JAVA BASED IMPLEMENTATION OF AN ONLINE HOME DELIVERY SYSTEM

Mr. Fiaz Ahmad   **Dr. Mohamed Osama Khozium**

Assistant Lecturer   Assistant professor

Faculty of Information Technology

MISR University for Science & Technology, 6th of October City, EGYPT

fiaz.ahmad@yahoo.com   Osama@Khozium.com

ABSTRACT

Technology means science and theories implementation to help the human-beings. We are also familiar, how the computer technology and computer developments are introducing luxuries in the life of the mankind of this planet.

This paper reveals not only the benefits of the computer technology that are directly making the life of human-being easier and easier but also putting valuable impact on the environment of this society. The paper describes the design and implementation phases of the Online Home Delivery System. The paper commences with highlighting the momentous aspects of computer technology and its development effects on today's society. The system also brings to light how computer technologies are mounting the luxuries of today's life by introducing new amazing aspects every day. Java is used to develop the system. Java is an object oriented language that's well suited to designing software that work with in conjunction with the internet.

The system is designed and developed for providing the home delivery service in a completely different way. The system can be utilized in the real world environment and can give fruitful effects in the business. The key contribution of the proposed system is the entirely new concept that is "delivery to password secured box". The system is also introducing a unique interface for placing order using cellular phones.

This system is a generic product developed for prospective organizations which are providing facility of home delivery of their goods. The system also shows how to co-op up with security issues while considering resources with all its availability.

Keyword: Robust and Secure, Cellular Phone Application, Platform independency, POST, J2ME, Internet Security.

1. INTRODUCTION

Every moment that comes to us brings new challenges. The rising boom of computer technology has brought new horizons to our attention. Today continuous progress and service delivery has changed business as well as the daily life of today's human-being.

Continuous advancement in computer technology has introduced many valuable impacts on today's life. Online Home Delivery System is also a powerful reflection of computer technology.

Is it OK ... to use a home-delivery service? It's not the idea, but the application of the idea that is the key to success. So say the business gurus. Indeed, it's striking how many successful businesses are based on ideas that failed for others before them.

The case of Webvan.com is a good example that there are often rich pickings to be had from the carcass of failure. Webvan was one of the most luminescent stars of the dotcom boom - and one of the most startling failures of its inevitable crash. The company's founders raised about $1bn to fund their idea of a **super-efficient home-delivery**. Initially serving Silicon Valley in California. The company's fleet of vans promised to deliver to customers within 30-minute time slots. Customers loved the service but the company grossly over reached and it floundered with colossal debts [1].

Information technology advancements have introduced a number of incredible things that was a trance in the past. The idea of home delivery service is a very strong idea for today's business

and it can put valuable effects on the business of any organization in today's competitive business environment.

The Online HDS (Home Delivery System) is developed for replacing the existing manual system at organizations providing facility of home delivery with online shopping capabilities. The far-off user can place order from web and from internet enabled cellular phones. It provides online Shopping facility to remote users. It would like be a point of order system. The system will capture Sales Information at POST (point of sale terminal), Manages Inventory, and Customers Information. Unlike the existing outdated largely manual Sale, and Inventory systems. The product provides accurate and up-to-date Sale, Inventory, and Customer information to the management.

Tesco's e-grocery service has also proved a big success. it is now the world's largest home-delivery service, with 150,000 orders a week and sales in 2005 of £719m - an annual growth of 24%. Considering that home shopping only accounts for 2% of Tesco's total group sales of £37bn, there is still huge potential for growth [1]

The successful implementation of the system is also introducing some environmental benefits. In this way, Information technology is impacting valuable effects on the environment of this planet. There are also possible environmental advantages - not something you can usually say with supermarkets - to an increased move towards home deliveries. You would think it is obviously better to encourage people not to drive themselves to a store and instead rely on a van making multiple drop-offs, thereby cutting the need for many journeys.

2. BACKGROUND

The idea of Home Delivery Service is a crucial for any organization that wants to do strong business in the market.

Research by the University of London centre for transport studies in the late 1990s showed that even with vans each carrying just eight customer orders per round, an estimated 70-80% reduction in total vehicle kilometers could be achieved if it stopped customers going to the shops by car. A related questionnaire also showed that 74% of car owners said they used their cars less because of their home deliveries [1].

The main purpose of this system is to replace the existing manual system. Limitations of the manual system are as follows.

- Stock checking is time consuming, and error prone. Items can be placed at other locations in the store. Due to this reason, item tracking process is very cumbersome and time consuming.
- In the manual system it is very difficult to maintain the records of items, like item price, quantity, and last purchase rate.
- No facility to maintain the records of suppliers and manufacturer.
- No synchronization between item quantity at POST and at Store.
- In rush hours, the sale speed gets to low and cashier can make a mistake.
- Sale invoice does not include any item description.
- If two items has same price on sale invoice then it is difficult to identify the item.
- This problem can also generate difficulties on return of sales.
- Inventory is handled very poorly.
- No tracking of item categories and sub categories.

A successful implementation of the System can improve the image of the organization, catch the attention of more Customers and an automated system fulfills customers and owner's needs.

3. DFD OF THE SYSTEM

In the late 1970s *data-flow diagrams (DFDs)* were introduced and popularized for structured analysis and design (Gane and Sarson 1979). DFDs show the flow of data from external entities into the system, showed how the data moved from one process to another, as well as its logical storage [2].

The DFD of the proposed system is given in figure 1. It shows different process and system behavior while interacting with it.
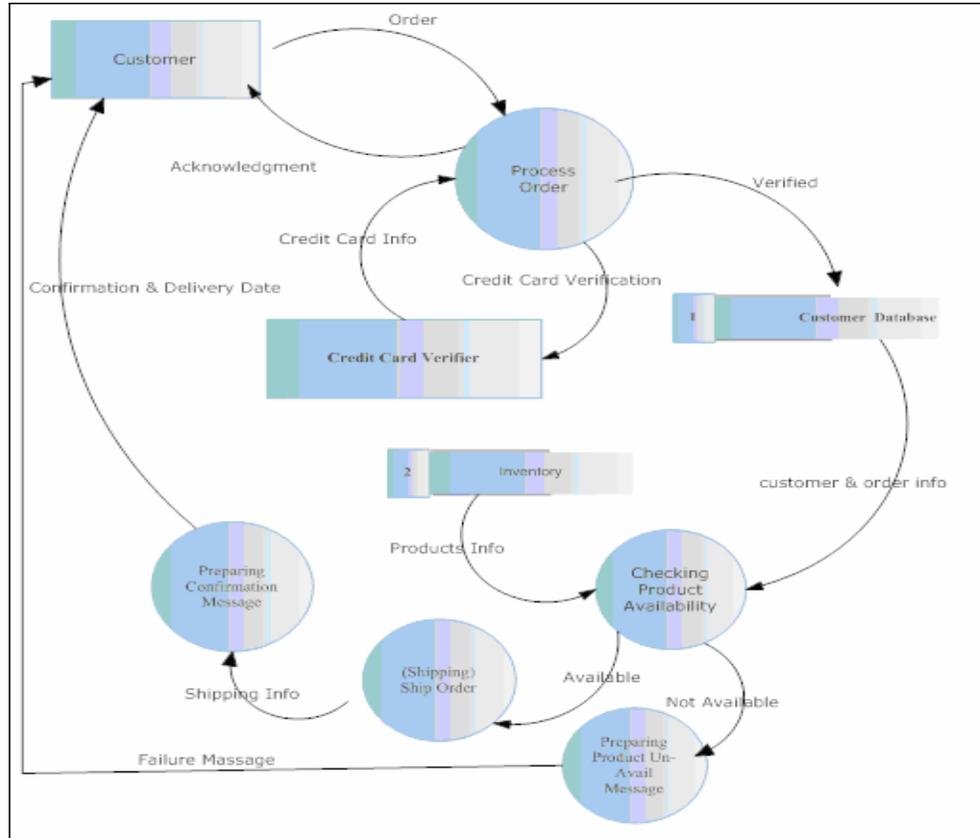
Figure1: Data Flow Diagram of the proposed system

4. SALIENT FEATURE OF THE PROPOSED SYSTEM

The proposed system is also bringing-in a new concept for the efficient and secured home delivery. The concept of **"delivery to box".** This idea will be very supportive for any organization for the speedy deliveries as well as it will also eliminate the need for the customer to be at home. The "delivery to box" service (where the shopping is left in a password-secured box outside the home, thereby eliminating the need for the customer to be at home and allowing the driver greater flexibility to choose more efficient routes), the average journey length per delivery dropped to 0.9km [1].

When the customer will place an order, he/she will provide a password to open the box that is outside his/her home. The password will be recorded with the order receipt. So that the deliverer could put the order into the box.

In the last few decades the usage of internet and mobile technology increased in a very rapid way. This technology also impact very valuable impacts on today's life. The graph given in figure 2 shows the rapid growth of the usage of internet technology.
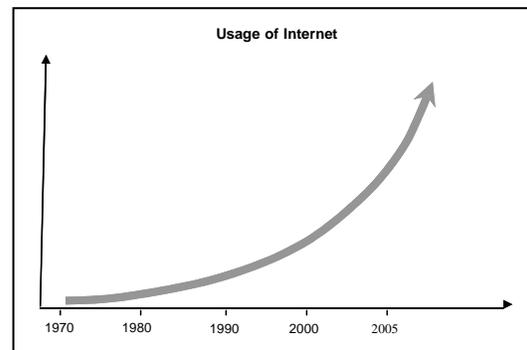

Figure 2: Growth in internet usage

In the same way, usage of mobile technology is also increased in a very speedy way. Now a day more cellular phones are used to connect with the internet for achieving different tasks and accessibility of internet using cellular phones is putting a clear effect on today's business.

The graph given in figure 3 shows the usage of cellular phones to connect with the internet.
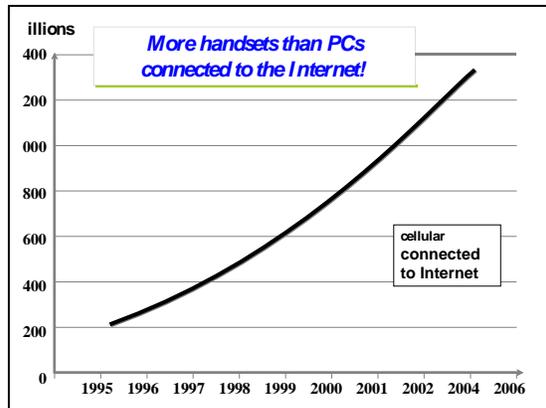
Figure 3: Usage of handsets connecting with internet.

The major contribution of the proposed system is that the system is going to provide a new facility that was not introduced before this in such type of systems, is the usage of cellular phone for putting online order and the" delivery to password secured box ". This facility can put valuable effects on the business of any organization as well as it can introduce ease for the customers.

5. DESIGN AND IMPLEMENTATION
5.1 Development Environment

Java is a programming language that is well suited for designing such type of software that work in conjunction with the internet [3]. Additionally it's a cross platform language, which means its program can be designed to run the same way on Microsoft Windows, Apple Macintosh and most versions of UNIX, including Solaris. Java extends beyond desktops to run on devices such as televisions, wristwatches, and cellular phones as it is small, secure, and portable [4].

Java is best known for its capability to run on World Wide Web pages [5]. Java's strength include platform- independence, object oriented nature, as well as easy to learn [6].

Furthermore, java has JSP (Java Server Pages), Struts, EJBeans (Enterprise Java Beans), like dominant technologies that create attraction for the development of distributed web applications.

For all the above mentioned advantages, java was selected to develop the System.

5.2 Security & Privacy Threats and Controls:

Security and privacy issues have much more importance in any organization and can't be neglected for any secured business system.

The term "system security threats" refers to the acts or incidents that can and will affect the integrity of business systems, which in turn will affect the reliability and privacy of business data.

Most organizations are dependent on computer systems to function, and thus must deal with systems security threats. Small firms, however, are often understaffed for basic information technology (IT) functions as well as system security skills. Nonetheless, to protect a company's systems and ensure business continuity, all organizations must designate an individual or a group with the responsibilities for system security. Outsourcing system security functions may be a less expensive alternative for small organizations [7].

Possible security threats that can affect any business system are:

5.2.1 Security Threats:
- **Malicious Threats**
- **Unintentional Threats**
- **Physical Threats**

5.2.1.1 Malicious Threats:
i.   Malicious Software (codes)
ii. Unauthorized Access to Information
iii. System Penetration
iv. Theft of Proprietary Information
v.   Financial Fraud
vi. Misuse of Public Web Applications
vii. Website Defacement

5.2.1.2 Unintentional Threats:
Malfunction
Equipment Malfunction
Software Malfunction

Human Error
Trap Door (Back door)
User/Operator Error

5.2.1.3 Physical Threats:
Physical Environment
Fire Damage
Water Damage
Power Loss
Civil Disorder/Vandalism
Battle Damage

5.2.2 The formulation of following steps can enhance information security structure for any organization i.e.
1. Identify Security Deficiency
2. Continuous IT planning for technical & operational tasks
3. Self Assessment mechanism
4. Incident handling procedures
5. Information recovery methodology
6. Back up of Data & Configuration
7. Future Security Visions

8. Quality measures for security
9. Coordination with departments for regular monitoring of all servers.
10. Develop action plans and milestone for information security

Security safeguards needed to be improved via identification & authentication where low risk environment prevails. While considering security procedures access privileges need to be monitored and controlled for every level of access.

Organizations have to apply departmental zones with reference to security control and access mechanism. As one key mechanism that is often neglected by many organizations is continuous monitoring of network traffic with all its available resources [8]. A combination of preventive and detective controls can mitigate security threats.

5. 3 Design Class Diagram of the Proposed System

In the Unified Modeling Language (UML), a class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, and the relationships between the classes[9].
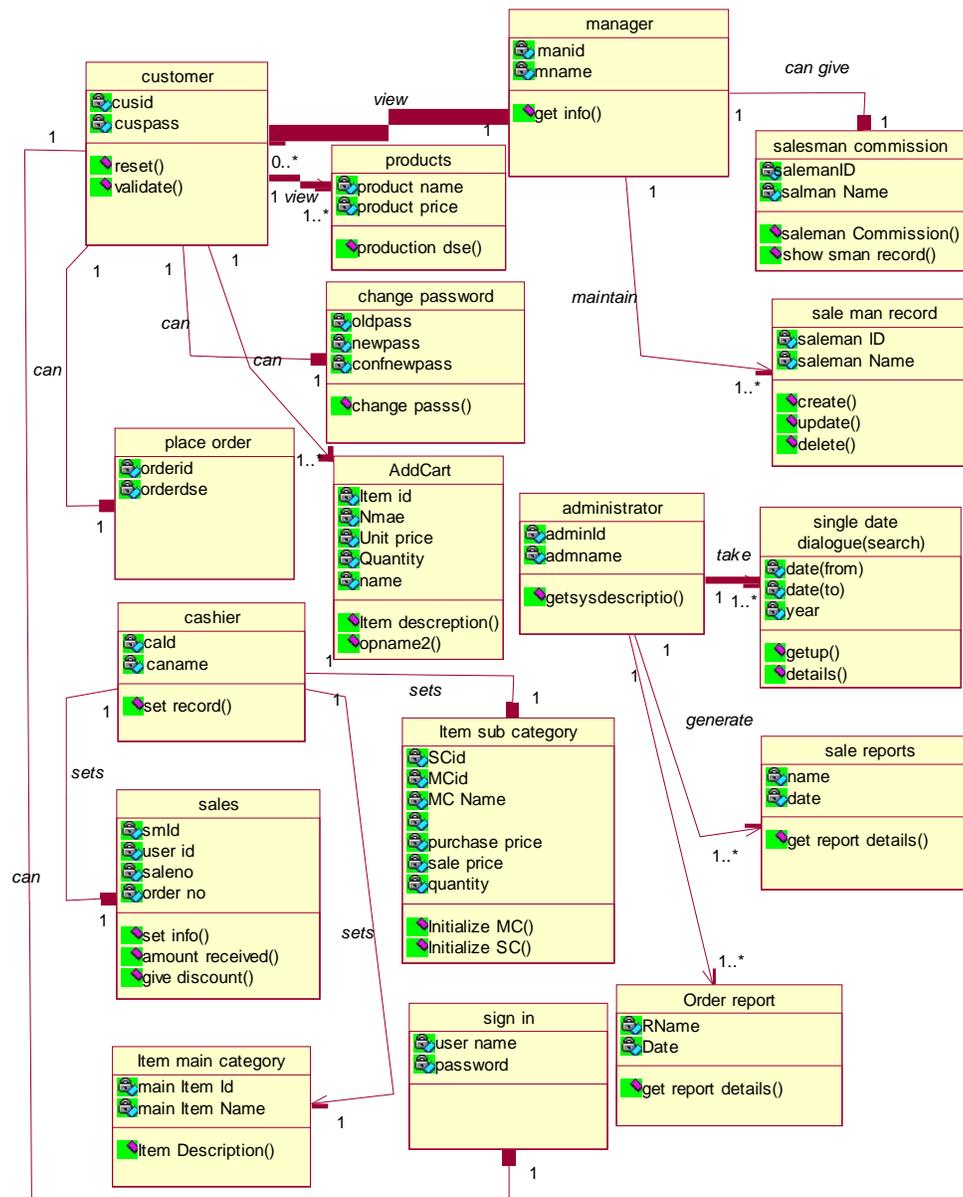

Figure 4: Design Class Diagram of the system proposed

5.4 STRUCTURE OF THE SYSTEM

The proposed system is a distributed web application, containing three modules.

1. Web Module
2. Cellular Phone Module
3. Desktop Module (Server Side Module)

Struts are used as architecture that is famous model view controller pattern. EJBeans (Entity Java Beans) are used an application layer between browser and data base.

Through the web application of the system customer can log in to the super store and can do shopping according to his/her needs.

The cellular phone application is developed using J2ME (Java 2 Micro Edition) to facilitate the customer to place order using cellular phones. That is basically a Midlet and data moved from Midlet to JSP and from JSP to EJBeans

(Inside application server which is Bea Web Logic) and then to the database.

The basic functionality is to place order and display a unique order id and display it to the user. It is important how at run time a catalog is made and its sub items are retrieved from database using EJBeans and displayed on a constrained memory and user interface cellular device.

The desktop application (server side application) that is communicating with the database through Bea Web Logic, which is an application server for sending and retrieving data from the data base.

5.5 State Chart Diagram of Super Store Management

A state chart diagram shows the behavior of classes in response to external stimuli. This diagram models the dynamic flow of control from state to state within the present system [10].
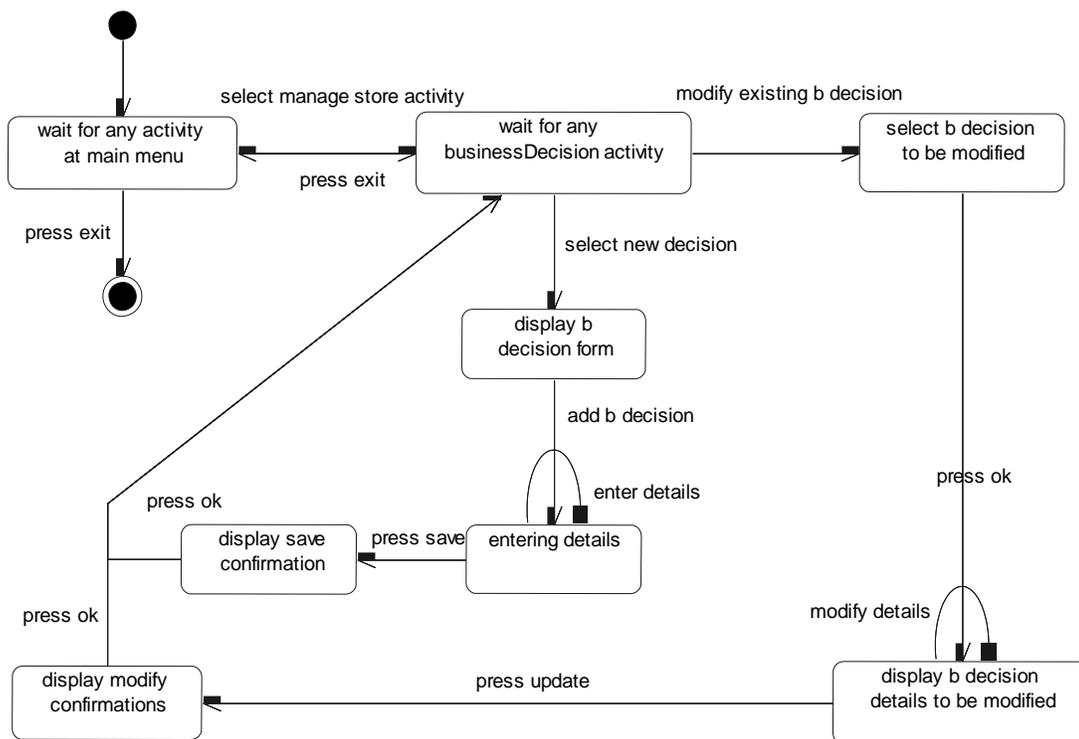

Figure 5: State Chart Diagram of Super Store Management

6. CONCLUSION

The design and development phases of the proposed system for Online Home Delivery are described in this paper. The manual system, of any organization or super store can takes care of its stock and store items to a limited extent. It does not provide technically mature and sophisticated

features that are currently needed by the management.

The Proposed system will capture Sales Information at POST, Manages Inventory, Customers Information, and provides online Shopping facility to remote users. Unlike the existing outdated largely manual Sale, and Inventory system. The product provides accurate

and up-to-date Sale, Purchase, Inventory, and Customer information to the management. This will reduce duplication of work and improve the efficiency of the available resources.

The supermarket delivery service means that I can get large and bulky items delivered and use the local shops for smaller things. It has also proved indispensable for ordering groceries for my housebound elderly relative in another county. It seems that home deliveries offer environmental advantages, but much more so if we are less demanding about delivery slots and favor using secured delivery boxes [1].

Among the advantages of the system that are normally not available in other similar systems is the facility, "delivery to the password secured box". The system provides the facility to the customer to choose the delivery option while ordering online. In the case of delivery to box the system inquired for the password that is dispatched with the customer address on the order receipt. The system also facilitates the customer by giving payment option. The customer can pay online as well on home after receiving safe his/her order. The system is also participating to achieve environmental benefits as well as personal benefits e.g. saving money, time etc.

The system was tested and showed a high accuracy and success. The system can be utilized in research knowledge-seekers its usage, properties and applications.

REFERENCES

[1] Guardian Website, "Is it OK ... to use a home-delivery service?", *http://www.guardian.co.uk/g2/story/0,,1698496,00.html, 2007*

[2] Scott W., "The Object Primer 3rd Edition", Cambridge University Press, 2004 ISBN#: 0-521-54018-6, http://www.agilemodeling.com/artifacts/dataFlowDiagram.htm , 2007

[3] Java *web site, Sun Microsystems, java.sun.com, 2007.*

[4] Newman A., A Special Edition Using Java, Indianapolis, IN, Que Corporation, 1996.

[5] Gridley M., Web programming with java, Indianapolis, IN, Sams.net, 1996.

[6] Horstmann C., Core Java 1.2, Sun Microsystems's Press, California, 1999.

[7] *P. Paul Lin ,The CPA Journal online."* System Security Threats and Controls*",* http://www.nysscpa.org/cpajournal/2006/706/essentials/p58.htm

[8] Khozium, and et." Process Management for Information Security Assessment", *The 2006 International Arab Conference on Information Technology (ACIT'2006)p 45.*

[9] Wikipedia "The Free Encyclopedia", http://en.wikipedia.org/wiki/Class_Diagram , Last visit, 2007.

[10] Smart Draw "What is a UML State chart Diagram?**" ,** http://www.smartdraw.com/tutorials/software/uml/tutorial_09.htm , Last visit, 2007.