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Decision-making support in management accounting in the intelligent era

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Abstract. With the development of the intelligent era, digital and Artificial Intelligence (AI) tools are widely used in daily life. In the field of corporate management, decision-making has evolved from simple operation control to intelligent performance analysis driven by technology tools. Correspondingly, management accounting also transfers roles from dealing simply with financial data to actively participating in company management and decision-making. Therefore, the integration of AI tools into management accounting decision-making systems becomes a main issue in the digital society. This paper emphasizes the usage and limitation of traditional management accounting from different aspects, such as technologies, staff, or organization, and analyzes the application of new intelligent tools in management accounting decision-making systems, extending risks and prospects. This survey mainly focuses on analyzing AI's significant role in management accounting by case study and context analysis. Intelligent management accounting not only promotes financial goals in the company's short-term management but also predicts analysis for future long-term goals. Therefore, this survey has important significance for improving company development.

Keywords: decision-making, artificial intelligence, healthcare, data analysis, management accounting

1. Introduction

Under the development of intelligent society, Artificial Intelligence (AI) application takes a significant role in company management. Traditional management accounting has more and more disadvantages in the current year, such as low working efficiency or human mistakes; therefore, there is a growing use of AI applications in management accounting decision-making. In the current survey stage, AI applies in more aspects of financial information, risk management, and resource allocation. However, AI application has certain risks, such as lacking effective legal AI usage standards. At the same time, AI decision-making lacks transparency in that the process of dealing with data by AI is automated, and it has information security problems such as stealing and leakage. The following parts expand to describe survey outcomes specifically from different aspects. Firstly, this survey describes AI application in the whole company management, then shows traditional accounting's limitation to lead to AI application in management accounting and decision-making and it adds case study analysis on healthcare to show AI decision-making processing and states risks and prospects. This survey adapts for AI development trends in the intelligent era and dealing with big volumes data's demanding, at the

same time, it emphasizes more intelligent functions to help decision-making such as predict analysis, budgeting.

2. AI application in company management

AI is widely used and takes a significant role in company management. Firstly, AI helps business operation. In a journal article named "AI can evaluate our company's goals using different data sources and recommend the best client acquisition options," Pal shows that AI collects data such as different customers' feedback, product quality checking, price preference, and more information from the warehouse to classify different client groups [1]. The company sets up different development goals and provides corresponding business models according to every goal and group to confirm the best client option. Secondly, AI automates different sectors' operation processes and increases efficiency. In the accounting sector, AI helps to deal with big volumes of financial information and automate to form financial statements. Under the sector of human resources, AI helps companies choose worker partners according to the conference letter and calculate staff salaries and bonuses to reduce human cost. Thirdly, AI can promote risk management and predictive analysis to help decision-making. AI collects historical data to set up risk evaluation systems and identify potential risks and unnormal items. At the same time, AI uses historical data to predict market trends and demanding changes to future market trends analysis.

3. Strategic decision-making support of management accounting in the traditional context

3.1. Application of management accounting in strategic decision-making

In traditional management accounting, strategic decision-making relies heavily on company performance measurement and cost control. According to Frigo and Krumwiede, "many organizations struggle with individuals pursuing their own goals, often at the expense of the company. The balanced scorecard approach helps firms develop measures that are in harmony" [2]. This indicates that the balanced scorecard is an important tool for measuring performance and focuses on strategic harmony between the individual and the whole company. The balance scorecard focuses on satisfying the demands of different stakeholders, such as financial workers, customers, internal management workers, and innovation development workers. It integrates the goals of different sectors to develop the whole industry's goals. Therefore, different sectors and stakeholders unify the company standards and use unified KPIs to measure the whole company's performance and decision-making for the next stage.

In terms of cost control, companies identify every stage for production operation, including collecting raw materials, production line, distributing, marketing, sales, and customer service, and find the highest cost driver to decision-making to optimize it. According to Falck et al., "for competitive reasons in the automotive industry, great efforts are set on optimal cost-efficient product solutions in the design and manufacturing engineering process" [3]. A typical automobile manufacturer examines costs across all stages of production, such as buying car components, the car production line, distributing cars to different markets, and selling cars to confirm high-cost drivers about resource waste in the production process. Therefore, firms make up for decision-making to adjust cost allocation and take advantage of technology to reduce production time and increase resource usage rate.

3.2. Limitation of traditional approaches

According to Pavlovic et al., "traditional decision-making processes often rely on historical data and manual analysis, which can be time-consuming and may only sometimes capture the full complexity of the business environment" [4]. Traditional approaches focus primarily on historical data and do not effectively predict future demands or trends.

At the same time, they tend to divide the organization into different sectors to achieve corresponding goals and do not integrate the whole sectors to form information isolation. Thus, human decision-making under these conditions is prone to errors and inefficiency. It does not respond to financial problems and predict risks in time. From traditional approaches, it only focuses on financial data; therefore, some non-financial factors, such as customer relationships or customer loyalty, are not shown in traditional methods.

In addition, traditional methods just focus on short-term financial goals to achieve current benefits, not long-term sustainability benefits. Therefore, all these limitations lead to decision-making uncertainty and mistakes. Therefore, AI application in management accounting' decision-making plays an important role in the current era.

4. AI in supporting strategic decision-making of management accounting

4.1. Application of AI in management accounting

With the development of an intelligent society, management accounting increasingly applies AI to company operations. According to Fotache and Bucasa, AI assists managers in "real-time financial monitoring reporting, predictive analysis, and risk management" [5]. It shows that AI can automate data processing and form timely reports to satisfy short-time information needs by using tools such as Natural Language Processing (NLP). Moreover, AI analyzes data predictively for risk management purposes. It sets up new business models such as advanced budgeting, cost driver analysis, and customer preference analysis. AI collects these data to predict future market trends and potential risks. Then, AI gives advice to deal with these problems and sets up suitable standards according to cost and other data, and managers use these strategies to achieve company goals.

4.2. Technological applications in management accounting

4.2.1. Management Accounting Systems (MAS)

According to an article conducted by Alnor in 2024, "using contemporary technology-based MAS improves control and accountability through budget control" [6]. It shows that MAS is an important tool combining AI with more accounting information systems to get budgeting. Therefore, MAS calculates budgeting according to current customer demanding or historic data from previous year, which gets budget for future market trends. At the same time, MAS tends to combine different sectors data to achieve the whole budgeting goals harmony.

4.2.2. Innovative Management Accounting Tools (IMAT)

According to Varzaru et al., "IMATs are proactive tools that allow the organization to focus on sustainability, instead of traditional managerial accounting tools oriented towards the past and the organization's internal environment" [7]. It shows that IMAT is not only a financial accounting tool but also a sustainability development tool. It considers more factors, including social, environmental, and governmental factors, and takes advantage of financial tools to predict future resource usage rate or future influence on the whole society. Therefore, IMAT focuses on technology innovation to develop long-term sustainable development.

4.3. Advantages of AI in supporting management accounting decision-making

Devianto notes that "AI has had a significant impact on operational decision-making across various domains" [8]. It shows that AI has an important role in decision-making in different accounting fields, such as accounting theory, AI application in accounting processes, and business operation. In addition to that, AI has a strong capability to deal with big volumes of data and optimize production workflow to increase decision-making efficiency. At the same time, AI wide application is used in small- or medium sized companies, which is no longer exclusive to large companies and promotes a wide range of businesses for small companies. AI also focuses on customizing products. It represents how AI helps companies to develop customized decision-making to improve quality.

From resource allocation aspects, AI automatically deals with production information such as production cost or historical resource usage rate. Simultaneously, AI monitors production influence on the environment to form more ESG reporting, provide advice and help standardize practices that protect the environment and improve corporate social responsibility. Therefore, AI helps managers to achieve long-term development decision-making.

5. Case study: AI applications in medical decision-making

According to Jiang et al., their study surveys AI applications in healthcare [9]. AI systems collect data from activities, such as screening and treatment assignment. Then, this research adds different tools to analyze disease, such as Machine Learning (ML), NLP, unsupervised learning, supervised learning, machine learning algorithms, and neural networks. This survey mainly analyzes AI applications in stroke, such as predicting and analyzing the performance of stroke treatment. Therefore, it responds to the process of management accounting's decision-making. Firstly, AI helps managers to search and classify related data from data warehouses. Then, managers use different AI tools for predictive analysis or cost calculation to get advice and solve problems. Corresponding to healthcare, managers adjust planning according to these data.

6. Risk and prospects

6.1. Risks

According to an article conducted by Wu in 2021, AI application leads to "legal risk and information technology risk" [10]. It shows that firstly, AI does not have completed usage standards, and it is not completed by research or survey; therefore, it lacks legal level. In addition to that, AI leads to low information security due to open network access and data availability, leading to information risk. Therefore, the government ought to complete standards and legal usage ranges, and companies ought to increase information protection, such as information drafts to prevent losing or invading and setting up strong passwords for self-data.

6.2. Future

According to an article conducted by Ajayi-Niflse et al. in 2024, "AI-powered analytics revolutionize decision support in accounting by processing vast datasets rapidly and extracting actionable insights. Accountants leverage predictive analytics to anticipate trends, identify risks, and make informed strategic decisions" [11]. It shows that AI uses automated functions to predict trends and risk management to help decision-making.

Therefore, managers will change roles from simple workers dealing with data to intelligent decision-making performers in the future.

6.3. Role transformation in accountants

From the following future part, it shows that management accounting transfers from traditional roles to new roles on intelligent tools, and that accountants' roles change in the direction of intelligence. From historic experience, accountants tend to simplify to deal with data, check bills, or collect invoices, such as an accountant clerk. In the current year, accountants focus on data analysis and risk management by using technology tools such as AI investor consultants. This change shows that management accountants take an important role in helping company decision-making, making optimal strategies, and updating innovation ability.

7. Conclusion

This survey examines the application of AI in companies, particularly in supporting management accounting within traditional frameworks. It then explores AI application in management accounting to decision-making. Finally, this research extends the discussion to AI-based decision-making in healthcare, analyzing the associated risks, prospects, and the evolving roles of accountants in response to AI adoption. The findings indicate that AI has an important role in management accounting's decision-making, including predictive analysis, automizing ability, long-term development strategies, resource allocation, and so on. And this survey has important significance in future combinations with AI and accounting.

However, the research mainly focuses on theoretical output, while it does not give more examples about AI, new business models, or data support. Future studies can search for more statistics to prove decision-making, such as financial statement data, market price or operational data, production cost, and sale staff salaries. And a later survey can add different business models, including an investment model or a budgeting model, to deepen AI application in different models. Furthermore, later surveys can focus on different fields' management accounting decision-making, such as manufacturing and the natural energy's field, to expand AI availability examples in different fields. And it can give further discussion on more specific tools for application in decision-making to expand this survey's outcomes, such as Power BI or Blackline, to help the company decrease costs and increase profits. Future research can also focus on AI application sustainability decision-making to develop long-term development such as ESG analysis and governance decisions to achieve the balance of development between the individual and the whole industry.

In conclusion, this study highlights AI's potential for value creation and its growing influence on management accounting decision-making and future research can further deepen this topic from different perspectives.

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