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Framework Development for the Development of Mobile Commerce Applications

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Abstract: In general, the definition of Electronic commerce is the process of selling and buying both of information or goods and services through internet media. Applications can be made by making designs based on commonalities, that are common from existing application designs. Development techniques using designs existing applications utilizing the concept of reusability are called frameworks. The general requirements model of the B2C M-Commerce application in Indonesia has been analyzed by looking for similarities in the specific applications available. The class design framework for developing B2C M-Commerce applications is a solution to the increasing need for this application which is already widely available in Indonesia. This framework was successfully created by designing

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classes that are described with Class Diagrams along with patterns of interaction and their connectedness with other classes that are described with Sequence Diagrams. This design framework has been successfully used by testing the use in application development with a case study. In addition, this design framework has also met the evaluation based on fulfilling the criteria and achieving the benefits of the AlamDanau Indah Pringsewu Residence.

Keywords: *C2CM-Commerce, Framework.*

I. INTRODUCTION

Trade is actually an activity carried out by humans since the beginning of civilization. In line with human development, the ways and means used for trading are constantly changing. The newest form of commerce is making it easier for users now is e-commerce. What exactly e-commerce is, how it can facilitate its users, as well as its important role will be discussed in this paper. The forms of e-commerce that exist are very diverse nowadays. There is an E-Commerce to facilitate transactions between business organizations called Business-to-Business (B2B), transactions between business organizations and customers called Business-to-Customer (B2C), transactions between customers called Customer-to-Customer (C2C)), and several other forms. In Indonesia, direct transactions between customers (C2C) are on the rise today. By accessing an existing E-Commerce site, one consumer can see goods or services sold by other consumers or sell goods and services to other consumers. Eventually, the transaction process will emerge from the existence of a short business transaction facilitated by this E-Commerce site.

With the rapid development of information technology, access to the internet can already be done anywhere and anytime using mobile device. E-Commerce activities carried out using mobile devices are often referred to as Mobile Commerce or abbreviated as M-Commerce. Access to this buying and selling information should be obtained faster, easier, and personally by using mobile device access. To facilitate M-Commerce users properly, M-Commerce applications are needed that are in accordance with the transaction model at AlamaDanau Indah Pringsewu Residence. Facilities advertised in this framework include online marketing, online communication, online payment, online auctions, and several other variants. The many variants of the existing application should be utilized by the AlamDanau Indah Pringsewu Residence to further optimize marketing and information prospects.

M-Commerce application to build new applications. Development techniques using design abstractions from existing

applications utilizing the concept of reusability called the framework.

The framework is a basic conceptual structure that is used to solve or handles a complex problem. This term is often used among other things in the field of software for describe a software system design that can be reused, as well in the field of management to describe a concept that allows the handling of various types in this Journal, a framework developed in the form of design will be carried outclass for application development that facilitates electronic transactions between customers (C2C) to interact and transact using mobile device technology. Thus the framework is expected this can facilitate developers to develop M-Commerce applications with more effective and efficient.

II. E-COMMERCE

According to Roger Clarke. 2013. In "Electronic Commerce Definitions" states that e-commerce is *"The conduct of commerce in goodsand services,with theassistanceof telecommunicationsand telecommunications-based tools"* (e-commerce is a procedure for trading goods and services that uses telecommunications and telecommunications media as tools to help). According to MarizaArfina and Robert Marpaung. 2013. E-commerce or better known as e-com can be interpreted as 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. Then on the E-Commerce Net website, E-Commerce is defined as the activity of selling merchandise and / or services via the internet. All components involved in business are practically applied here, such as customer service, available products, ways of payment, guarantees for products sold, ways of promotion and so on.

In general E-Commerce is the purchase, sale, marketing of goods and services through electronic systems such as the internet or television, or other computer networks. E-commerce can involve electronic fund transfers, electronic data exchanges, automated inventory management systems, and systems automatic data collection.

In general, the definition of Electronic commerce is the process of selling and buying both in the form of information or goods and services through internet media. In the beginning, when the web became popular in the community in 1994, many journalists predicted that e-commerce would become a new economic sector. However, it was only about four years later that secure protocols such as HTTPS entered the mature stage and were widely used. Between 1998 and 2000 many businesses in the US and Europe developed this trading website.

The benefits of using E-commerce is able to reduce the cost of goods, services and can increase customer satisfaction as long as it involves speed to get the goods needed with the best quality and

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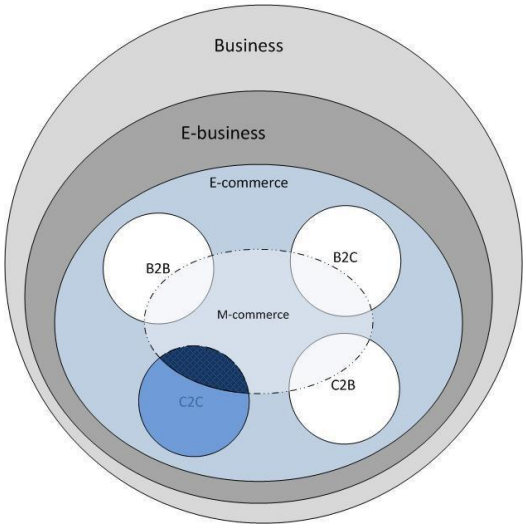
accordance with the price. Order cycle of a business that used to take 30 days, the time can be accelerated to only 5 days. A fast process will certainly increase revenue.

Shopping or trading on the internet is very different from shopping or trading in the real world. E-Commerce allows us to transact quickly and at low cost without going through a convoluted process, where the buyer is enough to access the internet to the company's website that advertises its products on the internet, then the buyer simply learns the terms of condition (conditions required) the seller or AlamDanau Indah Residence.

Figure 1 below shows the interrelationships



of Business, E-business, E-commerce, and C2C M-commerce.

Figure 1 The interrelationships of Business, E-business, E-commerce, and C2C M-commerce

According to JokoSupriyadi e-commerce can be classified into two types namely; Business to Business (B2B) and Business to Consumer (B2C). Business to Business (B2B) is an online business communication system between business people, while Business to Consumer (B2C) is an online shop (electronic shopping mall) mechanism, namely transactions between e-merchants and e-customers. In Business to Business, transactions are generally carried out by trading partners who are already familiar with the agreed data format. Whereas in Business to Customer its nature is open to the public so each individual can access it through a web server. In this study, the next thing to be discussed is Business to Customer.

III. FRAMEWORK

At present, the use of frameworks in developing web-based applications is a trend in the topic of conversation. Because the use of the framework can reduce the workload of programmers, the framework can be more practical and save time when compared to the pure coding model (making from scratch). In addition, there are interesting things if you follow the developments between framework publishers. According to SaifullohRifa'i. 2012. The framework is simply a collection of functions/procedures and classes for specific purposes that are ready to be used, it can further simplify and speed up work programming person, without having to create functions or classes from scratch.

The developer of AlamDanau Indah Pringsewu Residence can do the application framework into a special application by making a subclass or doing composition in the instantiation of classes existing framework. Making it easier for AlamDanau Indah Pringsewu residence to market products and interact directly with consumers. The purpose of the framework is to make it easy for programmers to do general work and do it repeatedly. With the framework, these things become easier because the framework already provides these features, so the expected processing time can be faster and obtain better results. Another advantage of using a framework is that the programming style of the development team can be more uniform (consistent) because the framework already provides working patterns that have been proven effective for developing applications.

A. The Benefit ofFramework

- The benefits can help work in AlamDanau Indah Pringsewu residence in building applications so the applications can be completed in a short time.
- Application of Design Patterns facilitate the design, development, and maintenance system.
- Stability and Reliability, the application that we build is more stable and reliable because it is based on a framework that has proven its stability and reliability.
- Coding Style is consistent, makes it easy to read code and find bugs.
- Security Concern, the framework anticipates and installs a shield against various security problems that may arise.
- Documentation, frameworks can discipline us to write documentation for what we write.

B. The advantages of Framework

- The first advantage is the framework will make it easier to understand the working mechanism of an application. This will certainly greatly help the system development process that is carried out as a team. All members are required to understand the working pattern of the framework, the rest of the team members only learn the business processes that are desired by the system to then be poured into the framework. In the sense that everyone must have the same method in completing the application.
- The second is using a framework will save time working on an application, because each member already has a reference in completing the module. In this case, the more libraries there are the more speed up members to find a solution because not every member has to

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create a class or function for a relatively similar case.

C. The disadvantages of Framework

- The AlamDanau Indah Pringsewu residence will probably find limitations when designing the application uses a framework
- It is likely to increase the cost of AlamDanau Indah Pringsewu residence if the framework used less documented and less supported.

The advantage that we can take from the framework is completing the modules that are developed so it created the work method that is more efficient, neater, more general in nature, and more homogeneous.

IV. ANALYSIS OF GENERAL REQUIREMENTS FOR APPLICATION B2CM COMMERCE

At this stage, the first activity is carried out in the process of building a framework. The first activity undertaken is an analysis of the general requirements model of the applicationB2CM-Commerce. Analysis of the general requirements model of an application is done by describing the general definition of the application of the specific applications that have been implemented. A concept of selling goods or services that are sold in retail, marketing using the internet whose sales are direct to consumers. B2C Example: www.walmart.com (selling daily necessities individually on the internet) B2C Model: B2C does not really need good accountability and formal relationships with customers in their transactions. This is certainly different from B2B which requires these things in order to maintain professionalism with the company. In addition, the most prominent characteristic of B2C is its ability to create a direct relationship with consumers without the intervention of intermediaries, such as distributors

By direct selling on the internet and bookings, it can be directly made by consumers because of it the advantage of B2c, they are:

1. Called a market transaction
2. Consumers study the products offered through publications
3. Buy with electronic cash & secure payment system

B2CM-Commerce applications can be seen in table 1.

Table 1 List of Functional RequirementsFramework C2C M-Commerce

No.	SRSID	Requirment
1.	SRS-F-01	Users can do Login
2.	SRS-F-02	Users can register goods to be sold
3.	SRS-F-03	Users can see a gallery of goods according to category
4.	SRS-F-04	Users can see item information

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5.	SRS-F-05	Users can send messages to other users and receive private messages or offers
6.	SRS-F-06	User can receive notification directly when the personal chat

In addition to the main features mentioned above, the B2CM-Commerce application also has security aspects that must be considered in carrying out its transaction services. These security aspects include: authentication, confidentiality, data integrity, non-repudiation, availability, and authorization. In addition to these aspects, the issue of mobile network security is also a matter that must be considered. By looking at the functional requirements, services for credit transactions remain available. Therefore some security aspects that are important to consider in the process of running services on credit transactions are not used as non-functional requirements, functional requirements that can be concluded for existing functionality are to guarantee the integrity of transaction data (data integrity). Non-functional requirements of the B2C M-Commerce Application can be seen in the Table 2 of the following:

Table 2 List of Non Functional requirement

M-Commerce C2C Framework

No.	SRS ID	Requirement
1.	SRS-NF-01	Ensure data integrity transaction

Note: SRS: Software Requirement Specification.

F/NF : Functional or Non-Functional

V. FRAMEWORK DESIGN CLASS FOR B2CM-COMMERCE APPLICATIONS IN INDONESIA

In this section, a class design framework will be documented for the development of C2C M-Commerce applications. This documentation will contain three main things, namely a description of the purpose of the framework, how this framework works, and how to use this framework.

A. The Purpose of Framework

The purpose of the framework is to facilitate the AlamDanau Indah Pringsweu residence to do the work generally and repeatedly. With the framework, these things become easier because the framework already provides these features, so time workmanship is expected to be faster and obtain better results.

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B. How to Work the Framework

This framework provides basic classes that have been designed based on the results of an analysis of the general needs model of M-Commerce applications in Indonesia. These basic classes can later be used as a reference for creating implementation classes when developing software with a particular problem domain. In addition to the basic classes, this framework also provides an interaction guide between each class that is illustrated through a sequence diagram for each use-case that is determined based on the general needs model that has been analyzed previously. This sequence diagram can be used as a reference to guide the interaction of implementation classes that are made.

A. How to use the Framework

The following will be explained how to use framework as follows:

1. Determine the problem domain or theme for the M-Commerce B2C application to be built.
2. Pay attention to class schemes the existing design in Figure 2.
3. Linking the design class scheme to the class implementation of the application iron and variables and their functions.
4. Paying attention to relationships/interactions between classes according to the relationship that is in the Figure in connecting to the implementation of the relationship between classes.

If needed, a new implementation class can be created to provide features, variations, or added value for the application to be built.

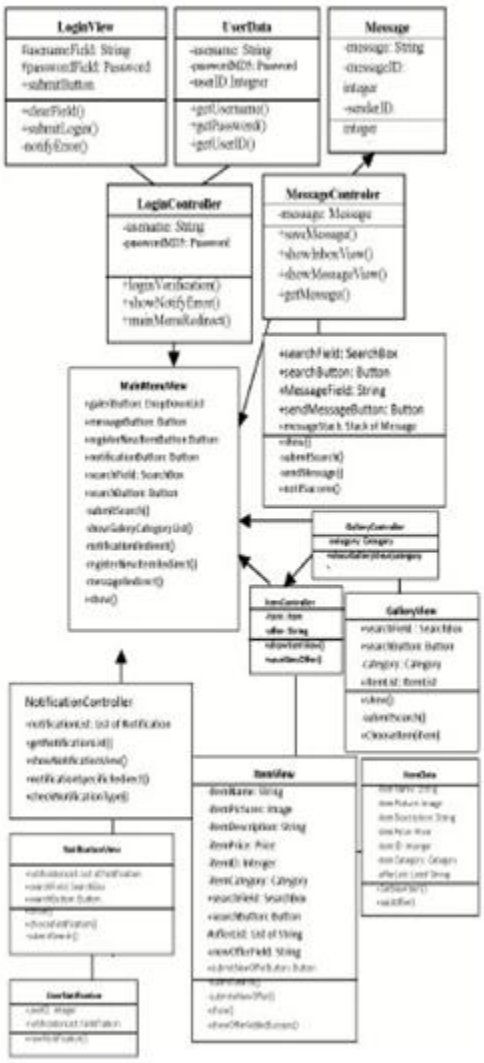

Figure 2 Collaboration Class C2C Framework M-Commerce client subsystem

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VI. TESTING

Package Controller	Implementation Class
LoginController	LoginController.java
MainMenuView	MainMenuScreen.java

The testing process of the framework created is done by conforming the class at the design stage to the implementation stage of the study case and by evaluating the use of this class design framework to the application implementation. This chapter also contains an evaluation of the overall framework both the fulfillment of the framework criteria and the achievement of the framework benefits. To test the design framework that has been designed and written in chapter five, an application is implemented in the client subsystem to connect the class design framework and evaluate the results of the framework. In carrying out the application implementation phase, a case study is taken namely the buying and selling portal of goods and services related to computers. The implementation environment of the system used to develop applications is as follows:

1. Operating system:Windows7Professional64- bit
2. *Hardware*:
a. *Processor* IntelCore 2 Quad Q66002.40 GHz
b. *Hard Disk*500 GB
c. VGAMSIG-Force 9600GT
d. RAM 4GB
3. *Software:*
a.E*clipse* Helioswith Blackberry JavaPlugin
b. BlackberrySmartphoneSimulator6.0.0 (versi6.0.0.706(9780_Asia)
c. Library:
i.Java Runtime Environment7.0 ii. BlackberryJDK6.0.0

The translation of the design class to the implementation class can be seen in Table 3, Table4, and Table 5.

Table3TableDesign Class Translation to Implementation Class

Package View Design Class according to Framework	Implementation Class
LoginView	LoginScreen.java
MainMenuView	MainMenuScreen.java
GaleryView	GaleriScreen.java
ItemView	ItemScreen.java
MessageView	ConversationScreen.ja
NotificationView	NotificationScreen.jav

Table 4 The Design of Class Translations to Implementation Class in Package Controllers

GaleryController	GaleriController.java
ItemController	ItemController.java
MessageController	ConversationController.java
NotificationControl Ler	NotificationController.java

Table 5 The Translating Design Class to Implementation Class in Package Data Entity

The design of Package Controller Class is in accordance with Framework	Implementation Class
UserData	User.java ; Database.java
UserNotification	Notification.java ; Database.java
ItemData	Barang.java ; Offer.java ; Database.java
Message	User.java ; Database.java

In Table 3 and Table 4, the translation of the package Controller Framework design class and the package Framework design class in the implementation class are done appropriately, this proves one of the criteria for the framework which is easy to use or implement. Modifications and variations were made to the Package Data Entity (Table 5). These modifications were made to match the design class to the software implementation environment. In addition, this modification was also carried out for the purpose of proving the fulfillment of the criteria and achieving the benefits of expansion and meeting flexible criteria.

VII. CONCLUSION

Based on the explanation above, it can be taken some conclusions as follows,

- The general requirements model of the M-Commerce B2C application consists of activities: Login, View Gallery, View Item Information, Message Management, and Receive Notifications.
- Class design framework for developing B2C M-Commerce applications successfully developed by designing design classes along with patterns of interaction and connectedness with one another. The results of this design are based on the results of an analysis of the general needs model of the existing B2C M-Commerce application in Indonesia.
- The B2C M-Commerce application prototype using a case study was successfully built more effectively and more efficiently by utilizing the results of the development of a class design framework that has been designed.
- The class design framework that was built was successfully validated by testing the application development prototypes. This framework also fulfills evaluations based on fulfilling the criteria and achieving benefits.

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