Modeling and Analyzing of Financial Data within Digital Transformation Era and its Impact on Balanced Scorecards Utilizations: A Theoretical Review

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Abstract: - The present theoretical review outlines the interaction between digital transformation and financial data modeling and the use of Balanced Scorecards in improving strategic management in organizations. Considering the context of rapid technological processes and the growing influence of international competition, the principle question of this work is how current management accounting methods, most of which are inspired by digitization, shift the theoretical perspective of how organizations use (BSCs) for strategic forecasting and performance assessment.

By conducting a thorough review of the literature within the realms of management accounting, information systems, and strategic management, this theoretical review identifies the main trends, the rationale, and the challenges behind the use of (BSCs) and digitization. The current finding indicates that the implementation of digital technologies into the process of financial data modeling substantially increases the potential of (BSCs) by offering real-time, useful information for strategic decision-making. At the same time, the implementation process raises a set of challenges, such as security issues, hefty financial investments into technological infrastructures, and human factors of organizational change. Despite these hurdles, the potential benefits of digitally-enhanced (BSC) framework-such as improved decision-making accuracy, strategic agility, and operational efficiency-underscore the importance of adopting a holistic approach to digital transformation in strategic management practices.

This review calls for a balanced perspective that considers both the technological and cultural dimensions of implementing digital innovations within (BSC) frameworks. It concludes with recommendations for future research, emphasizing the need for empirical studies to validate theoretical insights presented and explore the practical implications of digital transformation organizations-BSCs effectiveness in diverse organizational context.

Key-Words: - Financial Data Modeling, Digital Transformation, Balanced Scorecard (BSC), Management Accounting, Financial Engineering.

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1 Introduction

Management accounting is concerned with the provision of information; it serves the management of the enterprise in: setting objectives, planning; achieving them; monitoring and evaluating their implementation; and industrial sector accounting focuses on an information system for the collection, compilation, analysis and storage of data in a coherent and sequenced manner, with a view to providing quantitative information of both types: financial and non-financial, based on the nature of the company's needs, to assist its management in

planning, oversight and sound decision-making, making it part of the company's Integrated Management Information System (IMIS) [11].

Given the world ' s intense competition and openness in global markets, many companies have resorted to modern management accounting methods; they provide time, effort and cost in providing timely information to decision makers. Business organizations, especially industrial organizations, are living in a working situation that is experiencing rapid changes as a result of rapid technological development. They must direct their efforts to keep pace with the constantly evolving process by linking performance to modern technological developments and adopting modern management methods that reduce production costs without compromising their quality. One of the most important of these methods to be addressed in this study is: graceful accounting, a system of costs based on time-oriented activities and balanced scorecards (BSC).

Balanced Scorecards (BSC) as a managerial accounting method became an effective and powerful tool that can provide and support the organizations performance [24].

The new digital era, such as ERPs and cloud accounting, needs to take into consideration the modern techniques and the new forms of integrations between these modern techniques to utilize them inside new ways to create new data and information support decision-making process [21].

The method of the analysis of an econometric model of the impact and elasticity of human resources outflow and remittance to economic growth in Ukraine by [17] reveals the interaction and influence of remittances on economic activity and inflation of the country, as well as capital investment. This research also shows how it is possible to use financial modeling to develop BSCs further, making them more valid and up-to-date in strategic planning terms. Such a measure is relevant due to the need to develop adaptive strategies given that modern financial markets present a wide range of phenomena for which traditional strategies tend to be insufficient. Therefore, such integrated approaches are essential for strengthening the stability of socioeconomic systems from extreme stressors.

This study highlights the modelling and analysis of financial data and their impact on promoting the use of balanced performance cards in industrial firms.

2 Literature Review and Theoretical Background

Data modeling and analytics is the process of preparing and designing models that include pre-defined vocabulary within precise sequences that are used as a database to support the operations and activities carried out by the organization. Thus, this stage enabled the auditor to store, update, modify, and retrieve the data that was prepared through the model used [9].

It is the process of planning and visualizing the entire methodology of collecting an organization’s data, from its inception and updating to the process of storing it. It focuses on transforming raw data into structural, often visual, representations that help analysts extract more meaningful insights from the data. Data analysis is the process of examining, interpreting, transforming, and migrating. ; It aims to extract useful information for internal and external performance goals. Accordingly, data analysis sets the model in motion. To benefit from data and obtain valuable information that helps in the process of rationalizing and making appropriate decisions.

With emerging electronic formats and innovative financial reporting processes, accounting requirements and systems in practice have evolved in line with the accounting system. With internet technology advances, online accounting, audit, and analysis capabilities have increased, and new systems have been introduced. The improvement has been activated from conventional paper-based practices and has focused on accelerating the production of accounting and reporting [1] The convergence and transformation of accounting and the Internet of Things (IoT), cloud computing, big data, and the digital economy have led to significant improvement and necessary reforms. However, there is inadequate awareness of the application of FinTech in accounting and finance research. This may cause losses in experience.

Employers cannot assign conventional audit and evaluation methodologies to the digital world. Conventional procedures cannot effectively scrutinize digital accounting data. This research suggests that the application of accounting and management big data, monetary and non-monetary information, and interdisciplinary big data return falls into the barrier. With a digital gain from the internet industry and transactions, exploration of FinTech's intrinsic value or relevant questions, FinTech can disperse serious under-allocation, diverting concerns regarding misuse and deixis in accounting management. With technological development and moral justification, FinTech's comprehension extends, and its appropriation supersedes the objectives of living agile-business evolution while preserving associated moral promises [10] and [16].

[26] Concluded that accounting studies have begun to address digital transformation since 2017, and the number of studies has increased, especially in security and blockchain/big data subjects. However, while digital transformation studies in information systems have focused on digital/social media, automation programmes, the environmental regulations of digital platforms and the value of the company, we do not find similar accounting patterns.

A balanced scorecards (BSC) is a control methodology that provides a comprehensive measure; on how the organization progresses towards its strategic objectives through performance indicators, which serve as golden threads, for five dimensions or perspectives: the client and interested parties dimension, the financial dimension, the focus of management performance processes within the organization, the post-growth and learning dimension, and the social dimension. Each dimension has a different weight and importance for the organization, and the institution does not rely on a single measure of performance -- for example, financial, but on different measures that balance financial and non-financial measures.

[20] mentioned that risk management is a necessary mechanism for reducing volatility and ensuring financial protection in a more and more unpredictable world, which includes natural disasters, economic crises, and other incidents. Financial engineering allows to collectively scatter risks by concluding hedges, and although it creates risks and problems for individual portfolios, it significantly strengthens the financial system as a whole.

(BSC) is a management system aimed at translating the organization ' s strategic objectives into a set of organizational performance targets that are measured, monitored and, if necessary, changed; to ensure that the organization ' s strategic objectives are met; and one of its main assumptions is that the financial accounting standards traditionally followed by the organizations to monitor their strategic objectives are insufficient to keep the institutions on track, and the financial results highlight what has happened in the past and not where the business is going or should be going.

Data modelling is the first step in electronic transformation, where it encodes and arranges analogue information in electronic form; for storage, operation and electronic transmission, which means moving from analogue duties to electronic duties, thus creating common denominators between existing duties to work with information technology, and the auditor must evaluate appropriate control methods; to prevent change in data: by misrepresentation, sabotage, deliberate deletion or total elimination of data, achieved through pre-emptive electronic surveillance programmes, allowing access only to the authorized group of personnel [5]; [8] and [2]. The concept of data analysis refers to the transformation of primary data into a clear, applicable and measurable vision, which includes a set of techniques used in the knowledge and analysis of the operational mentality of the Organization, working to find solutions to problems using data. The process of data analysis is aimed at demonstrating the nature of the organizations activities, promoting business growth, and developing and providing modern decision-making.

Non profit organizations, advocacy groups and community based organizations often advocate for education policy issues, like funding, culturally sensitive curricula and inclusive practices [18].

In todays changing business landscape incorporating technologies has become essential for organizations aiming to stay competitive.

This incorporation, referred to as transformation involves adopting digital tools and technologies to enhance business processes improve decision making and foster innovation. In the field of management digital transformation has brought about changes in how financial data is gathered, analyzed and used to support strategic decision making. Thus, this literature review reflects the analysis of transformation in intersection with financial data modeling and analysis, and the use of Applied scorecards BSC, as strategic management tools.

The Resources Based View (RBV) framework suggests that a firms competitive advantages arise from its combination of resources and capabilities.

In the realm of transformation and financial management the Resource Based View (RBV) theory suggests that organizations can achieve an edge by utilizing digital technologies to improve their financial capabilities. This includes enhancing data analytics skills utilizing time data and streamlining decision making processes [4].

Theories centered around technology driven innovation highlight the significance of progress, in fostering innovation and competitiveness. In the field of management innovations like AI powered analytics blockchain based financial transactions and automated financial processes empower organizations to make informed decisions on a large scale [22].

Frameworks for strategy execution underscore the importance of flexibility and agility in implementing initiatives within rapidly evolving environments. When employing scorecards an adaptive approach involves monitoring and adjusting performance metrics based on up, to date financial data and market trends. This enables organizations to effectively respond to emerging opportunities and challenges [13].

Embracing advancements, in management includes utilizing technologies like data analytics, artificial intelligence (AI) machine learning (ML) and cloud computing to simplify financial procedures and derive valuable insights, from financial information. Studies by [15] and [6] emphasize the importance of digital transformation in enhancing the efficiency and effectiveness of the financial operations, enabling, real-time data analysis consider as a base to enhance and improve the forecasting accuracy.

Financial data modeling and analysis play crucial role in supporting the process of decision-making inside- organizations, while the traditional financial models are being augmented or replaced by more sophisticated data-driven approaches that leverage advanced analytics techniques. [14] highlights the significance of predictive modeling and data visualization techniques in extracting actionable insights from financial data, thereby enabling informed decision-making.

Balanced scorecards (BSCs) are a management tool that helps organizations turn their vision and strategy into goals and performance measurements, from various viewpoints, such, as financial, customer service, internal processes and learning and growth. While (BSCs) have been widely adopted across various industries, their effectiveness relies on the quality of data used measures business environment. [12] and (Rappaport, 2017) mentioned the importance of aligning (BSCs) inside organizational goals and ensuring the relevance and accuracy of performance metrics.

Traditional scorecards utilize Key Performance Indicators (KPIs) with a balanced ratio representing different functions such as customers, internal business processes, financials, and viewpoints of each KPI. Each organization has its unique KPI ratio representation based on the company's vision. However, recent research shows that this traditional approach does not satisfy performance management needs. Most organizations have tried financial scores and HR scores in addition to the traditional score. Unfortunately, it has only shown improved employee productivity in a few organizations. The reason for this is that this method does not cater to innovative technology development. Today, the seeds sown for the digital era have started to show their roots in areas

such as big data, cloud storage, blockchain technology, IoT, and AI. These technologies transform organizations and make businesses more evolved and transformed [3].

Balanced Scorecard (BSC) is a strategic management performance tool to identify the green zones among all functions widely used across the globe. It is used to evaluate company performance and compare it with similar industries and world-leading industries. In the current digital era, advanced data collection models depend on big data, blockchain, and financial API. They provide BSC visualizations and prescribe alignment activities [7]. It is interesting to analyze and compare the score of performance management and the organization's tendency to utilize score metrics in financial data, traditional methods, and digital transformation improvement [19].

3 Methodology

To have a clear perception of the impact of financial data modeling on BSCs adoption through the digital transformation, the research included the whole theoretical review techniques. The purpose of the study is to synthesize the cuurent literature.

4 Conclusion

The aforementioned theoretical review identified the intersection of digital transformation, financial data modeling and analysis, and the application of balanced scorecards to make strategic management within this paper. The review of the literature allowed the formation of several important implications and conclusions: on this basis:

1. The use of advanced financial data modeling enriches BSC-centered decision-making, while real-time data analysis facilitated by the adoption of AI, ML, and cloud computing technologies renders BSC metrics more accurate and relevant.
2. Digital transformation as a catalyst of BSC evolution. Finally, the rise of digital technologies has spurred a reassessment of traditional BSC practices, and digital tools for monitoring, accounting, and reporting financial data have become available for deploying a more dynamic and agile strategic management. Consequently, this is part of an enhanced federal trend for evidence-based decision-making in the digital era.
3. Implementation challenges. While the benefits seem quite transparent, the shift to a digital or BSC-enhanced framework is always associated with certain factors that might compromise this process. Specifically, one should mention data security, while the increased use of technological solutions implies substantial investment in this field and training of the personnel, which is another limiting factor. Moreover, the issue of structural resistance remains acute; therefore, a strategy should encompass a broader scope.
4. Future prospects and possibilities. In the future, the dynamic changes in digital technologies create additional opportunities to use BSC. For example, the development of AAR services and novel data analytics methods that increase transparency, efficiencies, and strategic fit. In this case, offsetting organizations would constantly adjust their strategies to new BSC conditions.
5. Utilization of Balanced Scorecard; Emerging technologies such as advanced data analytics methods offer potential, for enhancing transparency, efficiency and strategic alignment further. Companies should stay flexible in updating their BSC approaches to capitalize fully on these approaches to a competitive level.

In conclusion, for future research, it is necessary to look at how advanced financial data modeling and advanced analytics, including predictive analytics and machine learning, might complement BSC frameworks in strategic decision-making. Research on the integrated use of real-time data analytics and BSC metrics and the influence of digitalization, automation, and digitization, including AI technology and cloud computing, should also be prioritized. These areas may be researched from the perspective of a case study or empirical experiments. Furthermore, attention should be paid to the associated problems of implementing digital BSC frameworks, along with issues like data protection, technology funding, and personnel training.

At the same time, attention should be paid to the potential of augmented analytics and robotic process automation on BSC-enhancing analytics, and a comparative study on strategic adaptation to new technology would be beneficial to remain

competitive in the changing technological environment.

5 Recommendations

1. **Integration of expertise of fields to improve the evolution of Balanced Scorecard :** It is suggested that companies should proactively create teams consisting of IT experts, data scientists, financial analysts, and strategic managers to oversee the integration of digital transformation implementations into their Balanced Scorecard framework. This will ensure that the use of technological innovations and data analysis tools align with the goals which lead to a sophisticated and effective use of the tool. Moreover this team can serve as mediators, which connects the capabilities offered by transformation with the organizations strategic goals to ensure digital transformation projects become rooted in actual business needs and strategy.

Moreover, this team can fostering an environment of continuous learning and sharing knowledge which will help organizations stay a head and in parallel with technological trends.

2. **Recommendations for Educational Institutes:** there is a significant demand for the improvement of courses plans for students studying business, accounting, and finance, which should be considered in conjunction with the growing utilization of digital resources. This advice contained in [25] and [23] are likewise applicable to these.

3. **Recommendations for future research:** there is a clear need for further empirical research to explore the practical implementations and outcomes of digitally-enhanced (BSC) various organizational context. These future studies need to aim to quantify the impact of digital transformation on (BSC) effectiveness and investigate the strategic for over coming implementation challenges.

6 Final Thoughts

The intersection of digital transformation, financial data modeling, and (BSC) utilization represents fertile ground for both academic research's practical innovation. As organization navigate the complexities of the digital age, the findings of this review offer valuable insights for enhancing strategic management practices through the integrated use of digital technologies and (BSC) frame works.

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