

## UTILIZATION OF SAAS (SOFTWARE AS A SERVICE) CLOUD COMPUTING ON FINANCIAL MANAGEMENT APPLICATIONS SMES IN KUDUS DISTRICT

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### ABSTRACT

*Micro, Small and Medium Enterprises (SMEs) have a strategic role in the economic development of Indonesia. Kudus is one of district in indonesia that the area of industry and commerce are able to absorb a lot of labor and contributed greatly to the GDP (Gross Domestic Product). Kudus regency have many SMEs with a concentration different business sectors with the number reaching 10 954 SMEs. Problems often occur on SMEs in Indonesia, especially in the Kudus district is poor financial management. Most SMEs do not use the software application in financial management. This is because, the source of funds and resources owned by SMEs so limited that they are very difficult to procure or purchase a software applications. In applying the concept of SaaS application software into the financial management of SMEs, this study using object-oriented systems development method with UML tool. The purpose of this study is to assist SMEs in Kudus district in regulating financial management with financial management applications using software based on SaaS (Software as a Service) Cloud Computing. The results of this research is a financial management application software for SMEs. By embracing the concept of SaaS Cloud Computing , financial management software application can be used by all SMEs in Kudus district. SMEs in the Kudus district does not need to pay cost of the procurement and maintenance of software, they can directly use the software by using various alternative media that are connected to the Internet.*

Key words: SMEs, software as a service, financial management software.

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### Introduction

Micro, Small and Medium Enterprises (SMEs) have a strategic role in the economic development of Indonesia, because its operations were able to expand employment and provide economic services to the wider community. Kudus is the area of industry and commerce are able to absorb a lot of labor and contributed greatly to the GDP (Gross Domestic Product). The industrial sector has a dominant role in the economy of the Holy District. The sector's contribution to GDP Kudus District amounted to 58.89 percent. In addition to large-scale industry in Kudus regency are also many SMEs with a concentration different business sectors with the number reaching 10 954 SMEs.

Often, small and medium enterprises in Indonesia felt the difficulty in working capital requirements. However, this is contrary to the data of investors for SMEs, both by venture capitalists as well as of the aid agencies in Indonesia. They lately with aggressively, launching a fresh financial assistance. In generally, small and medium enterprises in Indonesia today is to have a weakness in the implementation of enterprise management system one of which relates to poor financial management which cause many problems in developing their business.

In the era of today's global economy, SMEs are required to make changes in order to increase their competitiveness. One important factor that will determine the competitiveness of SMEs is an information technology (IT). The use of IT can improve business transformation through speed, accuracy and efficiency of information exchange in large numbers. The case studies in Europe also showed that more than 50% productivity is achieved through investment in IT. SMEs are said to have global competitiveness if it is able to run its business operations as a reliable, balanced and high standards. Information technology can also be used to overcome the problem of the financial management system implementation in SMEs. By using the IT, SMEs can automate the application of financial management systems and facilitate the planning, reporting and evaluation.

Although the use of IT in various aspects of business can bring success and strategic benefit to SMEs, but the adoption and application of technology is not always easy, especially for SMEs. The main obstacles faced by SMEs in using IT is the lack of funds to procure IT infrastructure and labor shortages that have the knowledge and skills necessary to manage the IT infrastructure (Hairuddina,2012).

An important aspect in providing IT services is a resource. Resources are an important factor in producing a quality and sustainable services. However not easy to always be able to provide the necessary resources. This is because the cost factor which is always proportional to the procurement of resources. Besides the time factor also affects the readiness in providing the

resources that will be used, particularly IT resources such as hardware and software always requires configuration and installation before it can be used well.

Cloud Computing is a technology that can help resolve problems of limited IT resources. This technology combines the basic principles of economics and the laying of computing resources. This computing technology has several characteristics, one of which is a usage-based leasing. Cloud computing is a computing paradigm which involves the outsourcing of computing resources with the ability to perform scalability of IT resources, the determination of the use of resources on demand with infrastructure costs which do not require IT investments in advance.

One of the services offered by cloud computing is a Software as a Service (SaaS). SaaS offers an ease, speed and cost efficiency in developing the use of software for business needs. By using the concept of SaaS, user can directly use the software and utilize the software without having to incur the cost of developing or procuring beforehand. In addition, users also only pay the rental fee for the software they use. In terms of the hardware used to support the path of the software, users do not need to think about the cost of procurement and maintenance, as all are borne by the vendor or service provider cloud. SaaS is a new paradigm in the financing and the use of information technology resources (Wyld, 2009).

There are many opportunities and advantages for SMEs in using Cloud Computing, such as opportunities to test new software, evaluate third party applications, increase resources on demand to satisfy seasonal or temporary demand and offer software to customers as SaaS. Other benefits include time saved dealing with technology issues, allowing staff to focus on core competencies (Neves, 2011).

### **Research methods**

System design method used is OOD (Object Oriented Design). Standard notation that is used is the Unified Modeling Language (UML). OOD is a method that brings us to the object-oriented decomposition. By applying object-oriented design, we can create a formidable software by minimizing the writing of expression as well as reduce the risk inherent in the development of complex software systems (Fowler, 2004).. UML is a family of graphical notations, backed by single meta-models, which help in describing and designing software systems, particularly software systems built using the style of object-oriented (OO) (Booch, 2007). Design models that included in the UML are use case diagrams, class diagrams, sequence diagrams, activity diagrams, state diagrams, collaboration diagrams.

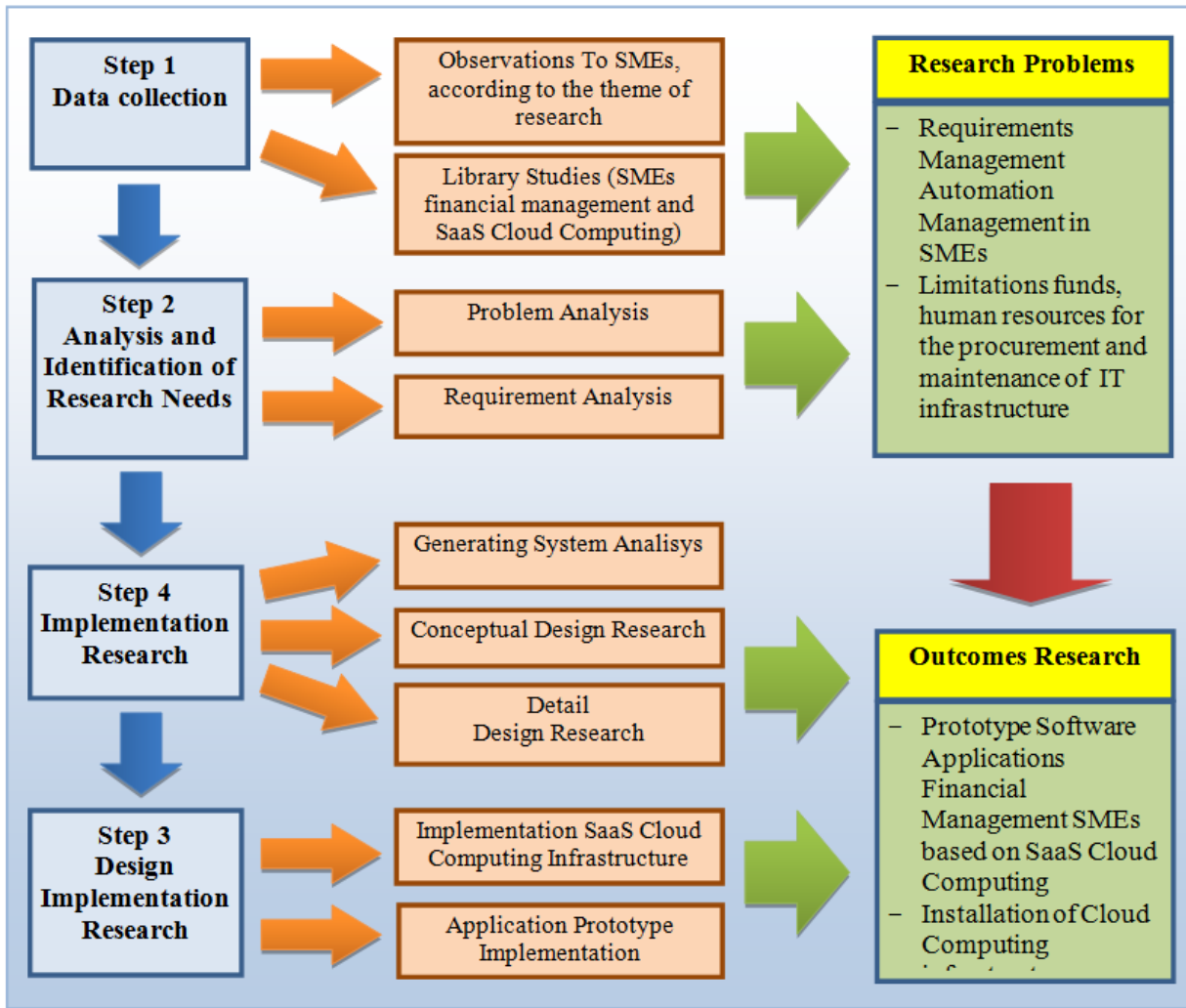
Figure 1 shows the details of the steps being taken in this study. Who performed at the first stage is collect the required data. Activities conducted at this stage is the observation and study literature. The observations were made to the location of SMEs that used as a sample and the Department of Industry, Cooperatives and SMEs Kudus District. The observations were made, accompanied by interviews to owners or managers of SMEs. Studies conducted by searching the literature and journals relating to the financial management of SMEs and SaaS cloud computing.

Based on the data that has been obtained in the first stage, on the second stage the analysis and identification of research needs is done. Activities conducted in the second phase consists of the analysis of the problems and needs analysis. From the observation and interview, summarized the issues raised in SMEs. Once the problem is found, then identify what is needed to find solutions to these problems.

Based on the solutions that have been generated in the second stage, on the third stage, the solution are implemented in the system design. Activities conducted in the third stage consists of the analysis of the needs of the system, then pour the analysis results into UML notations. Last activity of this third stage is to apply the system design into prototype software.

That done in the fourth stage is implement a system that have produced in the third stage. activities carried out in the fourth stage beginning with implementing cloud computing infrastructure in the Department of Industry, Cooperatives and SMEs Kudus which acts as a provider of cloud computing services. Then apply the resulting prototype software to service providers in this case the Department of Industry, Cooperatives and SMEs Kudus and service users in this case SMEs in Kudus district.

Figure 1: Stages research details



**Results and discussion**

Architecture used by SaaS Cloud Computing is a Multi-tenant. Multi-tenant applications introduce the concept of single application which can be used for multiple customers. Each customer is called a tenant. Multi-tenant architecture runs the application on the infrastructure of the service vendor, and multiple tenants are then allowed to access the same instance of the application with customized configurations (Khatri, 2013).

Multi-tenant is meet lots of enterprises to share one application instance in which each user can only access data belonging to his tenant (Zhu, 2014). Method of use of a database of multi-tenant architecture used in this study is a separate database. In the method of separate databases, each tenant will run the same applications, but use different databases. Each tenant will use its own database to store their data. Methods of use of the database separately on a multi-tenant architecture is shown in Figure 2. By using a separate database method, the data security of every tenant will be more secure, although later will need more storage space.

Cloud computing services in the form of SaaS will be provided by the Department of Industry, Cooperatives and SMEs Kudus, as the party responsible for development of SMEs in the holy district. Cloud infrastructure will also be placed there. Financial management software based on SaaS that resulting from this research will be managed by IT staff Department of Industry, Cooperatives and SMEs Kudus. SMEs acting as tenant just access financial management applications services that have been provided over the internet, using various tools such as smartphones, laptops, PCs, tablets and other. Distribution of cloud services from the Department of Industry, Cooperatives and SMEs Holy ukm are shown in figure 3.

Financial Management System based on SaaS that developed consists of three actors, namely Administrator, SME owners and employees of SMEs. Administrator is the IT staff that is in the Department of Industry, Cooperatives and SMEs Kudus. SME owners are managers of SMEs, whereas SME employees are workers employed in SMEs and in charge of data entry into the system. A detailed explanation of anyone acting as users of the system and what it would do was described by usecase diagram. Usecase is the specification of a set of actions executed by the system (Ibrahim, 2011). Usecase diagram for the SMEs financial management system based on SaaS are shown in figure 4.

Figure 2: Multi-tenant architecture with separate database method

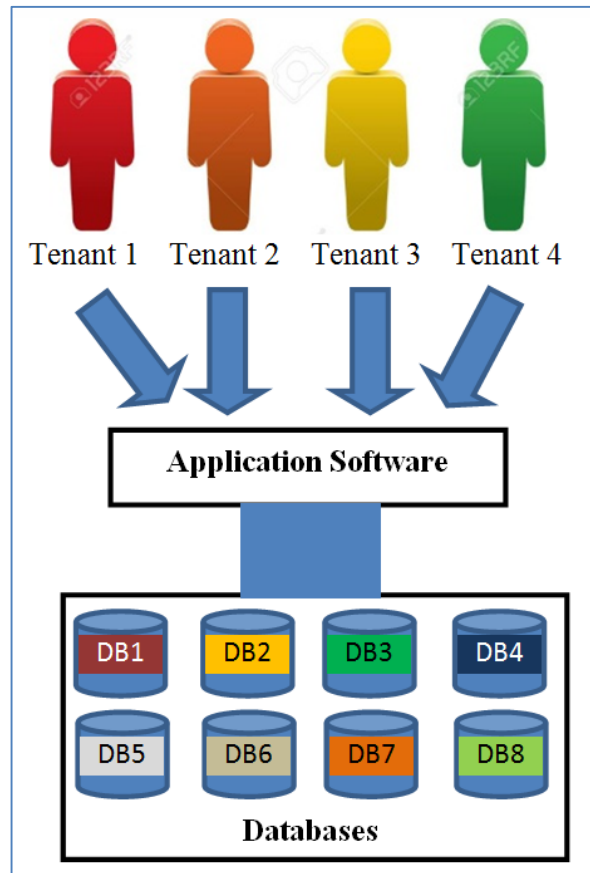


Figure 3: Distribution of cloud computing services

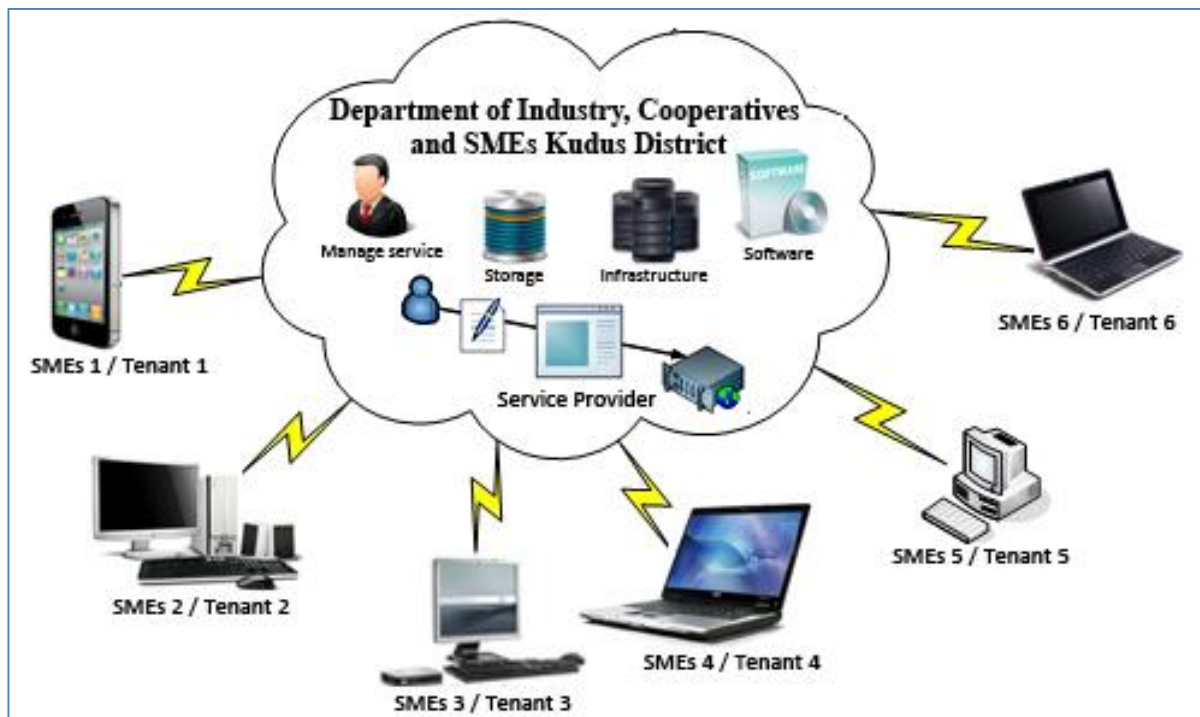
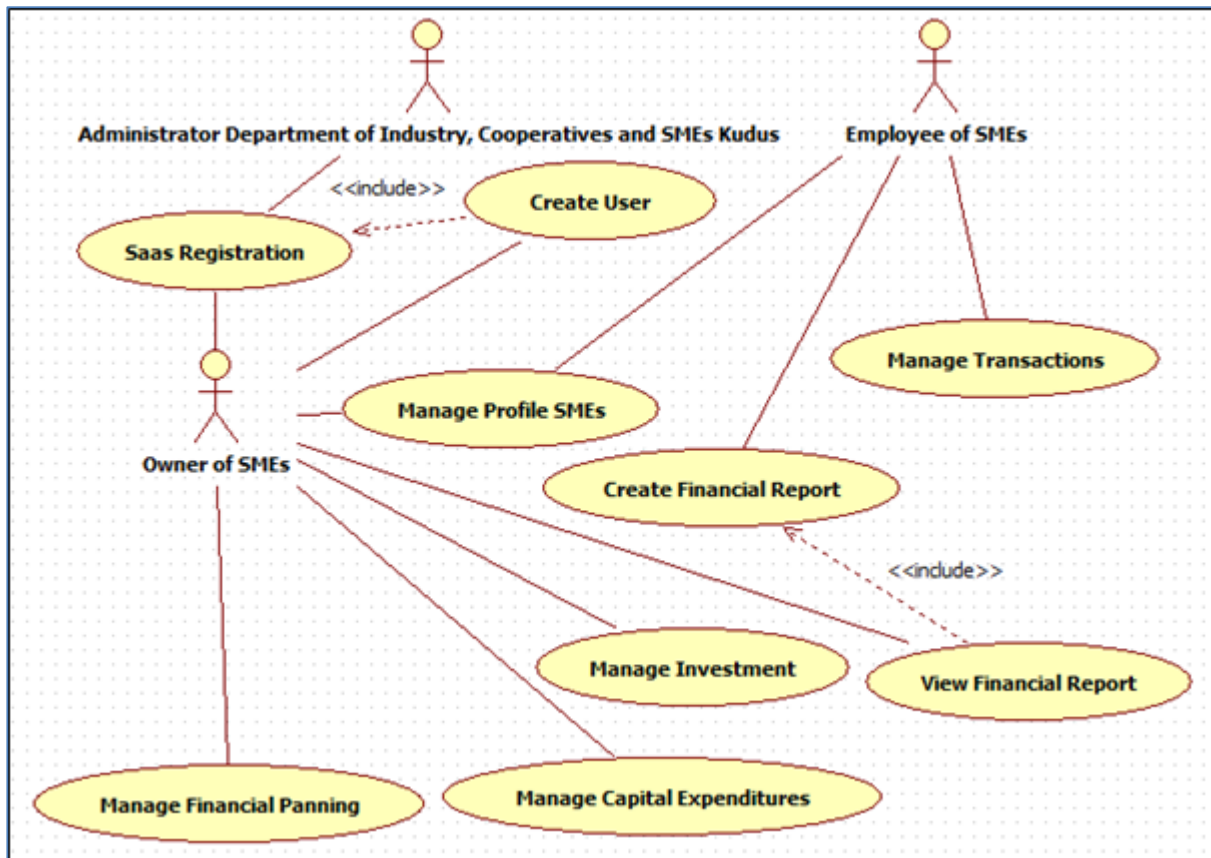


Figure 4: Use case diagram of financial management system based on saas cloud computing



## Conclusion

IT resource constraints faced by SMEs in Kudus district can be overcome by using cloud computing services in the form of SaaS. This service will be provided by the department. The service can be accessed by SMEs through the Internet using a variety of tools. By using cloud computing services in the form of financial management application software, SMEs can easily manage their financial and can rapidly create financial reports. With good financial statements and up-to-date, owners of SMEs can do an evaluation of their financial condition and can be used as an ingredient to plan their spending further.

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