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## Inventory System Development Using Sequential Search And More Security

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### Abstract

In this paper the goal is to provide by offering a sales and inventory management system as a substitute for antiquated manual processes, this paper explains the goal is to give the store a system with improved and more flexible capabilities. The system's objective is to provide resources for better managing the store's inventory. To achieve the predetermined objectives, the paper's focus will be on components like databases, report production, standard control (QA), and the store's point of sale. It is envisaged that the system will provide an intuitive user experience that is easy enough for anyone without an IT background to use.

**Keywords:** inventory management, rad techniques.

### I. INTRODUCTION

Monitoring and tracking a company's inventory is known as inventory management. Controlling inventory guarantees that the company will always have what it needs. Materials and goods can be kept as affordable as possible by doing so. Effective inventory management is the foundation the superior supply chain management. The old artificial method of managing inventory has severe drawbacks, including low efficiency, inadequate security, and a tendency to accumulate a lot of files and data over time, making it difficult to identify, update, and maintain. For these reasons, the warehouse must keep an eye on storage. Businesses must have a core inventory management system, and corporate decision-makers and managers are crucial. So, you need to establish a thorough inventory management system based on a flexible supply chain. This system must enable managers to switch from qualitative to quantitative analysis, reflect inventory immediately and dynamically, and provide users with appropriate information and easy querying. The inventory management system is an essential part of any organization, whether it focuses on selling goods or providing services. Inventory management aims to establish rules that will lead to optimal inventory. The requirement for capital is decreased through effective inventory management. Inventory control lowers costs and increases profitability. The company included in this study's case study is a flexible maker of printed circuit boards for commercial electronics devices [1], [2]. The retail industry is one area of the economy that is growing swiftly, with new stores frequently opening to meet the demands of nearby customers. Depending on what is most convenient for them, customers can choose from a variety of retail locations, from hypermarkets to mini-marts. The vast bulk of the shops is situated in neighborhoods.

The store's suppliers and wholesalers offer a wide range of goods and services that the end customer can buy. Because of this, good inventory management was required in the retail sector to meet customer demand. Spreadsheets are the most used tool by retailers to manage their inventory and sales, but as businesses get larger, they are less effective. This is due to the availability of more items in larger quantities, which will make it challenging and time-consuming for the retailer to match sales made with inventory levels in the store. The problem gets worse when the shop utilizes a flawed method to identify the items that customers have purchased. This project will therefore provide a solution for businesses that are currently using a traditional approach to maintain their inventory data by creating an inventory system. The computer-based Sales and Inventory Management System, which also manages and keeps track of the item inventory, provides the shop structure [11].

The Sales and Inventory Management System approach is widely used to prevent product overstock or outrages by connecting each day's "Point of Sales" with the business's inventory level. Inventory is a critical area that needs careful management to ensure the efficient running of routine corporate operations. There is consequently essentially no protection for any data, papers, or other items related to regular business or inventories. Numerous records have been kept for each good and each supplier, consuming time and becoming obsolete for future use. For food-based products like milk, bread, wheat, etc., existing inventory management does not provide any capabilities for detecting products with an expiration date. Certain products whose expiration dates were not noted result in losses for the retailer. The current system in use is unable to produce a report on point of sales at the end of the day since it only determines the total amount of each customer's purchases and does not have a database link. Because there is no set technique for making reports in the store's log book, various types of reports are produced every time. The basic report gives the owner no advice on how to run the business profitably because it just calculates the day's total sales using the cash in the teller deck. The owner cannot determine whether there is insufficient cash on the cashier's desk or whether any cases have been taken because the current system does not have a database to track daily sales totals. Another issue that has been identified is the fact that most customers who made purchases at the business don't get enough receipts to use as references. Instead, there are simply system-generated receipts with prices.

## II. LITERATURE REVIEW

### 1) Inventory Management System: History and Concepts:

Every day, millions of people across the globe engage in countless sales transactions, creating a continual flow of wealth that serves as the cornerstone of our economies. In general, a sale is an agreement between two parties where the buyer obtains products, services, or assets in return for money. As a result, each participant in the transaction must give something up to receive something valuable to them. On the other hand, inventory is defined as the unfinished goods, work-in-progress items, and raw materials that are considered to be a component of a business's assets that are still in use and are ready to be sold. This explains why a company needs inventory on hand to offer goods to clients, receive payment, and ultimately turn a profit. The two main problems that firms face when managing their inventory levels are high inventory and low inventory. A company should generally avoid storing a large amount of inventory for an extended period due to the costs involved with storage, obsolescence, and spoiling. However, having little inventory is also detrimental because it increases the company's risk of losing market share and potential clients. Effective inventory management is essential for addressing inventory problems. Inventory management systems are usual for businesses, as well as smaller organizations and suppliers, to know which products are selling and which are taking up shelf space, according to Tim Crosby's (2012) study on "How Inventory Management Systems Work." The tactic achieves a balance between the retailer's need to have as little inventory as possible and the goal of guaranteeing that customers always have plenty of what they want (Tim Zierden, 2009). Modern inventory management systems must therefore be able to monitor sales and inventory levels, communicate instantaneously with 14 suppliers, and gather and incorporate additional data, such as seasonal demand [4].

According to Anton Dolinsky (2010) in his essay on "Barcodes, Sales, and Inventory Control," merchants kept track of purchases or tallied the number of units left at the end of the day to forecast future requests in the early days of inventory tracking. However, it became challenging to sustain this practice after the Industrial Revolution because mass production and enhancing consumer experiences at the moment of sale became the core goals of the business. Early in the 1930s, the first modern check-out system was introduced, using punch cards to link with items from catalogs. It was developed by a Harvard University team. In the 1960s, the development of accessible laser technology raised hopes for revitalizing the concept. The modern bar code, also known as the Universal Product Code (UPC), was then developed right before the 1970s [6]. As a result, the UPC's capacity to assist in tracking and controlling stocks improved significantly as processing power increased concurrently. As technology advances, yet another new inventory tracking system has recently infiltrated stores, warehouses, and factories (Edward A. Silver, 2007). Radiofrequency identification (RFID) uses a microchip to transmit product data to a scanner or other data aggregator. To represent modern inventory management systems of stock tracking, the continual "beep, beep, beep" of bar codes being read at the checkout lane.

### 2) Assessing the benefits of the Barcode technology:

In their study paper titled "The Impact of the Usage of Bar Code Technology on Supply Chain Operations," Yves Dallery and colleagues (2010) claim that the bar code system is one of the data capture technologies that has been broadly embraced in virtually every industry. The supermarket industry, for example, saw revenue savings of 2.67 percent and 2.89 percent, respectively, by using the barcode sector. Implementing a barcode system often aims to reduce data entry errors, gather timely data for inventory control, improve customer service, and promote buyer and seller contact. The technology also serves as the primary source of real-time input, allowing businesses to monitor operations, manage resources, and spot anomalies before they influence throughput. Research into the potential advantages of barcode applications for supply networks is substantial. One of the research includes a qualitative analysis that explains the concept underlying bar code technology and develops conceptual frameworks to better understand it. Barcode systems are essential for enhancing the effectiveness of inventory management, according to case studies conducted in manufacturing and distribution companies [7]. The studies also show enhanced inventory control, greater customer service, and empowered personnel. As a result, less money is spent on inventory. Integration of marketing and inventory information systems using barcode technology is crucial for a successful supply chain.

### III. PROPOSED METHODOLOGY

#### 1) Rapid application development (rad) methodology:

When developing the system, the author chooses to employ one of the "rapid application development (RAD)"-based approach categories to provide simple interaction between users and developers with varied IT backgrounds. The RAD-based methodology can be used to modify the SDLC phases to speed up the delivery of specific system components to users. Users will have a better understanding of the system and be able to recommend modifications to make it work more efficiently.

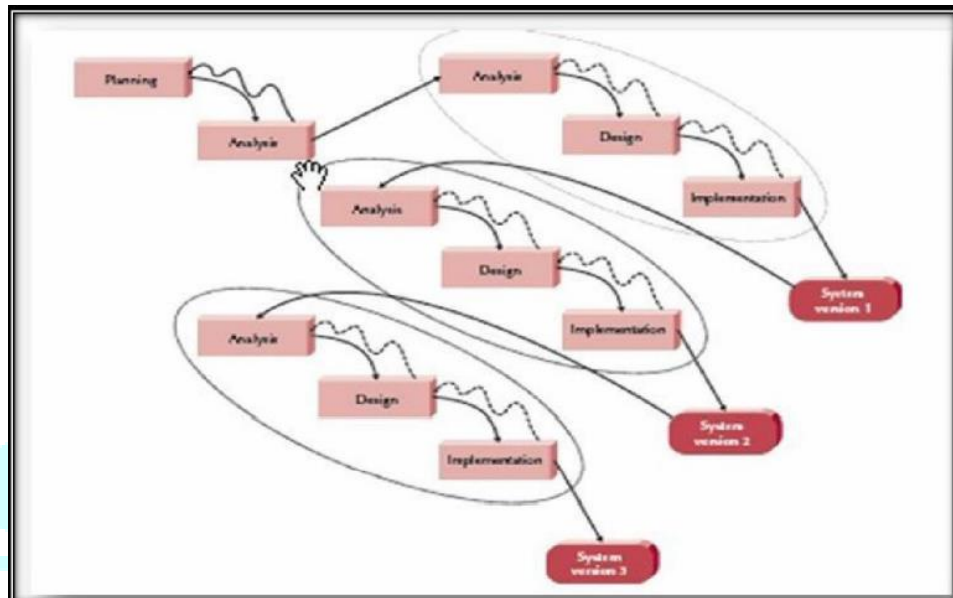


Figure 1: Phased Development-based Methodology

The best methodology to cope with this issue is phased development based, which divides an overall system into several versions that are generated one after the other. This is so that the system can function as a complete program as it has numerous module bindings. The developer has a restricted number of ideas for future work because of time constraints, which prevent them from adding numerous functionalities to the system. By connecting the two systems, the Store system may instantaneously send the Supplier an inventory order request when the stock level is low. Due to the need to manually make the order with the supplier, the delivery of the items may be delayed. It is possible to use just-in-time inventory because of this connectivity, which eliminates the requirement for the retailer to maintain high stock levels, a subpar inventory control technique. As a result, each module will be used to build a system prototype. Once the general system architecture had been established through the analytical method, the requirements were split into a variety of variants. The visibility of the layout is another crucial component of a window-based application. Instead of spending a lot of time designing the entire system, this allows the author to spot navigation and usability concerns when creating one of the modules. Version 1 is put into use, after which version 2 work begins. New concepts and issues that were discovered as a result of users' experiences with version 1 are integrated based on the previously mentioned demands. Then, additional research is done. The advantage of phased development-based approaches is that they enable users to achieve commercial value immediately by providing them with a practical solution. Users are also more likely to notice important new requirements early because they begin utilizing the system earlier. These are a few justifications for the author's choice to employ this methodology when creating.

#### 2) project phases:

The project activities are broken down into the following four basic phases: I. Planning: - The problem the chosen shop is having is identified, and a solution is offered - The project's goals and parameters are made apparent - The paper activities are scheduled by the project's deadline. ii. Evaluation To gather requirements, data is gathered, the literature is examined, and an interview is held. Design: models, prototypes, and UML diagrams are produced. iv. Execution: - Project coding starts and continues until the system is complete - Usability testing is done - It is made accessible to the user.

#### 3) Tools, Mechanisms, and Software:

In the second phase of the project, the system is developed using the following tools: I. Applications in Visual Basic Microsoft Visual Basic is an integrated development environment (IDE) from Microsoft. It is used to create console and graphical user interface applications in both native code and managed code for all platforms supported by Microsoft Windows, Windows Mobile, Windows CE,.NET Framework,.NET Compact Framework, and Microsoft Silver light. Windows Access (ii) Microsoft Access, often known as Microsoft Office Access, is a relational database management system that combines the Microsoft Jet Database Engine with a graphical user interface and software development tools. It is a component of the Microsoft Office program set in editions Professional and higher. Visual Basic for Applications supports Windows Access, which is used to create application software.

## IV. RESULT

The (Q, R) technique was implemented in the company's inventory management system via the proposed system. Given the huge reduction in manual labor, the material planners appeared to have an easier time working. These users include system administrators who can log in and change the details of goods and Employees in charge of handling sales. The apparatus will come with an intuitive interface. A database is needed to hold all the data. Through an interface, users will communicate with the system by providing inputs. The system will process the input after that, providing the information based on the given input. The system also keeps the user's processed data in the database.

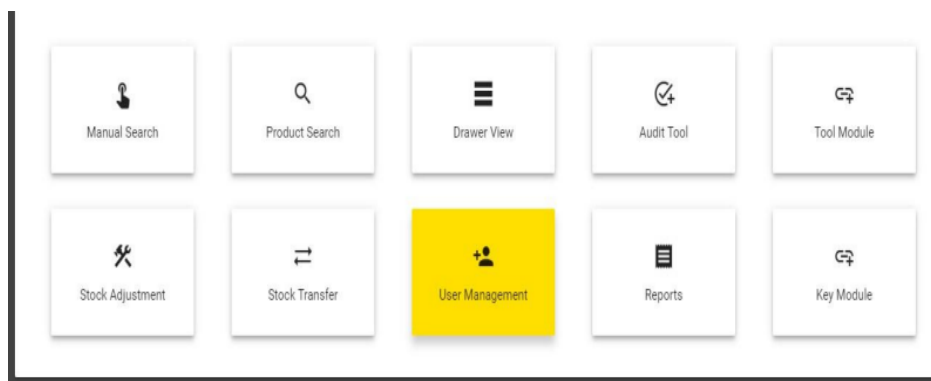


Figure 2: Content Page (Admin View)

Figure 2 shows the content interface for the admin view. Admin is allowed to choose all four functions on the menu page which are POS, Notifications, Inventory, and Report. However, for user login, only the POS button is enabled due to security purposes on store information.

Total No Of Drawers (44)									
D-1 COMPLETED	D-2 INPROCESS	D-3 INPROCESS	D-4 INPROCESS	D-5 INPROCESS	D-6 INPROCESS	D-7 INPROCESS	D-8 INPROCESS	D-9 INPROCESS	D-10 INPROCESS
D-11 INPROCESS	D-12 INPROCESS	D-13 INPROCESS	D-14 INPROCESS	D-15 INPROCESS	D-16 INPROCESS	D-17 INPROCESS	D-18 INPROCESS	D-19 INPROCESS	D-20 INPROCESS
D-21 INPROCESS	D-22 INPROCESS	D-23 INPROCESS	D-24 INPROCESS	D-25 INPROCESS	D-26 INPROCESS	D-27 INPROCESS	D-28 INPROCESS	D-29 INPROCESS	D-30 INPROCESS
D-31	D-32	D-33	D-34	D-35	D-36	D-37	D-38	D-39	D-40

Figure 3: Inventory Page

The third module is inventory modification. When the admin enters the inventory module, he will be directed to the interface where he can make changes as shown in Figure 3. When the transaction report will be completed, then it will show the one message of the drawer is completed otherwise it shows the message that the drawer is in the process after submitting the transaction report.

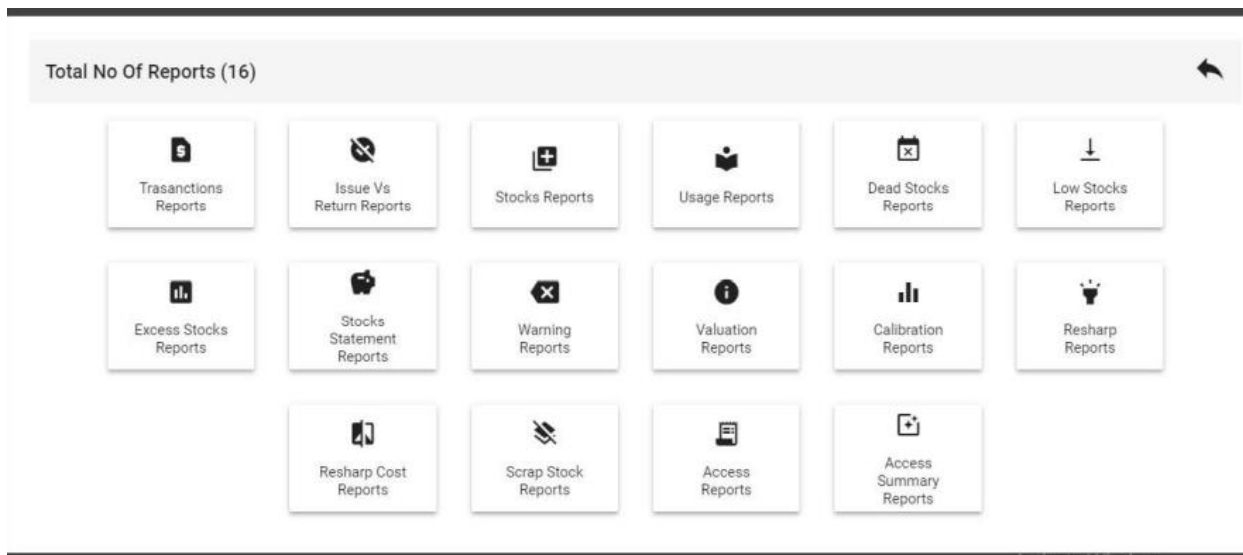


Figure 4: Report Page

The last module is the Report. This module will display the report on the sales made by the store daily, weekly and monthly basis. The report will be displayed in the form of a bar chart that shows sales amounts based on product categories. Figure 4 shows examples of the report on daily basis. The other facility available with the web application is the damage product list with all the products and their quantity that have encountered damage. This is a trivial part of the web application where the damages are recorded based on the product with the cause of the damage. So this data will serve as an eye opener for the shop management to prevent the losses due to those causes and take all the precautionary measures based on the data recorded. Also, this can be extended to have an ML-based analysis upon what are all the possibilities of damages and the prediction of damages can also be made using the ML algorithms based on the recorded data that would grossly decrease the damage.

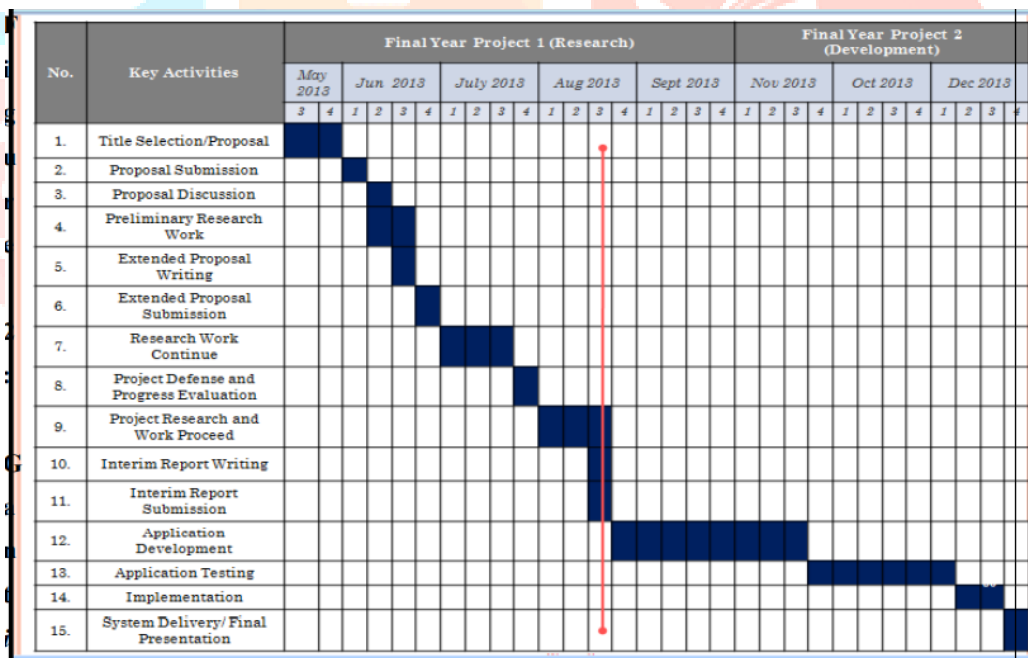


Figure 5: Gantt chart of Project Activities

Figure 5 shows the Gantt chart of the whole main project activities. This chart shows the scenario of whole key activities.

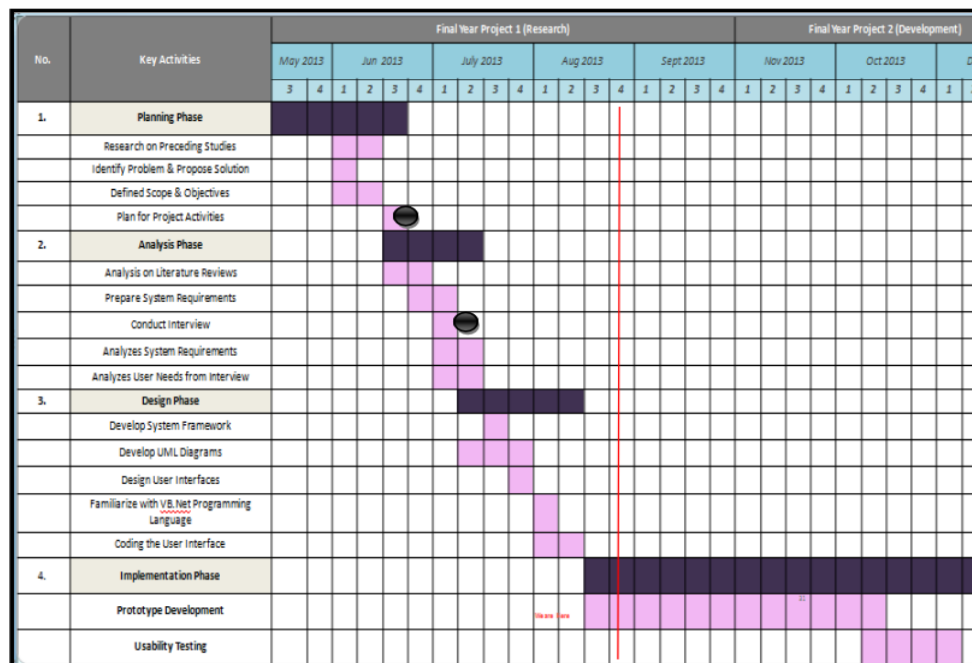


Figure 6: Key Milestones in Project Activities

Figure 6 shows the key milestones of project activities present in the project. Using this graph all activities search by project work using one unique key and after that generating a separate report of each activity.

#### IV. CONCLUSION AND FUTURE WORK

The concept was developed using research done on Store as a base. As a result, the planning and analysis phases of the system's development are based on the data obtained from the interview with the observer. Additionally, as it would be the store's first computerized system, all of its capabilities were focused on finding a solution to the inventory management issue. The interface design is also categorized as "user friendly" because the employees lack IT expertise, allowing anyone to utilize the system regardless of IT background. The developer has a restricted number of ideas for future work because of time constraints, which prevent them from adding numerous functionalities to the system. The development of system integration with the supplier system comes first. By connecting the two systems, the Store system may instantaneously send the Supplier an inventory order request when the stock level is low. Due to the need to manually make the order with the supplier, the delivery of the items may be delayed. Because of this connectivity, the store can use just-in-time inventory, eliminating the requirement for it to keep high stock levels, a subpar inventory control approach.

In the future, the proposed system may intend to extend efforts to the development of integration between the system with the supplier system. By integrating both systems, the system can directly send the request for inventory order to the supplier when the stock level is low. Thus, Store does need to order manually from the supplier which can cause a delay in the delivery of the products.

#### REFERENCES

- [1] L. Aleksejeva, "Agent system application as a tool for inventory management improvement," in 8th Int. Conf. on Soft Computing, Computing with Words and Perceptions in System Analysis, Decision, and Control, 3-4 Sep 2015. Antalya, Turkey, pp.157-166.
- [2] Carter, C.R. Rogers, D.S. A framework of sustainable supply chain management: Moving toward new theory. Int. J. Phys. Distrib. Logist. Manag. 2008, 38, 360-387.
- [3] Deloitte(2012), The Changing face of retail Retrieved 18, Jun 2013 from <http://www.deloitte.com/assets/DcomUnitedKingdom/Local%20Assets/Documents/Industries/Consumer%20Business/ Uk-CB-store-of-the-future-report.pdf>.
- [4] Tim Crosby(2007), How Inventory Management Systems Work Retrieved 22, Jun 2013 from <http://money.howstuffworks.com/how-inventory-managementsystems-work1.htm>
- [5] Wikipedia(2013), Inventory Management Software Retrieved 22 Jun 2013 from [http://en.wikipedia.org/wiki/Inventory\\_management\\_software](http://en.wikipedia.org/wiki/Inventory_management_software)
- [6] Anton Dolinsky (2007), Barcodes, sales, and inventory control Retrieved 22 Jun 2013 [http://www.almyta.com/Inventory\\_Management\\_History\\_4.asp](http://www.almyta.com/Inventory_Management_History_4.asp)
- [7] EvrenSahin& Yves Dallery (2010), The impact of the use of RFID on
- [8] supply chain operations Retrieved 30 July 2013 from <http://ebajic.free.fr/RFID%20Forum/Papers%20submitted%20but%20not%20presented/A%20LITERATURE%20REVIEW%20ON%20THE%20POTENTIAL%20OF%20RFID%20TO%20TACKLE%20INVENTORY%20MANAGEMENT%20ISSUES.pdf>

[9] Prototype development (image), Taken from (Dennis, Wixom, & Roth, 2006, p. 14)  
[10] Andre Honsberg(2011), User(image) Retrieved from <http://www.andrehonsberg.com/article/add-users-linux-command-line>  
[11] Jeannette(2012), Grocery Shopping: Why It's NOT a Man's Chore (image) Retrieved from <http://jmanandmillerbug.com/2012/02/grocery-shopping-why-itsnot-a-mans-chore.html>  
[12] Probilz Prof Ed Retail Pos Software screenshot(image) Retrieved from <http://www.softsia.com/PROBILZ-PROF-ED-Retail-POS-software-download66q4.ht>

