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Emerging Technologies in Management Accounting

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Abstract

This paper gives a broad overview of emerging technology fields and their effect on management accounting. The research involved reviewing, describing, analyzing, and summarizing some of the literature in the area. The first field examined was that of business intelligence (BI) and its necessary partnership with management accounting. Following the BI section is an examination of how software aids accounting analytics. Next up is the surging field of big data and how it is poised to revolutionize the accounting profession. Included in this area are the definitions of descriptive, predictive, and prescriptive analytics. The study found that many of the emerging technologies required more research at a rapid pace because of the importance that management accountants play in the success of organizations. An additional area impacted is accounting education because of the need for business schools to turn out graduates with the necessary skills to meet the needs of a changing accounting profession.

Keywords: Emerging Technologies, Management Accounting, Accounting

Accounting is the most vital part of the information system (Andrei et al., 2018). Managerial Accounting (MA) has evolved from the traditional costing information of providing relevant information for managers to newer guidelines of Activity Based Costing and the Balanced Scorecard approach creating added value (Hint et al., 2018). Managerial accounting is the first source of information, permitting corroborating decisions to accomplish stationary goals (Andrei et al., 2018). With the onset of globalization, managerial accounting has adapted to new circumstances by changing the role and expanding utility for management (Vultur, 2018).

Expanding Role of Managerial Accounting

Accounting is a social science because it meets the criteria of it having a terminology, a study object, methodology, and laws. And because managerial accounting can provide answers to questions about costs, the contribution amounts of goods and activity, it has won the informational conflict with financial accounting. Managerial accounting includes aspects necessary to provide information to managers about processes, operations of an organization, elements needed to make decisions and possible backlash of said decisions, and those elements required to administer control in a perennial and efficient manner (Andrei et al., 2018).

Traditional accounting systems have been replaced with forward-looking and forward-thinking advanced systems focusing on efficiency and effectiveness. Managerial accounting now has the role of driving, influencing decisions, and identifying new strategies. With such innovations as Life Cycle Costing and Strategic Managerial Accounting, the focus of MA is on creating measurable value (Hint et al., 2018). Using internal information to put forth business solutions makes managerial accounting a vital management tool regardless of the degree delegation of responsibilities (Andrei et al., 2018).

Increased competition has led to the revamping of organizations' internal processes and pointing to management accounting's essential place in producing better knowledge of costs, sales prices, forecasting, and the necessary tools for a company's success. Because of the continuous changes of economies, processes, the firm's activities, the production, and distribution of products requiring constant retooling and development of management techniques have led to continued research in management accounting (Nicoletta, 2019).

The role of the accountant has changed from a number cruncher to a trusted business partner and advisor. In every company, MA is an unequaled judge of past events, the crucial guide to the present, and the fundamental advisor for the future. In the current global economy, MA is an up to date path and a realistic choice for business leaders. MA allows business leaders to handle complex problems in a complex environment. And the management accountant's role is to know the costs and aid in shaping the managers' decisions by adapting to their tools and practices to meet the demands of the decision-makers (Nicoletta, 2019).

Kose & Agdeniz (2019) noted the function of MA is to provide upper management with vital information as a part of the accounting process. And the role of MA has changed to providing information for strategic decisions, solve complex problems, and the integration of methods used in decision making. Knowledge is a source of competitive advantage, and MA is at the center of defining, collecting, measuring, and analyzing data.

Kose & Agdeniz (2019) reported the institute of Management Accountant's revision of the MA Competency Framework. The definition of the competencies is:

Strategic Management: Leading the future of strategic planning, decision making, and performance monitoring.

Reporting and Control: Standardized measuring and reporting of performance.

Technology and analytics: Manage technology and analyze data.

Business acumen and operations: Contribution of a cross-functional business partner for company-wide operations.

Leadership: Inspirational team leadership to accomplish goals.

Professional ethics and values: Demonstration of ethics, professionalism, and legal compliance to sustain a business model.

In a global business economy, to be more effective in cost identification, increased productivity leading to more substantial profits, a firm must become familiar with MA tools (Kabir, 2019)

Business Intelligence

Business intelligence (BI) are technological tools used to gather, store, access, and analyze data to aid businesses to make informed decisions. Companies use BI to become more competitive by adapting quickly to customer demands and changes in their operating environment. Although many of the attributes of BI are intangible, a business should not discard its importance (Moreno et al., 2019).

The data revolution has caused a refinement and a change in the management accountant's careers and job descriptions. Accountants will be free from robotic tasks such as billing, management reports, and organizing financial data to evaluating, analyzing, and interpreting it. The leadership of an organization will expect to be more connected with the management accountant as they will have more time to analyze trends and create insight (Lawson, 2019).

Since business intelligence and analytics (BI&A) incorporate data collection for supporting decision making and management accounting is a decision-supporting activity, there is a clear link. Therefore, the integration of the two is necessary. There are four technological aspects BI&A (1) infrastructure, which is cloud-based (2) data management (internal and external data synchronization) (3) data analysis including artificial intelligence and statistical techniques (4) information delivery. There is an integration of these aspects because you can't have one without the other, referred to as the "technology stack" of BI&A. The foundational purpose of these is to gather, process, and analyze data to improve the manager's decision making (Rikhardsson & Yigitbasioglu, 2018).

BI can aid in today's global economy of needing real-time accounting data. Real-time accounting offers a multitude of benefits over traditional methods of reporting. Higher competition requires more current information allowing managers to make needed decisions in a fast-paced business environment. Recognized among several real-time reporting technologies, BI allows the creation and disseminating of more focused and relevant data to managers empowering long-term goal planning and optimization of the daily business process by the organization (Trigo et al., 2014).

There has been an elevation of interest in BI for accounting. Highly efficient BI systems are synonymous with the implementation of performance measurement system design. However, the usefulness of BI is only practical if the organization is laser-focused with concrete procedures and is not subject to improvisation. If managers make decisions not grounded in facts and data, but from spontaneous competencies, then BI is less effective (Peters et al., 2018).

Accounting Analytics

Business analytics (BA) is using computer software to garner insight from data to make a better business decision instead of leaving things up to a standardized process. BA applies a set of technologies and methods to use data to comprehend and analyze business data. The makeup of BA is (1) predictive analytics – what could happen now or later, is there a recognizable pattern? Predictive analytics consists of large-scale data usage to highlight analytical and predictive business model performance, (2) Prescriptive analytics – the approach of optimization in two areas, addressing the best outcome, and its achievement (Nielsen, 2018). (3) Descriptive analytics – answers the question of what happened; it is the most common analytics type used by firms today and contains descriptive statistics (Appelbaum et al., 2017).

Acito & Khatri (2014) pointed out BA addresses significant issues such as financial statement effect, stock prices, the cost of capital, and the precarious balance between management behavior and shareholder interest. A synthesis of knowledge gained from BA to apply to management accounting is (1) the focus of management accountants must be on a comprehensive view in an analysis culture (2) MA must be concerned with decision-based in facts having an impact on value (3) MA must be focused on predictions and forecast (4) MA must focus on visualized reporting and presenting the information in an understandable, exciting and useful way (5) management accountants must have the skillset for MA (Nielsen, 2018).

MA can use prescriptive analytics to reinforce decisions made about uncertainties. MA must infringe on the management accountants and non-accountants to solve problems unapologetically. MA has lengthened its traditional focus to include identifying financial performance drivers and new non-financial metrics. Trends occurring in MA now are (1) no longer focusing on customer profitability and product channel (2) MA explaining role in the organization (3) the shift of predictive accounting (4) BA entrenched in enterprise performance management (5) synchronized and improved MA methods (6) recognizing information technology and sharing of services is a business (7) improved MA skills (Appelbaum et al., 2017).

Big Data

Big data is in just about every element of organizations today. For example, a business may create, purchase, extract, administer, release, retrieve, and analyze millions of data elements from within or outside of the company (Appelbaum et al., 2017). The description of Big data is (1) volume – the total amount of data stored, (2) velocity – creation intensity for new data (3) variety – the assortment of data and its byproduct (Huttunen et al., 2019). Big data will bring extraordinary benefits and gains to individuals and companies by reducing data storage costs and making enormous volumes of data available in real-time, allowing organizations to make relevant and cost-conscious decisions (La Torre et al., 2018).

Big data has structured and unstructured data. Structured data has a pattern of well-defined information, and unstructured data is streaming free information. Obtaining value from big data, structured and unstructured data must be combined so that analysis can take place. The analytics of big data is advanced. The advanced processes

allow for large volumes of data to be processed. Utilizing advanced techniques of analysis includes text, audio, video, social media. The analysis leads to descriptive, diagnostic, or predictive analytics ((Huttunen et al., 2019).

The analysis of big data is quantitative, which entails testing training and scoring models. Several techniques are applied, such as data mining, semantic analysis, data visualization, data discovery, and geospatial analysis. Additionally, analyzed are email, tweets, and transaction analysis by text mining. Big data analysis involves software for data visualization such as Hadoop, NoSQL, and Tableau. The software empowers predictive analytics since it is the most popular form of analytics used (Dewu & Barghathi, 2019).

Discussion

Business Intelligence

Business Intelligence is in its infancy. There are still businesses that do not know what to do with it or how to use it. BI systems should not be embarked on merely because other companies are doing the same. However, firms must diligently analyze what their need is in terms of these systems and what benefits may lie ahead for them (Tamandeh, S. (2016).

BI is used to administer the flow and holdings of business information inside of a company. BI helps convert massive amounts of data into pure knowledge for the organization's managers. BI's main application is the assistance in firm decision making, therefore using the system's structural and non-structural data is the basis for BI (Tamandeh, S. (2016).

BI represents a shift in data analysis done by management accountants. Management accountants no longer must use the IT department for data analysis because of the ease of predictive analysis. Predictive analysis utilizes the BI power of big data, so basing the review on historical data is not used. Focusing on its four characteristics, (1) prediction (2) rapid analysis (3) relevant business analysis, and (4) user-friendly tools, BI takes on the need for real-time analysis head-on and links it to informed decision making (Brands, 2014).

Accounting Analytics

Management accountants can use data analytics to aid organizations to interpret data. Interpretation is made by:

- Determine the best metric to track - use data analysis to develop goals on the use of data.
- Ensure "clean" data – make sure the information received is accurate and relevant.
- Utilize the functionality of available tools – analyze the system thoroughly and use all elements completely.
- Don't let new terms like 'Big Data' scare you – data does not have to be analyzed and utilized by a data center (Amato, 2016).

Management accountants will need to learn an entirely new skill set in the area of analytics to be successful. They must be able to successfully excerpt and review the immense amount of data they are privy to while familiarizing themselves with the most modern methods of data governance, query, analytics, and visualization. Linking knowledge of technology with strategic and leadership skills will allow management accounting professionals to break-down and relay the story the data is telling (Lawson, 2019).

Using analytics directed at big data, accountants can widen their monitoring techniques to include unstructured data that may lead to the identification of improvement areas. Organizations will need to develop new procedures with the ability to continuously monitor, analyze, and decipher data. Accountants, because of their unique training and skills, can utilize these skills to examine the effect this has on performance measures and how it aligns with the firm's strategic objectives. Management accountants will see their roles grow within the organization because of their ability to interject their business knowledge into the mining of structured and unstructured data (Richins et al., 2017).

Big Data

The most meaningful thing about big data is there is now a more significant variety of data, including externally generated data from websites, email, and texts. However, expansion of service is nothing new to the modern-day accountant. Accountants have a history of responsibility expansion when it comes to organizational improvement (Janvrin & Weidenmier, 2017).

The management accountant's focus has changed because of big data. Businesses invest heavily in the ability to collect, process, prepare, and analyze data, and they expect their management accountants to possess a deep, clear understanding of the data. This data needs to be of high quality. High-quality data is complete, precise, valid, accurate, relevant, and timely. Most businesses view this data as an asset that impacts the firm's bottom line tremendously. If the data is of poor quality, it will harm the management accountant because it may cause errors in the forecasting. To be good at data analysis, the management accountant needs excellent data. (Appelbaum et al., 2017).

Big data contains massive data sets that traditional database management systems cannot analyze. The majority of big data, 90%, is unstructured and contains information considered soft data such as email, social media postings, phone calls, website visits, and streamed videos. Big data can aid as long as there is a conversion of storage units of big data into actionable information. This creates a specialization where a data analyst/scientist flourish. For management accountants to use big data, these specialists must comprehend, identify, convert, and analyze the data (Warren et al., 2015).

Because management accountants have access to more data and better ways to analyze this data, systems that incorporate this additional data can use descriptive, predictive and prescriptive analytics to answer the questions of what has happened, what will happen, and what is the best solution moving forward (Appelbaum et al., 2017). Big data may speed up the merging of U.S. GAAP and IFRS, developing a global system with accounting as the lynchpin. Big data is a technological advancement that is poised to change the processing of financial transactions and usher in new forms of documentation to support management accounting (Warren et al., 2015).

Future Impact

There is no doubt managerial accounting is changing in the next few years. Managerial accounting spotlights the future and what will happen (Ioana et al., 2019). Managerial accounting has evolved from traditional costing information to new guidelines (Hint et al., 2018). With the advent of big data and data analytics, management accounting will be the center of information for decision making in an organization. Management accounting key roles are strategic management, reporting, and control, operations, and leadership (Kose & Agdeniz, 2019).

In the future, with the onset of big data and with business analytics using several different ways to analyze information, data will pervade most accounting fields, including managerial accounting. Affected will be the decisions for product mix, make or buy, pricing, and profitability. Analytic data will become an intangible asset equal to personnel, machinery, and real estate. In this globalized business world, there is an overwhelming need to keep pace with rapid change. Successful businesses will be able to change in real-time with fluidity and ease. There will be a replacement and integration of simple modeling policies into models of advance statistical data allowing managers to make changes and test even small theories (Steen, 2018).

The traditional utilization of the general ledger continues to change by automation as managers continue to ask for more from their management accountants. Today's management accountants are challenged by explosive changes to forecasts and putting the rigor of the budgetary process on edge. More questions about the story behind the numbers remain, and the expectation is management accountants will have the answers. Management accountants are at the cusp of this evolution, analyzing metadata to create a strategic analysis for management, integrating these skills to not only divulge prospective strategy but also to anticipate trends for operational data. Tomorrow's management accountants should rise above the profession's historical competencies and stereotypes to become

real business colleagues and bridge the gap of what the business desires with the customer and the enterprise data accumulated by the organization (Eng, 2018).

Accounting Education

Accounting education holds a long history of identifying the needs of the industry and adapting the curriculum to meet those needs. Because data analytics may develop into a stand-alone major, business schools should teach it (Tschakert et al., 2017). Demand is continually increasing for graduates with data analytics in their educational background (Dzuranin et al., 2018).

Unlike the predictions of some researches on the demise of accounting as a profession (Frey & Osborne, 2013), academia is familiar with the specific skill set needed to be an accountant and the unique qualifications which an accountant brings to an organization. With the identification of accountants with data analysis as an identified need, the accounting curriculum has evolved. The expectation is that universities produce properly trained accountants, and because of this expectation, schools must evolve with the profession (Dewu & Barghathi, 2019).

Future Research

There are areas in management accounting with limited research conducted. This paper touched on some, for example, business intelligence. Torres & Sidorova (2019) remarked there are many unanswered questions on how business intelligence contributes to an organization. Research has failed to consider how BI plays a role in organizational spontaneity (Peters et al., 2018). Research is needed to see if SMEs take advantage of cloud-based business intelligence solutions (Trigo et al., 2014).

There is also some research to be done in analytics, as all the additional data bought on by big data needs to be analyzed. There is a lot of unknown information concerning the role of management accountants in company strategies supported by analytics (Rikhardsson & Yigitbasioglu, 2018). From an accounting analytics viewpoint, Nielsen (2018) recommended research to produce new and enticing solutions for accounting with a data-related and comprehensive view as the beginning point. In accounting education, research needs to be conducted that includes the opinions of professional bodies of accounting (Dewu & Barghathi, 2019). Lastly, an empirical study of the managerial accounting framework to use data analytics in the surroundings of an enterprise system is necessary before its application (Appelbaum et al., 2017).

Conclusion

This paper presented a broad overview of emerging technological fields in management accounting. It began with a look at the current state of management accounting and how the role of management accountants has expanded into the vital supplier of information for business decisions. The next section explored business intelligence and its essential contribution to managerial accounting. Accounting analysis, the main feeder for business intelligence, followed the section on BI. Big data rounded out the technological aspects of the article on emerging technologies; this section described big data and how it shapes management accounting moving forward. A discussion ensued on each of the emerging technologies, and this section also included future impacts on management accounting, the evolution of accounting education, as well as a look at recommendations for future research in the field of management accounting.

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