

Applying UML Modeling Techniques for Architecture View of Electronic Commerce System

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Abstract—Software architecture provides structural relationship in between the components and connectors. Electronic commerce system provides business for companies over the internet through out worldwide .Large number of transactions are performed for delivering the services to customers is possible through this system. In this paper Architecture view of Electronic commerce system is performed by using UML Modeling Techniques. This paper presents Process of Electronic commerce system, architecture, workflow management, Domain model of this system with the help of Object oriented design methods is presented in this paper.

Index Terms—electronic commerce system, software architecture, UML modeling techniques, domain model

I. INTRODUCTION

Software architecture provides high level design of the system. Now a day's Electronic commerce system is one of the most popular systems in an information system [1]. This type of system is used to buy the product or sell the product through internet services. So that it is considered as one of the application of web services. E-Commerce system has Business to consumer or consumer to consumer and business to business method. E-commerce system has people, network, software, database management system. Modeling is an activity to represent the system in a schematic form. Architecture of Electronic commerce system is given in the section of 2. Workflow process of Electronic commerce system is presented in the section of 3. In section 4 Domain model of Electronic commerce system is presented. Conclusions are given in the section of 5.

II. ELECTRONIC COMMERCE SYSTEM

Customers are attracted through advertising and marketing for selecting products. Customers are able to purchase products through interaction based on catalog of product specifications. Handle and manage the products through payment order, transaction, full fill ment etc. Customer services are order tracking and customer service.

A. Electronic Commerce System Architecture

Electronic commerce system uses two types of process [6].

One is Online shopping, Electronic procurement system. Among these two processes Online shopping is more preferable. Non private sectors are used Electronic procurement system. Electronic procurement applications are Supplier centric system, buyer centric system. In Supplier centric system manage and update the catalog. In Buyer centric system buyer is able to purchase the system.

B. Framework for Electronic Commerce System

Framework for Electronic commerce system has five phases. First of all identify the market demands and then prepare a business model. Interaction is made in between the customer and market managers. Prepare and implement the product based on market demands. Evaluate that product with customer requirements. Media infrastructure, Network infrastructure and public and politics are the basic factors in Electronic commerce system. Framework for Electronic commerce system is shown below [2].

C. Conceptual Architecture of the Electronic Commerce System

Architecture of the system shows the structural relationship in between the components and connectors. It achieves certain quality factors the system. Conceptual architecture consists of concepts and functions. Each concept is represented by rounded rectangle. Functions are used to provide communication in between concepts

for performing operations. Identify market needs, Product catalog, availability of items, Seller, Buyer are the concepts. Refer, check, send item, purchase item are the functions. Identify the market demands of product, refer that product is available in catalog. Whether that product is available, choose an item by buyer through online process. Purchase that item by buyer [7].

Identify market demands and Framing the market opportunities	Business Model	Customer Interface	Market Communications	Implementation	Evaluation
Media Infrastructure					
Network Infrastructure					
Public and Politics					

Figure 1. Framework for electronic commerce system

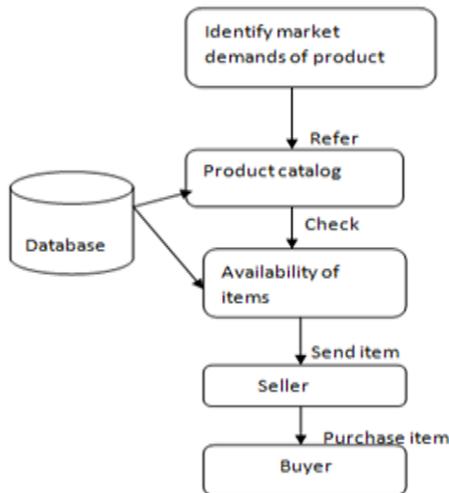


Figure 2. Conceptual architecture of electronic commerce system Applying UML modeling techniques for electronic commerce system

UML modeling Techniques are used for providing modeling of complex and large software systems in a successful manner. These techniques are used for developing architecture design of the system. UML diagrams are of two types Static diagrams and Dynamic diagrams. “Work flow process of Electronic commerce system provides systematic procedure for doing business process with the help of E business values [7]. Work flow process provide proper transactions, decisions and work activities are performed, and correct data and documents are routed to the customers.

Normally Electronic commerce system consists of three methods. Business to business, business to customer, consumer to consumer. Work flow process of Electronic commerce system is described by using UML modeling Techniques [2].

D. Class Diagram

Class diagram is an example of static diagram. Each Class consists of attributes and operations. Class diagram gives the relational ship in between classes. It gives conceptual analysis of the model. Classes are item, Catalog, order, purchase of item. Class diagram presents the detailed design of object oriented software system.

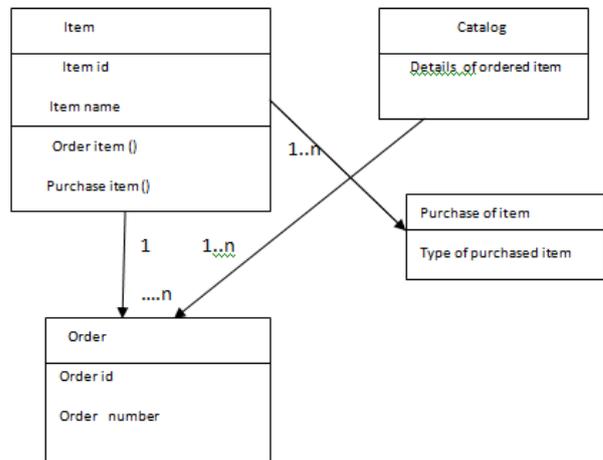


Figure 3. Class diagram for electronic commerce system

E. Use Case Diagram

Use case diagram shows the Behavioral aspects of the system. Use case describes actions of the system .Use case is represented by ellipse. Use cases show the system services. Actors are stakeholders for processing the system. Actors are represented by stick figures. Interaction is provided in between actors and states by association relationship. This type of relationship is represented by solid lines [2].

F. State Chart Diagram

It is an example for behavioral diagram. State chart diagram shows the various states of an entity. It gives how an entity responds to various events by giving the one state to another state.

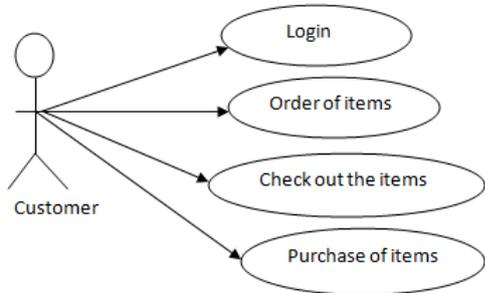


Figure 4. Use case diagram for electronic commerce system

G. Activity Diagram

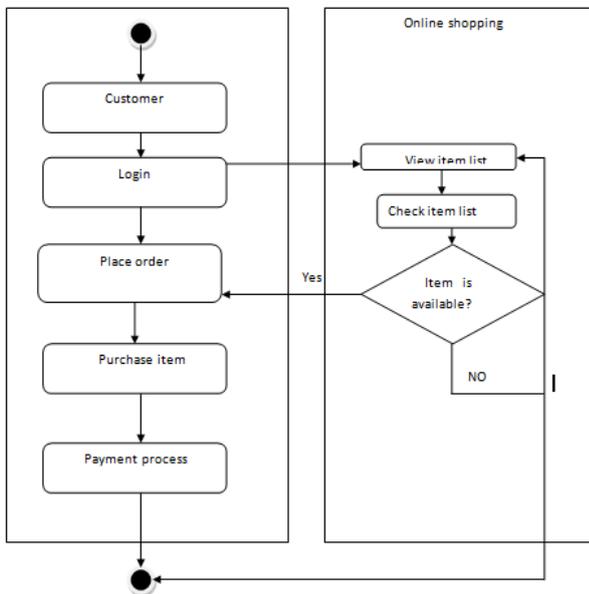


Figure 5. State chart diagram for electronic commerce system

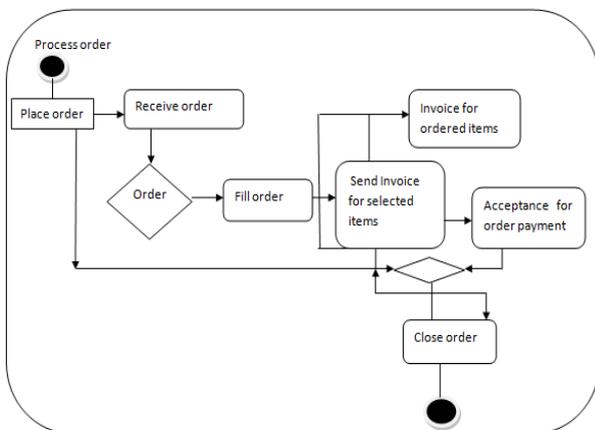


Figure 6. Activity diagram for online shopping item order process of electronic commerce system

Activity diagram is an example for dynamic nature of a system. Activity diagram shows various activities of the

system [3]. It gives the flow of control from one activity to another activity. These diagrams are used for modeling of workflow of business process. Here activities are Place the order, Receive order, Fill order, send invoice for selected items, invoice for ordered items, send invoice for selected items, Acceptance for order payment, close order etc [2].

III. CONCLUSIONS

- Software architecture gives high level design of system. Electronic commerce system is used for doing business through internet based on business values.
- Description of Electronic commerce system is presented.
- Workflow management of Electronic commerce system is presented with the help of Object oriented design methods.
- In future work design of Electronic commerce system is possible with the help of formal specifications.

REFERENCES

- [1] M. Shaw and D. Garlan, *Software Architectures: Perspectives on an Emerging Discipline*, Englewood Cliffs, NJ: Prentice-Hall, 1996.
- [2] G. Booch, J. Rumbaugh, and I. Jacobson, *The Unified Modeling Language User Guide*, Addison-Wesley, 1999.
- [3] A. J. Riel, *Object-Oriented Design Heuristics*, Addison-Wesley, 1996.
- [4] B. Tekinerdogan, "Synthesis-based software architecture design," Ph. D Thesis, Dept. of Computer Science, University of Twente, The Netherlands, March 2000.
- [5] B. Tekinerdogan, Aksit, "Providing automatic support for heuristic rules of methods in object-oriented technology," *ECOOP '98 Workshop Reader, LNCS 1543*, Springer Verlag, pp. 496-499, 1999.
- [6] L. Bass, P. Clements, and R. Kazman, *Software Architectures in Practice. Reading, Massachusetts*, Addison-Wesley, 1997
- [7] S. Y. Choi, D. O. Stahl, and A. B. Whinston, *Economics of Doing Business in the Electronic Marketplace*. Indianapolis, Macmillan Technical Publishing, 1997.



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