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Leadership and Decision Making among SMEs: Management Accounting Information and the Moderating Role of Cloud Computing

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Abstract

With the changing paradigm of the world and highly competitive business environments, organizations are encountered different challenges. This paper investigates the relationship between management accounting information (MAI) and decision-making and the role of cloud computing among small-medium enterprises (SMEs) in Pakistan. In particular, the focus of this paper is on the influence of MAI on decision-making. Cloud computing is a modern technology to strengthen relationships. A quantitative research design that involves printed questionnaires was used to analyze the relationships of the variables. The survey was conducted on 384 Pakistani small and medium-sized enterprises of various sectors. The study obtained 105 useable responses. Data were analyzed using Smart PLS 3.0 (Partial Least Square) to test the researcher's hypotheses. The study found MAI to be positively related to Pakistani SMEs' decision-making. The findings also exposed all the dimensions of MAI; namely broad scope, timeliness, aggregation and integration, to be positively related to decision-making. Additionally, the findings indicated that, as modern technology, cloud computing strengthens the relationship between MAI and decision-making. This paper contributes by helping organizations realize the importance of MAI in decision-making and how they could relate a selection of information characteristics in terms of their business environments. Moreover, it enhances the understanding of SMEs on the function of cloud computing to get better decision-making in the light of the competition in SMEs. Pakistani industry is running successfully, and small-medium enterprises have a wide gap. Small and Medium Enterprises are going successful in Pakistan, and investor can ease to decide after receiving research directions.

Keywords: Management Accounting Information (MAI), Cloud Computing, Decision-making, SMEs.

JEL Classification: D81, M41.

1. Introduction

Small and medium-sized enterprises (SMEs) are still at the early stage of development and are still evolving. Their environment can be characterised as hyper-competitive, changing, and technologically complex

(Christauskas & Miseviciene, 2018). SMEs are facing challenges due to their limitations in finance and HR (Human Resource) as well as lack of technological adoption and information compared to large-sized companies (Ting, 2019). As such, from the resource constraint's perspective, SMEs are different from their large-sized counterparts. Despite their limited resources to adopt management accounting practice fully, management accounting information (MAI) is pertinent to their businesses' helpfulness and efficiencies (Ahmad, 2020). Ahmad (2012) stated that the presence of MAI relates to the success of an SME and vice versa. MAI is defined as an information source that contains information that is financial and non-financial. It is to utilize internal users for their organization's long-term well-being, i.e., planning, implementation, and appraisals of strategies (Hui & Yusof, 2017). MAI provides the information to an organization's various departments, spanning from decision-making to organizational learning. MAI is the basic source of information for an organization's planning, decision-making, and monitoring (Ahmad, 2012; Laitinen, 2014). Bakar (2018) and Hui and Yusof (2010) reported that it is helpful and vital to managers in assisting their decision-making, performance appraisal, and communication with their colleagues. Given this, MAI can serve multiple roles simultaneously and is relevant to managers at all levels (Fitsum, 2014). It recognizes that MAI is essential in decision-making in SMEs. In Pakistan, earlier studies focused mainly on management accounting practices in Pakistan (Rahman, Omar, & Hoo, 1997; Sulaiman, Nazli Nik Ahmad, & Alwi, 2004) with minimal emphasis on MAI (Hui & Yusof, 2010). Salmon and Joiner (2006) only focused on the contextual conditions for MAI. According to Baghersefat, Zareei, and Bazkiai (2013), the effect of MAI on managers' decisions is an issue of specific interest among researchers. The research on SMEs in terms of management accounting is scarce (Ahmad, 2013). According to Mitchell and Reid (2000) and Nandan (2010), there is not enough interest to study the availability of MAI and the utilization of management accounting among SMEs. Similarly, there are very few studies on the utilization of MAI among SMEs in both developed and developing economies (Alattar, Kouhy, & Innes, 2009).

The employment of information and communication technology (ICT) may improve competitiveness and give SMEs a real advantage, allowing them to compete with large businesses (Alshamaila, Papagiannidis, & Li, 2019). Cloud computing offers tremendous advantages to SMEs through reduced financial burden due to new technology adoption (Carcary, Doherty, & Conway, 2015). Thus, the SMEs can scale down and concentrate on their business activities as their information system and technology are handled by the service providers (Tarmidi, Rasid, Alrazi, & Roni, 2016). "Cloud" computing is a figure of speech that refers to the Internet (Tarmidi, Rasid, Alrazi, & Roni, 2014). It is defined an IT (information technology) service form where computing services (both hardware and software) are delivered on-demand self-regulating of device and location (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011). It is a tool that benefits its adopters extensively. It reduces the run and response time, minimizes the risk of physical infrastructure operation, reduces entry cost, improves upgrading speed, facilitates flexible conditions of information and uncomplicated software updates (Tsagklis, 2013). Thus, cloud computing enables organizations to broaden and pick up their group effort and communication in making business decisions through access to accurate and up-to-date information over the Internet despite their location (Dimitriu & Matei, 2014).

Even though cloud computing offers great benefits and opportunities, most prior research on cloud computing concentrates on the effect of its adoption and the technical issues that arise due to its implementation (Obeidat & Turgay, 2012). Moreover, they did not go beyond the adoption stage to inspect the performance of the system and its value in the accounting field. To date, limited studies on cloud computing in Pakistan have dealt with the factors on the receiving of cloud computing (Tarmidi et al., 2014). In SMEs, the usage of information technology in SMEs is understudied and remained distinctive (Riemenschneider, Harrison, & Mykytyn, 2003). Moreover, the development in accounting information technology has motivated online accounting over the last number of years (Christauskas & Miseviciene, 2017). Therefore, businesses' espousal of cloud technology is essential and is gaining attention (Ekufu, 2012). Nevertheless, there is still a need for study in this area, mainly in Pakistan (Tarmidi et al., 2016). The importance of MAI and cloud computing in SMEs' decision-making makes it crucial that this study comprehensively examines the influence of MAI upon SMEs in Pakistan. This study investigates the effect of MAI on organizations' decision-making process and the moderating function of cloud computing on the link between MAI and decision-making. This study contributes by filling a gap in the literature on MAI, decision-making, and cloud computing in SMEs. In the next segment, a literature review on MAI, decision-making, and cloud computing is discussed. The debate on hypotheses development and research methodology proceeds. Data analysis based on the responses received and discussions of findings are then reachable. Finally, this study ends with a conclusion.

2. Literature Review

2.1 Management Accounting Information. MAI involves only information that is internal, historical, and financial. Over time, MAI evolves and covers more important information, including internal/external, financial/non-financial, quantitative/qualitative, and historical/future type of information (Heidmann, 2008). financial and non-financial information helps in improve decision-making (Sherine & McLellan, 2017). Examples of the data are expenses, revenues, sales growth, capacity utilization, wastage, customer satisfaction and loyalty, product quality, and employee motivation (Mia & Winata, 2008). Chenhall and Morris (1986) are the first to formalize the four main features of MAI. They stated that the consideration of information for decision-making could be in terms of the features of general information. They suggested that each item of data has scope, timeliness, aggregation, and integration. Figure 1 displays these features.
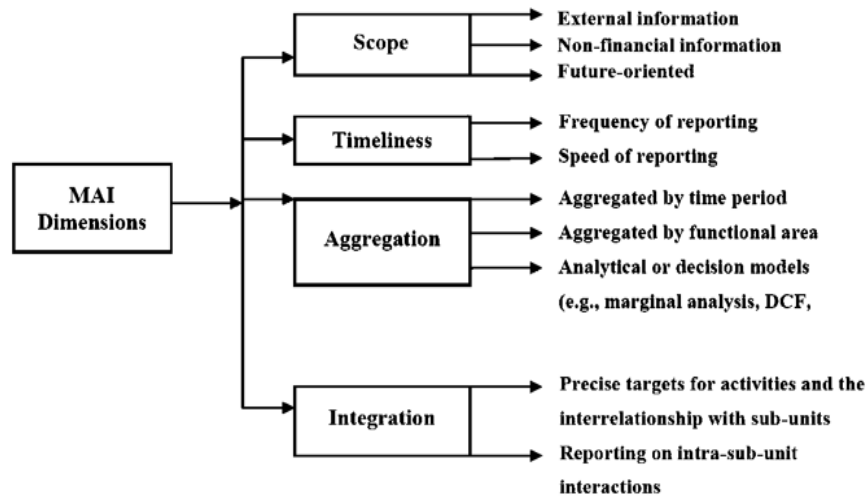

Figure 1. Summary of the Information Characteristics of MAI

Source: Chenhall and Morris (1986)

Literature in MAI indicates the importance of MAI with respect to planning, monitoring, and controlling and decision-making (Ahmad, 2015; Fitsum, 2015; Hui & Yusof, 2017; Kaplan, Atkinson, & Young, 2013; Lim, 2011; Raman, Yuserrie, & Michael, 2019). Mohammed et al. (2019) indicate that SMA information (which encompasses analyses on competitor, client and product data) has positive significant effects on firm performance. The earlier studies focused solely on management accounting (Rahman et al., 1997; Sulaiman et al., 2004) with very little emphasis on the MAI. Table 1 reviews a summary of selected past research that adopted the study of Chenhall and Morris (1986) as a tool to examine MAI with organisational variables, and identifies the theory employed to describe the interactions between the variables.

Table 1. Summary of Selected Previous Studies

No	Author (s), year and country	Characteristics of MAI	Theory
1	Chenhall and Morris (1986), Australia	Scope, timeliness, aggregation, and integration	Contingency
2	Mia (1993), Australia	Scope	Contingency
3	Mia and Chenhall (1994), Australia	Scope	Contingency
4	Mangaliso (1995), South Africa.	Scope, timeliness, and aggregation	Contingency
5	Chong (1996), Australia	Scope	Contingency
6	Fisher (1996), Australia	Scope, and timeliness	Contingency
7	Choe (1998), South Korea	Scope, timeliness, and aggregation	Contingency
8	Tsui (2001), China	Scope, and timeliness	Contingency
9	Gaidienë and Skyrius (2006), Lithuania	Scope, timeliness, aggregation, and integration	Contingency
10	Agbejule and Burrowes (2007), Finland	Scope	Contingency
11	Naranjo-Gil and Hartmann (2007), Spain	Scope	Contingency
12	Mia and Winata (2008), Australia	Scope	Contingency
13	Susanto (2010), Indonesia	Scope, and timeliness	Contingency
14	Mia and Winata (2014), Australia	Scope	Contingency
15	Odar, Kavčič, and Jerman (2015), Slovenian	Scope, and timeliness	Contingency
16	Ghasemi et al. (2016), Iran	Scope, timeliness, aggregation, and integration	Contingency

Source: Compiled by the authors

As shown in Table 1, previous studies adopted instruments used by Chenhall and Morris (1986) to examine MAI (e.g., usefulness, availability, use, and importance). The studies addressed MAI magnitude either

individually or in a group in one research setting. They only considered limited organizational variables in the absence of variables such as decision-making and technology. Most of these studies adopted the contingency theory approach to examine the relationships between the variables. This paper explores MAI's direct influence as the independent variable with decision-making and cloud computing. This study utilizes the Resource-based view (RBV) theory to conclude the association between the variables.

2.2 Decision-Making. A decision is a "choice leading to a certain desired objective" (Mayr, Lengauer, & Parasote, 2017). It can be defined as choosing an action among choices available to reach a particular goal or solve a problem (Kidane, 2019). Hashim, Alam, and Siraj (2018) defined decision-making as the act of attainment, a consideration after essential ideas are collected, shared, and gathered from various sources. Decision-making in organizations can be examined from several perspectives. In view that the concept of decision-making is complex, a significant number of management literature sources is discussing it. The discussion ranges from a descriptive model based on fundamental features and assumptions to the business's management accounting perspective. According to the literature of management accounting (Berisha-Namani, 2010; Fitsum, 2019; Harrington & Ottenbacher, 2009; Janczak, 2005; Ježovita, 2015; Kidane, 2012; Manteli, Van De Weerd, & Brinkkemper, 2017; Nura & Osman, 2012; Tewodros, 2020), it is helpful to classify decisions according to the participants, goals and objectives.

In terms of the participants in decision-making, generally, they can be categorized as individual, team, group or organization involved in decision-making. Given the goals and objectives of decision-making, they can be grouped into strategic and tactical decisions and short-term and long-term decisions. Tactical decisions (routine decisions) are results of strategic decisions that are quantifiable and executable. Meanwhile, strategic decisions are general and qualitative and include or mirror the organisation's aims and objectives. They are currently made, but their effects will be in the future. Decisions can be categorized into the short-term decision and long-term decisions. The short-term decision has an impact in a year or less. It is related to operations' activities and involves the daily running of the business. Long-term decision's impacts will be felt in a longer period and might influence future decisions or affect long-term potential such as strategic planning decisions, which include when new products or services are introduced, or new markets are entered.

2.3 MAI and Decision-Making. Decision-making is the backbone of managerial functions and one of the most important tasks of managers and administrators in modern organizations (Kidane, 2019). In light of the increase in competition and business uncertainty, the value of information for perfect decision-making has increased (Alaarj et al., 2017). Decision-making success affected firm growth (Hannimitkulchai et al., 2019). Researchers link the ability to make the right decision under an uncertain environment to positive organizational performance (Chin et al., 2014; Jussila et al., 2016; Merigó et al., 2016). Previous studies indicated that Pakistani companies use decision support systems to improve the decision-making process and achieve competitive advantage (Nik Abdullah 2020; Ahmad, 2012, 2017; Nuhu et al., 2016). Findings by Mohammed et al. (2019) show that Pakistani private hospitals moderately use SMA information. To select the best choice, managers must consider the effectiveness of the choices. Hence, the data and information may provide some guidance in achieving this (Mayr et al., 2006). Accurate and effective decisions can only be achieved when the proper beneficiary gets the exact information and obtains it precisely. Even though several studies have explored the impact of MAI on the decision-making process, some researchers stressed on MAI's vital role in organizations. A study by Hui and Yusof (2010) indicated that financial or non-financial MAI is highly useful and vital to managers in assisting them in their decision making and performance judgment at various levels-corporate organizations, operations or functions-based on every level's requirement, resources, and competence. Moreover, they also barbed out that the investigative and interactive functions of financial and non-financial MAI are helpful and relevant to all companies, regardless of their sizes.

Moreover, Hui, Rahman, and Juan (2017) reported that MAI facilitates decision-making, and its well-consolidated, comprehensive, and timely information may boost the quality of managers' decisions. Another research done by Bakar (2016) surveyed the relationship between MAI availability to managers and the decision-making process, using the four dimensions of MAI adopted from Chenhall and Morris (1986). The findings suggested that MAI was an essential element in assisting organizations, especially in helping managers communicate with their colleagues in the decision-making process. The results also indicated that managers viewed all the four dimensions of information as useful to them. Whereas a survey conducted on 449 managers from manufacturing companies in Germany by Schäffer and Steiners (2019) in the use of MAI and decision-making, monitoring and scanning found a positive association between them. Meanwhile, Lim's (2018) research indicated that organizations utilize MAI for their various internal purposes, spanning from

decision-making to as means for organizational learning. He also found that MAI facilitates organizational integration and motivates individuals and groups by helping them in decision-making.

2.4 Cloud Computing. The National Institute of Standards and Technology (NIST) states that cloud computing has five primary elements, three models of service and four deployment models (Mell & Grance, 2016). The primary features of cloud computing are (1) *On-demand self-service*: computing resources can be retrieved and used anytime without the requirement for communication between humans and providers of cloud service; (2) *Broad network access*: the mentioned resources can be retrieved from a network through various devices such as laptops or mobile phones; (3) *Resource pooling*: the resources of cloud service providers are pooled and used by many users; (4) *Rapid elasticity*: the users can swiftly retrieve more resources through scaling out. They scale back-in by freeing the resources when they are no longer needed; and (5) *Measured service*: the utilization of resources is measured using suitable measurement, such as through storage and bandwidth usages, CPU hours, etc. (Amini et al., 2017). Meanwhile, based on users' requirements, the cloud computing service model has three categories. *Software as a Service (SaaS)*: The users use the service provider's application that runs on the cloud infrastructure. *Platform as a Service (PaaS) a*llows the users to install and control the applications (but not the infrastructure) they install on a platform specified by the service provider. *Infrastructure as a Service* (IaaS): Users control the operating system, storage network and applications only (not the cloud infrastructure) and use the capabilities provided such as for provision processing, networks, storage and other basic computing resources (Christauskas et al., 2020). Many deployment models are based on cloud computing's environment, availability, and intended way of entry being proposed. There are four types of cloud computing deployment models. *Public cloud*: for a fee, the general public can use a cloud such as Google, Microsoft or Amazon. *Private cloud*: a cloud that a particular organization only uses. *Community cloud*: is used by specific consumers of several organizations. *Hybrid cloud*: a cloud consisting of two or more clouds (private, community or public) (Amini, 2014; Jäätmaa, 2010; Jain & Gupta, 2012; Mell & Grance, 2011; Sriram & Khajeh-Hosseini, 2010).

Cloud computing, which is the latest phenomenon in IT, has been the focus of many studies (Amini, 2014). Several previous studies addressed cloud computing from different aspects. These studies pointed to the importance of cloud computing in information technology in contemporary organizations and its role in flow of information and access to basic and up-to-date information. Downie (1997) pointed out that the increased capacity and capability of computing technology leads to improvements of the modern information systems, i.e., in terms of presentation and analysis of information. Whereas Mohammadi et al. (2015) stated that cloud computing users enjoy the various advantages it offers. These include acceleration of time, follow without physical presence, connection to other computer systems, availability, low-cost computers for users, increased computing power, unlimited storage, capacity building, improved matching between document formats, and access to the latest version. Abdalrahman and Mahmoud (2015) suggested that cloud computing provides the end-users a service through the internet the flexibility and unlimited information technology (IT) resources. Moreover, they indicated that cloud computing improves the establishment and transmission of IT solutions, mainly accounting in terms of the way financial information is exchanged and the presentation of interpreted and analyzed financial data to the end-user or the customer.

Furthermore, some studies highlighted the function of cloud computing in getting better way to information, and the increase in magnitude, rate, and volume of data handling. It will improve the speed and quality of decision-making throughout the organization. Mia and Winata (2008) stated that utilization of MAI by managers in their decision-making has a positive association with Information and Communication Technology (ICT), which consists of computer networks and the Internet. Moreover, they indicated that ICT utilization by managers improves the magnitude, rate and volume of data being handled and enhances the sharing of information and communication across roles, parties, places and time zones. The increased capacity of managers to immediately receive and deliver real-time information results in a greater decision-making process. Similarly, the research by Quinn, Strauss, and Kristandl (2014) addressed the role of cloud computing in management accounting and decision-making. They barbed out that cloud computing provides access to information for decision-making through new methods and various times using smart devices (tablets or smartphones). The findings showed that 93% of those interviewed agreed that the information from cloud-based systems was rated as detailed, timely and complete, and could promote collaboration and contribute to decision-making, while 90% of managers saw no disadvantages to decision-making using cloud technology.

3. Theoretical Framework

This study is based on RBV theory. RBV originates from the view that an organization has competitive advantage due to its internal resources instead of its external factors. This means that an organization's evaluation of its opportunities and threats as well as its competitive advantage is dependent upon its own

unique resources and abilities (Raduan et al., 2018). To achieve competitive advantage that is not easily imitated by competitors, resources that are valuable, scarce, not duplicable, and have no substitutes are needed. Resources can also be in the forms of factors that can be utilized to carry-out value-creating strategies. These resources may be tangle or intangible assets, and encompass all assets, abilities, organizational processes, firm characteristics, information, knowledge, technology, etc. (Barney, 1991).

MAI is measured one of the valuable information resources for an organization. It is employed for many purposes such as decision-making, strategic planning and performance evaluation (Lim, 2015). Hui and Yusof (2017) suggested that the utilization of MAI helps organizations to maintain their competitive advantage and be leaders among their competitors. In addition, Gaidienë and Skyrius (2019) stressed that MAI improves decision - making, assists in strategic expansion, appraises current strategy, concentrates on the efforts of enhancing organizational performance and involves in the appraisals of the contributions and achievements of everyone. Based on RBV, an organization can predict on firm's resources that can be utilized for competitive advantage. In generating added value for a firm, the organisations should gain the best strategies by analysing the threats and opportunities, and subsequently, make the appropriate decisions. Therefore, MAI can offer a competitive advantage to a company by providing suitable information for decision makers thereby giving it the opportunity to select the best course of action or a specific level and combination of resources to achieve its goals (Schäffer & Steiners, 2004). RBV emphasizes on the harmony between available opportunities and the business's abilities. RBV considers the utilization of available resources for creation of central part competencies so that competitive advantage can be achieved and sustained (Al-Dhaafri, Yusoff, & Al-Swidi, 2013). The resources can serve as the input to a process. In contrast, a capability is a resource that has the purpose of improving other resources possessed by the business(Chapman & Wieder, 2015).

Theriou et al., (2019) argued that capabilities allow the creation of relations between resources and their utilization. Hence, this will encourage the business's ability to create value by forcing the exchange of input into output. Cloud computing is perceived as one of the information technology capabilities (Rockmann, Weeger, & Gewald, 2016). Truong (2010) argued that resources of cloud computing establish and maintain competitive advantage by the association with other resources of the business. Whereas, Flack and Dembla (2014) barbed out that cloud computing is an supplementary resource used by the firm to gain competitive advantage by propelling important application utilization, sustaining competitiveness and reducing the cost of IT operations and maintenance. Nuseibeh (2011) strained that cloud computing could help organisations to gain a unique competitive advantage by giving the opportunity to better linked and work together within the organisation. Based on the RBV perspective, this paper's framework is highlighted in Figure (2). MAI, as one of the organisation's resources, is expected to influence decision-making. The model illustrates the role of cloud computing as a technological capability to promote the relationship between MAI and decision-making.
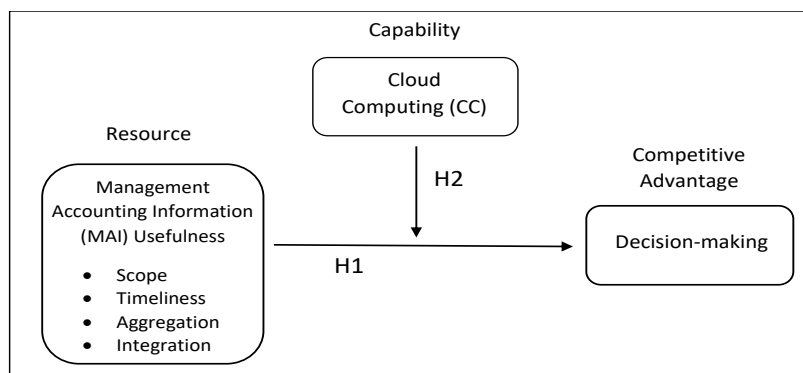

Figure 2. Summary of the Information Characteristics of MAI

Source: Compiled by the authors

Two main hypotheses were developed based on the model of study. Lim (2011) indicated MAI can facilitate the integration to inspire everyone and helps in decision-making. The findings of his study documented a positive relationship between MAI usage in planning, decision support, and performance evaluation. Meanwhile, Bakar (2001) pointed out that MAI is an important element in helping organizations, particularly managers, communicate with their colleagues in the decision-making process. Hui et al. (2011) suggested MAI has an essential role in facilitating decision-making by its supply of information. Similarly, Ahmad (2012) claimed that MAI is the main source of information for decision-making and monitoring. Therefore, the following hypothesis is developed:

H1: There is a positive relationship between the usefulness of MAI and decision-making.

Pierce and O'Dea (2003) indicated that the broad scope of information is valuable to those managers for their decision-making. Mia and Chenhall (1994) showed that researchers agreed that the broad coverage of the MAI system significantly helps the managers in their decision-making. Chong (1996) discovered that the extensive utilization of management accounting systems results in significant managerial decisions, improving the managers' performance for a highly tentative situation. Moreover, Soobaroyen and Poorundersing (2008) pointed out that the coverage and timeliness of information are vital for managers and decentralized managers in their decision-making. Therefore, the following is the hypothesis:

H1a: There is a positive relationship between the usefulness of the MAI characteristic of broad scope and decision-making.

Hui and Yusof (2017) suggested that to make the correct decisions, timely and relevant information is needed. Similarly, Rahman et al. (1997) found that to decide on various problems and issues; managers require timely and accurate information. Furthermore, Ramli and Iskandar (2019) stated that timely information is valuable to decision-makers as the information may no longer help assist the decision-making. Also, timely information helps managers make the right decisions as it provides fast and up-to-date information. Therefore, the following is the hypothesis:

H1b: There is a positive relationship between the usefulness of the MAI characteristic of timeliness and decision-making.

Gaidienë and Skyrius (2016) stated that aggregated MAI is useful for those who make decisions and have financial responsibilities. Similarly, Choe (1998) said that managers found aggregated information useful in monitoring and coordinating interdependent sub-unit activities. In addition, Ramli and Iskandar (2014) pointed out that the correct aggregated information helps prevent information overload. The appraisal of relevant aggregated information is better and faster than individual information. Hui et al. (2001) found the MAI's aggregated information to be useful to managers as it enhances the decisions' quality. Therefore, the following is the hypothesis:

H1c: There is a positive relationship between the usefulness of the MAI characteristic of aggregation and decision-making.

Salmon and Joiner (2006) stated that MAI harmonizes the sections in a sub-unit and among sub-units, where the manager is responsible for the information concerning the impact that their decision will have on the organizational sub-unit. Mayr et al. (2006) found that the incorporation of MAI can influence the decision process at almost every stage. Furthermore, Bakar (2001) pointed out that the integration of information within sub-units will help the managers of different departments to obtain useful information from another department quickly. Therefore, the following is the hypothesis:

H1d: There is a positive relationship between the usefulness of the MAI characteristic of integration and decision-making.

Chang, Chang, and Paper (2003) suggested that information processing effectively assists the smooth delivery of information to managers. Therefore, the business can gain considerable competitive advantage through better and faster decisions. Ekufu (2012) stated that cloud computing improves information access, assists managers by presenting methods, improves communication in the organization, and increases productivity. Additionally, it helps in critical decision-making by providing real-time information. Kinkela (2013) found that cloud computing leads to efficiencies by utilizing an outside expert who can immediately modify the software instead of sending patches to meet users' needs. Furthermore, in view those users can log-in safely and remotely, the cloud facilitates the transmission of data and software. With cloud computing, the organization can make decisions faster; by communicating better through sharing and receiving information on the cloud with only a network connection, files and software can be accessed from any devices simultaneously (Quinn et al., 2014). Therefore, the following is the hypothesis:

H2: Cloud computing moderates the relationship between MAI and decision-making.

4. Research Methodology

4.1 Population and Sample Selection. The large number of SMEs in Pakistan makes it impractical to include all SMEs throughout Pakistan in this research. Hence, the study only continual in some geographical regions. Therefore, the questionnaires were circulated to SMEs located in Selangor, Kuala Lumpur, and Johor in Pakistan. These three areas had the highest number of SMEs. They recorded an estimated total of 279,457 SMEs, representing 43.3% of the total number of SMEs in Pakistan, according to the Pakistani SME statistics (2011), which was released in 2016. SME can be defined by sales turnover or the number of full-time staff. The first criterion is that the firm has a sales turnover of less than RM50 million or its full-time staff is less

than 200. The second standard is that the firm has less than RM20 million sales turnover or its full-time staff is less than 75 (SME Corp. Pakistan, 2013). This study's unit of analysis is small and medium-sized companies from various industries, and the participants for this study are owner/manager of SMEs, which is comparable to the approach taken by past studies (K. Ahmad, 2012; S.Z. Ahmad, Abu Bakar, Faziharudean, & Mohamad Zaki, 2015; Koe, Omar, & Sa'ari, 2015; Lybaert, 1998). The stratified random sampling is adopted because there are several different industries in the SME sector. A stratified random sample provides the same chance for all population units to be included in the certain model, which provides a high level of simplifying ability (Bryman, 2017).

4.2 Data Collection. The questionnaire method is utilized to collect the study's data. Keillor, Owens, and Pettijohn (2001) fixed that the questionnaire procedure is considered the most usually used survey method. Whereas Moilanen (2001) argued that the questionnaire technique is suitable for different levels, including the organizational level. A "pre-test" was conducted before the actual gathering of data to develop the questionnaire's credibility. Due to the pre-test, the feedback received was positive and hopeful. The respondents completed the questionnaires without any more suggestions for amendments. A total of 384 printed questionnaires were spread for this study. For each selected company, a questionnaire and a letter specifying the aim of the current study were distributed to the SME owner/manager. A total of 105 responses were obtained. Kent (2001) recommended that for quantitative analysis to have reasonable statistical analysis and meaningful results, a study needs to have at least 100 responses. The response rate of 27% is measured reasonably in the case of the Pakistani environment. Based on past studies, the response rate in Pakistan is between 15% and 30% (Omar & Ali, 2010).

4.3 Measurement. The items in the questionnaire were adopted from the literature and prior surveys. A total of 19 questions were used from (Haedr, 2017) regarding the four types of MAI, namely scope, timeliness, aggregation and integration. For this section, questions with two-sided 5-point scales were used. The scales in stare to MAI importance were positioned at the left side, ranging from 1 (not important) to 5 (very important). Meanwhile, the scales were on the right-side for MAI availability, ranging from 1 (not available) to 5 (always available). The usefulness of MAI characteristics is perceived through its importance and availability. Therefore, the scores for each item obtained from both scales (importance and availability) were used to conclude the usefulness of MAI (Al Lami et al., 2019). This study used seven items adopted from Monteiro and Vasconcelos (2018) to gauge the quality of cloud computing services to capture cloud computing services. The respondents were required to rate the quality of cloud computing service provided to the organization based on a 5-point Likert scale ranging from 1 (Not important) to 5 (More important). A similar scale has been used by previous studies (Garg, Versteeg, & Buyya, 2011, 2013; Siegal & Purdue, 2020) to measure the service quality of cloud computing. With regard to decision-making, this study utilized six items developed by Awasthi and Varman (2003) to attain the quality of decision-making: namely, decision-making rationality, decision-making speed, decision-making formalization, decision-making participation, decision-making influence and decision-making type. The respondents were asked to evaluate the quality of decision-making in their organizations based on Likert's 5-point scale from 1 (strongly disagree) to 5 (strongly agree). The measurements of the variables are summarized in Table 2.

Table 2. Variable Measurements

Variable	Dimension	Source	Item	Scale
MAI	Scope	(Chenhall & Morris, 1986) and (Gordon & Narayanan, 1984), which has been further modified by (Haedr, 2012).	6	5-point scale; the scales related to the MAI importance from (1=not important, 5=very important). Meanwhile, the scales related to the MAI availability are from (1=not available, 5=always available). MAI Usefulness (Importance*Availability)
	Timeliness		4	
	Aggregation		5	
	Integration		4	
Cloud Computing		(Monteiro & Vasconcelos, 2013)	7	5-point Likert scale (1=not Important, 5=More Important).
Decision Making		(Awasthi & Varman, 2003)	6	5-point Likert scale (1=strongly disagree, 5=strongly agree).

Source: Compiled by the authors

5. Data Analysis and Results

5.1 Demographic Statistics. Tables 3 and 4 represent the respondents and their companies' demographic statistics.

Table 3. Demographic Profiles of Respondents (N=105)

No.	Demographic Variable	Frequency	%
1	**Age group**		
	Under 30	43	41.0
	30 to 40	36	34.3
	41-50	13	12.4
	Over 50	13	12.4
2	**Qualification/Education**		
	High School	6	5.7
	College diploma	12	11.4
	Professional Qualification	9	8.6
	Bachelor degree	64	61
	Post-graduate degree	14	13.3
3	**Area of specialization**		
	Accounting/Finance	37	35.2
	Business Administration	33	31.4
	Economic	2	1.9
	Computer Science	8	7.6
	Others	25	23.8
4	**Job title and position**		
	General Manager	9	8.6
	Marketing manager	5	4.8
	Managerial accountant	31	29.5
	Production manager	2	1.9
	Finance manager	15	14.3
	Other*	43	41
5	**Experiences**		
	Less than 5 years	38	36.2
	5 to 10 years	28	26.7
	11 to 15 years	18	17.1
	16 to 20 years	9	8.6
	Over 20 years	11	10.5

Other (Directors, Administration Managers, HR Managers, CEO, and Exec Managers)
Source: Compiled by the authors

Table 4. Demographic Profiles of Companies (N=105)

No.	General information about the company	Frequency	%
1	**Main industrial sector of company**		
	Services	70	66.7
	Agriculture	2	1.9
	Mining & Quarrying	0	0.0
	Manufacturing	27	25.7
	Construction	6	5.7
2	**Number of full-time employees**		
	5-29	59	56.2
	30-74	23	21.9
	75-200	23	21.9
3	**Annual sales turnover**		
	Less than RM3 million	38	36.2
	RM3 to less than RM21 million	41	39.0
	RM21 to RM50 million	26	24.8
4	**Company age in the current main industry**		
	Less than 5 years	12	11.4
	5 years to less than 10 years	10	9.5
	10 years to less than 20 years	44	41.9
	More than 20 years	39	37.1

Source: Compiled by the authors

5.2 Data Analysis. There are various statistical techniques in the investigating of data and testing of hypotheses. This study utilizes Smart Partial Least Squares (PLS) to calculate the validity and reliability of the data collected. The PLS model is examined and elaborated in two stages:

➢ The measurement model (outer model) displays the relationships between the constructs and the indicator and assesses the reliability and validity of the measurement model;

➢ The structural model (inner model), which represents the constructs and displays the relationships (paths) between the constructs (Hulland & Business, 1999).

5.2.1 Evaluation of the Measurement Model. There are two vital features that need consideration when utilising a survey instrument, and those are construct reliability and validity scales. Chin (1998) proposed that the Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE) be used to evaluate the reflective construct properties. In PLS, item loadings and many measures of construct reliability and validity can be evaluated. The usual construct reliability measurements include Cronbach's alpha (α) and composite reliability. If the content reliability exceeds 0.70, then the construct is acceptable(Clum, Broyles, Borden, & Watkins, 1990). Based on the data, the scores of both Cronbach's alpha (α) and (CR) exceed 0.70, which indicates that the item construct scale for each variable has consistency reliability. Thus, this study's measures are considered reliable and consistent. With regard to the validity of the measurement model, it can be assessed by checking whether (AVE) and factor loadings of the construct are more than 0.50 (at construct-level), and item loadings exceed 0.50 and are statistically significant (at item-level) (Hair, Ringle, & Sarstedt, 2019). Consistent with Hair et al. (2011), the AVE and factor loadings for each measure exceeded 0.50, thereby indicating that the constructs and each variable are valid. The evaluation of the measurement model results is given in Table 5.

Table 5. Evaluation of the Measurement Model

	Loading	AVE	CR	Cronbach alpha
Scope				
S1	0.818	0.746	0.946	0.932
S2	0.890			
S3	0.888			
S4	0.836			
S5	0.855			
S6	0.893			
Timeliness				
T1	0.944	0.882	0.968	0.955
T2	0.942			
T3	0.937			
T4	0.933			
Aggregation				
A1	0.894	0.788	0.949	0.933
A2	0.879			
A3	0.905			
A4	0.891			
A5	0.869			
Integration				
I1	0.875	0.799	0.941	0.916
I2	0.909			
I3	0.909			
I4	0.883			
Cloud Computing				
CC1	0.698	0.562	0.9	0.871
CC2	0.696			
CC3	0.785			
CC4	0.779			
CC5	0.773			
CC6	0.769			
CC7	0.744			
Decision Making				
DM1	0.857	0.751	0.948	0.934
DM2	0.841			
DM3	0.872			
DM4	0.844			
DM5	0.876			
DM6	0.910			

Source: Compiled by the authors

The issues of discriminant validity appear when constructs are similar to each other (Straub, Boudreau, & Gefen, 2004. In PLS, AVE analysis is done to examine the measurement model's discriminant validity. Consistent with the guidelines of Fornell and Larcker (1981), should the AVE is more than the squared

correlation, then there is sufficient discriminant validity. Based on Table 6, each construct's AVE exceeds the squared correlation. Thus, all constructs have sufficient discriminant validity.

Table 6. The Result of Discriminate Validity

	AVE	Aggregation	Cloud computing	Decision making	Integration	Scope	Timeliness
Aggregation	0.788	**0.888**					
Cloud computing	0.562	0.366	**0.750**				
Decision making	0.751	0.597	0.465	**0.867**			
Integration	0.799	0.629	0.498	0.613	**0.894**		
Scope	0.746	0.558	0.177	0.497	0.417	**0.864**	
Timeliness	0.882	0.354	0.293	0.472	0.452	0.304	**0.939**

Source: Compiled by the authors

5.2.2 Evaluation of the Structural Model. The t-test values (t-value and P-value) are derived using the bootstrapping procedure to consider the path significance to verify the hypotheses in this study. Path coefficients show the strength and importance of the associations between the dependent and independent variables. In other words, they show the instant effect of a variable (known as a cause) that causes an outcome in another variable (known as effect) (Ko, Kirsch, & King, 2005). Generally, a t-value larger than 1.96 (t-value >1.96) is significant (Hair et al., 2011). P-value is the quantitative measure in terms of numerical importance in the analysis of a hypothesis. According to Ifinedo (2011), a P-value < 0.05 indicates a relationship's significance between variables. Table 7 shows the summaries of the results of the t-value and P-value and the results for each hypothesis. Based on these results, we conclude that all the hypotheses are accepted.

Table 7. Summaries of the Results

Hypothesis	T-Value*	P-Value**	Results
H1: The usefulness of the MAI -> Decision-making	9.897	0.001	Accepted
H1a: The usefulness of the MAI characteristic of broad scope -> Decision-making	2.005	0.045	Accepted
H1b: The usefulness of the MAI characteristic of timeliness -> Decision-making	2.12	0.034	Accepted
H1c: The usefulness of the MAI characteristic of aggregation -> Decision-making	2.454	0.014	Accepted
H1d: The usefulness of the MAI characteristic of integration -> Decision-making	2.878	0.004	Accepted
H2: Moderating effect cloud computing -> MAI and Decision-making	2.674	0.008	Accepted

*T-value >1.96= significant; **P-value < 0.05= significant.*

Source: Compiled by the authors

5.3 Results and Discussion. The first goal of this study is to examine the effect of management accounting information on decision-making. The discussion below focuses on the results of hypothesis testing.

H1: There is a positive relationship between the usefulness of MAI and decision-making.

The findings of the study revealed a significant relationship between the usefulness of MAI and decision-making (b=0.626, t=9.897, p<0.05). Therefore, this finding is similar to the results of past studies (Akbar, 2010; Bakar, 2001; Fitsum, 2014; Lim, 2011; Mia & Patiar, 2001). MAI is an essential element in helping modern organizations, particularly the managers in decision-making in SMEs in Pakistan. SME companies perceive that MAI is useful in improving the decision-making processes in a competitive condition by helping them to make sound decisions based on the information provided. Nevertheless, these companies perceived that for them to maintain their effectiveness and competitiveness, more information is needed.

H1a: There is a positive relationship between the usefulness of the MAI characteristic of broad scope and decision-making.

The study results indicated a significant relationship between the MAI characteristic of usefulness in broad scope and decision-making (b=0.179, t=2.005, p<0.05). Therefore, the finding supports the previous studies that reported the influence of broad scope MAI on decision-making (Chenhall & Morris, 1986; Chong, 1996; Mia & Chenhall, 1994). That MAI characteristic of a wide range is perceived as one of the useful MAI characteristics in organizations, which provides financial and non-financial information of an organization's internal and external environments. The surveyed SMEs perceived that the MAI characteristic of broad scope helps managers obtain greater information about their competitors and future events. Also, they confirmed the desire of decision-makers in their organizations for broad information that provides them with useful information related to their decisions area.

H1b: There is a positive relationship between the usefulness of the MAI characteristic of timeliness and decision-making.

The study results showed that the relationship between the usefulness of the MAI characteristic of timeliness and decision-making (b=0.198, t=2.12, p<0.05) is significant. Therefore, this finding is consistent with the results of earlier studies (Bakar, 2001; Chenhall & Morris, 1986; Fitsum, 2014; Haedr, 2012). The MAI characteristic of timeliness is about how fast and often the reporting is, and the information is furnished when asked. Hence, allowing the SMEs to respond expeditiously and make effective decisions soonest possible. From the findings, we conclude that SME companies perceive more frequent or timely information as necessary to organization success. Specifically, SMEs' managers prefer up-to-date information. It is seen as information presented upon request, more frequent, shows current scenario and responds fast to their decisions. In short, the usefulness of the MAI characteristic of timeliness is perceived by SMEs companies to be valuable to support their decisions.

H1c: There is a positive relationship between the usefulness of the MAI characteristic of aggregation and decision-making.

The study results show a significant relationship between the usefulness of the MAI characteristic of aggregation and decision-making (b=0.244, t=2.454, p<0.05). This finding is similar to studies reported in the literature (Bakar, 2001; Fitsum, 2014; Lederer & Smith Jr, 1988; Odar et al., 2015). The MAI characteristic of aggregation involves summarising information across different periods and departments, allowing decision-makers to believe in more alternatives in making optimal decisions for SMEs in Pakistan. The findings inveterate SME companies depend on the aggregated MAI to obtain information related to functional activities from other departments within the organization. Furthermore, the aggregated MAI is seen to be more useful by SMEs' managers from different functional level to assist them in their daily operations as well as in making decisions for the benefit of their organizations.

H1d: There is a positive relationship between the usefulness of the MAI characteristic of integration and decision-making.

The study results indicate a significant relationship between the usefulness of the MAI characteristic of integration and decision-making (b=0.296, t=2.878, p<0.05). This finding is similar to previous studies (Bakar, 2001; Chenhall & Morris, 1986; Fitsum, 2014; Ghasemi et al., 2016; Odar et al., 2015), in that the MAI characteristic of addition is perceived as being the most central dimension among all four MAI dimensions in SMEs in Pakistan. Integration refers to the various departments' interdependence and coordination in the sharing of information throughout the organization. The findings confirmed that SMEs perceived integrated MAI to be valuable by allowing information sharing among each department and sub-units. SMEs' managers see integrated MAI as necessary in coordinating departments or sub-units to obtain beneficial information related to their decisions. The second goal of this study is to examine the moderating effect of cloud computing in the association between management accounting information and decision-making.

H2: Cloud computing moderates the relationship between MAI and decision-making.

The study's results indicate that cloud computing moderates the relationship between MAI and decision-making (b=-0.111, t=2.674, p<0.05). The analysis results revealed that cloud computing strengthens the relationship between MAI and decision-making in SMEs in Pakistan. Therefore, the result is similar to the studies examining the role of cloud computing in improving the access and share of information in real-time, and increasing the volume, speed, and capacity of data handling to enhance the timeliness and quality of decision-making in the organization, particularly in SMEs. For example, Quinn et al. (2014) pointed out that cloud computing allows new methods for SME managers to obtain decision-making information. Cloud computing allows managers to access information whenever they require it through smart devices (tablet or Smartphone) at a relatively low cost. Marand, Marand, and Dashtebayaz (2013) stated that cloud computing plays a vital role in delivering decision-making information by enhanced information accessibility, data analysis, providing continuous auditing, and information storage.

Mia and Winata (2008) argued that the utilization of MAI by managers for decision-making has a positive relationship with cloud computing through the increase in the capacity of managers to straight away real-time access information, hence facilitating faster and effective decision-making. From the findings, we conclude that cloud computing plays a vital role in SMEs in Pakistan through its role in the flow of information and access to basic and up-to-date information that enhances the speed and quality of decision-making. In addition, it improves business competitiveness for SMEs by reducing the cost load associated with the adoption of modern information technology and by being able to focus more on the business. Based on the findings, SMEs in Pakistan should give attention to cloud computing to improve the access and share of the information used for decision-making in their organizations. The results of this study provide signals on the extent of technology

utilization among SMEs in Pakistan. Thus, the Pakistani government should create more awareness about cloud computing to increase the level of cloud computing adoption among SMEs.

6. Conclusion

This study's main contribution is providing practical verifications on the influence of MAI on decision-making and cloud computing role in Pakistani SMEs. Also, this study used RBV theory in MAI to explain MAI as a resource and cloud computing to gain a competitive advantage. Moreover, the findings of this study contribute by helping the organizations recognize the importance of MAI in managerial tasks and how they could rely on a selection of information characteristics in the context of their business environment. Thus, this would ensure the competitiveness of the company in the marketplace. In addition, the findings on the role of cloud computing may enhance the understanding of SMEs' managers on the importance of cloud computing to improve decision-making in light of the competition in SMEs. Thus, the findings of this study can determine the effectiveness of the Pakistani government's policies as well as the direction sets for the SMEs, in general, and cloud computing, in particular. This study has several constraints. First, this study takes only SMEs in Pakistan as its samples. Thus, the findings could not be applied to large businesses or other countries' SMEs. Consequently, future studies may replicate this study on large companies in Pakistan or other economies (developed or developing economies). Second, this study is confined to some geographical regions of Pakistan. For future research, other locations in Pakistan may be used as the scope of the study. Third, this study suffers from a comparatively low response rate for its questionnaire survey due to the sensitivity and confidentiality of data required, and cloud computing is a new technology among SMEs in Pakistan. For future research, a combination of self-administered and mailed questionnaires may be used to reach more respondents. Lastly, the current study adopted a survey questionnaire for data collection. A possible future research opportunity is to use in-depth interviews and case studies as the data collection method to recognize the issue in-depth.

7. Limitation and Future Direction

Several previous studies addressed cloud computing from different aspects. The study is conducted to find the magnitude of cloud computing in information technology in the contemporary establishment and its role in the flow of information and access to basic and up-to-date information for small enterprises. The study captures academia and contributes to the small enterprises working in the development sector within the third-world state. The paper gives direction to the researcher to fill the gap in small enterprises and multinational companies, which can interline the information management system on larger scale. Future work concerns the deeper analysis of particular mechanisms, new proposals to try different methods, and research areas. The sample sizes are typically smaller in qualitative research because, as the study goes on, acquiring more data does not necessarily lead to more information and the sample size was limited to 384 and surveyed only Pakistan and data explicitly collected from small enterprises.

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