

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions of the research

The objective of this investigation is to improve the decision-making process in the mould department of a plastic packaging manufacturer. The process of reaching a strategic decision to make or buy has been studied in regard to supplying moulds to the company's production line in a timely manner. The availability of moulds with minimal lead times is desirable, but it should be at a cost that can be justified against opportunity losses. Therefore, the mould department needs to decide systematically whether it is worthwhile to fabricate moulds in-house or to order from subcontractors. Other issues such as the quality control of moulds and the utilization of core competencies should be taken into account, as well.

There are two major sections in this thesis. Firstly, the current operational behaviour in the Make-or-Buy process in regard to the acquisition of new moulds and current capabilities of the mould department are analysed for a better understanding of the existing conditions. Secondly, an improved model for the Make-or-Buy decision regarding mould fabrication is proposed in order to overcome the problems that are encountered in the current process.

Finally, the conclusions drawn concerning shortcomings of the current process and improvements from the proposed model may be stated as follows:

5.1.1 Current model

In the existing model, the experiences of the manager of the mould department would strongly influence his decision to proceed with fabrication or to outsource a new mould. To make new moulds, all work processes are initiated by the manager of the mould department. The manager regularly aims to construct entire moulds in-house in order to keep every staff member busy. There is lack of

consideration of the required lead time versus production time that might be saved if a mould were outsourced, which is clearly an opportunity cost. Moreover, the company has only semi-automatic equipment in the mould shop for the machining process. The machinery is not modern and it cannot make moulds that have high precision components in a short time. Finally, a primary responsibility of the department is to repair moulds in order to service the production line. Staff need to rotate from making a new mould to fix a broken one, which can possibly create time conflicts and interrupt a new project.

The current process is comprised of five stages, namely, (1) requisition for a new mould, (2) mould design, (3) estimation of production cost and time, (4) comparison of production cost and time with suppliers and (5) reach a make-or-buy decision for in-house production or outsourcing. The various steps leading to a make-or-buy decision according to this model are illustrated in Figure 5.1 below.

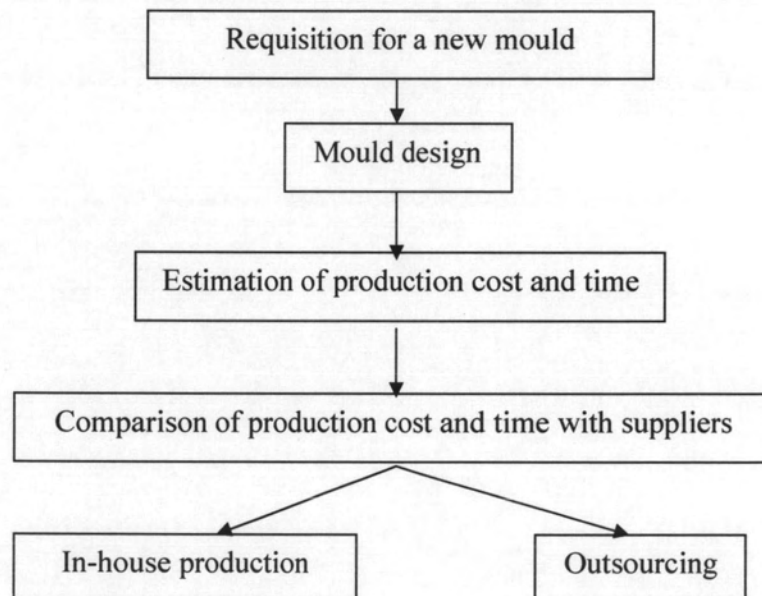


Figure 5.1: The current process for a make-or-buy decision

5.1.2 Proposed model

In the proposed model, the Make-or-Buy decision on mould fabrication plays an important role in each new project, which is modified from the existing model. It gives the department a clear basis for deciding whether to construct a mould in-house or outsource it to subcontractors. In this decision model, it is crucial to analyse the tasks of the department in order to identify core activities and separate them from non-core ones. Moreover, the factors of capacity and technical capability in major steps of the process shall be examined in order to identify which alternative should be selected, which are: 1) in-house production utilizing existing facilities, 2) increasing capacity and technical capability by investing in additional machinery (such as, computer numerical control equipment - CNC), or 3) outsourcing to subcontractors. See Figure 5.2 below for various steps in the proposed decision model.

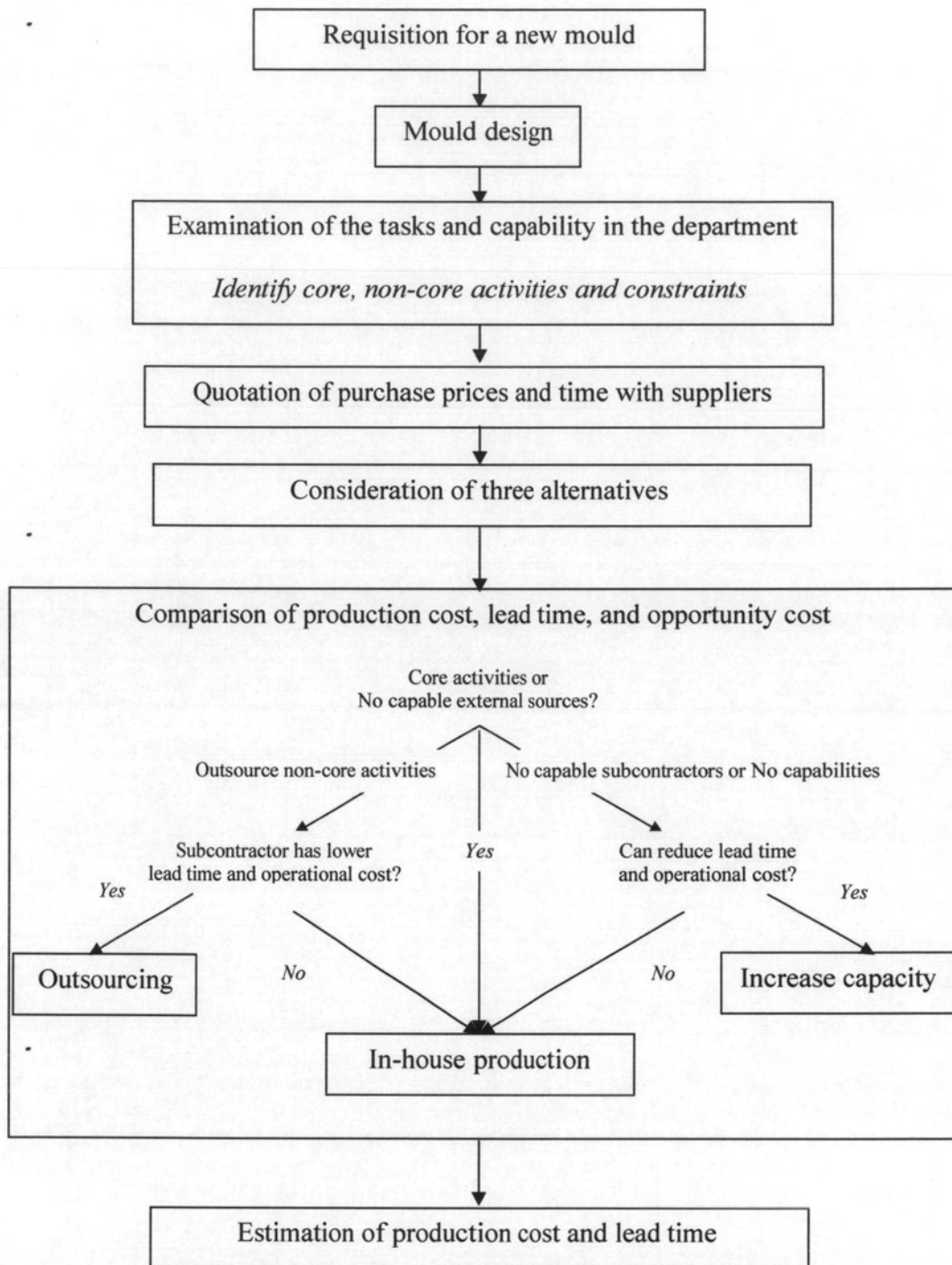


Figure 5.2: Proposed model for the make-or-buy decision

As a result from implementation of the proposed model to the construction of an eight-cavity mould for making the plastic lids of ice cream cones, the fabrication time was decreased by about one month or 27 working days when

compared with the current model. The shortened time period was made possible mainly by outsourcing non-core activities, which are the machining of the mould base and rough machining of the mould shoe and inserts. Consequently, the opportunity cost for one month, which was equal to 190,238.50 Baht greatly exceeded the additional cost of 2,776 Baht incurred by outsourcing.

5.2 Problems discovered while implementing the research and comments

5.2.1 Resistance to change

Due to the improvement of work methods in the department, there are several areas that have been changed, such as form a project team and transform the culture from a power culture to a task culture. In practice, change in the organisation may create resistance or scepticism in employees, which can be a significant obstacle to effective organisational change.

Workers often prefer to follow familiar routines, since they may feel a sense of insecurity or have a fear of the unknown. Wariness of what may result from changes can lead to individual resistance. For example, the mould department's manager and supervisors may feel that their authority is undermined, when participative decision in the empowerment and team working system is implemented.

Furthermore, in order to introduce new technology such as an automatic machine to the mould shop, staff shows resistance since they feel their expertise is being undermined. Operators who operate semi-automatic machines may feel that their skills may become obsolete. They may become less important, and therefore they develop negative attitudes toward participating in the improvement. Moreover, the staff resist because they believe that change may lower their income. Since a large investment is required for purchasing a CNC machine, it could become more difficult to increase their salaries. In addition, they may have less overtime work, since new projects ought to be completed faster on CNC equipment. Finally, employees often show resistance when they are introduced to

new techniques, because some fear that they will be unable to carry out new procedures in a satisfactory manner.

At this point, consideration of how an organisation can manage its people's interactions in adapting to a changing environment is an area of concern. The processes of change should be closely monitored, and management procedures need to be adapted in a timely manner when conditions change. The company should communicate clearly with employees regarding the reasons for change and what the company seeks from changes. Finally, employee commitment will usually not result from what the company tells its personnel, but it is frequently a result of the firm's listening to staff concerns and allaying their feelings of uncertainty regarding change.

5.2.2 Problems from organisational structure and culture

The company requires top-down agreement in decision-making, whilst the project team normally make individual judgments based on a project culture. Moreover, This may be familiar with high levels of hierarchy and formal styles of management. Older people normally exert more authority than younger colleagues. A problem that might occur is one of seniority, whereby it might be difficult for senior staff members to accept the opinions of junior personnel.

In addition, conflicts between department managers and functional team leaders may happen, leading to the confusion of employees. Therefore, good collaboration between leaders and managers should be maintained.

5.2.3 Time constraints

In order to purchase CNC machines, a few months are required to prepare the budget and obtain financing. Moreover, staff in the mould department has only skills to operate non-automatic machines. Some staff members will need to be trained to control automatic machinery by the equipment distributors or by a technical institute, which may take up to one month. Consequently, the lead time

for the new machinery may be several months, which depends on the type of device purchased. Similarly, in order to hire more machinists, the recruitment process may need one to two months to find people who have all of the required skills and experience to fill these positions. Moreover, it may take up to two years in order to train new staff members to perform the tasks that the department requires.

Therefore, the alternatives of purchasing CNC machinery or hiring more machinists are not appropriate for the present project. The research carried out for this thesis is limited by these time constraints. However, in the long term the company should consider these options.

5.3 Recommendations

- The proposed model can be applied to other projects of the company and serve as a basis for improvement in other areas. More studies and detailed information are required. Any changes should be closely monitored, and planning is adapted in a timely manner when conditions change.
- In the long run, the company may consider increasing its capabilities by purchasing CNC machines and hiring additional technical staff in the mould department.