

# CHAPTER 7

## CONCLUSION



### 7.1. Discussion

The aim of this thesis was to show how a simple, low cost MRP system could be developed within a SME, in this case an electronics company. The company where this investigation took place was having problems with its production planning and inventory control, in its TKM Department in particular. The company did not have any formal production planning and inventory control procedure, and the main problem that occurred was the setting of a production schedule that did not take into account whether any components are in stock or whether ABC subsidiary has the capacity to make the components if they are needed. It was often the case that ABC subsidiary could not meet the demand for components from the TKM Department. Another problem was the company's approach to inventory control, which was based on a judge by eye method. The inventory department staff would look and see if any components were needed to be ordered, and this does not take into account the future demand of the components. The result of this would either be that there would be insufficient levels of components and there would be stockout, or that components would be unnecessarily ordered, which takes up valuable capacity from ABC subsidiary.

It was decided that an MRP system was needed to help facilitate the production planning and inventory control. The system would help the production manager to set the production schedule by taking into consideration current and future inventory levels, indicating what components have to be ordered and when, and allowing the production manager to communicate with ABC subsidiary's production manager about whether the production schedule is suitable for ABC's production capacity.

The company could not spend money on a fully featured MRP system from a specialised software company, so it was decided that a simplified system suited to the company's requirements was to be developed within the company.

The system was developed with the ultimate aim of implementing the system, so the critical success factors of implementing an MRP system were considered where applicable. The reason for doing this was to ensure that the next stage could proceed with some sort of continuity, which is important if the implementation process is to succeed. Also, failure to implement the system would mean that the development of the system was a waste of valuable resources.

### **Top Managements Support**

This is essential for the success of the project; not only for the success for the development stage, but also for the success for the implementation stage. Without the support of top management, the project will most likely fail, because it is not getting the attention it needs in terms of resources, and in turn the development will suffer through delays and eventually the project will most likely be forgotten about.

Gaining management support in the company was done through some meetings to discuss what the MRP system could do for the TKM Department and what they expected the system to achieve. Once the management were satisfied with what was required of the system, it was a case of maintain management support, which was done through frequent communication on the progress of development with the production manager.

### **Formal Project Planning & Organisational Arrangements**

Formal project planning is required to ensure the smooth execution of the project. This stage informs everyone who is involved with the project what is required of them and when it is required. This was done by setting up a project team, which consisted of a full time project leader, specialist IT staff and the production manager. The team formulated the project plan, along with a timeline, which allowed the team to check that the project was on schedule. The team held weekly meetings to check on the progress of the project and well as discuss any problems that have been encountered and possible solutions.

## **Data Accuracy**

Data accuracy within a MRP system is important if the system is to produce any useful outputs. Finding sources for data that was to be included in the MRP system was a major obstacle. This was apparent when trying to find leadtime data for the components produced by ABC subsidiary. Unfortunately, ABC did not have any formal records of leadtimes, and due to the time constraints, it was not practical to manually measure the leadtimes for each component. It was agreed that an estimate based on the average time from component order placement to order receipt would be sufficient. This data was available from both the purchasing department and the stock department.

## **Software/Hardware Characteristics**

Software and hardware characteristics were an important consideration in the development of the MRP system. Without considering these constraints it is impossible to design a system that is suitable for the equipment that the company has, or is willing to purchase. In the case of this company, the most important situation to avoid was to design a system that is too demanding for the hardware that it is installed on. Also, it was important that the system was to be developed using tools that were readily available to the company.

The development process had to address each of the critical success factors, so the method of development was as follows:

## **Method of Development**

The method of development for the MRP system is summarised as follows:

- Planning
- Data Collection and Analysis
  - Analysis of Existing Processes
  - User Requirements and Information Needs

- Leadtimes and Lot-sizing
- Safety Stock and Safety Leadtimes
- Hardware and Software Constraints
- Drafting of the Overall System Specification
- System Design
  - Programme Design
  - Database and SQL Query Design
  - User Interfaces
  - Outputs of the System
- Programming, Testing & Debugging

The planning and data collection stages are important to success of the project, because they are the stages where the critical success factors can be implemented. The planning stage is where the top management support and organisation arrangements are obtained, and the data collection stage is where the hardware and software characteristics are obtained and data accuracy is checked.

The drafting of the Overall System Specification is where all the system design data is summarised for the benefit of everyone working on the project, including the top management. This document is important because it communicates to everyone exactly what is required of the system, and it becomes an important reference for the project.

The system design and the programming, testing and debugging stage was done with consultation with IT department, because they had the technical knowledge required for efficient programme design and had more experience in programming and testing.

## **Challenges**

The biggest challenge throughout the whole development process was the gathering of accurate data for the MRP system. The TKM Department did not have any formal production planning and inventory control procedures, and it seems that this is the

case for the whole company, including ABC subsidiary. Very little information was recorded, so obtaining data such as component leadtimes was made difficult.

In the case of obtaining leadtime data, it was suggested that an estimate based on the average time from order placement to material receipt would have to do until accurate data could be obtained at a later date. Measuring the leadtimes for all the components produced by ABC subsidiary was not practical under the time constraints of the thesis. Order placement data was obtained from the purchasing department and material receipt data was obtained from the stock department.

Another challenge was to design a system that was simple enough for people with limited computer knowledge to be able to use, yet be sufficiently functional. The interfaces had to be carefully designed with the help of the people that were ultimately going to be the users of the system.

## **System Validation**

After all the stages of development were completed, the system was validated by senior management of the company. This was done to check that the system performed as expected and that it met all the requirements set by the management.

The management concluded that the system met all the requirements and performed as expected, without any expenditure in terms of additional hardware or software purchases.

## **7.2. Recommendations**

- The development project did not include components from outside suppliers. Obtaining accurate leadtime data for these components would require some supplier management, not only for obtaining the data, but to ensure that the suppliers adhere to their leadtimes.
- The leadtime data that was included for components produced by ABC subsidiary were only estimates, because of the lack of accurate production

data. This data should be accurately obtained by work study and work measurement at a later date.

- The MRP development project is merely the first step in the implementation of the MRP system. It would be interesting to see the implementation of this system, which would include system stabilisation and performance evaluation, as well as staff training.