Virtual Enterprise for Batik’s Small Medium Enterprises

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Abstract. This study discussed virtual enterprise in Batik’s Small Medium Enterprises (SMEs). The capacity of SMEs in accessing potential markets was a problem that often faced. There were many SMEs, which have not been able to export products overseas. They only sold their products in the domestic market. Marketing promotion was the cause of recognition and capabilities lacking. In this study discussed about E-commerce for SMEs which applied Business to Business (B2B) and Business to Consumer (B2C). This research used several tools for modelling processes which were represented by Use Case Diagrams and Activity Diagrams. The results of this study were the form of an enterprise virtual model that was applied become E-commerce. This e-commerce implemented B2B in two levels of admin system, which were super admin managed by the cooperative service and ordinary admin managed by several local SMEs. The virtual enterprise model, which implemented business to costumer, could be seen through the form of shopping transactions or online trading on websites.

Keywords—virtual enterprise; e-commerce; SMEs; batik

Introduction

The SMEs usually have inadequate infrastructure, which are less flexible and have a small capital budget. It needs to be a good management function in SMEs, basically consisting of a function of planning, implementing and evaluating strategies implemented to achieve company goals. In order for the business, which is run by SMEs to succeed well, they need to do the right strategy beforehand. Strategy is a series of large plans or plans that illustrate how a company must operate to achieve its objective. There is a need for development through its marketing strategy. Herewith SMEs can explain all activities related to marketing. This marketing activity includes a variety of activities, ranging from product descriptions, product design, product promotion, product advertising, and communication to costumers.

The existence of SMEs is the backbone of the community's economy which plays an important role in growing the economy of a region. This can be seen from the East Java's economic growth data, it was recorded at 6.7% above the national average of 6.1%. The main contribution of Gross Regional Domestic Product (GRDP) coming from the SME’s sector which reached 53.4% or IDR 415.7 trillion. Fortunately, SMEs in Bangkalan location are very close to Surabaya. Surabaya is the capital city and the industrial centre of East Java. The existence of the Suramadu Bridge is also can be benefit for SMEs.
in Bangkalan. The proximity of this location makes big opportunities to partnering with industry players by becoming suppliers.

Virtual enterprise is created to be directed at a specific market opportunity, formed from two or more different companies, and designed to facilitate the incorporation of production resources quickly, broadly, and together. The companies incorporated in the virtual enterprise jointly carry out cost effectiveness, product creation, geographic location, computing environment, developed technology, or operations which are implemented by their respective organizations [1]. The virtual enterprise concept is based on the distribution of business functions, utilities, and outsourcing to partners who work with companies to deliver products to end customers. Virtual enterprise applications in small and medium enterprises (SMEs) are considered suitable to meet rapid market changes and make SMEs more flexible and agile.

2. Literature Review

2.1. Definition of Small and Medium Enterprises

Law Number 20 of 2008 concern about Small and Medium Enterprises (SMEs). Small Business is a stand-alone productive economic enterprise, carried out by individuals or business entities. SMEs are productive economic businesses which are independent, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become part of either directly or indirectly with Small Businesses or large businesses with total net assets or annual sales proceeds as stipulated in this act [2].

2.2. Virtual Enterprise

Virtual enterprise is an ad-hoc coalition of independent companies and organizations. It is working together to achieve a certain goal, by utilizing the resources, skills and competencies of coalition members. A virtual enterprise does not have a dominant partner, legal existence or physical ownership of the dominant resource inventory. Members can join or leave the coalition at any time, but within the boundaries of the contract [3].

2.3. E-commerce

E-commerce is a way to shop or trade online or direct selling that utilizes Internet facilities where there are websites that can provide get and deliver services. E-commerce will also change all marketing activities and at the same time reduce operational costs for trading activities. E-commerce can be classified based on the nature of the transaction, namely Business to Business, and Business to Consumer [4].

2.4. Database Definition

The database is a file that coordinates data files that are interconnected and have the same interests so that it will facilitate data processing. The database is an important component in the information system, because it is the basis for providing information to the user. The application of the database in information systems is called the database system, which is an information system that integrates data sets that are interconnected with one another and make it available for several applications within an organization. The main purpose of managing data in a database can handle easily and quickly [5].

2.5. Access Privilege

Access privilege is usually given to information systems that limit users to access certain areas of the system. The extent of users can work in the relevant database, is determined by access privilege. For instance, an administrator is usually given full rights to access the system. Related to access, there are privileged terms. Privilege is actions that can be performed by a user on relations or views. Privilege is very important to be determined in physical design because functionally everyone has different rights to access data. Determining privileges is based on the duties of each user [6].
3. Methodology

The method steps in this study were as follows:

1. Pre Survey. It conducted a preliminary survey to find out what problems were being faced by Batik’s SMEs, then set goals.
   a. Problem analysis
   b. Background setting
2. Survey
   a. Literature review
   b. Field study
3. Data Collection
   a. Primary data. Such as the condition of SMEs, observation, and interview.
   b. Historical data. These were obtained from the archive of SME and Cooperative Service District. Bangkalan.
4. System Analysis, at this stage an analysis of the system that will be implemented, which determines who will interact with the system either B2B or B2C, then determine each user's access rights to the system.
5. System Design
   a. Design the Use Case subsystem, Activity Diagram
   b. Designing database subsystems (CDM and PDM)
   c. Build user interface
6. Implementation Phase, at this stage the system is implemented into a real application as a follow-up to the design results that have been done before. In this stage testing is also carried out on the results of the implementation.
7. Conclusion Withdrawal, after implementing and feasibility tests, conclusions are obtained related to virtual enterprise modeling in Batik SMEs

4. Result and Discussion

System design included website design and database design. Input in this system was carried out by 3 actors who had different access rights, such as super admin, regular admin and user member. The output of this system was a website that displayed Bangkalan batik products from several SMEs, then the appearance and features of the website vary according to their respective log in access rights. Users who can use this system will be explained in the following table:

| No | Label          | Type    | Description                                                                 |
|----|----------------|---------|-----------------------------------------------------------------------------|
| 1  | First Admin    | Operator| Responsible for managing all data on the website, including: CRUD (create, update, update and delete) master website data |
| 2  | Second Admin   | Operator| Responsible for managing the SMEs data on the website, including: CRUD SMEs profile, product data from each SME and displays transaction data. |
| 3  | Member         | user    | View products, search, order products and provide testimonials.              |

System Design

Step for designing website:

a. Use case diagram
   Use case diagram described how users can manage this system.
b. Activity diagram
Describes activities, objects, states, state transitions and events. In other words, the activity diagram is a description of the use case, how each one starts. Activity diagrams can also describe parallel processes that might occur in several executions.
Figure 2. Activity diagram for admin

Figure 3. Activity Diagram for SME
System implementation

This information system was managed by the Bangkalan district cooperative and MSMEs which responsible with several SMEs in Bangkalan. Information system created in the form of a website that displays products from SMEs that have been registered in the system. All content contained in the website was managed by the admin. In this system there were two admin levels that have different access rights. First admin was the super admin level, which was the administrator who has full rights to the system to publish and update all content in it. The super admin level was managed by the Bangkalan district cooperative. Second admin was administrator who has a local function on the admin system, for example can add products but not appear on the website just enter the product database. The admin level was managed by each SME that was already registered in the system.

By default this website looked like an online store that allows transactions to occur, consumers can search for desired product information but if you want to buy a product, make a payment or give a testimonial the customer must register first. All data on purchase transactions that occur will be entered into the data admin, in this case the agency has a super admin level that will respond to the transaction.
Figure 5. Home page

Figure 6. Member area
On the member area page displayed 3 menus, such as log in for registered members, a button for members who forget the log in password, and a button to register for a new member.

![Log in Administrator](image1)

Figure 7. Log in Administrator

On the log in page the administrator displayed the form to enter the admin specific page, consisting of a username and password.

![Dashboard](image2)

Figure 8. Dashboard

On the dashboard menu page there were a profile and password sub menu, account settings, and log out.

**Trial**

At the trial phase, the required features have been included in this information system application. It carried out testing the functionality and testing of information systems. Functional testing explained about checking procedures and services which contained in the Bangkalan Batik Center information system. It was in accordance with current service procedures, furthermore the level of feasibility can be analysed. System testing was done to test the system's ability to receive
input, carry out processes and provide outputs. The list of tests is arranged in the form of the following tables.

Table 2. Bangkalan Batik Center Information System Procedure Test and Service Information System Table

| System Service Standards       | Compatibility with Bangkalan Batik Sentra Procedures | Mismatch |
|-------------------------------|------------------------------------------------------|----------|
| Data and procedures for e-commerce services | √                                                   |          |
| Admin data and procedures     | √                                                   |          |
| Integration of all system admins | √                                                   |          |
| Member data recapitulation    | √                                                   |          |
| Product data recapitulation   | √                                                   |          |
| Data recap of all sales transactions | √                                                   |          |
| Testimonial data and procedures | √                                                 |          |

Table 3. Information System Trial Table

| No | Pengujian                      | Fungsi dan Proses                                                                 |
|----|--------------------------------|----------------------------------------------------------------------------------|
| 1  | Log in each user level         | Entering data were the username and password                                      |
| 2  | Add new user data             | Adding a new user in the system included admin and member                          |
| 3  | Add basic data, such as data on all products on the website and products in SMEs | This data were used to record all items related to products available in Bangkalan Batik Center |
| 4  | Conduct e-commerce transactions | Record data about purchase transactions, transaction history, payment confirmation made by members |
| 5  | Conduct testimonial input      | Record data about opinions, suggestions, criticisms from visitors                 |
| 6  | Display product sales history  | Report recapitulation was used to display product sales data in the daily, monthly and annual ranges |
| 7  | Complete maintenance of all data | All forms are input, update, delete and saved as reporting                         |

5. Conclusion

The virtual enterprise model that applies business to business can be interwoven in two levels of the admin system, which is between super admin managed by the cooperative service and the UMKM Bangkalan district with ordinary admin managed by several SMEs. The virtual enterprise model that implements business to consumer can be seen through the form of shopping or trading transactions online on the website of the Bangkalan batik center. Based on the results of the functionality testing and system testing, this information system is in accordance with the procedures and services at Bangkalan Batik Center.

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