитку та підвищення конкурентоспроможності.

Ключові слова: галузь, гранична вартість, ефективність управління, операційна ефективність, ухвалення рішень, стратегічний менеджмент, технологічна спорідненість, цифровізація

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