ABSTRACT

The material that is lying quite long in the industry beyond its scheduled date of dispatch for various reasons is called slow moving inventory. The industry procures material(s) as per the customer sales order projection. On account of various reasons, the industry may not utilize the raw materials fully and hence the materials procured becomes slow moving. Inventory is a huge investment for most companies and in a recession, holding inventory can become a significant financial burden. Inventory that is not being utilized will create a drain on cash flow and ultimately, a negative impact on the corporate bottom line. Decision support system (DSS) for material and slow moving inventory optimization is a valuable tool that industries can use to solve the problems of high scrap and high inventory as well.

By using computers and specialized optimization algorithms, one can minimize the inventory levels of paper boards in printing and packaging industry. Reducing slow moving inventory costs is at the center of many cost-reduction efforts, since it accounts for more than 40% of the company’s manufacturing cost. Even the smallest reduction in these costs can have a huge impact on the company's financial bottom line.

Hence, this research aims in developing specialized scrap optimization software that will help to analyze and determine the optimal board varieties to be manufactured and maintained in inventory. Selecting the
most desirable board quantities to be kept in inventory typically means relying on personal experience or a set of complex manual calculations using spreadsheets. These calculations can take several days or even months to perform, especially when a different set of calculations must be performed for each unique material specification. Also, without having knowledge of complex optimization algorithms, producers may base their calculations on invalid assumptions. Hence, this research provides an imperative to build an algorithm in a software that analyzes and forecasts production requirements for a set of products. The developed software has determined the optimal boards to purchase and maintain in inventory, and also shown how to cut parts with lower scrap and thus lower the holding cost.

To find out the slow moving nature of paper boards in inventory, theoretical root cause analysis was carried out. Using the data collected from the printing and packaging industry data analysis and cost analysis were carried out. From the analysis the vulnerable customer and reason were identified. Those customers projected and confirmed demand were analyzed using transition probability matrix. The loss function of the customer is also calculated. A new approach based on modified Runge-Kutta method has been developed for identifying the slow moving items on weekly and monthly bases. Automatic decision support system based on artificial neural networks has been proposed for identifying the slow moving items. Also for identifying the information about the inventory level in the warehouse, Radio Frequency Identification (RFID) technology has been used to track the materials in the warehouse.