

# Supply Chain Management System: A Web-Application for Distributors

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**Abstract:** Distributor refers to a company that is supposed to purchase merchandise from the manufacturer in bulk and sale it to retailers. The distributors are usually required to perform a long-complicated process which includes different activities such as taking orders, delivering goods, payment recovery etc., along with maintaining proper record for reporting, auditing and other future purposes. In this regard, the distributors are used to fill information in printed-sheets manually. This practice makes them burdensome and increases the possibility of errors due to large amount of work and complexity in terms of item details. Furthermore, this causes problems in reporting, business analysis, segregating of the customers by loyalty, etc. In this regard, this paper proposes a web-application named as Supply Chain Management System (SCMS), which takes care of the above mentioned issues very conveniently and provides an easy work environment. In order to do so, entire process of good's distribution is well-understood from the stakeholders and then a prototype of SCMS is developed.

**Keywords:** Supply Chain Management System, Inventory Control, Supply and Demand Planning, Recovery Management System.

## I. INTRODUCTION

Business of good's distribution is growing with the passing time. The flow of information and recording it in proper way is always the one of the biggest issue for operational works in order to maintain the transparency [1]. Most of the distributors are working manually to record the information and are dependent to the hardcopies and/or verbally communication to transfer the information, which causes errors and misunderstandings.

Taking all these things in mind, we have come up with an idea to develop a software application that can handle all these issues and provide a simple and powerful way to record and flow the information within the organization. This software application is supposed to be operated by the employees of the distributor. The proposed solution is termed as *Supply Chain Management System*(SCMS). The SCMS is web-application powered by PHP programming language and MySQL database [2] with proper authentication to login.

Furthermore, in our proposed SCMS, we have developed a centralized-database to store all the records of a particular organization that can be used to recheck, or to create any reports, and even for audit purpose etc.

The remaining part of the paper is divided in such a way that section 2 comprises of the overview of the problems faced by the distributors, the process of supply chain and the stakeholders. Section 3 states the activities performed during a complete life-cycle of a single order. Section 4 contains some discussion with the working of

current distributors in the market and in section 5, the entire proposed solution is concluded.

## II. THE OVERVIEW

### A. Problem Statement

Most of the distributors are not using any software application to maintain record of their daily business activities which causes so many issues. Consider, someone is not maintaining any electronic data for their business transactions; in that case so many problems may arise in creating reports, analyzing future needs such as estimation of the quantity of required stock and performing audits.

Here the typical situation of distributors' offices can be seen in Fig. 1 below.

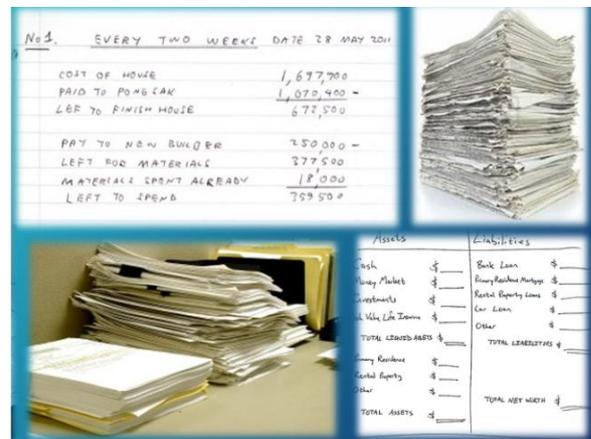


Fig. 1 Typical office environment of distributors.

We have summarized some of major problems hereafter [3].

- Information sharing
- Rechecking any previous record
- Creating report from manually filled sheets
- Verifying manual calculations
- Analyzing business performances
- Performing audit operations

### B. The Supply Chain Process

One of the prominent process that is mostly used in Pakistan as well as in most parts of world is the supply chain process, in which the products are distributed by the third party (Distributors) other than the manufacturer of that product. For instance, Colgate Toothpaste (Product) is manufactured by Colgate Palmolive Ltd. (Manufacturer) and distributed by the Brand Active (Distributor) and then the distributor sells it to the shops or super marts (Retailers), finally customer (Consumer) purchases it to use for household purpose as shown in Fig. 2. (See other details in [4])

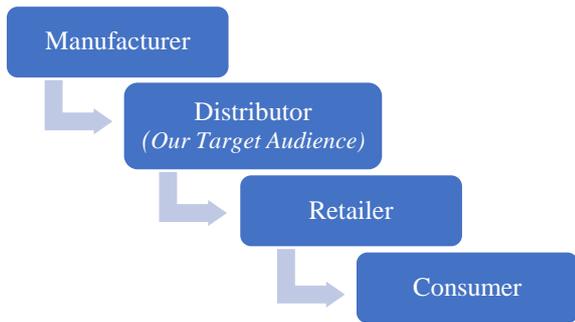


Fig. 2 The flow diagram of supply chain process.

### C. Stakeholders

A prerequisite requirement is fulfilled for gathering, planning, designing, developing and testing our proposed solution at the initial stage. In this regard, it was needed to be in coordination with any distributor who is currently working in market. Therefore, we were in coordination with Amin & Son’s distributor of Eva Oil.

Now, it is required to describe here some core employees working in a distributor, who are directly involved in the supply chain process of merchandise from manufacture to retailer.

**Manager:** Manager is one of the most important employees in the distributor, who manages the entire business operations, along with purchasing of merchandise in bulk from the manufacturer as per the market demand and related circumstances.

**Booker:** Booker is the employee of distributor, who is responsible for taking orders from the retailers and to collect the payments against the supplies of products.

**Salesman:** Salesman is another employee of distributor, who is responsible for processing orders and mainly to deliver the ordered products to the retailers.

### III. PROPOSED PROCESS

After gathering all the necessary requirements from the stakeholders, we analyze them to create a flow diagram to represent the entire process.

The created flow diagram in Fig. 3 contains core activities that are required to perform for every single order from starting till the completion by the distributor. It includes order booking, delivering the goods to the retailer, getting payments against those goods and managing accounts. Fig. 3 gives a good reference about the stakeholders as explained in part C of section II.

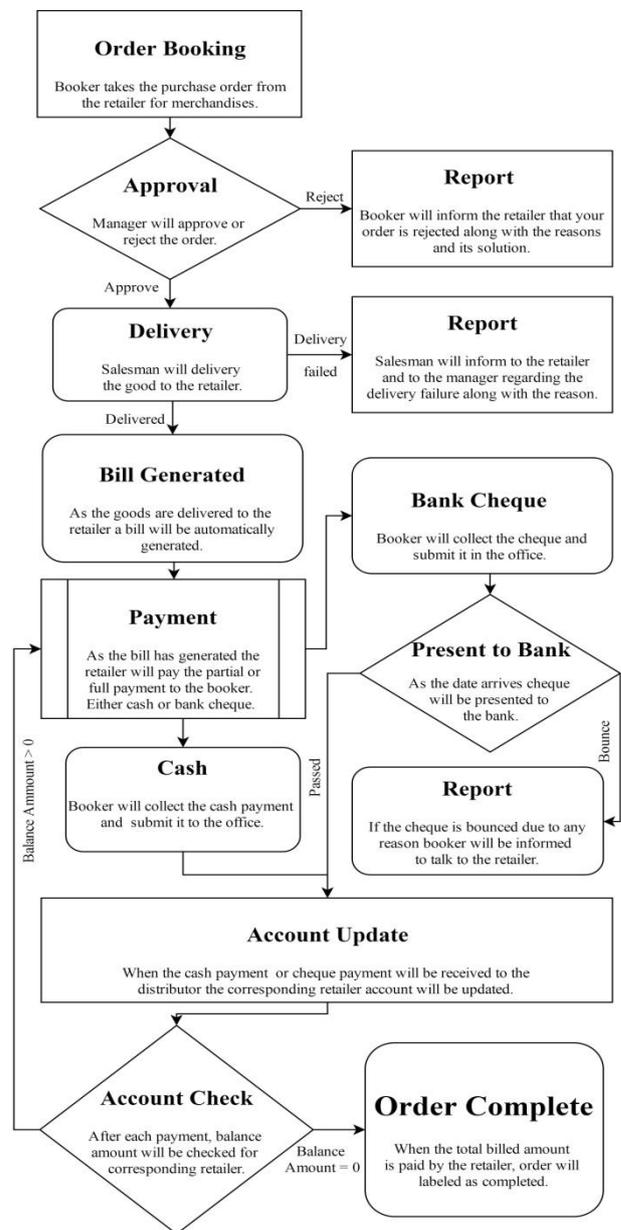


Fig.3 Detailed activities to perform in order life-cycle.

Based on this flow diagram, a prototype of proposed web-enabled SCMS is developed. In Fig. 4 and 5, some screenshots of prototype can also be seen.

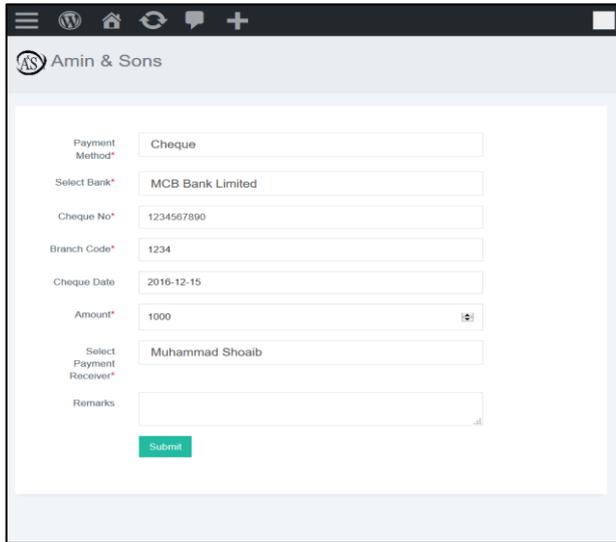


Fig.4 Screenshot of entering payment record

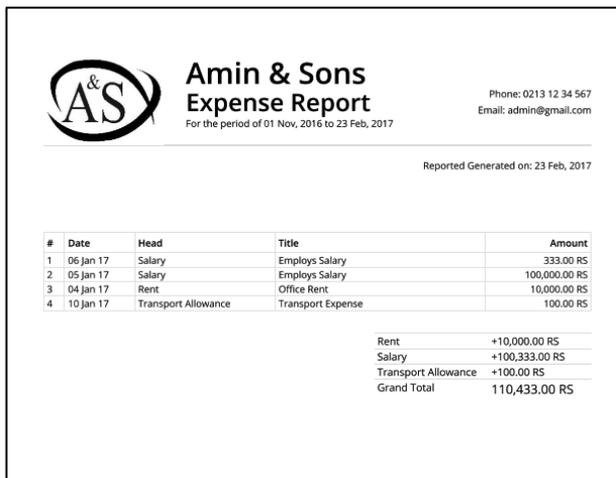


Fig. 5 Screenshot of expense report generated by SCMS

#### IV. DISCUSSIONS

As stated earlier, it was required to be in coordination with any distributors, who is actively working in market. Therefore, we were in close coordination with a distributor “Amin & Sons” during all the stages of developing our proposed SCMS. We also, proposed them the same SCMS and demonstrated the working of this application. In response, they highly appreciated this solution and acknowledged that it can improve the speed of their working along with great deal of accuracy (see Fig. 5).

As far as the implementation of application is concerned, the SCMS should initially be installed in a computer system at the office of distributor. Then, the staff of distributor can login using provided username and password to operate it on same computer system.

However, it can also be operated at any other device including cellular phones via communication link such as internet.

#### Security Measures

In the proposed application, we also consider the security threads that may affect our application or may allow access of organizational confidential data to unauthorized persons. To prevent all these actives we implement user management module in which we assigned a username and password for every single user.

#### V. CONCLUSION

Our primary objective was to use the technology to develop a software solution for the local distributors. So that, it may help: (i) to minimize the problems that were previously faced, (ii) to maximize the productivity with accuracy, and (iii) to enable the head of organization to analyze the business performances.

At the end, we can recommend our SCMS as a best solution for local distributors to provide ease in flow of information and to record related information. In addition, this application can be used by the distributor to reduce almost half of the work load of their staff, because the proposed SCMS can generate required reports in a few clicks and allowing the staff to focus on improved business performance and maximize profit for the organization.

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