

Some Studies on Supply Chain Management Automation for Efficient Vendor Management

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Abstract—Supply Chain Management from a shop floor viewpoint encompasses a number of elements which include Supplier network, Inventory as well as Process Integration. In today's globally competitive environment, Companies have a compelling need to reduce the investment in Inventory, lower the cost of products and services, manage the cash flow effectively and enhance the productivity. This requires that they need to adapt an effective Supply Chain management system. Such Automation of the Supply Chain process ultimately benefits both the suppliers and the company. We herein present a case study carried out towards Automation of the Supply chain management process right from raw material procurement to finished goods from multiple vendors. The company is a Tier I supplier to Two-wheeler and Four-Wheeler Original Equipment Manufacturers (OEM's) with a large volume of finished goods and services. The effect of automating the Supply chain management process has resulted in significant Qualitative and Quantitative benefits to the Company. The lead time has also been brought down, cash flow on inventory improved and a reduction in warehousing costs has been achieved. The automation has also resulted in adding newer elements to the integrated process such as demand forecasting and Resource Planning, using efficient mathematical models and Optimization techniques.

The study was executed with active support from the employees involved in the overall Supply chain eco system. It is also envisaged that further studies with the aim of total automation of Sales and Marketing activities using Artificial Intelligence and Machine learning would follow.

1. INTRODUCTION

Over the last few years, attempts towards Automation of Supply Chain Management have gained significant importance due to its inherent advantages towards improving efficiency and Cost Reduction. While the ultimate goal of Automation should extent to a range of Supply Chain activities, it is a worthwhile for the exercise to begin with individual modules of small workflow processes. While carrying out such an exercise, it is important to plan out the ultimate overall integrated process to ensure that the modules are ultimately compatible with the final Automation goal.

The exercise, presented herein is aimed towards Automation of the Supply Chain Process which would result in the ability

of the management to meet timely Customer demands, reducing Operational costs and also reduce Ware housing costs.

2. GOALS OF AUTOMATION

The project was initiated with a review of the present process of vendor development and develop an automated system for its Supply Chain Process. This design and development is expected to result in improved process efficiency and productivity.

The secondary objective is to obtain a higher level of information and data capture and resultant analysis. This could effectively be used in demand forecasting and Resource planning from the Inventory management perspective.

3. APPROACH METHODOLOGY

As a first step it is important to understand the present methodology being followed in the Organisation to ensure that to the extent feasible, there is continuity. This would also ensure that the employees working on the existing process would have a seamless transition to the new process without much resistance and training.

Fig. 1 presents the Work flow that represents the existing process and our proposed process mapped on to the system, with appropriate adaptations.

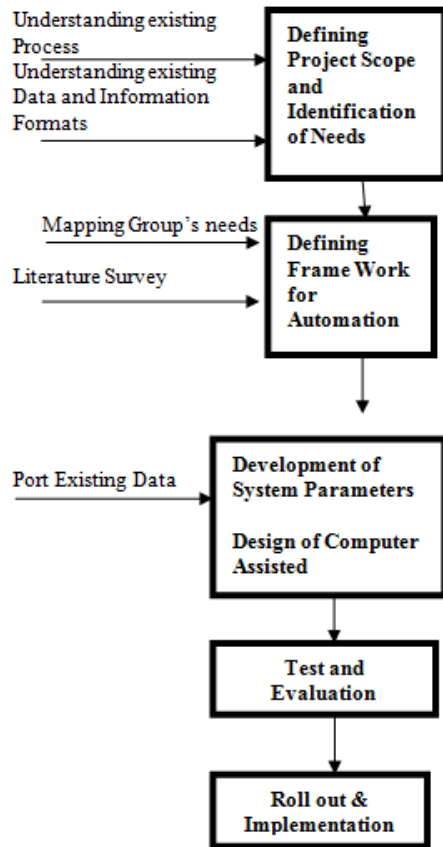


Fig. -1: Existing Vendor Process Floor

From this, a new approach to automating the process has been proposed, as could also be seen from Fig. 2. The adapted System integrates both Raw material and System Integration vendors. It also integrates all the three type of vendor supplies- Just in Time(JIT), Medium term supplier lead time, consisting of 3 to 7 days and the long lead time vendor of 7 to 15 days.

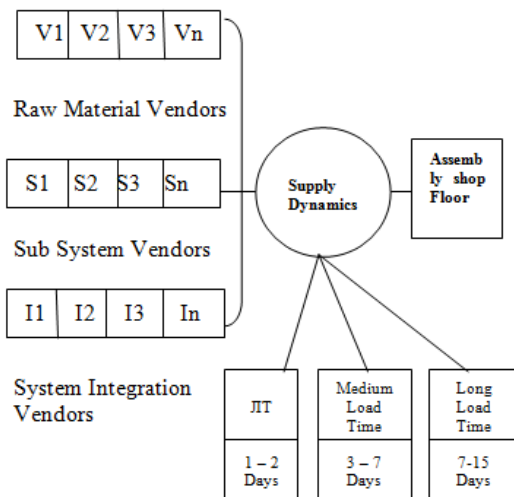


Fig. 2: Steps to Automation followed in this Exercise

4. ALGORITHM DEVELOPMENT

As a next step an efficient algorithm has been conceived and developed. The software design addresses the various Supply chain Transactions, supplier relationship and an efficient Ware housing Process. Java Script and SQL have been used for developing a simple and efficient purpose built process.

5. DATA ANALYSIS & FINDINGS

Table 1 presents some typical results from this exercise of automation.

Table 1: Results of Automation

S. No	Activity	Average Time (hrs)		Output Measure %	
1.	Vendor Activity (Block of 10 Vendors)	3520	2960	15.9	12
2.	Overall Administrative Costs of the Department (Block of 10 Vendors) Man hours	6200	4920	-	-

The measure of Developmental Efficiency defined in terms of man hours spent for handling a group of vendors (10 in this exercise) has improved by 16% due to Automation.

From the analysis of the data carried out before and after automation, it was seen that in more than 17% of the items, which initially had a lead time of 10 plus days were moved to Just in time (JIT) inventory basket of 1-2 days. This resulted in 11% savings on cash flow. Nearly 18% of the items which had a long lead time, have been moved to medium Lead time, after identifying delays that disrupt routine production due to non availability at the needed time)

The warehousing cost, defined in terms of storage space for volume storage (Say one cubic meter of inventory), forming part of the automation module, has resulted in 14% saving in costs and in terms time saving , nearly 18 % over existing time.

The work also included an exercise that has been carried out to assist in Demand Forecasting. This has yielded important pointers to forward planning of the overall activity for Resource optimisation.

6. SUMMARY

A Simple and efficient Automation System that facilitates the various sub-system modules of Supply Chain management has been successfully developed using Java Script and SQL based Algorithms. This has resulted in significant improvement in process efficiency and productivity.

As a further extension of this exercise, a fully enveloped system which includes Sales and Marketing can be developed.

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