**MATURITY LEVEL ON COMPUTER-BASED ACCOUNTING SYSTEMS: THE CASE OF INDONESIAN SMALL MEDIUM ENTERPRISES**

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**Abstract**

This study aims to provide the empirical facts of the maturity level of computer-based accounting systems adopted by small and medium enterprises (SME’S's) in Indonesia. This study was motivated by the limited research on antecedent's adoption of computer-based accounting systems in SME’S’s. A survey conducted in Semarang SME’Ss through a questionnaire, which was analyzed by a correlation test. The results show the maturity level of the SME’S accounting system at the third level (defined), which means that the accounting system development activities have been determined but are not yet optimal. Key maturity activities that are significantly related are 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 SME’S system maturity.

**Keywords:** *The maturity level of the system, SME’S's, computer-based accounting system, level of adoption*

**INTRODUCTION**

Recently, the development of information technology (IT) has significantly changed the business (Elliott, 1992) and make it a competitive advantage (Porter & Millar, 1985). Therefore, various business entities have used IT as a resource to increase productivity, product quality, 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).

SME’Ss have adopted a computer-based accounting system (CBAS) model because it is considered essential and determines the survival and success of the business (Louadi, 2009). SME’S’s also need to increase the competitiveness of prices and product quality to compete with large companies (Ardiansah, 2011). Furthermore, SME’S’s 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’S’s has a small market share, relying heavily on a small number of customers (Storey & Cressy, 1996). Thus, to be able to compete successfully, SME’S’s needs to have an information system that will make it possible to prepare reports when more timely and informed about business decisions (Ismail et al., 2003).

The urgency and existence of SME’S in the developing country's economic development have received considerable attention in the number of literatures. SME’S’s lead an essential role because of their significant contributions fulfilling employment and income distribution in many countries (Ardiansah, 2011; Seyal, Rahim, & Rahman, 2000; Wijewardana, 2018). Moreover, the critical contribution of SME’S’s 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% (BPS, 2018)

Several studies conducted to identify factors that influence the level of IT use among SME’S's (e.g. Davis, Bagozzi, & Warshaw, 1989; DeLone & McLean, 1992; DeLone, 1981; Gatautis & Neverauskas, 2005; Hakim & Nurkamid, 2017; Lees, 1987; Montazemi, 1988; Oswari, Suhendra, & Harmoni, 2008; Poorangi, Khin, Nikoonejad, & Kardevani, 2013; Raymond, 1985; Shahrum et al., 1996; Widjaja & Matitaputty, 2018). Some of the identified factors have an influence on the IT maturity's adoption among SME’S, for example, organizational characteristics such as size and business age, managerial aspects, employee knowledge, consultant support, government support, information intensity, and external pressure (Oswari, Suhendra, & Harmoni, 2008; Widjaja & Matitaputty, 2018). These aspects make the IT maturity model factor in SME’S exciting for further.

Most of the studies on IT implementation in SME’S’s focus on the use and application of IT in business organizations. Several studies have attempted to identify the purpose of IT accounting systems in SME’S’s correctly, 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., Daniel & Wilson, 2002; Duschinsky & Dunn, 1998; King & He, 2006; Noor Azizi & Malcolm, 2007). This study aims to provide empirical evidence of the CBAS maturity model for Indonesian SME’S’s, especially in Semarang city, a mixture of urban and rural areas. Some research questions that can develop include how the identification and level of adoption of CBAS between SME’S’s and the maturity level of CBAS is taken between SME’S’s. The results of this study will serve as important indicators for the readiness of SME’S’s. The future challenges by IT are adopting, which can accelerate the preparation of timely financial reports and contributions to the design of comprehensive computerized accounting systems.

**LITERATURE REVIEW**

SME’S’s are business units managed by community groups and families. Data published by the Ministry of Cooperatives and SME’S's show that the number of SME’S’s at the end of 2016 was 58.2 million units and continues to increase. Absorption of labour can reach 97.04% of the total employment in Indonesia. The development of SME’S’s in Central Java with the number of SME’S’s at the end of 2016 was 80,853 units (BPS, 2018).

SME’S’s has a strategic role in developing all business, but it had constrained by some complex problems (Sarosa, 2012). Indonesian SME’S’s carry out their 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 essential 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 (Al-Fahim, Wan Jusoh, & Abideen, 2016). Small entrepreneurs see that the accounting process is not too necessary to apply. The same goes for this, where be in reality, most SME’Ss in the Semarang have not organized and used accounting in managing their businesses (Li, 2008; Tambunan, 2009; Widyaningdyah, 2014).

SME’S’s, 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, it forces SME’S’s to prepare facing competition in the future (Matrane et al., 2015). Therefore, it's possible if financial resources and the use of technology are relevant, among other factors, available and adequate, cost-effective, and use properly (Louadi, 2009). In recent market competition, SME’S’s needs to recognize that IT has the potential to increase productivity, quality, and performance - areas that are important for their survival and success. SME’S’s also need non-financial information, such as price changes, market trends, and customer behavior to survive and grow (Chenhall & Morris, 1986).

Various government programs and incentives actions, including the application of technology and competency in human resources building, has supported the development of SME’S’s. The adoption and effectiveness of IT adoption among SME’S’s is still an issue of great concern to the government. Ismail et al. (2003) and Shahrum et al. (1996) for example, found that IT adoption among SME’S was only fifty-one percent, which used computers for accounting and financial purposes. Duschinsky & Dunn (1998) found that 86% of small companies established in the U.K. had a computerized accounting system.

The slow adoption rate is an essential issue because SME’S's make up the majority of manufacturing in Indonesia as a developing country. One possible explanation for the low-level adoption is the lower attention of most SME’S’s owners about IT (Agwu & Murray, 2015). Understanding of IT technology could be relatively low (Alonso Mendo & Fitzgerald, 2005), or they are not aware of incentives offered by supporting institutions.

The progress of IT has created a new generation of computerized accounting outside the high-end system, namely, ERP (Enterprises Resource Planning). An ERP system is an integrated software package designed to provide complete integration of the business system for organizations processing and all related data (Awa, Ukoha, & Emecheta, 2016; Lai, Lai, & Lowry, 2016). 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’Ss tend to use computers primarily to support operational or administrative tasks, not to making strategic decisions (Chen, Windasari, & Pai, 2014; Daniel & Wilson, 2002; Debreceny, Gray, Jun-Jin Ng, Siow-Ping Lee, & Yau, 2005; Duschinsky & Dunn, 1998; Raymond & Magnenat-Thalmann, 1982; J.Y.L. Thong & Yap, 1995). Among the popular software modules used by SME’S are basic accounting modules such as ledgers, accounts payable, accounts receivable, and payroll. The findings show that SME’S has not fully utilized the available technology offered by the latest accounting software systems to produce strategic information.

CBAS 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 store in the database, the intensity of use, and ease of modification and customization (Spivak & Honig, 1997). Moreover, (Xiao, Dyson, & Powell, 1996) found the accounting system's central determining aspect is the level of computerization, the type of IT-based systems, the kind of IT applied, workstations to staff, and years of using IT. Other results showed that most UK companies have some IT applications integrated into the accounting system and other specifically a separate computerized accounting system (Chen & Williams, 1998). They also found that the level of computerization was higher in large companies than small and medium-sized companies.

The findings of Levy & Powell (1998) and Powell (1996) previously confirmed in other studies that argued that the size of the company as a determinant of the level of sophistication (e.g., DeLone, 1981; Lees, 1987; Thong, 1999). 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 barriers 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. Xiao et al., (1996) subsequently found that eighty percent of companies were almost or fully satisfied with their IT-based accounting system. Nearly ninety percent stated that their IT application objectives were entirely or almost satisfied. Shahrum et al. (1996) have confirmed the Xiao et al. (1996) findings. Another related study, Duschinsky & Dunn (1998) stated that almost 96% of established small companies in the U.K. have a computerized accounting system. Those companies use the system for invoices recording, managing the report, payroll, and marketing.

However, another research conducted by Chen & Williams (1998), offers results in different directions. They found that only fifty-five percent 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 SME’Ss. 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 (Thong, 1999).

Evidence about the use of IT among SME’S is still conflicting. Even small businesses in the same country do not show a similar pattern of adoption. This fact is because SME’S 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. Besides, the nature of the business becomes less complicated, SME’S shows a greater tendency to buy commercial accounting packages. That is much cheaper than internal and external packages tailored to the needs (Gray, 1991). Shahrum et al. (1996) then confirmed this finding among Indonesian SME’S. Generally, SME’S has experienced in leading their business, but lack the information systems knowledge. Therefore, most SME’S always turns to external experts to help. Unfortunately, external experts may have very little understanding of the nature of the company's business. Thong & Yap (1995) propose a concerted effort to enhance cooperation between SME’S and external expertise to help SME’S to obtain technology transfer. (Matrane et al., 2015) revealed findings 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 described in indicators of achievement of maturity. That will place each SME’S in the group at the level of implementation, development, and capability in developing a better business strategy (Matrane et al., 2015; Rajendran & Elangovan, 2012)

The structure of our maturity model is built upon the following four dimensions:

1) Maturity level dimension:

1. Level 1(initial): there is no process area, and a process is chaotic.
2. Level 2 (defined): is the level where implementation processes are documented, standardized, and integrated into a standard implementation process for the organization.
3. Level 3 (managed): Process and activities are controlled and managed based on quantitative models and tools.

2) Maturity Model for Information Security Management.

3) Maturity Model for Project Management.

4) Governance of Information System.

The maturity model for Information System gives the possibility for managers of organizations to see where it stands and how it can improve its 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. It is called the five management (5M) of information security.

1. Level 1: Business Management. This level is synthesizing the key objectives and resources that must be protected to achieve them. This level allows management to integrate the security into all the processes and structures and to support external requirements (regulatory compliance, and others) and internal (business lines, policies).
2. Level 2: Risks Management. This level is quantifying the actual level of risk and bringing closure to the acceptable level by the company. This level helps to identify, order risk, and control projects to reduce risk.
3. Level 3: Operations Management. This level is evaluating the daily running of security operations and their ability to provide an optimum ratio cost /security. This level aligns processes and controls policies to reduce the rate of conversion of risk in incidents.
4. Level 4: Incidents Management. This level is assessing the ability of the company to respond to security incidents to ensure that the level of risk tolerance is never exceeded. This level allows detecting, analysing, processing, and communicating security events to minimize the effects and costs of resolution. It is vital to be able to detect and analyse very quickly for taking appropriate measures to limit its impact.
5. Level 5 Problems Management. This level is the unknown cause of one or more incidents, often identified as a result of multiple similar events. The objective of Problem Management is to minimize the impact of problems of security on the organization. Problem Management plays a vital role in the detection and providing solutions to problems (workarounds & known errors) and prevents their reoccurrence.

**METHODS**

The population in this study was Small and Medium Enterprises in the Semarang, which identified as using IT in their business in the amount of 608 (data from the Semarang City Cooperative and SME’S Office). The procedure for determining the sample carried out with purpose random sampling. The sampling chose the managers of small and medium enterprises that registered in the economic census of the Central Bureau of Statistics in 2015, the reach of 120 small companies in the Semarang city, especially for the financial and service industries. The financial services sector is considered information sensitive (Chen et al., 2014), and so it is expected to provide the most comprehensive use of IT because of the presence of all primary business functions (Raymond & Thalmann, 1982).

The developed questionnaire divided into three main parts. The first part is in the general background of the company: 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 taken from (Matrane et al., 2015):

1. *Business management*, including indicators of the definition of business objectives, the level of business risk, and essential 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 managem*ent, including indicators of neglect of incidents that have occurred, minimizing the effects of the problem, initiating events that might be repeating.

The electronic questionnaire mail and a direct filling were submitting to the SME’S owner for getting a higher collecting rate. Mailing questionnaires are returned within a specific date to be processed and analyzed further. 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’S who use the output of accounting systems to make business decisions. Responses to grains 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. They are testing the level of adoption of CBAS for five instruments using Spearman Correlation for alpha 5%, with higher values ​​indicating high intensity.

**RESULTS AND DISCUSSION**

The SME’S of Semarang city 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’S leaders, or managers 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 setting, the questionnaire collected is 98 copies or with a response rate of 81.67%. No questionnaires returned after the arranged time, so there was no need for a non-response bias test. The description of the respondent's answers could be presented in the following table:

**Table 1**

**Descriptions of Respondents' Statistics**

| Indicators Variables | 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 |

Sources: primary data processing

Based on the table above, some findings can be described. First, the minimum limit is one in four variables (PO1, ME1, R.M., I.M.) that indicate conditions: there are no documents that support and there are no processes that show appropriate performance and no activity to develop determined innovations. The minimum limit mode is two, which indicates conditions. Some documents support or processes that show adequate performance, and there are activities to develop determined innovations that are routines operational. Second, the maximum limit is five in two variables (I.M., CO) that indicate conditions: there are documents, processes, and development activities that are well managed, widely known and implemented as good practices and implementation constraints are managed well. Minimum limit mode is four different conditions (PO1, ME1, R.M., I.M.) with a value of five in conditions not yet widely known and implemented well and routinely. The three average values range more than 3 (R.M., 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 situation 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 adopted in connection with the content, accuracy, format, and timeliness of the conditions of SME’S system maturity. This dimension will provide evidence of the extent to which the output of CBAS is considered useful for the end-user. Tests on the aspects of CBAS on the condition of SME’S system maturity, with correlation showing the following table results:

**Table 2**

**Correlation of System and Dimension of CBAS**

| Var | 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 |

Sources: primary data processing

Notes:

P.O.: planning and organization, ME: monitoring and evaluation, B.M.: business management, R.M.: risk management, PM: operational management, MI: incident management, MM: problem management, S.T.: standardization, S.Z.: size, CI: continuous development, MS: CBAS system maturity

Based on the table with the Spearman Rho method above, it shows several things; 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 (P.O. = 0.609), business management (MB = 0.627), risk management (MR = 0.806), problem management (MM = 867), standardization (S.T. = 0.668) and measurement (U.K. = 0.770); second, a correlation of more than 0.6 at a significance of 0.05 indicates a high perceptional 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). These facts show that the very high maturity dimension of CBAS is related to problem management perceived and faced by SME’S.

**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, but there are still implementation constraints that need to be adequately managed. This condition is supported by further findings that some conditions of CBAS adoption are highly correlated with the CBAS maturity level. Constraints that still need to be controlled at maturity level 3. The situation showed that of system planning and organization towards business, business management patterns, concern for risk management in information technology-based business is a severe concern for CBAS maturity level.

The results also show that some indicators influencing the CBAS adoption were: planning and organization, business patterns, risk management, business problems, standardization of documentation and reporting, and measurement of business data. It must be clearly defined for SME’S's classification. High relationships in planning and organization are not followed by a monitoring and evaluation (M.E.) process and high operational management (MO), which SME’S suspicion do not prioritize.

A presumption that SME’S in running a business lacks knowledge in information systems, especially their operational processes. Therefore, most SME’S 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 (1995) and Thong, Yap, & Raman, (1996) propose a concerted effort to enhance cooperation between SME’S and external expertise to help SME’S to obtain technology transfer.

These findings alter the results of the study Matrane, Talea, & Okar (2015) revealed findings 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. The determinants that our findings in this study focus on security management, which business management, risk management, and problem management. The determinant shows are high variables related to the maturity level of CBAS. SME’Ss are aware of the need for security and the importance of risk on CBAS while the business is running.

The development of CBAS adoption for SME’S in the Semarang directed not only to use systems and information technology but to better manage and control business-based management planning and organizing useful resources, business management based on business risk management, and handling functional business problems and data standards consistent business base. This fact supports the findings by 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 & 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 systems and processing information and all related data (Venkatraman & Fahd, 2016)

**CONCLUSIONS AND IMPLICATIONS**

Based on the description of the results above, it can be concluded that: (1) identification of the level of adoption of CBAS shows that SME’S in Semarang has adopted CBAS sufficiently, evidenced by the minimum 1 (existing) maturity level that indicates that there is an activity for development CBAS although it is still documentative and not optimal, (2) The maturity level of CBAS is taken between SME’S on an average level 3 (defined) which shows that the processes and activities have been documented, development has been carried out but there are still obstacles that need to be adequately managed and (3) Key maturity activities that are significantly related to CBAS adoption level are planning and organization, business management, risk management, problem management, standardization, and measurement.

Some suggestions for Semarang SME’Ss are: first, it needs more attention for the readiness adopting of SME’Ss in future challenges. That condition accelerates the adopting preparation, which divides into planning and organization, business management, risk management, problem management, standardization, and measurement of a business database. Semarang Cooperative and SME’S Office need more massive programs and incentives to the obstacles faced in the use of information and communication technology in the development of CBAS.

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