Application of Distributed Databases for Information Systems Fertilizer Management

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Abstract. The purpose of this study is to identify and build applications that will integrate two databases and testing system by using black-box. The stages of the research method were systematic observation, data collection, system design, manufacture, and final system testing. The results of this study are the implementation of distributed database-based fertilizer buying and selling transactions that are used as online fertilizer stock reporting from retailers to distributors. The conclusion of this study is by utilizing the Internet with the proposed system (distributed database application) than providing an alternative in the process of fertilizer transactions by distributor and fertilizer stores.

1. Introduction
The definition of distributed databases is as a collection of several logically interconnected databases that are distributed through computer networks [1]. Distributed databases management information system is then defined as software systems that allow management of distributed databases and make transparent distributions to users [2]. Two essential terms in this definition are “logically interrelated” and “distributed through computer networks”.

There is no general definition of Management Information Systems. The term Management Information System is identical to computer-based data processing related to topics such as system analysis and various other technical aspects of computer-based systems [3]. At first, the Management Information System was done with a manual system, then created the first mechanical machine to process the numbers that produced information [4]. PT. Bonecom Agro Nusantara (BAN) is an organic fertilizer distributor located in the Makassar Industrial Area. This research was undertaken from January to March 2016. PT. BAN in the management of financial reports is often delayed. This is due to the fertilizer shop which still uses manual systems. The application of distributed databases is the key to various problems experienced by the PT. BAN. Another related research with the application of distributed databases, for example, controls in distributed database systems [5]. The purpose of control in a distributed database system is that distributors can monitor the availability of stock products from retailers. This is to prevent cheating, like hoarding which causes search products to become scarcer and make prices go up.

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2. Method
This research was located at PT. Bonecom Agro Nusantara (BAN), at Makassar Industrial Area. This research was undertaken from January to March 2016. There were four stages in this study, consist of 1) Observation System, this stage was where the researcher observes the system currently applied [6]. 2) Data Collection, at this stage data collection, was in the form of archives or documents from PT. BAN. Implementation of this stage was in line with the implementation stages of the observation system [7]. Primary data collection was an integral part of the research project. Use the right techniques to ensure that data was collected scientifically and consistently [8]. 3) System Design and Manufacture, after conducting System Observation and Data Collection, the next stage was the system design process, be it an ongoing system or a system that will be proposed to PT. BAN distributor [9]. 4) System Testing, in this stage a prototype will be tested which has been designed whether there are still errors in the interface, database, performance, or whether the tested functions are valid [10]. System testing was related to testing all systems based on functional and non-functional specifications [11].

3. Results and Discussion
3.1 Observation System and Data Collection
Based on result Observation System and data collection, sales reporting system from retail stores that have been running is still often experiencing delays in reporting, causing PT. BAN as a distributor is late in getting sales information from retail stores. In Figure 1 below is a flowchart applied in PT. BAN.

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**Figure 1.** Existing Flowchart Document.
3.2 System Design and Manufacture

Based on the analysis of the current system, we design the proposed system document flowchart, as shown in Figure 2 below.

![Flow Chart of the Proposed System](image)

**Figure 2.** Flow Chart of the Proposed System.

Furthermore, the context diagram to describe the state of the overall system, where the entities involved are represented by two system entities, namely entities Admin Information Systems PT. BAN with Admin Information System for Fertilizer Shop. In the context diagram, you can see the flow of data flowing into the system and the data flow that flows out of the system towards each entity. Database Integration can also be seen with a request from the Admin Information System Distributor into the system, then the system will respond to sales data from the Fertilizer Shop Information System. As shown in Figure 3.
3.3 System Testing
Prototype testing is used to prove that the prototype developed is in accordance with the results of functional requirements analysis. While the model testing is used to prove that the model meets functional requirements.

The implementation of the web service in the Distributor Information System was built using the PT. BAN Information System web service. The general architecture of the implementation is shown in Figure 4.
This Information System Architecture is the architecture found in the Fertilizer Shop Information System (Web Service) that is integrated with the PT. BAN (WS client) Information System. Integration is in terms of providing data sources in the form of goods data. PT. BAN Information System and Fertilizer Shop Information System can be used by all users, namely admin and cashier staff in their respective environments. The web service in the PT. BAN Information System to this Fertilizer Shop Information System is as follows:

A. Web Service items:

In the PT. BAN Information System there is a web service client; this service functions to make data requests on the Fertilizer Shop Information System.

In the Fertilizer Store Information System, there is a service server that serves to respond to data requested from the web service client that is in the PT. BAN Information System.

B. The process:

At first, the web service client requests data item from the Fertilizer Shop Information System. The request is a request data items/stocks in the database Fertilizer Store Information System, then by the web service server of the Fertilizer Shop Information System, all data in the item list in the Fertilizer Shop Information System database will be sent to the PT. BAN Information System database item list. Implementation of web service items is presented in Figure 5.
Prototype testing carried black-box testing, which is functional testing without regard to the flow of program execution, only to prove the results of program execution in accordance with expectations.

There are several studies on distributed databases, such as controls in distributed database systems and transactions in database systems [5, 12]. Both of these studies focus more on transaction management in the database system. Because in business, control is indispensable in online data processing activities. So that it can reduce the occurrence of delays in transaction reports from both parties and avoid fraud, such as hoarding which causes products to become scarce and the price of these products to rise.

4. Conclusion
The conclusion of this study is by utilizing the Internet with the proposed system (application of distributed databases) so that PT. BAN gets time-efficient facilities in transaction reports from fertilizer stores.

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