

Investigating the Maturity Level of Computer-Based Accounting Systems in Small and Medium-Sized Enterprises: Empirical Evidence in Indonesia

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Abstract

This study aims to provide empirical evidence of the maturity level of computer-based accounting systems adopted by small and medium enterprises (SMEs) in Semarang – Indonesia. This study is motivated by the limited research on antecedents' adoption of computer-based accounting systems in SMEs. A survey of 120 SMEs in the city of Semarang through the questionnaires is conducted. Data further is analyzed using the correlation test. The results show the maturity level of the SMEs accounting system at the third level (defined) have been determined, but are not yet optimal. Key maturity activities are significantly related to planning and organization, business process management, risk management, and problem management, as well as system standardization and measurement. The results of this study contribute to the government to create a strategy to strengthen adoption by strengthening the SMEs system maturity.

Keywords: maturity level of the system; small and medium enterprise; computer-based accounting system.

1. Introduction

In recent years, the development of information technology (IT) has significantly changed the business (Elliott, 1992) and makes it gains a competitive advantage (Porter & Millar, 1985). Therefore, various business entities have used IT as a resource to increase productivity, product quality, and service satisfaction and create confidence for consumers as well as making relevant decisions (Matrane, Talea, & Okar, 2015). IT has influenced no exception in the form and substance of business, but also the recording techniques in accounting (Ardiansah, 2011). The accounting system is needed to capture not only financial but also non-financial data to support more relevant financial information (Brecht & Martin, 1996). The accounting system must be able to produce reliable, accurate, and timely information that is relevant to making a decision (Ismail, Abdullah, & Tayib, 2003).

Small and medium enterprise (SME) has adopted a computer-based accounting system (CBAS) model because it is considered important and determines the survival and success of the business (Louadi, 2009). SME also needs to increase the competitiveness of prices and product quality to compete with large companies (Ardiansah, 2011). Furthermore, SME has experienced a high failure rate (Ballantine, Levy, & Powell, 1998), because of their inability to influence market prices by changing output levels (Storey & Cressy, 1996). SME has a small market share, relying heavily on a small number of customers (Storey & Cressy, 1996). Thus, to be able to compete successfully, SME should have an information system that will make it possible to prepare reports more timely and informed about business decisions (Ismail et al., 2003).

The urgency and existence of SME in the developing country

have received great attention in the number of literature. SME plays an important role because of its significant contributions to fulfilling employment and income distribution in many countries (Ardiansah, 2011; Seyal, Rahim, & Rahman, 2000). Moreover, the important contribution of SME in the Indonesian economy as a developing country, it was clear, among others that the number of 52.4 million business units absorbed 67% of the workforce with a contribution to gross domestic product (GDP) of 63.5% and a contribution to total exports of 18.4% (Badan Pusat Statistik, 2017).

A number of studies have been conducted to identify factors that influence the level of IT use among SMEs (e.g., DeLone, 1981; Raymond, 1985; Montazemi, 1988; Davis, 1989; Lees, 1987; DeLone & McLean, 2004; Kartiwi, Hussin, Suhaimi, Mohamed Jalaldeen, & Amin, 2018). Some of these identified factors have an influence on the IT maturity adoption among SMEs, for example, organizational characteristics such as size and business age, managerial characteristics, employee IT knowledge, consultant support, government support, information intensity, and external pressure. This makes the IT maturity model factor in SME interesting for further.

Most of the studies on IT implementation in SME focus on the use and application of IT in business organizations. Several studies have attempted to identify the use of IT accounting systems in SME specifically, but are very limited for studies. These findings do not examine the relationship between indicators of adoption and IT used in the accounting system and the factors that influence its use (e.g., Ismail et al., 2003; Popovič, Puklavec, & Oliveira, 2019). Therefore, this study aims to provide empirical evidence of the computer-based accounting systems (CBAS) maturity model for SMEs in Indonesia,

especially in Semarang city. Some research questions that can be developed include: how is the identification and level of adoption of CBAS between SMEs and the maturity level of CBAS taken between SMEs. The results of this study will serve as important indicators for the readiness of SMEs.

2. Review of Literature

2.1. The Role and Existence of Small and Medium Enterprises (SME)

SMEs are business units managed by community groups and families. Data published by the Ministry of Cooperatives and SMEs show that the number of SMEs at the end of 2016 is 58.2 million units and continues to increase. Absorption of labor can reach 97.04% of the total employment in Indonesia. The development of SMEs in Central Java with the number of SMEs at the end of 2016 is 80,853 units.

SME has a strategic role in developing all business, but quite complex problems constrain it. SME in Indonesia carries out its business activities using traditional methods. On the other hand, companies compete through the use of sophisticated IT technology to win the competition. IT also plays an important role in quality economic decision making (Haryani, 2012). Small business managers and cooperatives stated that they did not have accounting knowledge, and many of them did not understand the importance of recording and bookkeeping for business continuity. Small entrepreneurs see that the accounting process is not too important to apply. The same goes for SME in Semarang, where, in reality, most SMEs have not organized and used accounting in managing their businesses (Achjari, Abdillah, Suryaningsum, & Suratman, 2011).

2.2. The Need for Computer-Based Accounting Systems (CBAS) for SMEs

SMEs, as other profit organizations, are expected to strive to achieve profitability through the value of product or service quality competitiveness. According to the globalization of trade, investment, and dynamic technology, SME is forced to prepare facing competition (Matrane et al., 2015). Therefore, it is possible if financial resources and the use of technology are relevant, among other factors, available and adequate, cost-effective, and properly used (Louadi, 2009). In recent market competition, SME needs to recognize that IT has the potential to increase productivity, quality, and performance that are important for their survival and success. SME also needs non-financial information, such as price changes, market trends, and customer behavior to survive and grow (Chenhall & Morris, 1986).

Apart from various government programs and incentives, including the application of technology and competence in human resources building, the effectiveness of IT adoption among SME is still an issue of great concern to the government. The studies of Adams et al. (2011), Ismail et al. (2003), Rahayu & Day (2015), for example, found that IT adoption among SME was only 51%, which used computers for accounting and financial purposes. Ingirige, Bingunath, Wedawatta (2018) found that over 86% of small companies established in the UK had a computerized accounting system.

The slow adoption rate is an important issue because SMEs make up the majority of manufacturing in Indonesia as a developing country. One possible explanation for the low adoption rate is the alarming attention of most SME owners to IT (Turner & Endres, 2017) because their technical understanding is relatively low (Zhou, 2016), or they are not aware of incentives offered by institutions.

The progress of IT has created a new generation of computerized accounting outside the high-end system, namely, ERP (enterprise resource planning). ERP system is an integrated software package designed to provide complete

integration of business system organizations to processing information and all related data (Rodríguez-Ardura & Meseguer-Artola, 2010). ERP systems will further strengthen the company's strategic position with the availability of information that can support management decision-making processes. Despite the availability of several fully integrated software empirical evidence so far, however, it reveals that SME tends to use computers primarily to support operational or administrative tasks, not to make strategic decisions (Maguire, Koh, & Magrys, 2007; Rahayu & Day, 2015). Among the popular software modules used by SME are basic accounting modules such as ledgers, accounts payable, accounts receivable, and payroll. The findings show that SME has not fully used the available technology offered by the latest accounting software systems to produce strategic information.

2.3. Adoption and Maturity of CBAS Research

CBAS is classified into two main categories, namely low-end and high-end systems. The characteristics that distinguish are the ease and speed of information. Information is taken from the accounting database, the quantity of information that can be stored in the database, the intensity of use, and ease of modification and customization (Grover & Kar, 2017). Moreover, it found the main aspects of the company to determine the extent of IT used in accounting, which includes the level of computerization, the type of IT-based systems used, the type of IT applied, workstations to staff, and years of using IT. Result by Mohd Sam, Hoshino, & Hayati Tahir (2012) shows that more than 94% of these companies are fully or most of their computerized accounting systems, while 50% have at least some IT applications integrated into accounting. They also found that the level of computerization was greater in large companies than small and medium-sized companies.

The finding of Powell (1996) confirmed the other previous studies, which argued that the size of the company as a determinant of the level of sophistication (e.g., DeLone, 1981; Lees, 1987; Thong & Yap, 1995). A study by Hunton & Beeler (1997) found that firm size is significantly negatively correlated, even though weakly, with the level of IT used in accounting. They suggest that differences may be caused by lower capital and risk barrier (Azam & Quaddus, 2009) due to dramatic decreases in IT costs. Companies of all sizes can benefit from the latest IT development. Another possible explanation is that midsize companies may have developed from small companies. Otherwise, their managers may have limited capabilities, namely time and education, to appreciate the benefits of using an integrated accounting system. Powell (1996) subsequently found that 80% of companies were almost or fully satisfied with their IT-based accounting system. Nearly 90% stated that their IT application objectives were fully or almost satisfied. The confirmed findings were found by Shahrums et al. (1996). In another related study, research by Duschinsky & Dunn (1998) in established small companies in the UK shows that 86% of companies have a computerized accounting system. The same percentage of companies use IT for invoices; 73% for management reporting; 66% for payroll and 58% percent for marketing.

However, another research conducted by Chen (1993) offers results in different directions. They found that only 55% of small-scale enterprises or agricultural handicrafts located in rural areas in East England had used microcomputer systems. This evidence could indicate that geographical location and type of business sector might have a significant impact on the use of IT among SMEs. Besides, the decrease in computer hardware and software costs, availability and ease of use of computers, and better software packages could cause an increase in the number of computer accounting installations in smaller and medium-sized organizations (James Y.L. Thong, 1999).

Evidence about the use of IT among SMEs is still inconsistent. Even small businesses in the same country do not show a similar pattern of adoption. This is because SME is not

regulated and the need for timely financial reporting. It has pressing compared to large companies too that IT adoption depends on the type of business and IT management awareness and its benefits. In addition, the nature of the business becomes less complex. SME shows a greater tendency to buy commercial accounting packages. That is much cheaper than internal and external packages tailored to the needs (Gray, 1991). Turner & Endres (2017) was confirmed this finding among Indonesian SMEs. Generally, SME is experienced in running their business, but lack knowledge in information systems. Therefore, most SME always turns to external experts to help. Unfortunately, external experts may have very little understanding of the nature of the company and business. Thong & Yap (1995) propose a concerted effort to enhance cooperation between SME and external expertise to help SME to obtain technology transfer. Matrane et al. (2015) revealed that IT adoption maturity, in this case, the CBAS concept was determined by (1) business management, (2) risk management, (3) operations management, (4) incident management, and (5) problem management in implementing IT adoption. This determination will be described in indicators of achievement of maturity. That will place each SME in the group at the level of implementation, development, and capability in developing a better business strategy.

The structure of maturity model is built upon the following dimensions (Matrane et al., 2015), i.e., *Level 1 (initial)*: there is no process area; *Level 2 (defined)*: implementation processes are documented, standardized, and integrated into a standard implementation process for the organization; and *Level 3 (managed)*: Process and activities are controlled and managed based on quantitative models and tools. A maturity model for information systems gives the possibility for managers of organizations to see where it stands and how it can improve the information system. Thus, it provides a methodology for an organization to develop an improvement roadmap to its information system. The new maturity model for information security management is composed of five distinct phases that encompass historical practices and future aspirations (Matrane, Talea, & Okar, 2014). It is further called a five management (5M) of information security.

1. *Level 1: Business Management*

This is to synthesize the key objectives and resources that must be protected to achieve them. This allows us to integrate the security into all the processes and structures and to support external requirements (regulatory compliance) and internal (business lines, policies).

2. *Level 2: Risks Management*

This is to quantify the actual level of risk and bring closure to the acceptable level by the company. This helps to identify, order risk, and control projects to reduce risk.

3. *Level 3: Operations Management*

This is to evaluate the daily running of security operations and their ability to provide an optimum ratio cost / security. This aligns processes and controls policies to reduce the rate of conversion of risk in incidents.

4. *Level 4: Incidents Management*

This is to assess the ability of the company to respond to security incidents to ensure that the level of risk tolerance is never exceeded. This allows detecting, analyzing, processing, and communicating security events to minimize the effects and costs of resolution. It is vital to be able to detect and analyze very quickly for taking appropriate measures to limit its impact.

5. *Level 5: Problems Management*

A 'Problem' is the unknown cause of one or more incidents, often identified as a result of multiple similar incidents. The objective of Problem Management is to minimize the impact of problems of security on the organization. Problem Management plays an important role in the detection and providing solutions to problems (workarounds & known errors) and prevents their recurrence.

3. Research Methodology

3.1. Population and Sample

The population of this study was SMEs in the Semarang city, which were identified as using IT in their business in the amount of 608 data. The procedure for determining the sample was carried out with purpose random sampling. The sampling used by choosing the managers of SMEs that are registered in the data of the economic census of the Badan Pusat Statistik in 2015 with a turnover reaching to scales of 120 small companies scattered in the city of Semarang, especially for the financial and service industries. The financial services sector is considered information sensitive, and it is expected to provide the widest use of IT because of the presence of all major business functions (Raymond & Magnenat-Thalmann, 1982).

3.2. Instruments and Data Collection

The developed questionnaire was divided into three main parts. The first part, which is in the general background, includes company background and ownership, legal status, type of industry, year established, number of employees, and total income for the previous fiscal year. The second part investigates the adoption and extent of CBAS used. Five IT adoption maturity instruments were taken from Matrane et al. (2015):

1. *Business management*, including indicators of the definition of business objectives, the level of business risk, and important business resources;
2. *Risk management*, including indicators of understanding internal and external barriers, identification of fraud, and the classification of resources with high values;
3. *Operations management*, including priority work indicators based on risk, increased awareness of security, the need for supervision and ratification of the system;
4. *Incident management*, including indicators of identification of events, priorities for business impacts, and reporting on business managers;
5. *Problem management*, including indicators of neglect of incidents that have occurred, minimizing the impact of the problem, initiating events that might be repeated.

Primary data in the form of questionnaires are submitted to SMEs by mailing and direct filling to increase the rate of return. Mailing questionnaires are returned within a certain date to be processed and analyzed.

3.3. Data Analysis

Respondents measured the third part of the perception of the quality of the computerized accounting system adopted in connection with the content, accuracy, format, and timeliness. This dimension will provide evidence of the extent to which the output of CBAS is considered useful for the end-user. In this study, end-users are leaders of sample SME who use the output of accounting systems to make business decisions. Responses to grains were recorded on a five-point Likert scale. The test begins with a non-response bias test to determine the difference in the respondent's answers before and after the date of the questionnaire return limit. Testing the level of adoption of CBAS for five instruments uses Spearman Correlation for alpha 5%, with higher values indicating high intensity.

4. Results

The SMEs of Semarang city was identified as a research sample of 120 companies, which are engaged in the financial and service industries. The unit of analysis that is the respondent is SME leaders or managers who use the output of the accounting system to make business decisions. The submission of questionnaires is made directly to respondents to ensure a high rate of return. When the collection deadline is set, the

questionnaire collected is 98 copies, with a response rate of 81.67%. In addition, there are no questionnaires returned after the set time, so there was no need for a non-response bias test. The description of the respondent's answers is presented in the following table.

Variable	Value Description Maturity			
	Minimal	Maximal	Average	Standard Deviation
PO 1	1.00	4.00	3.08	0.176
PO 2	2.00	4.00	3.34	0.059
PO 3	2.00	4.00	3.39	0.056
PO 4	2.00	4.00	3.43	0.061
ME 1	1.00	4.00	3.04	0.181
ME 2	2.00	4.00	3.39	0.256
ME 3	2.00	4.00	3.39	0.156
BM	2.00	4.00	3.39	0.167
RM	1.00	4.00	3.04	0.057
OM	2.00	4.00	3.42	0.390
IM	1.00	5.00	3.34	0.170
PM	2.00	4.00	3.47	0.055
SI	2.00	4.00	3.46	0.157
SZ	2.00	4.00	3.63	0.256
CO	2.00	5.00	3.64	0.050
CI	2.00	4.00	3.31	0.152

Table 1. Description of Respondents

Based on the findings, it can be described: first, the minimum limit is one in four variables (PO1, ME1, RM, IM) that indicate there is no activity to develop determined innovations. The minimum limit mode is two, which indicates that some documents support activities to develop determined innovations that are routines operational. Second, the maximum limit is five in two variables (IM, CO) indicate there are documents, processes, and development activities that are very well managed, widely known and implemented as good practices and implementation

constraints are managed well. Minimum limit mode is four different conditions (PO1, ME1, RM, IM) with a value of five in conditions not widely known and implemented well and routinely. The three average values range more than 3 (RM, PM, CO) with a standard deviation of less than 0.6, which indicates a relatively low limit so that the condition of maturity shows: there are documents, processes, and development activities that are very well managed. The condition is widely known and implemented as good practices, but there are still implementation constraints that need to be managed properly.

Subsequent findings related to the computerized quality of accounting systems were adopted in connection with the content, accuracy, format, and timeliness of the conditions of SME system maturity. This dimension will provide evidence of the extent to which the output of CBAS is considered useful for the end-user. Testing on the dimensions of CBAS on the condition of SME system maturity, with correlation showing the following results (Table 2).

Based on Table 2 with the Spearman Correlation method, it shows that: first, there are several variables of the level of adoption of CBAS which correlate above 0.60 with the CBAS maturity variables including variables: planning and organization (PO = 0.609), business management (MB = 0.627), risk management (MR = 0.806), problem management (MM = 867), standardization (ST = 0.668) and measurement (UK = 0.770); second, a correlation of more than 0.6 at a significance of 0.05 indicates a high perceptual relationship between the CBAS adoption level variable to the CBAS maturity dimension; third, the highest correlation of the CBAS adoption level variable to the CBAS maturity dimension is reflected in the problem management variable (0.806). This shows that the very high maturity dimension of CBAS is related to problem management perceived and faced by SME.

Variable	PO	ME	BM	RM	PM	IM	MM	ST	SZ	CO	CI	MS
PO	1.000	0.305	0.466	0.305	0.712	0.492	0.657	0.241	0.223	0.398	0.756	0.609
ME		1.000	-0.50	0.246	0.674	0.304	0.876	0.641	0.871	0.451	0.431	0.348
BM			1.000	0.291	-0.38	0.691	-0.57	0.539	0.761	0.765	0.566	0.627
RM				1.000	0.447	0.591	0.991	0.601	0.545	0.551	0.811	0.806
PM					1.000	0.871	0.765	0.403	0.076	0.546	0.762	0.402
IM						1.000	0.657	0.567	0.362	0.771	0.234	0.505
MM							1.000	0.387	0.221	0.547	0.761	0.867
TS								1.000	0.341	0.331	0.541	0.668
SZ									1.000	0.268	0.165	0.770
CO										1.000	0.817	0.520
CI											1.000	0.230
MS												1.000

Notes:

PO: planning and organization, ME: monitoring and evaluation, BM: business management, RM: risk management, PM: operational management, MI: incident management, MM: problem management, ST: standardization, SZ: size, CI: continuous development, MS: CBAS system maturity

Table 2. Correlation of System and Dimension of CBAS

5. Discussion

CBAS maturity level in Semarang shows the condition on the third level. That means CBAS has documents, processes, and development activities that are well managed, widely known, and implemented. As good practices, there are still implementation constraints that need to be managed properly. This condition is supported by further findings that some conditions of CBAS adoption are highly correlated with the CBAS maturity level. Constraints still need to be controlled at maturity level 3. The condition showed that of system planning and organization towards business, business management patterns, concern for risk management in information technology-based business is a great concern for CBAS maturity level (Matrane et al., 2014).

The CBAS adoption rate of SMEs shows that it is influenced by some indicators include business planning and organization, business management patterns, concern for risk management in information technology-based business, management processes for business problems, standardization of documentation

and reporting, and measurement of business data. High relationships in planning and organization are not followed by a monitoring and evaluation (ME) process and high operational management (MO), which SME suspicion do not prioritize. A presumption notes that SMEs in running a business lacks knowledge in information systems, especially their operational processes. Therefore, most SME always turns to external experts to help implement CBAS. Unfortunately, external experts may have very little understanding of the nature of the company's business. Thong, Yap, & Raman (1996) propose a concerted effort to enhance cooperation between SME and external expertise to help SME to obtain technology transfer.

These findings alter the result of Matrane et al. (2015) that IT adoption maturity, in this case, the CBAS concept was determined by (1) business management, (2) risk management, (3) operations management, (4) incident management, and (5) problem management in implementing IT adoption. These findings focus on security management, business management, risk management, and problem management. The determinant

show is high variables related to the maturity level of CBAS. SME is aware of the need and importance of the security level of CBAS in the business being run.

The development of CBAS adoption for SMEs is directed, not only to use systems and information technology but to manage better and control business-based management planning and organizing good resources, business management based on business risk management and handling good business problems and data standards consistent business base. This supports the findings of Honig (1999) that CBAS is not only about the ease and speed of information taken from the accounting database. The information quantity can be stored in the database, the intensity of use, and ease of modification and customization (Spivak, W., & Honig, 1997) but also patterned as a corporate resource-planning (ERP) model. An ERP system is an integrated software package designed to provide complete integration of business system organizations to processing information and all related data (Venkatraman & Fahd, 2016).

6. Conclusion

This study concludes that the maturity level of the SMEs accounting system at the third level (defined) have been determined, but are not yet optimal. Key maturity activities are significantly related to planning and organization, business process management, risk management, and problem management, as well as system standardization and measurement.

Some suggestions for SMEs in the Semarang city to develop the accounting systems include: (1) paying attention to important indicators for the readiness of SME to face future challenges by adopting IT, which can accelerate the preparation of timely financial reports, namely: planning and organization, business management, risk management, problem management, standardization and measurement of business database; and (2) paying more attention to the obstacles faced in the intensity of the use of information and communication technology in the development of CBAS.

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