



## **CHAPTER I**

### **Introduction**

In this fast paced world, people often take for granted things that they do regularly, such as eating. How many people realise the tremendous efforts contributed by the kitchen staffs of hotels, restaurants, and catering services, for example, in making sure that the meals they prepare and serve would be satisfactory to the diners in taste, quality, and presentation? Behind the hectic businesses of foodservice industry, as with any others, appropriate interaction between Man, Machine, and Material are required. To achieve the desired results, not only fresh ingredients, and expertise in cooking are essential, right preparation and cooking equipment are also necessary. Since the foodservice equipment are one of major keys to the success in foodservice industries, their market growth are usually directly proportional to each other.

As a result of rapid economic expansion in Thailand in the past decade, the foodservice industries, such as hotels, restaurants, and fast food chains have also been enjoying tremendous increase in their businesses. The establishment of new companies and manufacturing facilities also bring about the ever-increasing requirements for staff canteens, as well as dining places for workers. With the convenience of modern-day air transportation, more and more air travellers are making their ways into the country from all over the world, resulting in a greater requirements for in-flight catering capacity, in order to serve client airlines who have also been increasing their presence in this region. To enable their businesses to operate effectively, the foodservice

industries require all kinds of equipment for storing, preparing, cooking, and washing. This is where foodservice equipment industry comes in.

In foodservice equipment industry, a company can either be a mass producer of equipment, or a total solution provider to the customers. The latter type of companies, which will be the case study of this thesis, typically deal with their clients on turnkey projects basis. The services that the company provides include design, supply, and install complete package of the kitchen equipment for foodservice industries. The scope of each service will be discussed below.

1) Design - This is where everything begins. Before anything can be started, the customer's requirements on the foodservice facility must first be converted into kitchen plans, (see Appendix A for an example), and perspective drawings of each equipment, showing their looks and technical specifications. Generally, depending on the types of food to be served, eg. European, Chinese, Thai, etc., and the sizes of the foodservice operation, eg. staff canteens, restaurants, banquet kitchens, flight kitchens, etc., requirements for equipment would vary from one kitchen to another. Although some of the clients have their kitchen plans designed by outside firms, an in-house design team is also available to support those who need such services. Regardless of who does the designing of the kitchen, a list of necessary equipment needed for each kitchen are compiled from the layout drawings for further proposal to the customer.

2) Supply - Foodservice equipment, that are supplied by the company in a given project, can be classified into two major categories

according to their origins, namely, the imported/buy-out equipment, and the locally fabricated equipment.

1) *Imported and Buy-out Equipment* are considered to be either more technically complexed than the locally made items, or are simply not cost effective to be manufactured by the company. These equipment are mostly mass produced in standard models by their manufacturers to keep their unit prices down. Because they either have to be imported from abroad, or bought from local suppliers, the company does not have any real control over their deliveries. Hence, enough lead time must be allowed so that these equipment could arrive for the project in time. Some of these equipment includes:-

1. *Preparation Equipment* - such as food cutters, mixers, grinders, slicers, meat saws, etc.
2. *Cooking Equipment* - such as kettles, fry pans, steamers, deep-fat fryers, roast duck ovens, etc.
3. *Baking Equipment* - such as dough dividers, dough sheeters, dough kneaders, bake ovens, etc.
4. *Holding Equipment* - such as Dough Retarders, Proofers, Warm Holding Cabinets, etc.
5. *Washing Equipment* - such as Dishwashers, Glass washers, Vegetable washers, etc.
6. *Special Equipment* - such as Self-cleaning Exhaust Hoods, Blast Chillers, Blast Freezers, etc.

2) *The Locally Fabricated Equipment*, on the other hand, are less technically complicated. They are manufactured by the company domestically to reduce costs and lead-time. These equipment can be

categorised into "Standard" and "Non-Standard" equipment. The so called "Standard" equipment are those that are likely to be required in a given kitchen project. Despite some demands, however, the volume of these equipment still do not justify mass production, and hence, they are made in batches of 10s or 20s for stock. Unfortunately most of the locally made equipment have to be "Non-Standard" in one way or another to suit the various needs of each kitchen. Hence, the "Non-Standard" equipment are only manufactured for specific jobs where there are requirements for them. Some of the locally fabricated foodservice equipment are listed below (see also Appendix B for illustrations).

1. *Stainless Steel Kitchen Furniture* - eg. tables, sinks, cabinets, shelves, etc.
2. *Cooking Equipment* - various types of ranges for various types of cooking (Low Pressure range, High Pressure range, Chinese Ranges, Kwali ranges, etc.)
3. *Cooling Equipment* - Reach-in and Undercounter-type refrigerators and freezers of various sizes.
4. *Accessories* - eg., Grease Traps, Oil Filters, Traffic Rails, Tray Slides, etc.

3) Install - The installation of foodservice equipment is not as straight forward as it sounds. Since the sales of equipment are done mostly on a project-by-project basis, the site supervisor must coordinate closely with the General Contractor, other subcontractors, as well as among different department of the company, in order to make sure that all the installation and test-run of equipment are completed on-time.

## OBJECTIVES OF THE STUDY

The objective of this study is to establish a working model for project planning and cost control in a foodservice equipment industry.

## SCOPE OF THE STUDY

This research will be conducted under the following scopes:-

1. Within a Job-shop Foodservice Equipment Industry only.
2. Within the industry's manufacturing and installation department of a company.

Assumption:

1. Production has a higher priority than installation.
2. The names of the company and its customers' in this thesis have been altered upon the request of the parties concerned for their privacy.
3. In order to protect the company's strategic position, all the numbers shown in this thesis (man-hours, materials used, product costs, etc.) are fictitious, and do not represent the actual occurrence in the company.

## PROCEDURES

The process for conducting this research will be as follows:-

1. Study related theories and techniques.
2. Study, Define, Collect Data and Analyse existing problems.
3. Develop a production and installation planning/controlling

system with the emphasis on material consumption and work scheduling.

4. Set up a Project Cost Estimation system and design necessary document for controlling costs.
5. Develop a computer programme for estimating project costs.
6. Implement the solution.
7. Compare with the previous results using costs as a performance measure.
8. Conclude the findings.
9. Thesis preparation.

### **BENEFITS EXPECTED**

1. Production and installation planning and control system
2. To achieve a better cost estimation for a project
3. To control the cost of a project
4. Promote better inter-department coordination
5. To serve as a guideline for productivity improvement

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

## LITERATURE SURVEY

### Anuratananon, Chanpen - 1992

This thesis involved the improvement of the information system in an export-oriented jewellery industry whose products were medium-quality casted precious metals. A Management Information System, in forms of documents and reports, was set up so that data gathering, classifications, and analysis of the production could be used by the management for better work planning, and controlling of the production costs.

### Kansomkai, Lui - 1989

This thesis set up a documentation system for costs control and reduction in a Fishing Net Industry. The costs structure was analysed and grouped accordingly, and the related information system was established for better costs controlling by the management.

### Kriengkorakot, Kitti - 1995

Design and development of a computer-based material requirement planning system for a job-shop factory was the basis of this thesis. The computer programme, running under a DOS operating system, consisted of 5 modules, ie. inventory control, bill of material, material requirement processing, purchase control, and work order control.

Pongpanich, Pongtiwa - 1994

The daily production planning system of sheet metal works in an air-conditioning industry was set up using a software programme running on a microcomputer. The production, as well as technical database, were used to determine when the work should be started. This system was said to be able to reduce the production planning tasks, and facilitate better control and follow up of the work.

Rungittivong, Chavrit - 1987

The production planning and control system, decision making criteria for documents, and the production resources allocations were studied in this thesis. The Brook's algorithm was used for analysis, plan, and control of job orders, and was found to be very effective.

Sanguansak, Somchai - 1989

The objective of thesis was to design a manufacturing system for productivity improvement in an industry whose multitudinous products were made in variety of ways. A parawood industry was used as a case study. The work led to a continuity in the production line, and thereby, reducing the number of work-in-process and losses in the line. The machine efficiency was increased and the reliability of the delivery schedule was improved.



Sitthichancuna, Somsak - 1993

A master plan for the management planning and control of a factory was formulated in this study of a clutch manufacturing facility. The plan, which was implemented using a computer software, encompassed important areas in the company, namely, marketing, production planning, purchasing, inventory management, raw material consumption, labour, machine, and time usage.

Tangkitiwongporn, Kijja - 1992

This study involved a proposition for production scheduling system in a sheet metal fabrication plant, using an air-conditioning factory as a case study. The system, which utilised a personal computer for data processing, required two distinct, but interlocking sub-system for database management and job scheduling. When operational, it enabled the reduction of the foreman's planning skills and planning time. Also, the plans created by the new system would be more accurate and comply with the management policy.

Threewattanawong, Mitmanee - 1995

In this study, the manufacturing process and requirements of a parawood furniture industry was examined, and an improvement to the existing computer system for job scheduling was made. This resulted in a reduction of idle time and production costs, while the efficiency, as well as on-time delivery of goods, were increased.