"Designing a Digital Accounting Model in Value-Based Management Based on Momentum Theory Using an Integrated Approach of DEMATEL and Interpretive Structural Modeling (ISM)"

Roya Tavanaei Ahoei
Department of Accounting, Science and research Branch, Islamic Azad University, Tehran, Iran
Email: roya.tavanae@iau.ac.ir

Fraydoon Rahnamay Roodposhti
Department of Accounting, Science and research Branch, Islamic Azad University, Tehran, Iran. (Corresponding Author)
Dr.Rahnama@iau.ac.ir

Hamidreza Vakilifard
Department of Accounting, Science and research Branch, Islamic Azad University, Tehran, Iran
h-vakilifard@ iau.ac.ir

Ghodratollah Talebnia
Department of Accounting, Science and research Branch, Islamic Azad University, Tehran, Iran
Gh-talebnia@ iau.ac.ir

Submit: 28/06/2025 Accept: 23/08/2025

ABSTRACT

The aim of the present study was to design a digital accounting model in value-based management based on momentum theory. This research is developmental-applied in terms of its purpose. The method used in this study is a combined method that includes the historical method (data collection) and the survey method (questionnaire distribution). Also, articles, books, and reliable sources available to the researcher were used to collect and write the theoretical foundations of the research. The population and statistical sample of this study are experts familiar with digital accounting concepts. The sampling method is purposive. The methods used in this study are DEMATEL techniques and interpretive structural model. The software used was EXCEL and MICMAC.9 indicators were identified. These indicators include: digital technologies and accounting transformation, data management and information security, momentum analysis and financial forecasting, value measurement and management, transparent and timely reporting, automation of accounting processes, compliance with regulations and legal changes, support for strategic decision-making based on momentum analysis, and digital learning and training of employees. The model designed in this study, by combining technological, analytical, managerial, and human components, provides a practical model for organizations, financial institutions, and the accounting industry. This model can not only help promote transparency and financial accountability, but also provide a strategic tool for long-term value creation through data-driven and analytical decision-making. Also, from a policy perspective, the findings of this study can be a basis for designing digital transformation strategies in the country's financial system and reviewing accounting education. Finally, this research, while expanding the boundaries of knowledge in the field of digital accounting, provides practical solutions to increase the resilience of organizations to economic fluctuations and environmental changes.

Keywords: Digital accounting, value-based management, momentum theory

1. Introduction

In recent years, the transformations brought about by digital technologies have emerged as a fundamental driver in reshaping economic and managerial structures. Tools such as block chain, artificial intelligence (AI), and big data analytics have profoundly altered the traditional landscape of accounting and paved the way for the emergence of innovative, intelligent, and technology-driven systems (Zambon et al., 2019; Arifin et al., 2023). Among these developments, digital accounting, as one of the key manifestations of digital transformation, has gained a prominent role in improving efficiency, enhancing the transparency of financial processes, and increasing organizational accountability (Zhang et al., 2022).

Despite its significant benefits, a comprehensive framework that can systematically explain the conceptual and practical link between digital accounting and value-based management has not yet been clearly defined in the academic literature (Monticallo et al., 2018; Rozmala, 2024). Value-based management, as a holistic strategy, aims to align an organization's decisions and activities with the goal of creating long-term and sustainable value for stakeholders (Koza et al., 2024). This approach does not focus solely on financial gains but also considers social, environmental, and structural values as inseparable elements of the decision-making process (Koza et al., 2024). It therefore addresses not only financial value but also social, environmental (Blaschke et al., 2019; Shukla et al., 2024), and organizational values (Yakuzi et al., 2024).

In the context of digital transformation, accurately identifying the factors that influence value creation in organizations requires the use of models and tools capable of effectively analyzing and interpreting the complexities of modern systems (Massaro et al., 2023). From this perspective, integrating digital accounting with the principles and goals of value-based management can offer an innovative approach to enhancing strategic decision-making. Such a combination not only optimizes financial performance but also emphasizes non-financial and sustainability dimensions, paving a new path for organizational development and competitiveness (Otley, 2016; Horner et al., 2024).

Momentum theory, which analyzes market movements and dynamics in economics and finance, provides a theoretical framework for understanding behavioral patterns and the dynamics of complex systems (Olfani, 2024). In the realm of value-based management, this theory can help identify key value-adding points and predict future organizational behaviors (Krahel et al., 2015; Tricquanti et al., 2022). Given its potential in trend analysis, combining momentum theory with digital accounting can be highly effective in designing models for evaluating and managing organizational value (Moll et al., 2019).

One of the main challenges for organizations in the digital era is their ability to adapt to new technologies and optimally utilize digital data for managerial decision-making (Shirkavand et al., 2021). A lack of integration between digital accounting systems and value-driven approaches can lead to resource waste and reduced effectiveness. This issue becomes particularly significant in dynamic and competitive environments (Vazaro, 2022), where organizations must quickly adapt to changes. Therefore, developing a comprehensive model that synergistically integrates these two domains is critically important (Sotoseke et al., 2023).

In an era marked by digital transformation and increasing environmental complexity, organizations must reconsider traditional financial and managerial structures to maintain their competitive edge. Value-based management, as a comprehensive and forward-looking approach, seeks to align all organizational decisions with the goal of creating and enhancing long-term stakeholder value (Yazidi et al., 2021). Meanwhile, the emergence of advanced technologies—particularly in accounting—has created a unique opportunity to align financial structures with value-oriented goals (Saputra et al., 2023). Digital accounting, as a key outcome of digital transformation in financial systems, leverages technologies such as AI, data mining, cloud computing, and blockchain to improve the accuracy, speed, and transparency of financial data recording and analysis (Hebke, 2023).

On the other hand, momentum theory, rooted in physical concepts of motion, has recently gained significant traction in economic and financial analysis. The theory is based on the premise that behaviors and trends persist over time and that past momentum can help predict future behavior. In this context, integrating momentum theory insights with digital accounting capabilities can provide both conceptual and operational frameworks for monitoring, analyzing, and managing organizational value. Utilizing this approach enables the identification, measurement, and management of financial and non-financial trends that influence organizational value, allowing decision-makers to pursue long-term goals with dynamic, data-driven insights (DiAngelo et al., 2024).

Accordingly, the primary objective of this study is to design a comprehensive model for digital accounting within the framework of value-based management, grounded in the principles of momentum theory. This model aims to identify the key dimensions influencing the creation and sustainability of value in organizations and to examine their interactions through a systems-oriented approach. To achieve this goal, a mixed-methods methodology is used, employing the DEMATEL technique to identify causal relationships among components and Interpretive Structural Modeling (ISM) to hierarchize and structurally analyze these components. This combined approach allows researchers to gain an in-depth understanding of the conceptual linkages between model elements and to map their logical and multi-layered structure.

The lack of a comprehensive model integrating digital accounting with value-based management based on momentum theory may lead to flawed and inefficient organizational decision-making (Azizi et al., 2020). Such shortcomings can result not only in diminished value for shareholders but also in reduced public trust, a lack of transparency, and potential managerial crises (Vorontis et al., 2022). Under these conditions, the development of a comprehensive model that leverages emerging technologies to create value and manage market dynamics is seen as essential. Given the growing importance of digital technologies in the global economy and their profound impact on organizational management, there is a pressing need for a model that integrates digital accounting with value-based management using momentum theory (Mohammadi & Ghasemi, 2022). Such a model can offer a novel solution for utilizing digital data to create sustainable value and manage organizational risks.

The application of the DEMATEL method in this study allows for the assessment of the intensity of influence and interdependence among key variables in digital accounting, value creation, and momentum indicators, enabling the identification of the most causally influential or affected components. Simultaneously, the ISM model facilitates the development of a hierarchical and interpretable structure of these elements. This structure is not only practical for organizational decision-makers but also valuable in strategic planning, prioritization of actions, and the design of intelligent financial systems. In such a model, key parameters such as data orientation, adaptability to environmental changes, value sustainability, and reporting transparency are emphasized.

The expected outcome of this research is the development of a coherent and applicable model that can assist organizations in improving financial performance, enhancing strategic decision-making, and evolving value-based systems. Additionally, this model can serve as a framework for redesigning digital accounting processes and formulating modern financial policies. Theoretical contributions of this research will also advance the conceptual foundations of value management and expand the applications of momentum theory in the fields of finance and accounting.

Momentum theory, as a modern concept in behavioral pattern analysis and trend forecasting, offers an effective framework for analyzing and managing organizational value (Mohammadi Nureh et al., 2022). By emphasizing trend continuity and analyzing value dynamics over time, this theory enables managers to more accurately identify market behaviors and stakeholder responses, leading to data-driven and value-based decision-making. Utilizing this approach alongside emerging technologies such as digital accounting allows organizations to evaluate their financial and non-financial performance with greater accuracy and responsiveness to environmental changes.

The synergy between digital accounting and momentum theory goes beyond analytical accuracy—it strengthens an organization's ability to continuously monitor value and forecast transformative trends. This integration provides a novel method for deeper insight into organizational data and plays a critical role in developing flexible and responsive strategies in volatile markets. From this perspective, designing a model based on digital accounting and guided by the principles of momentum theory can bridge gaps in traditional valuation systems and foster more precise, forward-looking decision-making. Ultimately, adopting such a model not only enhances transparency in financial management but also equips managers with a strategic tool for making value-driven decisions. This approach supports the advancement of theoretical knowledge in finance and accounting while delivering practical benefits that improve organizational performance and competitiveness in turbulent markets. Therefore, this study aims to pursue the following objectives:

- Identifying the key indicators influencing the digital accounting model within value-based management based on momentum theory
- Determining the relationships among the indicators and their levels of influence and dependency using the combined approach of Interpretive Structural Modeling (ISM)
- Assessing the intensity of relationships among variables through the Fuzzy DEMATEL technique

Theoretical Foundations

Digital Accounting

Digital accounting is an innovative approach in the field of accounting that involves utilizing digital technologies to collect, process, analyze, and report financial information. This concept is a result of the digital transformation in financial and accounting domains and encompasses the use of tools such as cloud-based accounting software, artificial intelligence, machine learning, block chain, and big data analytics to enhance the accuracy, speed, and transparency of accounting operations. In this approach, traditional manual processes have been replaced by automated and intelligent systems capable of performing complex calculations and providing real-time reports. Digital accounting plays a vital role in improving internal controls, reducing human errors, and accelerating financial decision-making, thereby enhancing organizational efficiency and accountability (Richens et al., 2017).

The shift towards digital accounting not only involves technological changes but also requires redefining the role of accountants and transforming their skills and professional knowledge. Modern accountants are no longer solely responsible for recording and classifying financial information; they must possess the ability to analyze data, understand emerging technologies, and interpret analytical results for managers. For instance, a digital accountant may use machine learning algorithms to identify hidden patterns in financial data and provide forecasts for future financial conditions. Additionally, block chain technology, by providing a secure, transparent, and immutable platform for recording transactions, plays a significant role in enhancing trust and accuracy in financial data. The adoption of these technologies necessitates the development of new accounting standards and principles, as well as continuous education for accountants to remain competitive in this digital environment (Yashikoni et al., 2023).

Ultimately, digital accounting is recognized as a fundamental pillar of organizational transformation in the digital age, assisting organizations in improving financial controls, reducing costs, detecting fraud, and making better decisions. This form of accounting enables the integration of financial data with other organizational information systems and provides analytical dashboards and interactive reports to aid managers in better understanding financial conditions. Moreover, with the increasing volume of data and complexity of businesses, the use of digital technologies in accounting has become inevitable. Therefore, digital accounting is not only a technological necessity but also a competitive advantage for organizations, steering the future of the accounting profession towards intelligence and innovation (Quattrone, 2016).

Momentum Theory

Momentum theory is an analytical concept derived from the principle of motion in physics, examining the persistence and acceleration of trends in various fields such as management, economics, and finance. In physics, momentum refers to the quantity of motion of a body, influenced by its mass and velocity. When applied to social and economic sciences, this concept suggests that many trends and behaviors exhibit continuity or acceleration, and past events can often make future directions somewhat predictable (Wadan et al., 2019).

In financial markets, this theory is utilized as a strategy based on the historical performance of assets. According to this approach, assets that have yielded positive returns in the past are likely to continue this trend, whereas those with negative performance may persist in the same direction. Investors analyze past data to identify strong or weak trends, enabling them to make decisions aimed at capitalizing on these patterns (Wadan et al., 2019).

In management and business contexts, momentum theory serves as a valuable tool for analyzing organizational dynamics and market behaviors. For example, when a company is on a path to success, the likelihood of maintaining this trajectory increases unless disrupted by internal or external factors. Managers can leverage momentum principles to identify and reinforce positive trends while implementing corrective actions against negative ones. In essence, momentum theory provides an effective analytical framework for understanding and forecasting recurring or reinforcing behaviors across various domains, emphasizing that examining the past can offer valuable insights into the future (Salijani et al., 2019).

Tools and Methods

This research is categorized as applied-developmental, focusing on designing a conceptual model that links digital accounting with value-based management, grounded in momentum theory. The study aims to present an innovative model that is both scientifically robust and practically applicable within organizations and financial institutions. By integrating theoretical knowledge with multi-criteria decision-making analytical methods, the research seeks to provide a model that enhances value-based managerial decision-making in a digital context.

Methodologically, this study adopts a mixed-methods approach comprising two main phases:

1. **Phase One**: A historical-library method is employed to identify the components and dimensions of the model. In this phase, the researcher utilizes credible scientific sources such as research articles, specialized books, and reports published by international academic organizations to gather theoretical information and extract initial components.
2. **Phase Two**: The research progresses to an empirical phase, utilizing specialized questionnaires and the Delphi technique to screen, validate, and analyze the relationships among components.

The statistical population of the study consists of experts familiar with the concepts of accounting, information systems, and value-based management. Samples are selected through a judgmental-purposive method based on the experts' experience, expertise, and accessibility. A total of 12 qualified specialists are chosen as the final sample for implementing the Delphi, DEMATEL, and ISM techniques. The primary criterion for selecting these individuals is their academic or executive experience in areas related to the research topic.

Data analysis employs two main techniques:

- DEMATEL (Decision-Making Trial and Evaluation Laboratory): This technique is used to determine the causal relationships and influences among components.
- ISM (Interpretive Structural Modeling): ISM is utilized to elucidate the hierarchical levels and structural framework of components in the final model.

These methods are integrated to analyze both the interactions among variables and their hierarchical structure. Computational tools such as Excel and MICMAC software are employed for data analysis and structural relationship mapping.

Findings

The Delphi study was conducted based on the perspectives of 12 experts knowledgeable in digital accounting concepts. Ultimately, 5 individuals had between 10 to 15 years of work experience, and 7 individuals had over 15 years of experience, as detailed in Table 1.

Table 1: Demographic Characteristics of the Experts

<table>
<tr><th>Percentage</th><th>Frequency</th><th colspan="2">Demographic Characteristics</th></tr>
<tr><td>66%</td><td>8</td><td>Male</td><td rowspan="2">Gender</td></tr>
<tr><td>34%</td><td>4</td><td>Female</td></tr>
<tr><td>42%</td><td>5</td><td>10 to 15 years</td><td rowspan="2">Work Experience</td></tr>
<tr><td>58%</td><td>7</td><td>Over 15 years</td></tr>
<tr><td>50%</td><td>6</td><td>Master’s Degree</td><td rowspan="2">Educational Degree / Academic Qualification</td></tr>
<tr><td>50%</td><td>6</td><td>Doctorate</td></tr>
<tr><td>100%</td><td>12</td><td colspan="2">Total</td></tr>
</table>

In this study, a total of 9 main components were identified through a literature review. Subsequently, to ensure the validity of the identified dimensions and components and to address the research questions, the Delphi technique was employed. The Delphi method was conducted as follows.

Based on the results obtained from the Delphi technique, all components scored above 5. Therefore, no component was eliminated, and all were approved.

The Kendall's W statistic was also calculated as 0.669, which is acceptable; hence, the Delphi process in the first round is confirmed.

In the DEMATEL technique, expert opinions were first collected.

Normalization of the Direct Relationship Matrix

To normalize, first the sum of all rows and columns of the direct relationship matrix is calculated. The largest sum among the row sums and column sums is denoted by kkk. For normalization, each element of the direct relationship matrix is divided by kkk.

$$k = max\left\{max\sum_{j=1}^{n} x_{ij}, \sum_{i=1}^{n} x_{ij}\right\}$$

$$N = \frac{1}{k} * X$$

Table 2: Delphi Analysis of the Identified Components

Status	Symbol	Mean	Symbol	Component
confirmation	0.80	6.50	C1	Digital Technologies and Accounting Transformation
confirmation	1.17	7.00	C2	Data Management and Information Security
confirmation	1.02	6.00	C3	Momentum Analysis and Financial Forecasting
confirmation	0.75	5.50	C4	Value Measurement and Management
confirmation	0.98	6.00	C5	Transparent and Timely Reporting
confirmation	0.80	7.00	C6	Automation of Accounting Processes
confirmation	0.49	6.00	C7	Compliance with Regulations and Legal Changes
confirmation	0.75	6.00	C8	Strategic Decision Support Based on Momentum Analysis
confirmation	0.75	6.00	C9	Digital Learning and Employee Training
12			Number of Respondents	
0.669			Kendall's W	
129.18			Chi-square Statistic	
8			Degrees of Freedom	
0.000			Significance Level (p-value)	

Table 3: Calculation of the Direct Relationship Matrix

C9	C8	C7	C6	C5	C4	C3	C2	C1	
17	19	8	8	28	8	18	28	0	C1
22	15	4	5	21	6	21	4	18	C2
3	14	2	2	2	0	2	3	4	C3
28	28	28	28	28	2	22	21	21	C4
21	21	2	1	0	0	15	3	4	C5
28	28	28	0	22	27	22	22	22	C6
26	26	0	23	23	22	22	21	22	C7
6	0	1	1	3	1	10	3	7	C8
1	20	4	7	12	4	14	7	8	C9

Table 4: Calculation of the Normalized Direct Relationship Matrix

C9	C8	C7	C6	C5	C4	C3	C2	C1	
2.4286	2.7143	1.1429	1.1429	4.0000	1.1429	2.5714	4.0000	0.0000	C1
3.1429	2.1429	0.5714	0.7143	3.0000	0.8571	3.0000	0.5714	2.5714	C2
0.4286	2.0000	0.2857	0.2857	0.2857	0.0000	0.2857	0.4286	0.5714	C3
4.0000	4.0000	4.0000	4.0000	4.0000	0.2857	3.1429	3.0000	3.0000	C4
3.0000	3.0000	0.2857	0.1429	0.0000	0.0000	2.1429	0.4286	0.5714	C5
4.0000	4.0000	4.0000	0.0000	3.1429	3.8571	3.1429	3.1429	3.1429	C6
3.7143	3.7143	0.0000	3.2857	3.2857	3.1429	3.1429	3.0000	3.1429	C7
0.8571	0.0000	0.1429	0.1429	0.4286	0.1429	1.4286	0.4286	1.0000	C8
0.1429	2.8571	0.5714	1.0000	1.7143	0.5714	2.0000	1.0000	1.1429	C9

Calculation of the Total Relationship Matrix

To calculate the total relationship matrix, first, an identity matrix of size n×n is created. Then, this identity matrix is subtracted by the normalized matrix, and the resulting matrix is inverted. Finally, the normalized matrix is multiplied by the inverted matrix to obtain the total relationship matrix.

$$\mathrm{T} = \mathrm{N} \times (I - N)^{-1}$$

The identity matrix is a matrix in which all elements are zero except for the main diagonal elements, which are equal to one. The resulting matrix is the definite total relationship matrix and can be used to calculate the pattern of causal relationships.

Displaying the Network Relationship Map

To determine the Network Relationship Map (NRM), a threshold value must be calculated. This method allows disregarding minor relationships and drawing only the significant network relationships. Only the relationships whose values in matrix T are greater than the threshold value will be displayed in the NRM. To calculate the threshold value, the average of all values in matrix T is computed. The threshold intensity was calculated as 0.0123. After determining the threshold intensity, all values in matrix T that are below the threshold are set to zero, meaning those relationships are not considered causal.

Table 5: Total (Definitive) Relationship Matrix

C9	C8	C7	C6	C5	C4	C3	C2	C1	
0.018233	0.020374	0.008375	0.008368	0.028196	0.008299	0.019159	0.027687	0.0014	C1
0.022415	0.016277	0.004468	0.005408	0.021342	0.006237	0.021587	0.004965	0.018	C2
0.003238	0.013726	0.002045	0.002032	0.002254	0.00017	0.002342	0.003145	0.0041	C3
0.029956	0.030472	0.028065	0.027983	0.02954	0.003667	0.024238	0.022384	0.0223	C4
0.020462	0.020858	0.00212	0.001221	0.000582	0.000226	0.015037	0.003304	0.0043	C5
0.029796	0.030304	0.027987	0.001889	0.023924	0.026904	0.024124	0.023263	0.0232	C6
0.027642	0.028129	0.001692	0.023108	0.024557	0.022099	0.023848	0.0221	0.0229	C7
0.006067	0.000545	0.001101	0.000183	0.003257	0.001079	0.009925	0.003186	0.0069	C8
0.002057	0.020226	0.004288	0.007038	0.012285	0.004229	0.014401	0.007397	0.0083	C9

Table 6: Significant Relationship Matrix of Study Variables

C9	C8	C7	C6	C5	C4	C3	C2	C1	
0.0182	0.0204	X	X	0.0282	X	0.0192	0.0277	X	C1
0.0224	0.0163	X	X	0.0213	X	0.0216	X	0.0180	C2
X	0.0137	X	X	X	X	X	X	X	C3
0.0300	0.0305	0.0281	0.0280	0.0295	X	0.0242	0.0224	0.0223	C4
0.0205	0.0209	X	X	X	X	0.0150	X	X	C5
0.0298	0.0303	0.0280	X	0.0239	0.0269	0.0241	0.0233	0.0232	C6
0.0276	0.0281	X	0.0231	0.0246	0.0221	0.0238	0.0221		C7
X	X	X	X	X	X	X	X	X	C8
X	0.0202	X	X	X	X	0.0144	X	X	C9

Table 7: Defuzzified Total Relationship Matrix (Deterministic)

D-R	D+R	R	D	
0.0501	0.1772	0.0635	0.1136	C1
0.0042	0.1951	0.0954	0.0997	C2
-0.1287	0.1561	0.1424	0.0137	C3
0.1659	0.2640	0.0490	0.2149	C4
-0.0712	0.1839	0.1276	0.0564	C5
0.1584	0.2606	0.0511	0.2095	C6
0.1154	0.2275	0.0561	0.1715	C7
-0.1804	0.1804	0.1804	0.0000	C8
-0.1139	0.1831	0.1485	0.0346	C9

The sum of the elements in each row (D) indicates the degree of influence that factor has on other factors in the system. It is clear that land use has the greatest influence on other system elements. The sum of the elements in each column (R) for each factor represents the extent to which that factor is influenced by other factors in the system. The horizontal vector (D + R) reflects the total degree of influence and dependence of the factor within the system. The vertical vector (D - R) indicates the power of influence of each factor. Generally, if D - R is positive, the variable is considered a cause; if negative, it is considered an effect.

The first step in Interpretive Structural Modeling (ISM) is to calculate the internal relationships among the indicators. To reflect the internal relationships among indicators, expert opinions are used. The resulting matrix in this step shows which variables influence others and which variables are influenced by others. Conventionally, to identify the pattern of relationships among elements, symbols like those in Table 8 are used.

The Structural Self-Interaction Matrix (SSIM) is constructed from the dimensions and indicators of the study by comparing them using the four types of conceptual relationships. The obtained information is summarized based on the Interpretive Structural Modeling (ISM) methodology, leading to the formation of the final Structural Self-Interaction Matrix. According to the symbols listed in Table 8, the Structural Self-Interaction Matrix is presented as Table 9.

The matrix obtained from converting the Structural Self-Interaction Matrix (SSIM) into a binary zero-one matrix is called the reachability matrix. In the resulting matrix, the diagonal elements are set to one. Therefore, the reachability matrix for the ISM technique is presented in Table 10.

The method of obtaining the reachability matrix is based on Euler's theory, where the adjacency matrix is added to the identity matrix.

Table 8: States and Symbols Used to Describe the Relationships among Identified Indicators

O	X	A	V
No relationship	Two-way relationship	Variable j influences Variable i	Variable i influences Variable j

Table 9: Structural Self-Interaction Matrix (SSIM)

C9	C8	C7	C6	C5	C4	C3	C2	C1	variable
V	V	A	A	V	A	V	X		C1
V	V	A	A	V	A	V			C2
A	X	A	A	A	A				C3
V	V	X	X	V					C4
X	V	A	A						C5
V	V	X							C6
V	V								C7
A									C8
									C9

Table 10: Reachability Matrix of Identified Indicators

C9	C8	C7	C6	C5	C4	C3	C2	C1	variable
1	1	0	0	1	0	1	1		C1
1	1	0	0	1	0	1		1	C2
0	1	0	0	0	0		0	0	C3
1	1	1	1	1		1	1	1	C4
1	1	0	0		0	1	0	0	C5
1	1	1		1	1	1	1	1	C6
1	1		1	1	1	1	1	1	C7
0		0	0	0	0	1	0	0	C8
	1	0	0	1	0	1	0	0	C9

Table 11: Final Reachability Matrix of Identified Indicators

C9	C8	C7	C6	C5	C4	C3	C2	C1	variable
1	1	0	0	1	0	1	1	0	C1
1	1	0	0	1	0	1	0	1	C2
0	1	0	0	0	0	0	0	0	C3
1	1	1	1	1	0	1	1	1	C4
1	1	0	0	0	0	1	0	0	C5
1	1	1	0	1	1	1	1	1	C6
1	1	0	1	1	1	1	1	1	C7
0	0	0	0	0	0	1	0	0	C8
0	1	0	0	1	0	1	0	0	C9

Determining the Relationships and Leveling of Dimensions and Indicators

To determine the relationships and leveling of criteria, the sets of outputs and inputs for each criterion must be extracted from the reachability matrix.

- **Reachability set** (row elements, outputs, or influences): The variables that can be reached through this variable.
- **Antecedent set** (column elements, inputs, or influenced-by): The variables through which this variable can be reached.

The output set includes the criterion itself and the criteria it influences. The input set includes the criterion itself and the criteria that influence it. Then, the set of two-way relationships between the criteria is identified.

Table 12: Input and Output Sets (Influences) for Each Variable

surface	sharing	output	Input	symbol
3	C1-C2	C1-C2-C3 -C5 -C8-C9	C1-C2-C4-C6-C7	C1
3	C1-C2	C1-C2-C3 -C5 -C8-C9	C1-C2-C4-C6-C7	C2
1	C3-C8	C3-C8	C1-C2-C3-C4-C5-C6-C7-C8-C9	C3
4	C4-CC6-C7	C1-C2-C3-C4-C5-C6-C7-C8-C9	C4-C6-C7	C4
2	C5-C9	-C3 -C5 -C8-C9	C1-CC2-C4-C5-C6-C7-C9	C5
4	C4-CC6-C7	C1-C2-C3-C4-C5-C6-C7-C8-C9	C4-C6-C7	C6
4	C4-CC6-C7	C1-C2-C3-C4-C5-C6-C7-C8-C9	C4-C6-C7	C7
1	C3-C8	C3-C8	C1-C2-C3-C4-C5-C6-C7-C8-C9	C8
2	C5-C9	C3 -C5 -C8-C9	C1-CC2-C4-C5-C6-C7-C9	C9

Table 13: Determining the First Level in the ISM Hierarchy

Output	Input	Symbol	Component
5	4	C1	Digital Technologies and Accounting Transformation
5	4	C2	Data Management and Information Security
1	8	C3	Momentum Analysis and Financial Forecasting
8	2	C4	Value Measurement and Management
3	5	C5	Transparent and Timely Reporting
8	2	C6	Automation of Accounting Processes
8	2	C7	Compliance with Regulations and Legal Changes
1	8	C8	Support for Strategic Decision-Making Based on Momentum Analysis
3	5	C9	Digital Learning and Training of Employees

Therefore, variables C3 to C8 are the first-level variables. After identifying the first-level variable(s), these variables are removed, and the input and output sets are recalculated excluding the first-level variables. The intersection of sets is identified, and variables whose intersection equals the input set are selected as second-level variables. Variables C5 to C9 are the second-level variables. Variables C1 and C2 are the third-level variables. Variables C4, C6, and C7 are the fourth-level variables. The final pattern of the levels of the identified variables is shown in the figure. In this diagram, only significant relationships between elements of each level and the elements of the lower level, as well as significant internal relationships within each row, are considered.

Discussion and Conclusion

The aim of this study was to identify a digital accounting model in value-based management based on momentum theory. According to the Delphi technique, nine main categories were identified, including digital technologies and accounting transformation, data management and information security, momentum analysis and financial forecasting, value measurement and management, transparent and timely reporting, automation of accounting processes, compliance with regulations and legal changes, support for strategic decision-making based on momentum analysis, and digital learning and training of employees.

Based on the proposed model, automation of accounting processes, compliance with regulations and legal changes, and value measurement and management have the highest impact in the model, whereas momentum analysis and financial forecasting and support for strategic decision-making based on momentum analysis are at the highest level of influence ability.

The primary objective of this research was to design a comprehensive and practical model that can explain the role and position of digital accounting within the framework of value-based management using momentum theory. In today's complex and rapidly changing world, organizations need more than ever to base their financial and strategic decisions on accurate, timely, and value-driven information. In this context, digital accounting, as a novel technological platform, can intelligently process organizational data through tools such as block chain, artificial intelligence, machine learning, and big data analytics, aiding management in creating sustainable value.

On the other hand, momentum theory, as a behavioral and predictive framework, has the capability to analyze the dynamics of value over time, which is crucial in value-based management. Using the Delphi technique and with the participation of 12 experts from the fields of accounting, finance, information technology, and management, nine key categories influencing the designed model were identified. These factors include digital technologies and accounting transformation, data management and information security, momentum analysis and financial forecasting, value measurement and management, transparent and timely reporting, automation of accounting processes, compliance with regulations and legal changes, support for strategic decision-making based on momentum analysis, and digital learning and training of employees.

This comprehensive categorization indicates that the designed model considers not only technological and structural aspects but also behavioral, analytical, and educational dimensions of the organization. This comprehensiveness is one of the main strengths of the research.

By analyzing the causal relationships among the model's components using the DEMATEL technique, it was found that the three factors—"Automation of Accounting Processes," "Compliance with Regulations and Legal Changes," and "Measurement and Value Management"—have the greatest influence on other components of the model. This finding indicates that for the successful implementation of value-based digital accounting, it is essential first to establish automated process infrastructures, ensure full compliance with laws and regulations, and design and implement innovative methods for measuring value at both financial and non-financial levels. These three elements play a foundational role, and without them, other components of the model such as momentum analysis or transparent reporting cannot function effectively.

On the other hand, the analysis showed that the two factors—"Momentum Analysis and Financial Forecasting" and "Support for Strategic Decision-Making Based on Momentum Analysis"—are the most influenced components within the model. In other words, these components are in a receiving position compared to other parts of the model and depend on the proper functioning of other factors. This highlights the importance of analytical infrastructures and forecasting capabilities in digital accounting systems, because without automation, data security, and accurate value measurement, momentum analysis will not be properly conducted, resulting in ambiguity in strategic decision-making.

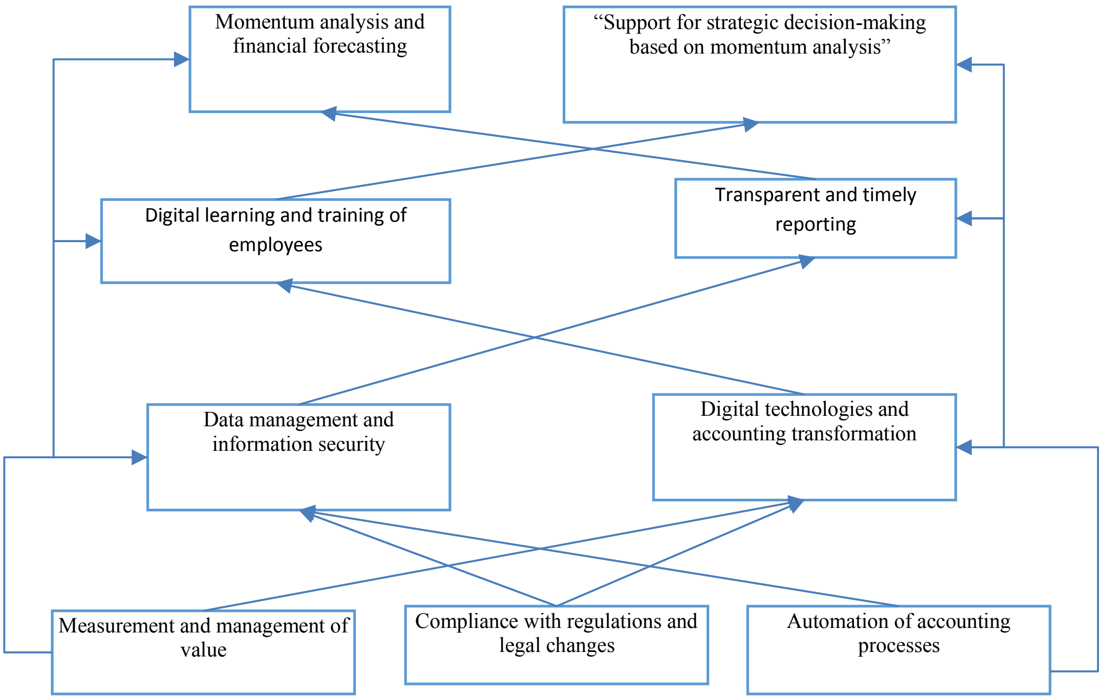

Figure 1: Digital Accounting Model in Value-Based Management Based on Momentum Theory

One of the significant findings of this research is the synergy between digital technologies and analytical methods in financial management and accounting. Modern technologies not only enable the collection of accurate and up-to-date data but also provide the necessary platform for predictive analyses such as momentum analysis. Artificial intelligence, machine learning, and cloud systems can automatically examine past behavioral patterns and simulate future trends. This capability increases the accuracy of market and stakeholder behavior forecasts and supports value-based decision-making. The proposed model effectively explains this synergy through a causal structure and different hierarchical levels.

Another key dimension of the model is the focus on digital learning and training of employees. Given the increasing complexity of new technologies and the need for new skills, successful implementation of digital accounting is impossible without developing human resources' knowledge and capabilities. This model, by emphasizing the role of education, aims to provide mechanisms to enhance employees' awareness of new technologies, data analysis, cybersecurity, and value management. Therefore, training and learning, alongside decision-making and technology, are presented as three complementary pillars for the model's success.

Overall, the model designed in this research combines technological, analytical, managerial, and human factors to provide a practical framework for organizations, financial institutions, and the accounting industry. This model not only contributes to enhancing transparency and financial accountability but also offers a strategic tool for long-term value creation through data-driven and analytical decision-making. From a policy perspective, the findings can serve as a basis for designing digital transformation strategies in the country's financial system and revising accounting education programs.

Ultimately, this research expands the boundaries of knowledge in digital accounting and provides practical solutions to increase organizational resilience against economic fluctuations and environmental changes.

The recommendations derived from the model's results are as follows:

- Given the high impact of automation in the proposed model, organizations can enhance productivity by using ERP software, RPA, and integrated financial systems to automate repetitive and traditional accounting processes.

- Organizations should establish units to continuously monitor legal and regulatory changes in finance and technology to maintain dynamic compliance, which reduces legal risks and increases conformity.
- It is recommended that financial departments utilize technical analysis tools, machine learning algorithms, and time series analysis to identify value trends and forecast future market movements.
- Organizations can revise their performance evaluation frameworks by developing key performance indicators (KPIs) focused on both financial and non-financial value creation, aligning these with strategic objectives.
- Considering the critical role of digital knowledge, ongoing training programs on emerging technologies (such as block chain, data analytics, information security, and digital accounting) should be designed and implemented for employees.
- To optimize the use of financial and behavioral data, organizations can establish specialized data analysis and business intelligence units within their financial structures to support value-based decision-making.
- Governmental and public sector institutions can utilize the proposed model to implement transparent, accountable, and value-based digital accounting systems aligned with the objectives of smart government initiatives.

References

Abobaker, E.A. (2014). Management Accounting in the New Economy. University Bulletin, 2(16), 131-150.

Alathamneh, M. (2020). The impact of accounting information systems reliability on enhancing the requirements of planning process at Jordanian commercial banks. Management Science Letters, 10(5), 1043-1050.

Al-Khasawneh, S. M., Endut, W. A., & Rashid, N. M. N. N. M. (2020). Factors Affecting Usage of Modern Management Accounting Techniques in Industrial Companies Listed in Amman Stock Exchange. International Journal of Research In Commerce and Management Studies (ISSN: 2582- 2292), 2(3), 14-36.

Andreassen, R. I. (2020). Digital technology and changing roles: a management accountant's dream or nightmare?. Journal of Management Control, 31(3), 209-238. https://doi.org/10.1007/s00187-020-00303-2

Aripin, S. N., Hadinata, H., & Kurnia, D. (2023). Dampak Akuntansi Manajemen dari Digitalisasi. ADI Bisnis Digital Interdisiplin Jurnal, 4(2), 109-115.

Azizi, Farhad; Rahnamay Rood, Pushti Fereydoun; Khan Mohammadi, Mohammad Hamed; and Khodaei & Lahzaqard, Mohammad (2020). Proposing a Model of the Effect of Accounting Information System Characteristics on the Performance of the System Based on the Moderating Role of Job Uncertainty. *Research in Financial Accounting and Auditing*, 12(47), 31-54.

Babajani, J., Ghorbanizadeh, V., & Khonkha, A. (2019). The future research of management accounting: from the perspective of education and research. Experimental researches of accounting, 9(35), 77-96.

Bhimani, A. Digital data and management accounting: why we need to rethink research methods. J Manag Control 31, 9–23 (2020). https://doi.org/10.1007/s00187-020-00295-z

Bhimani, A., & Willcocks, L. (2014). Digitisation, 'Big Data'and the transformation of accounting information. Accounting and Business Research, 44(4), 469-490.

Blaschke, M., Riss, U., Haki, K. et al. Design principles for digital value co-creation networks: a service-dominant logic perspective. Electron Markets 29, 443–472 (2019). https://doi.org/10.1007/s12525-019-00356-9

Cici Rosmala 2024. Digital Transformation in Management Accounting: Towards Efficiency and Competitive Advantage. JFBA : Journal of Financial Behavioural Accounting (1) 2024, 1-8.

Cockcroft, S., & Russell, M. (2018). Big data opportunities for accounting and finance practice and research. Australian Accounting Review, 28(3), 323-333.

Cosa, M., Torelli, R. Digital Transformation and Flexible Performance Management: A Systematic Literature Review of the Evolution of Performance Measurement Systems. Glob J Flex Syst Manag 25, 445–466 (2024). https://doi.org/10.1007/s40171-024-00409-9

D'Angelo, S., Cavallo, A., Ghezzi, A. et al. Understanding corporate entrepreneurship in the digital age: a review and research agenda. Rev Manag Sci (2024). https://doi.org/10.1007/s11846-024-00730-8

Dinesh, N., Juvanna, I. (2017). Dynamic auditing and deduplication with secure data deletion in Cloud. Artificial Intelligence and Evolutionary Computations in Engineering Systems. Springer, pp. 305–313.

Firk S., Richter S., Wolff M. (2021). Does value based management facilitate managerial decisionmaking? An analysis of divestiture decisions, Management Accounting Research, 51 (2021) 100736.

Hausberg, J. P., Liere-Netheler, K., Packmohr, S., Pakura, S., & Vogelsang, K. (2019). Research streams on digital transformation from a holistic business perspective: a systematic literature review and citation network analysis. Journal of Business Economics, 89(8), 931-963.

Heubeck, Tim. (2023). Managerial capabilities as facilitators of digital transformation? Dynamic managerial capabilities as antecedents to digital business model transformation and firm performance. 3. 10.1016/j.digbus.2023.100053.

Hon, M. T., & Tonks. I. (2003). Momentum in the UK stock market. Journal of ultinational Financial Management, 13(1), 43–70. 10.1016/S1042-444X(02)00022-1.

Hörner, Sven and Sommer, Friedrich, Value-based management sophistication and earnings management (September 09, 2024). Available at SSRN: https://ssrn.com/abstract=4498375 or http://dx.doi.org/10.2139/ssrn.4498375

Iacuzzi, S., Pauluzzo, R. Looking for missing outcomes: accounting for intellectual capital and value creation in ecosystems. J Manag Gov 28, 1117–1149 (2024).

Issa, H., Sun, T., Vasarhelyi, M.A. (2016). Research ideas for artificial intelligence in auditing: the formalization of audit and workforce supplementation. J. Emerg. Technol. Account. 13 (2), 1–20

Knauer, T., Silge, L., Sommer, F., (2018). The shareholder value effects of using valuebased performance measures: evidence from acquisitions and divestments. Manag. Account. Res. 41, 43–61.

Krahel, J. P., & Titera, W. R. (2015). Consequences of Big data and formalization on accounting and auditing standards. Accounting Horizons,29(2), 409–422.

Lakhtionova, L., Muranova, N., Bugaiov, O., Ozeran, A., & Kalabukhova, S. (2020, May). Balance Sheet (Statement of Financial Position) Transformation in the Light of New Digital Technology: Ukrainian Experience. In International Conference on Integrated Science (pp. 25-41). Springer, Cham.

Lindell, M.K., Whitney, D.J., 2021. Accounting for common method variance in cross- sectional research designs. J. Appl. Psychol. 86, 114–121.

Massaro, M., Spanò, R. and Kuruppu, S.C. (2023), "Accountability and the metaverse: unaccounted digital worlds between techwashing mechanisms and new emerging meanings", Accounting, Auditing & Accountability Journal, Vol. ahead-of-print No. ahead-of-print

Mohammadi Noreh, Shaker, Rahimian, Nezamoddin, Ahmadi Dehrshid, Jamil (2021). Investigating the Impact of Digitalization on Independent Auditors and Audit Firms in Iran. *Professional Auditing Research*, 3(5), 151-176.

Mohammadi S., Ghasemi R. A., and Mohammadi M. (2022). Digital Information and Management Accounting: The Need to Review Research Methods. *Journal of New Research Approaches in Management and Accounting*, 6(21), 1446-1461.

Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. The British Accounting Review,51(6), 1–20.

Montecalvo, M., Farneti, F., & de Villiers, C. (2018). The potential of integrated reporting to enhance sustainability reporting in the public sector. Public Money & Management, 38(5), 365–374. https://doi.org/10.1080/09540962.2018.1477675.

Moumtzidis, I., Kamariotou, M., & Kitsios, F. (2022). Digital transformation strategies enabled by internet of things and big data analytics: The use-case of telecommunication companies in Greece. Information, 13(4), 196. https://doi.org/10.3390/info13040196

Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. Management Accounting Research,31(2), 45–62.

Quattrone, P. (2016). Management accounting goes digital: Will the move make it wiser? Management Accounting Research,31(2), 118–122.

Richins, G., Stapleton, A., Stratopoulos, T., & Wong, C. (2017). Big data analytics: Opportunity or threat for the accounting profession? Journal of Information Systems,31(3), 63–79.

Salijeni, G., Samsonova-Taddei, A., & Turley, S. (2019). Big data and changes in audit technology: Contemplating a research agenda. Accounting and Business Research,49(1), 95–119.

Saputra, K. A. K., Subroto, B., Rahman, A. F., & Saraswati, E. (2023). Mediation role of environmental management accounting on the effect of green competitive advantage on sustainable performance. Journal of Sustainability Science and Management, 18(2), 103-115.

Shirkavand, Zahra, Rostami Mazoui, Nemat (2021). The Impact of Value-Based Management on the Market Performance of Companies Listed on Tehran Stock Exchange. *Management Accounting*, 51(5), 55-68.

Shukla, M., & Shankar, R. (2024). Impact Assessment of Smart Manufacturing System Implementation in Small and Medium Enterprises: Moderating Role of Enabling Technology and Government Support. Global Journal of Flexible Systems Management. https://doi.org/10.1007/s40171-024-00400-4

Soto Setzke, D., Riasanow, T., Böhm, M., & Krcmar, H. (2023). Pathways to digital service innovation: The role of digital transformation strategies in established organizations. Information Systems Frontiers, 25(3), 1017–1037. https://doi.org/10.1007/s10796-021-10112-0

Trequattrini, R., Lardo, A., Cuozzo, B., & Manfredi, S. (2022). Intangible assets management and digital transformation: Evidence from intellectual property rights-intensive industries. Meditari Accountancy Research, 30(4), 989–1006. https://doi.org/10.1108/MEDAR-03-2021-1216

Troshani, I., Locke, J., & Rowbottom, N. (2019). Transformation of accounting through digital standardisation: Tracing the construction of the IFRS taxonomy. Accounting, Auditing and Accountability Journal,32(1), 133–162.

Ulfani, A. (2024). Implementasi Teori Akuntansi Dalam Era Digital Dan Transformasi Bisnis. WANARGI: Jurnal Manajemen Dan Akuntansi, 1(2), 296-301

Vărzaru, A. A. (2022). An empirical framework for assessment of the effects of digital technologies on sustainability accounting and reporting in the European Union. Electronics, 11(22), 3812. https://doi.org/10.3390/electronics11223812

Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2022). Adoption of digital technologies by SMEs for sustainability and value creation: Moderating role of entrepreneurial orientation. Sustainability, 14(13), 7949. https://doi.org/10.3390/su14137949

Wadan, R., Teuteberg, F., Bensberg, F., & Buscher, G. (2019). Understanding the changing role of the management accountant in the age of industry 4.0 in Germany. In Proceedings of the 52nd Hawaii international conference on system sciences. https://hdl.handle.net/10125/60017.

Yazidi, Peyman and Ahmadi, Dehrshid Jamil (2021). Application of Internet of Things (IoT) in Accounting and Auditing. *Scientific Quarterly Journal of New Research Approaches in Management and Accounting*, 5(53), 102-115.

Yoshikuni, A.C., Dwivedi, R., Dultra-de-Lima, R.G. et al. Role of Emerging Technologies in Accounting Information Systems for

Achieving Strategic Flexibility through Decision-Making Performance: An Exploratory Study Based on North American and South American Firms. Glob J Flex Syst Manag 24, 199–218 (2023). https://doi.org/10.1007/s40171-022-00334-9

Zambon, S., Marasca, S., & Chiucchi, M. S. (2019). Special issue on ‘the role of Intellectual Capital and integrated reporting in management and governance: A performative perspective’. Journal of Management and Governance, 23, 291–297. https://doi.org/10.1007/s10997-019-09469

Zhang, M. Ye, T. Jia, L. (2022). Implications of the “momentum” theory of digitalization in accounting: Evidence from Ash Cloud. China Journal of Accounting Research, 15.