An Analysis Design for Betel-Nut Business by Using Unified Modeling Language (UML)

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Abstract

This system made for the convenience of the seller (owner) and buyer (customer) in betel-nut business by using UML. UML is a standard way to draw different perspectives of software and becoming more valuable in the market. In the market competition aggravating, it becomes necessary for market players to adopt a business model which can adopt dynamic business changes. This paper presents designing for Betel-Nut Business by using the StarUML software (version 5.0) to draw the diagrams. Requirements of the system are analyzed by Use Case diagram and are designed by Class diagram to generate codes. This system can be used in any Betel-Nut business start-up, especially any business that uses UML tools including use case and class diagram.

Keywords: Unified Modeling Language (UML), Customer Relationship Management (CRM), Use Case (UC), Class

1. Introduction

Unified Modeling Language is to support a structure notation that can be used by any objects. UML has been designed for these objects. This system uses Use Case and Class diagrams. Use Case model explains system's requirements in terms of Use Case. Use Case can do users to relate what they need from a system to how the system delivers on their needs. Class diagram is main modeling that runs through nearly all objects. Class Diagram describes the types of objects in the system and various kinds of static relation between these objects. UML supports developers to identify software systems and provides to build and document of the system to design and analyze programs and applications. This system is intended to draw design for betel-nut business. This system supports Buyer (customer) and Seller (owner) in trading convenient. Many people chew betel-nut in Myanmar. So, Betel-nut business is selling well in the market.

This paper is organized by five sections. Section 1 introduces the system concerned with UML. In section 2, Use Case, Class Diagrams and other tools of UML are described. Section 3 explains Customer Relationship Management. In section 4, analysis and designs of this system are presented with diagrams in detail. Finally we conclude in section 5.

2. Unified Modeling Language (UML)

The Unified Modeling Language (UML) is a standardized modeling language consisting of an integrated set of diagrams, developed to help system and software developers for specifying, visualizing, constructing and documenting the artifacts of software system, as well as for business modeling and other non-software system. The Unified Modeling Language (UML) makes it possible to describe systems with words and pictures. It can be used to model a variety of systems: software systems, business systems or any other system [12].

UML has been designed for a range of applications [13]. The UML is a graphical notation that helps in describing the designing software systems, particularly software systems built using the object-oriented (OO) style. Graphical modeling languages have been around in the software industry for a long time [6]. A model is presented to a designer as a set of diagrams. Diagrams are graphical representations of collection of model elements [7].

2.1. Models

A model is a representation in a certain medium of something in the same or another medium. The model captures the important aspects of the things. Model is described in a medium that is convenient for working [7]. Different views then correspond to different perspectives from which a system can be examined. The relevant information of each view is recorded in the various types of model defined by UML. For example, a use case model presents the information in the use case view in such a way that it is accessible to the intended audience of that view. A model is an abstraction of the objects or various stages of the development process [8].
2.2. Diagrams

A model is normally presented to a designer as a set of diagrams [7]. Diagrams are graphical representations of collections of model elements. Different types of diagram present different information, typically about either the structure or the behavior of the model elements they depict. [5]

2.3. Model-Driven Approach (MDA)

A model-driven approach focuses on model to work with systems, including understanding, designing, constructing, deploying, operating, maintaining and modifying them. Model-driven approach is the standard approach to using the unified modeling language (UML) as programming language; the standard is controlled by the object management group (OMG).

2.4. Use Case (UC)

Use cases are the various tasks that the users can perform with a system. Use case modeling understands how the system works by using relationships between actors and use cases. Usage issues represent the normal types that users can perform on the system. Actors represent the role that users can play when interacting with the system. It is very effective as a method of needs analysis based on application usage [7].

The purpose of the use cases is to define the system context, capturing system requirements, approval of system architecture, to produce cases that support implementation and issue test cases. [3]

2.4.1 Use Case Diagram

The simplest use case represents the interactions between the system and the user. Use case diagrams can differentiate between different users of the system and different use cases. Use case is formed as circles or oval. The standard form for use case of UML is described as shown in figure [6].

![Figure 2- Example of use case diagram](image2)

Use Case is system functions or process that is named after verbs + nouns (or noun phrases). Actors must be connected to use cases. However, some cases do not contact the actors [6].

![Figure 1- Use case](image1)

2.4.2 Actor

User interacts with use case named noun. It commitment in the business process and similar to the user’s concepts. However user can play others roles. An actor starts using use case.

Responsibility of the actor is to regard the input of the system and to expect the output of the system [6]

![Figure 3- Actor](image3)

2.4.3 Communication Link

An actor can connect with a use case using associations. [6]

![Association](image4)

2.4.4 Boundary of system

A system boundary can be formed for use cases specified each of these business functions as follow[6].

![Boundary of system](image5)
2.5 Classes

The class does not express particular properties of individuals, but set the common features in all the objects of the group. Class diagrams are the most effective UML diagrams used by the object oriented community. It presents the objects in a system and their relationship. There are three principle kinds of relationships which are important: Association, Inheritance and Aggregation. The class defines what object can do. Class Diagram includes three layers. These are class, attributes and operation.

The purpose of class diagram is to make frame that which is available for developer.

2.5.1 Relationship

Relationship can be used to connect classes with each other.

There are four kinds of relationships. They are dependency, association, generalization and realization. We explain them as follows;

2.5.1.1 Dependency

Dependency is a relationship to use the status on depending classes.

2.5.1.2 Association

Association is also a relationship to connect with different objects.

2.5.1.3 Generalization

Association Generalization is a relationship like inheritance to connect super class with sub class. Generalization shows that one class (subclass) inherits from another class (superclass).

2.5.1.4 Realization

Realization is a relationship to connect two objects whether one object implements or not.

Site search is realized (implemented) by search Service.

3. Customer Relationship Management (CRM)

Today, we need to know customers’ requirements to achieve successful business. In addition, we need how to offer the services to customers, what they use and to survey the feedback of the customers.

3.1. Supply Chain Management (SCM)

Supply Chain Management is the process to draw plan of the business operations and implement for producing products. After that, these products are distributed to the markets. Moreover, business men
effort in order to get successful points as much as they can. The supply chain covers everything from product development, sourcing, production and logistics. [1]

4. Analysis in Betel-Nut Business System by Using UML

We analyze the requirements of the system. These are;

Seller (owner) sells the products (betel-nut) with serving customers. These are:

▪ buy raw material for produce products
▪ produce product of various shape
▪ distribute the product in the market
▪ accept the product order from customers
▪ get paid from customer
▪ deliver the product to the customer
▪ pay salary for his staff

Buyer (customer) - Any buyer buys or orders the product from the businessman.

Staff – Any person work at their owner and servicing to the customers.

4.1 Designs for Betel-Nut Business System

In this section, we explain proposed system concerning UML using Use Case how to draw designs as following diagram.

According to figure 9, there are seller, buyer, and staff. First, seller have to buy raw materials and produce three types of products named stick shape, circle shape and cuboid shape. Second, these products distribute to the market. Customers can order products which they want. Moreover, customers have chances to cancel order. After that, customers will pay and seller delivers to customers. Finally, it includes payment for staff.

Figure 9. Use case diagram for betel-nut business system

Figure 10 describes about class diagram for betel-nut business. There are class name, attribute and operations in class diagram. Class name includes seller, customer, betel-nut business system, and staff.

For seller class, attributes of seller compose of seller’s name, address, phone number. Operations of seller include sell and pay salary. Attributes of betel-nut business system compose of kinds of betel-nut and weight. Operations of betel-nut business system include buy raw material, produce product, distribute product and deliver to customer. Betel-nut business system class includes three sub-classes. These are stick shape betel-nut class, circle shape betel-nut class, cuboid shape betel-nut class. Attributes of these three classes include betel-nut’s name. Attributes of buyer (customer) compose of customer’s name, address, phone number and weight. Operations of customer
include order/cancel and pay. Staff attribute consists of staff’s name, address and phone number. Seller class, betel-nut business system class and buyer class connect with association relation. Seller class and Staff class link with generalization relation.

Figure 10. Class diagram for betel-nut business system

5. Conclusion

In this paper, we present the diagrams for betel-nut business in order to be automated between buyer (customer) and seller (owner) by using Use Case and Class Diagram of UML tools. This paper only shows the design. Developer can use these diagrams to generate codes easily. In addition, these diagrams support owners to draw plan and concepts how to implement their system. These diagrams also provide sellers to complete their business in time. Especially, this paper presents how this is designed using UML tools. This system can be used not only for betel-nut business but also for any applications in the future.

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