

Planing for quality – organization and responsibility for purchasing

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Abstract

Very few organizations are totally self – contained to the extent that their products and services are all generated at one location, from basic materials. The total cost of bought-in material and/or services usually forms a large proportion of the final selling price of an organizations products or services. Consequently, purchasing is an extremely important, specialized function which should never be underestimated. The make or buy decision refers to the problem encountered by an organization when deciding whether a product or service should be purchased from outside sources or generated interlay. Often make or buy decisions and the suppliers are based on price, but this is a dangerous criterion with which to evaluate these strategic decisions. Purchasing is an important feature of just-in time (JIT) methods of inventory control. The development of long-term relationships with a few suppliers, rather than short-term ones with many, leads to the concert of coproduces in networks of trust providing dependable quality and delivery of goods and services. Each organization in the chain of supply is encouraged to extend JIT methods to its suppliers.

Key words: purchasing, organization and responsibility for purchasing, make or buy and supplier selection decisions

1. Introduction

Very few organizations are totally self – contained to the extent that their products and services are all generated at one location, from basic materials. Some materials or services are usually purchased from outside organizations and the primary objective of purchasing is to obtain the correct equipment, materials, supplies and services in the right quantity, of the right quality, from the right origin, at the right time and cost. It also plays a vital role as the organizations window- on-the-world, providing information on any new products, processes, materials and services. Purchasing should also advise on probable prices, deliveries, and per- for manse of products under consideration by the research, design and development functions. [1]

Table 1: Ranking of factors affecting purchasing and product competitiveness ranking by respondents

<i>Factor</i>	<i>Importance to the Competitiveness off the company's products</i>	<i>Importance placed by company when By company when purchasing materials Used in manufacturing</i>
<i>Price/cost</i>	2	1
<i>Quality/reliability</i>	1	2
<i>Delivery performance</i>	3	4
<i>After-sales/back up service</i>	5	5
<i>Design/ formulation/ Technical specification</i>	4	3

The total cost of bought-in material and/or services usually forms a large proportion of the final selling price of an organizations products or services. Consequently, purchasing is an exstremely important, specialized function which should never be underestimated. The value of purchases varies from industry to industry, but it averages 60 per cent of the turnover of all industries, and clearly the effects of good purchasing management on the profitability of a typical manufacturing or servise organization can be considerable.

2. The organization and responsibility for purchasing

The inputs to purchasing appear from various sources, depending on the nature of the operation, but they include:[2]

- **Design** from the concept to the product or service;
- **Research and development** of the processes used and the outputs produced:
- **Production or operations** process, including data on waste, efficiencies and conformance with existing or planned facilities:
- **Distribution** either by the supplier or the customer, e.g.in retailing:
- **Marketing** future demands, feed-back on quality, competitors and any other issues which affect purchasing:

- **Finance** terms of payment, creditors, invoice verification and payment, auditing of procedures, etc.:
- **Legal services** drawing-up and agreeing of contracts:
- **General management** make or buy decisions.

The purchasing function, like any other in an organization, is ineffective if it exists in isolation

3. Make or buy and supplier selection decisions

The make or buy decision refers to the problem encountered by an organization when deciding whether a product or service should be purchased from outside sources or generated interlay. Often make or buy decisions and the suppliers are based on price, but this is a dangerous criterion with which to evaluate these strategic decisions. [3] The lowest price may not necessarily be that which is least costly to the purchasing organization, since it may attract other costs of correcting, sorting out, chasing-up, etc. These increase the total cost of the purchase, and that is a far more useful criterion. Other key points which must have influence are:

Table 2: Make or buy decision refers

<p><i>Quality and how it is controlled</i> <i>Continuity of supply</i> <i>Technological and commercial knowledge and experience required</i></p>
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Most make or buy decisions are very complex, time consuming and affect many parts of an organization. Senior management involvement is required in number of the stages of this strategic decision. Problems may well be experienced in calculating accurate costs, and finding information on quality, supply and reliability, and technical know-how requirements, for each side of the equation. Information inputs are required from both inside and outside the purchasing function, which clearly has a vital role to play. Informal and formal involvement of technical, financial (accounts) and production or operations control will always be necessary, together with a systematic approach based on careful weighing of the key factors; it is unlikely that one single factor, such as price, will be so conclusive as to dictate the obvious path to be taken.

4. Just – in – time purchasing

Purchasing is an important feature of just-in time (JIT) methods of inventory control.[4] The development of long-term relationships with a few suppliers, rather than short-term ones with many, leads to the concert of coproduces in networks of trust providing dependable quality and delivery of goods and services. Each organization in the chain of supply is encouraged to extend JIT methods to its suppliers. The requirements of JIT mean that suppliers are usually

located near to the purchaser's premises, delivering small quantities, often servers per day, to match the usage rate. Paperwork is kept to a minimum and standard quantities in standard containers are usual. The requirement for suppliers to be located near to the buying organization, which places those at some distance at a competitive disadvantage, causes lead times to be shorter and deliveries to be more reliable.

It can be argued that JIT purchasing and delivery is suitable mainly for assembly line operations, and less so for certain process and service industries, but the reduction in the inventory and transport costs that it brings, should encourage innovations to bring about its widespread adoption. Those committed to open competition and finding the lowest price will find most difficulty, as will those contruis which, for geographical reasons, suffer greater transport distances between customer and suppliers. Nevertheless, there must be a recognition of the need to information and problems- which leads to the product or service of the right quality, being delivered in the right quantity, at the right time.

5. Quality and time-reliability

Quality is a property which may [5] change with the age of the product or service. Clearly, part of the acceptability of a product will depend on its ability to function satisfactorily over a period of time. This aspect of performance has been given the name reliability, which is the ability to continue to be fit for the purpose or meet the customer requirements.

Reliability ranks with quality in importance, since it is a key factor in many purchasing decisions where alternatives are being compared, and many of the general management issues related to achieving quality, are also applicable to reliability.

Clearly, every product will eventually fail, although in some cases the possibility is small enough for the product to be effectively infinitely reliable. With the pressures to reduce cost, and with the need for increasing complexity, the probability of a product or service failing within the user's anticipation of its working life is likely to be finite. As reliability is an exceedingly important aspect of competitiveness, there is a need to plan and design reliability into products and services. Unfortunately, the testing of a desing to assess its reliability is difficult, sometimes impossible, and the designer must therefore invest in any insurance which is practicable.

Table 3: Some methods of attempting to assure reliability

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|---|
| <ol style="list-style-type: none">1. <i>use proven designs;</i>2. <i>use the simplest possible design-the fewer the components and the simpler their designs, the lower the total probability of failure;Weight the criteria</i>3. <i>use components of known or likely high probability of survival. It is usually easier to carry out reliability tests by over-stressing components than by over-stressing the complete product or service;</i> |
|---|

4. *employ redundant parts where there is a likelihood of failure. It may be that a component or part of a system must be used which has a finite probability of failure (F). placing two of these parts in parallel will reduce the probability of both failing to F, and so on. Clearly the costs of redundancy must be weighed against the value of reliability;*
5. *design to 'fail-safe';*
6. *specify proven production or operational methods.*

When a product, system or component no longer performs its required function, it is said to have failed.

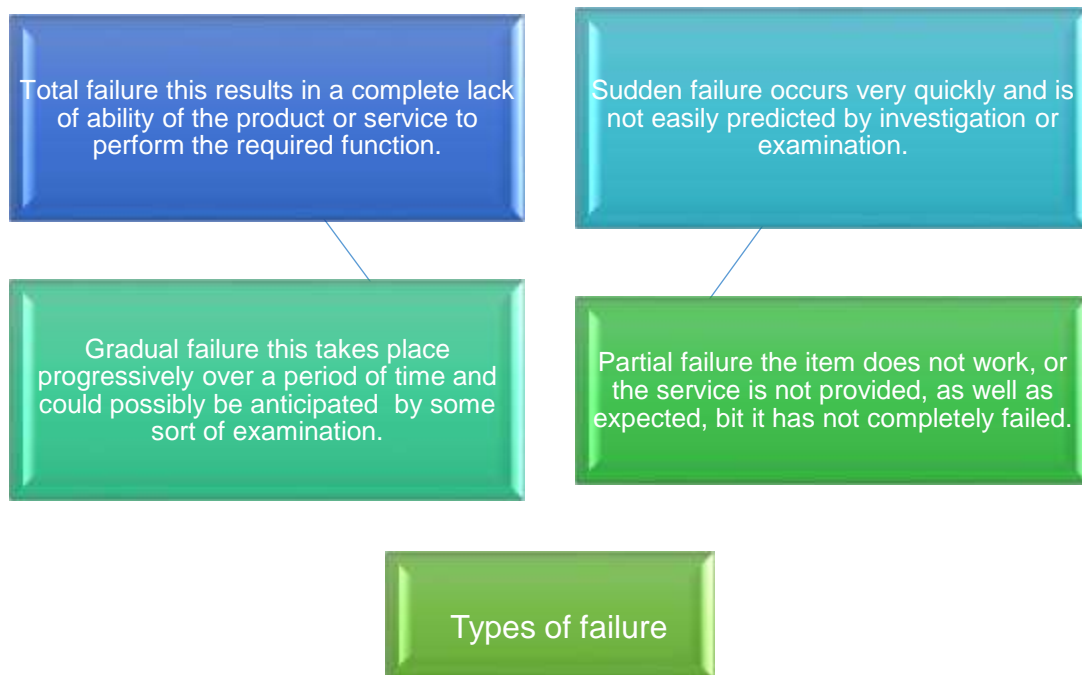


Figure 1: Types of failure

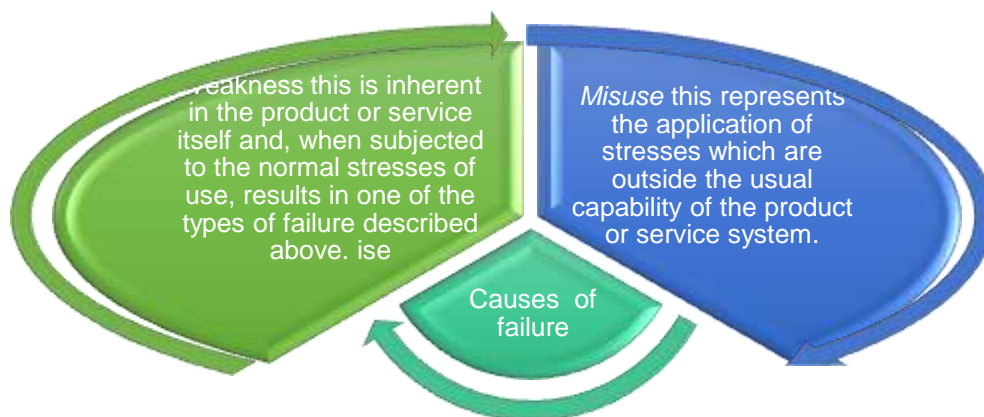


Figure 2: Causes of failure

5.1 Measures and analysis of reliability

All measures of reliability are time dependent. The reliability $R(t)$ of a product is the probability that will be still functioning at time t . This may be calculated as follows:

$$R(t) = \frac{\text{NumberSurvivingAtTime}T}{\text{NumberExistingAt}T = o}$$

There is another important measures of reliability in use, the failure or hazard rate $\varphi(t)$

$$\varphi(t) = \frac{\text{NumberFailingInUnitTimeAttime}T}{\text{NumberSurvivingAtTime}T}$$

5.2 System reliability

Systems, including managerial systems, can be considered to be of two kinds:

1. *Series systems* where two or more components operate in series.

The characteristics of this situation are:

- a) if either component fails, the system itself fails;
- b) the effective reliability of the system between points A and B is

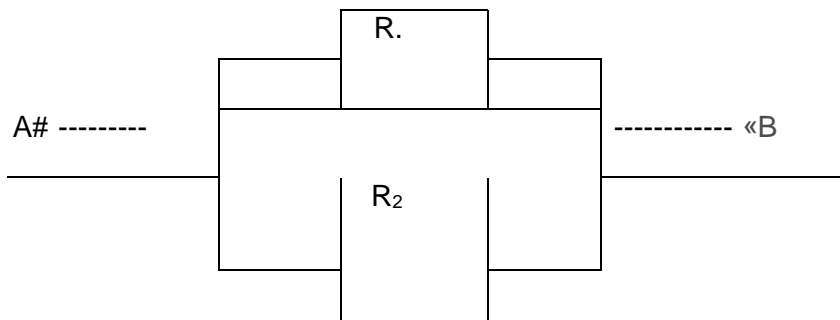
$$R_{AB} = R_1 R_2$$

where R_1 and R_2 are the reliabilities of the two components or, more generally

$$R_{\text{total}} = R_1 R_2 \dots R_N$$

Since R , by definition, is less than 1, then the total reliability of a series system is always less than reliability of each component.

Parallel system where two or more components operate in parallel



The characteristics of this situation are:

- a) if either component fails, the system continues to operate, albeit at a reduced performance;
- b) the effective reliability of the system between points A and B is

$$R_{AB} = 1 - (1 - R_1)(1 - R_2)$$

or more generally

$$R_{total} = 1 - (1 - R_1)(1 - R_2)(1 - R_3) \dots (1 - R_N)$$

In managerial terms, this means that the combined reliability of two control systems acting in parallel is greater than that of either system, and the greater the number of systems, the greater the total reliability. Thus, a cost control and a stock control system acting in parallel will be more effective than either system acting singly.

Reliability, like all other properties of products and services, will not just happen, it must be planned, designed and built in using systematic methods and techniques.

Conclusion

Although purchasing is clearly an important area of managerial activity, it is often neglected by both manufacturing and service industries. The separation of purchasing from selling has, however, been removed in many large retail organizations, which have recognized that the purchaser must be responsible for the whole product line – its selection, quality, specification, delivery, price, acceptability, and reliability. If any part of this chain is wrong, the purchasing function must resolve the problem. This concept is clearly very appropriate in retailing where transformation activities on the product itself, between purchase and sale, are small or zero, but it shows the need to include market information in the buying decision processes in all organizations.

The control of purchasing should be out in a written purchasing manual which:

- 1 assigns responsibilities for and within the purchasing function;
- 2 defines the manner in which suppliers are selected to ensure that they are continually capable of supplying the requirements in terms of material and services;
- 3 indicates the appropriate purchasing documentation- written orders, specifications and certificates of conformity-required in any modern purchasing activity.

Organizations which have verified their suppliers' quality systems, either by direct audit or by independent third-party assessment (see Chapter 9), often request a 'certificate of conformity', to be delivered with the purchased material. This is a simple statement by the supplier that what is being delivered actually conforms to the requirements, as laid down in a specification.

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