

Management Accounting in The Era of Big data

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ABSTRACT

With the rapid development of big data, the challenges and opportunities in the development of management accounting coexist in the enterprise transformation. To maximize the role of management accounting, enterprises must utilize big data's technology. In this process, combine management accounting and big data has become the key. The key part of management accounting is collecting information, which big data technology can satisfy this demand. Therefore, it is the inevitable trend of the future development of management accounting to use big data. This paper reports the background information of management accounting and big data respectively and finds out that the challenges and opportunities of management accounting development in big data era. The research finds out that it still has some challenges to developing management accounting in big data era, but also some opportunities occur in this field. This paper could facilitate the study of management accounting in big data era, which may help enterprises realize the importance of management accounting in big data era, as well as some solutions to solve the challenges. Finally, this paper argues the value of the development of management accounting in big data era, and further Strategy of management accounting in the transformation and development of Enterprises are also covered.

Keywords: *management accounting, big data, challenges, opportunities.*

1. INTRODUCTION

[1] states the history of management accounting as: "In the 1950s, the focus of management accounting was the cost calculation of finished goods and services. At the end of the 20th century, the need to focus on the external environment as well as the internal environment of the businesses was understood, and focusing on the whole business has become one of the significant elements of management accounting." Management accounting mainly collates, calculates, compares, and analyses the relevant materials provided by financial accounting through a series of special methods. Moreover, these relevant materials will be used to direct and control its operations by managers who are inside the organization. The destination of management accounting is to increase profit by making correct decisions. Traditional management accounting focuses on cost indicators, neglects other non-financial indicators closely related to enterprise strategy, and lacks the strategic concept of the external environment, so traditional management accounting cannot meet the needs of market competition. Therefore, under the background of accounting transformation and upgrading, it is urgent to innovate the management accounting system. Only innovation can ensure the

rapid development of enterprises. Big data has the characteristics of mass information, high-speed transformation, diversity of information, low-value density, and authenticity of the information. As a result of that, under big data era, managers can collect data easier than before, and the occurrence of the database provides more necessary information for both investors and managers. In the era of big data, the work of management accounting turned to the prediction of the future operation of enterprises because of timely information. [3] To explain that the development of big data brings information such as feedback of customers, latest market demands for managers to forecast future revenue and adjust financial strategies. However, it still remains unclear to set the future direction of development in management accounting. This paper is going to explain what opportunities and challenges that management accounting will face in the future. At the moment, it still has challenges such as the security of big data, lack of knowledgeable management accountants. [3] states, 'Enterprises must fully understand the impact of big data's technology on management, fully integrate the current management accounting activities, train professional compound talents, and strengthen data mining technology and security protection.' Although, there are challenges in

the development of management accounting in big data era, such as the security of information, lack of talents, and limited storage space and so on. The literature demonstrate how management accounting contributes to enterprises in big data era, and the consequence is that it faces many challenges when enterprises promote management accounting in big data era. The existing literature is not enough for enterprises to solve the challenges, so this paper combines the past researches and develops its own concepts to help enterprises realize the challenges and opportunities.

2. LITERATURE REVIEW

2.1. Literature Review of the Development of Big data (Florentina Raluca Bilcan, Ionica Oncioiu , Dumitru Alexandru Stoica , Alina Stanciu ,2019)

The core technologies of big data are big data collection, big data processing and big data storage. Big data uses artificial intelligence and algorithm to collect information and save the information in big data storage. Then, users can access the big data storage to get the information easily.

In practice, the changes brought about by the digital transformation of enterprises are the result of the wave of digital technology: the increasing demand for cloud computing services, the rise of artificial intelligence and big data analysis, and the necessity of building global data infrastructure. The increase of artificial intelligence and the algorithm of managing financial documents have led to the emergence and development of new related concepts in the new digital economy: accounting intelligence or network accounting. Through the use of computers that automatically identify and analyse documents to improve the quality of financial information and screen useful information to pave the way for management accounting. Network accounting is about capturing financial expectations. In this article, based on the latest theoretical explanation of digital transformation and emerging network accounting, it is considered that the impact of artificial intelligence on accounting will increase and expand the amount of data processed with the help of algorithms, so as to improve the process of making decisions in an empirical way. However, predicting the future of the business requires leaders to extend their vision to the core of the business, and all business growth capabilities need to be enhanced in a complex and intuitive medium. Real business growth is based on strategy and on the ability to develop real, strong, and trust-based relationships between future leaders and accountants in order to reshape the business in line with the requirements of digital transformation. Prevention means that attacks will be stopped. In general, prevention involves implementing mechanisms that cannot be offset by the user, and the

implementation is correct and intact, so an attacker cannot change these mechanisms (Singer&Friedman,2014). The National Computer Security Survey of the US Department of Justice Bureau of Statistics found that 68 per cent of cyber-theft victims will suffer losses of \$10000 or more, and victims of cyber-attacks will experience 24 hours or more downtime "(Lee&Kim,2017). Online accounting must be seen more as a driving force than as a threat.

2.2. Literature Review of the Development of Management Accounting (Pan Fei, Xu Yupeng., 2017)

The literature divides the development of management accounting into 3 stages, which are cost calculation stage, accounting information system, and the organization structure.

The first stage is cost calculation. In the first stage, the research topic involves management control system, cost accounting and management, decision-making methods, general issues of management accounting, external-oriented management accounting, and the application of information technology. The research of management accounting in this period takes normative analysis and conceptual research as the main body. In addition, the weak theoretical research foundation in China limits the development of management accounting at this stage. [5]

The second stage is accounting information system. In the second stage, the research has a wide range of topics, involving a variety of management accounting tools and information systems. It is found that the number and proportion of research on management accounting control system and externally oriented management accounting have significantly increased compared with those before 2006, while the two research topics of cost management and decision-making methods have decreased significantly. Performance-oriented compensation system and performance evaluation system have become the main research topics in the field of management control system. At the same time, the management control system itself has also become the research object, but it is still lack of strong theoretical explanation and support. [5]

The third stage is the organization structure. The natural characteristic of management accounting is that it is a changeable organization. The literature explains that since there is an organization, especially a modern enterprise organization, there is a manager's responsibility and management function, so there is a management accounting in the organization. Based on the observation of the evolution process of modern enterprise group, management accounting is a kind of contingency organization and management activity. [5]

The literature also demonstrates the current situation of management accounting in China. The development of management accounting research in China in the past two decades has been greatly improved both in the research topics and in research methodologies, and how to better integrate the internal environment of Chinese enterprise organizations in the future. Exploring Chinese management accounting problems from multiple perspectives, support each other with the field of financial accounting, and integrate the theoretical knowledge and methods of other social sciences. The construction of Chinese management accounting system is an important task in the field of accounting in China.

2.2.1. Research Framework of Management Accounting

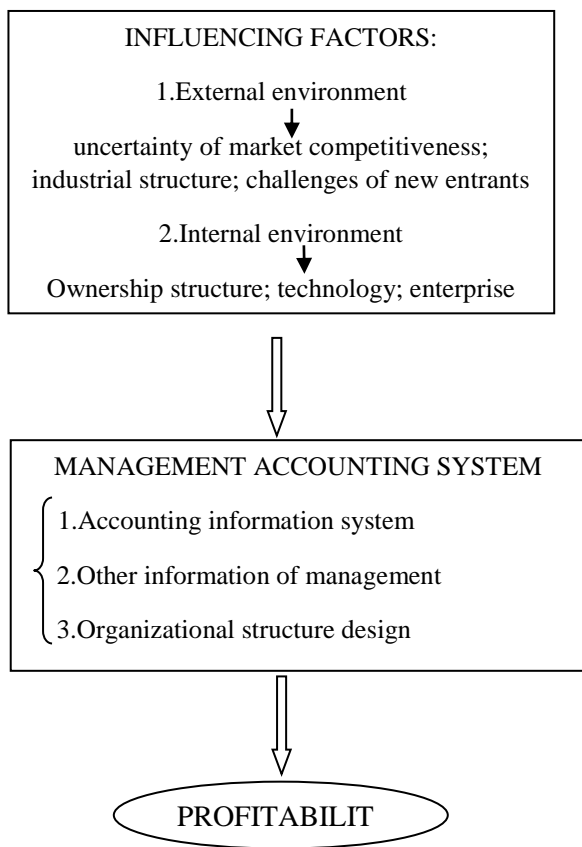


Figure 1 Research framework of management accounting.

The Among the many work results, Pan Fei integrates the contingency theoretical framework proposed by Otley (1980), the economics-based framework proposed by Brickley et al. (1995), and the value-based management framework proposed by Ittner and Larcker (2001). There three frameworks are different in placement of variables, but they all agree that management accounting and control should be organizational control procedures, which are including accounting information systems, performance evaluation and compensation systems, organizational design, and should consider how the choice of

management accounting and control systems is affected by the external environment, organizational objectives and competitive strategies, as well as the economic consequences.

To explain figure one, management accounting and control system consist of 3 items, which are accounting information system, other information of management, and organizational structure designs. This paper will analyse how both management accounting system/control and influencing factors affect profitability.

Firstly, the key factor is that an effective management accounting system/ control system will increase profitability of enterprises. Then, influencing factors affect management accounting system/ control system. To be specific, management accounting is aims to set useful strategies for enterprises to adjust the uncertainty or negative revenue which links to profitability intensely. On the other hand, uncertainty in management accounting such as external environment and internal environment will affect decision-making in enterprises.

3. THE CONTRIBUTION OF BIG DATA TO MANAGEMENT ACCOUNTING

3.1. Opportunities of Management Accounting in Big Data Era

Firstly, management accounting is conducted on the basis of financial accounting reports. So, the accuracy, timeliness, relevance, and understandability of financial and cost reports are required. With the development of cyber management accounting, users can see the opportunities to fix the issue of accuracy, timeliness, relevance by Its own characteristics. This paper looks back to the character which called cyber information sharing of management accounting in big data era. This character informed users that managers are possible to get the attitude of customers from their comments. For example, Deliveroo, which is one of the biggest delivery companies in UK. The comment mechanism can let the managers get the feedback from customers, which these feedbacks can make managers more beneficial in decision-making. On the other hand, for enterprises, because the management accounting in the era of big data provides a large amount of information, simultaneously, enterprises are also omitted to collect useful information. Therefore, this mainly improves the decision-making ability of enterprises.

Finally, management accounting is not mandatory in an organization, financial accounting is required in the organization, by contrast, management accounting is optional because of limitations. The future development trend of management accounting under big data era should be to realize the horizontal and vertical goals to

maximize the value of the company and shareholders. Horizontally, it integrates management accounting with financial accounting, financial management, corporate finance, and other related disciplines. More importantly, in big data era, it is realistic to combine statistics, economics, mathematics, computer science, and other disciplines, and makes full use of their respective processing methods and technology. Vertically, on the basis of strategic orientation and value chain, value chain accounting, strategic management accounting, and traditional management accounting are integrated, which are essential to enhance the value of organizations, unify and promote each other, and form a new comprehensive system of management accounting.

3.2. Challenges of Management Accounting in Big Data Era

3.2.1. Lack of High-quality Management Accounting Talents

In enterprises, the effective function of management accounting depends on the ability of accountants. In the era of big data, higher requirements are put forward for compound talents with the combination of computer technology and management skills. [3]

In some developing countries, management accounting is not as developed as developed countries. For example, in China, the main reason for the inefficiency of management accounting is the lack of relevant talents, and the development of management accounting starts late, which is not as mature as the management accounting system in western countries. [3] states 'The people in charge of management accounting are mainly financial audit, finance and other specialized accounting personnel, who are not competent for the work of computer technology and data mining, which directly leads to the inefficient utilization of big data in enterprise management accounting. Under the background of big data, management accountants should not only have modern management knowledge such as finance, but also master computer knowledge and big data's technical knowledge, so as to get rid of the trap of low-end accounting talents and structural redundancy in domestic management accounting.'

3.2.2. Information Security

Management accounting needs plenty of information to conduct forecasting steps. So far, information security become one of the biggest challenges in the era of big data. [7] said that 'Data of cyber space covers vast range, such as sensors, social network and emails. The gathering of data inevitably increases the risk of information leakage.' Apparently, the quality of data security influences management accounting in

enterprises. Information leakage, enterprises regard this issue as an unbelievable threat, because some information is secret for companies, and they don't want their competitors explore this kind of information. Consequently, it affects the equality of competitive market. Big data provides various useful information for managers, it makes management accounting operates more fluently and conveniently, simultaneously, the leakage may affect the company in some particular areas. On the other hand, big data probably become the obvious target of cyber-attack. In the cyber space, hackers can steal financial information and sell them to competitors to make individual profit.

Facing the threat of information security in the age of big data, enterprises should do more to solve the issues by establishing big data security platform, improving managers' awareness to assure the information security.

3.2.3. Increase the Storage and Upgrade Equipment

As more and more enterprises use online storage space, it is true that the current storage space is limited. The result is that in the near future, storage space will face the problem of not being able to store information. Due to the large amount of engineering, increasing the storage space of management accounting and upgrading system equipment has become a big problem.

3.3. Corresponding Solutions

The literature divides big data security platform into five layers: data storage layer, data processing layer, interface, data application layer and data management layer. [7] This paper believes that the security of data storage should be considered. First, the data should be encrypted and relevant measures for disclosure should be worked out. In addition, the work of data backup should be done well and the data should be maliciously deleted by hackers. Second, the data process should be divided into stream processing and batch processing to ensure that there are no errors in the data process and classify the data clearly. Third, when extracting big data's information, we should ensure the security of the network firewall. In order to correctly and safely use the convenience provided by big data in the management accounting work, the solution to data security should be timely and upgrade the security system in a timely manner.

4. EFFECT OF COMBIATION OF BIG DATA AND MANAGEMENT ACCOUTING ON FIRM VALUE

4.1. Promoting Scientific Big data and Management Accounting to Deal with Marketing Competitiveness

The development of management accounting can help enterprises get various kinds of information, big data deals with the issue of time. Big data solved the limitation of information access and the timeliness of information acquisition. First of all, through the use of management accounting framework, we can integrate the financial data and non-financial data of the enterprise, and effectively analyse the internal operating situation and external competitive situation of the enterprise efficiently, and then make a reasonable evaluation of the correctness of the strategy. Secondly, the core feature of management accounting is to summarize the past data information, analyse the present information content, and predict the future information changes, so enterprises can make use of the application of management accounting. Management accounting can make a comprehensive understanding on the development status and trend of the past, present and future dimensions of the enterprise, so as to effectively help the management to make a better enterprise development plan.

4.2. Cutting Cost and Increase Profit

It is the core value of management accounting in the process of transformation and development to develop management accounting and achieve cost reduction and efficiency increase in the daily operation and management of enterprises. As the management system of enterprises is not yet complete, the financial management level of many enterprises is generally low, which restricts the level of enterprise operation and suppresses the improvement of enterprise profitability. Through the application of management accounting, first of all, it is helpful for enterprises to formulate a reasonable financial system and effectively integrate the available information. Secondly, with the application of management accounting, there will be a great demand for talents with rigid demand for management accounting, improve the talent reserve of enterprises, and finally promote the improvement of the overall management level of enterprises.

4.3. Risk Control

The development of management accounting can effectively improve the internal control of the enterprise, and finally achieve effective control of the risk of the enterprise. The market is changing rapidly in modern times, and the business strategy is also facing continuous adjustment and optimization, but big data

can provide information in a timely manner, so that the time for enterprise optimization becomes shorter. The ability of risk control is closely related to the development of management accounting, so in the era of big data, managers can more easily obtain the information they need to formulate risk control strategies.

5. THE STRATEGY OF MANAGEMENT ACCOUNTING IN THE TRANSFORMATION AND DEVELOPMENT OF ENTERPRISES

5.1. The Importance of Management Accounting in Big Data Era

Management needs to make decisions to implement management accounting, and they need to know how important to implement management accounting in the era of big data. To realize that, complete system of management accounting is required, and every manager need to have basic knowledge of management accounting. In order to further improve the application efficiency of management accounting in financial management departments, change the management concept of traditional financial personnel, highlight the important role of management accounting in business decision-making, and make financial management departments attach importance to the application of management accounting, it is necessary to comprehensively improve the management accounting awareness of business personnel, especially upper-class personnel, and really apply framework tools of management accounting to daily development.

5.2. Invest More On R&D Expenditure

in order to optimize the resources allocation of management accounting in big data era. Look back to the history, enterprises concentrate more on financial accounting than management accounting, and the application of management accounting has limitations. Consequently, in practical experiences of enterprises, improving the expenditure on R&D is essential.

5.3. Talents Cultivation

In order to improve the cultivation of talents, enterprises need dual talents with both management accounting knowledge and big data knowledge. First, it is necessary to constantly improve the quality of talents in the financial departments of enterprises, form a group of people who not only understand financial accounting but also are familiar with the application of big data, and train management accounting talents who can make rational use of big data. Second, it is necessary to continuously introduce high-quality external management accounting talents, and third, incentive

measures and restraint measures should be taken to improve the subjective initiative and enthusiasm of management accountants. give full play to its important value and role in the management of enterprise managers.

5. CONCLUSION

This paper has presented the background of management accounting and big data respectively, then the connection between these two items is covered. In addition, this paper demonstrates the opportunities and challenges we meet now. This paper explains the development of management accounting and big data, both clarify the how they developed and what kind of situations they are at. Then this paper introduces the opportunities and challenges in development of management in big data era. Finally, this paper analyses the value of management accounting in the transformation and development of enterprises. In addition, this paper gives the further The Strategy of Management Accounting in the Transformation and Development of Enterprises as recommendations. The big data certainly contribute positively. Firstly, big data era provided a large amount of information for managers use to analyse the profitability of enterprises. Secondly, it improved the ability of decision-making. On the other hand, the challenges are information security, lack of talents and limited storage space. In the transformation and development of enterprises, management accounting in big data era aims to increase profitability of enterprises and control the risk of enterprises, more importantly, the core value is to help managers make more scientific decisions in enterprises. Then this paper gives 3 strategies to develop management accounting in big era, which require enterprises recognize the importance of management accounting and know it is necessary to invest more on management accounting in big data era, finally enterprises need to try to cultivate more talents to meet the demand of management accounting. By recognize the opportunities and challenges in management accounting in big data era, more clear solutions occur and give the direction of further development. On the other hand, core values have created the new system of management accounting which is important for enterprises to follow the trend. The strategies helped enterprises which are confused about how to develop management accounting in big data ear to know what should they do as recommendations.

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