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11

SERVICE OPERATIONS FLEXIBILITY

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SERVICE OPERATIONS FLEXIBILITY[1]

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Abstract

This paper discusses some aspects of flexibility in service operations. The importance of adopting a taxonomy for analysing service flexibility is addressed and the literature in the field, concerning both manufacturing and service operations is reviewed. A framework is proposed to help understand service operations flexibility. The managerial choice '*be flexible*' vs. '*avoid the need to be flexible in the first place*' is discussed and a model is proposed to help analyse this question from a strategic viewpoint.

Introduction

In most of the manufacturing strategy literature, flexibility seems to be regarded (at least implicitly) as having an important role in the organisation's manufacturing strategy at least in two ways: firstly, as a response to an increasingly turbulent environment, flexibility could be seen as one of the most valuable features a company can possess. Secondly, flexibility is very pervasive and can influence the performance of other organisation's competitive criteria, such as delivery speed and dependability.

To a certain extent, the literature on service operations overlooks flexibility as a strategic objective. Several authors have discussed performance criteria for service operations, e.g. Sasser et al. (1978), Fitzsimmons and Sullivan (1982) and Berry et al. (1985), but none of them considers flexibility explicitly. Slack (1991), analysing manufacturing systems, considers flexibility as "being able to vary and adapt the operation either because the needs of customers alter, or because of changes in the production process, or perhaps because of changes in the supply of resources". According to this, flexibility also seems to be important to service operations, mainly considering the high variability and uncertainty involved with providing services, particularly in front-office operations.

Hart et al. (1990) argue that as "service operations are performed in the customer's presence, errors are inevitable; but dissatisfied customers are not. While companies may not be able to prevent all problems, they can learn to recover from them. A good recovery can turn angry, frustrated customers into loyal ones". Service recovery depends heavily on the operations system flexibility, i. e., its ability to react to possible unexpected changes in the customer needs, in the process or in the supply of resources.

Gianesi and Corrêa (1993) proposed a matrix for analysing possible conflicts between operation objectives in a specific service operation, aiming to identify eventual lack of focus. The example based on a quick service restaurant showed *flexibility* conflicting with the objective *consistency*. This may be true if flexibility is considered as variety of dishes or satisfying special customer desires. In this

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case, the more flexible is the service and the operation system the more difficult could be to maintain the consistency of the service in terms of cycle time and food quality. On the other hand, if flexibility is considered as the ability to adapt to unexpected changes in the inputs or process, flexibility can help to keep consistency high. The absence of a certain specialised kitchen employee can for instance affect the consistency of the service in a restaurant. Consistency, however, can be maintained if multi skilled employees are used to cover for absenteeism. This examples show the need to better understand the nature of flexibility in service operations.

The literature on service flexibility

Despite the importance that flexibility as a strategic objective has in service operations, the literature still lacks a better understanding of the very nature of service flexibility. Silvestro (1993) proposes three dimensions of service flexibility: volume flexibility, delivery speed flexibility and specification flexibility. Silvestro's proposition is somewhat restrictive as an analytical tool, since her delivery flexibility is concerned only with speed of response and throughput time, not considering the location where the service is delivered. The existence of a number of branches of one bank or sites of one restaurant chain makes both businesses more flexible in terms of the *location*. Moreover, the flexibility dimensions adopted by Silvestro (1993) are only concerned with changes in the demand side of the service. However, unexpected changes can also affect the inputs or even the process itself, which would probably call for a certain level of ability/flexibility to respond/adapt to this kind of change.

The approach adopted by Silvestro i.e. the adaptation of manufacturing flexibility concepts to service environments is valuable mainly if we consider that: (i) the production of goods and services can be seen as extremes of a continuum (Sasser et al., 1978), (ii) the service and manufacturing sectors are continuously learning from one another (Bowen and Cummings, 1990), and (iii) the literature on manufacturing flexibility has already received contributions that allow for a good understanding of the nature of flexibility (see for example Slack, 1989 and Corrêa, 1994). However further work on the issue is still needed.

The literature on manufacturing flexibility

A review of the manufacturing flexibility literature suggests that the environmental uncertainty and the variability of outputs are the most usually mentioned reasons for an organisation to seek manufacturing flexibility (Corrêa, 1994).

Uncertainty - Swamidass and Newell (1987) argue that 'an organisation may find at least some help in coping with the high uncertainties imposed by the environment by increasing its manufacturing flexibility'. Gupta and Goyal (1989) and Slack (1989) agree. Gerwin (1986) suggests that, since there are several kinds of uncertainty, there should be several kinds of corresponding flexibilities to cope with them. Gerwin and Tarondeau (1989) uses Gerwin's (1986) classification and suggest links between types of flexibility and types of uncertainty. Flexibility may also be seen as an insurance (Carter, 1986) against uncertainty.

Variability together with uncertainty has formed the rationale for the operation's interest in flexibility. Flexibility, according to Gupta and Goyal (1989), Gerwin (1986), Chambers (1990) and Stecke and Raman (1986) the need for flexibility is increasing because of the changing nature of competition, which, is increasingly based on the responsiveness of the companies to different customer requirements, shorter product life cycles and greater product proliferation.

Although the point is not explored as much as one might have supposed, considering its implications, some authors suggest that flexibility is not necessarily desirable in all circumstances, given that flexibility would never come cheap (Slack, 1989). Slack claims that 'organisations should not make their lives unnecessarily difficult by generating the need for flexibility internally, in order to cope with bad design, poor communication, lack of focus, excessive routing complexity and year-end spurs'. Instead, they should try to eliminate the causes of such imperfections. With regard to controlling uncertainty, Thompson (1967) argues that 'organisations are open systems faced with uncertainty and ambiguity, yet require certainty and clarity to operate in a rational manner'. Managers of the organisation's technical core would therefore attempt to reduce uncertainty so as to maintain operational objectives.

An alternative approach to analysing flexibility

Corrêa (1994) proposes an alternative approach, according to which manufacturing flexibility, at least at the operational level, should be seen in broader terms, as *'being able to respond effectively to unplanned change'*. The author considers that uncertainty and variability are only particular attributes of unplanned change and that in order to manage manufacturing systems effectively, it is important to understand the concept of unplanned change.

Two large streams of research can be identified on managing unplanned change. One stream is found under the label 'flexibility' and aims to deal with the change and its effects *after the fact* or, in other words, after the unplanned change has occurred. The second stream, although not explicitly, aims at reducing the amount of the changes with which the system has to deal. Several management techniques and research fields are engaged in finding ways to control the dynamics and the magnitude of the changes which affect the manufacturing systems: forecasting techniques, maintenance systems, parts standardisation and manufacture focusing are some examples. Their aim is to try to avoid the change *before the fact*, preventively.

Although both streams aim at managing unplanned change, the current literature lacks an unifying framework which helps managers understand and analyse unplanned change, control and flexibility and their inter relation. Corrêa's (1994) work is an attempt to provide such a framework, the main aspects of which are described below:

a) stimuli, or relevant unplanned changes have dimensions: size, frequency, novelty, certainty and rate. It is important to classify stimuli because different stimuli dimensions may call for different managerial actions. The current literature is fertile when dealing with planned change; numerous publications can be found on issues relating to 'how to change the organisation', under various labels (e.g. organisational behaviour and management of change). However, it is scarce in terms of unplanned change (or *stimuli*). Flexibility is possibly the only research field where dealing with changing circumstances is explicitly considered.

b) there are two basic and complementary ways of managing stimuli in manufacturing systems: by controlling the stimuli and by being flexible. Control is defined here as the ability to interfere effectively with the causes of the changes or with the way the system senses the changes, in order to alter one or some of the dimensions of which effects the system will otherwise have to respond to. *Flexibility* is defined as the ability to deal effectively with the effects, experienced by the system, of the unplanned changes.

The unplanned change control methods thus work as a filter, restricting the amount of change effects the system has to deal with. The changes which 'pass through the control filter' have to be dealt with by the system, through its system flexibility characteristics. The next session is an attempt to analyse

the possible usefulness of the philosophy behind and of some elements of Corrêa's (1994) model in order to analyse service operations.

Towards a model to analyse flexibility in service operations

Similarly to manufacturing operations, it appears to be plausible that service operations are also subject to unplanned change affecting the systems inputs, process and outputs. In order to manage the unplanned changes affecting service operations, managers can also adopt two main emphasis in their approaches: emphasis on controlling the unplanned changes or emphasis on developing flexibility to deal with the unplanned changes effects once they have occurred. We propose that for service operations at least the following unplanned change control-related managerial actions can be used:

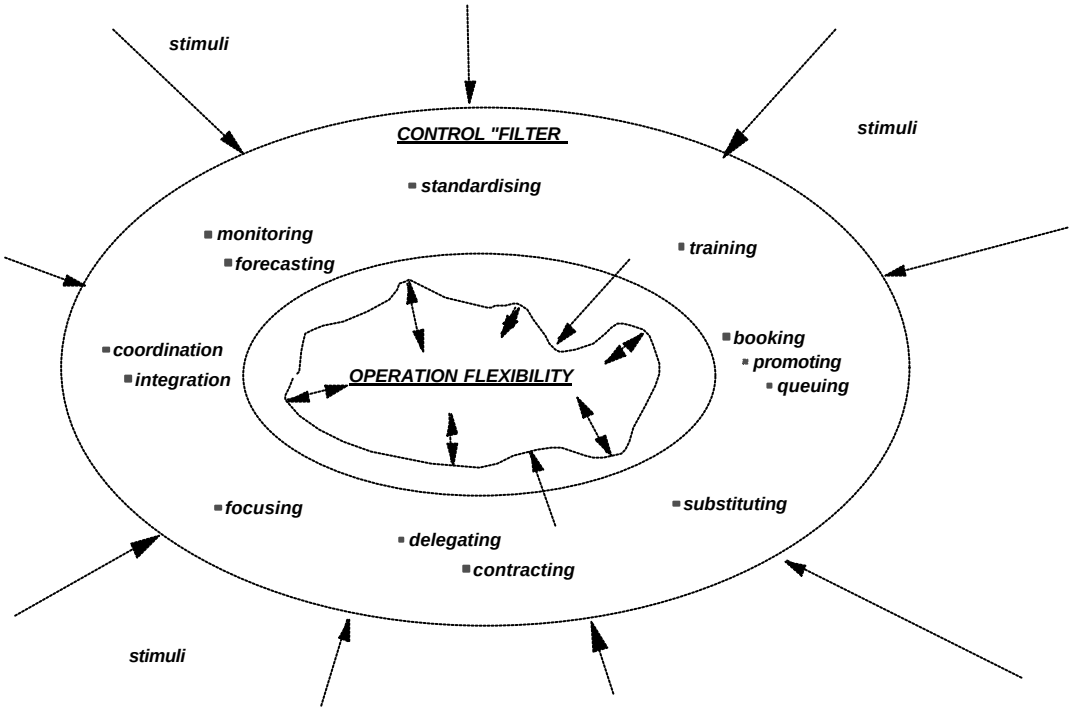

Figure 1. Stimuli, control filter and flexibility in service operations

Monitoring/forecasting: forecasting methods, for instance can help avoid the need to be flexible in adapting to unexpected changes in demand.

Standardising: standardisation of products help some fast food restaurants to avoid having to be flexible to deal with special customer's requirements.

Maintaining: which can take the form of equipment maintenance (of technological resources), training (of human resources) and updating (of data): by maintaining resources, a system avoids the need for responding for instance to breakdowns.

Booking/queuing/promoting: which are forms of trying to influence demand, aiming for instance to reduce the demand uncertainty (e.g. booking systems in medical practices).

Substituting: by substituting unreliable equipment or labour and replacing them with more reliable ones, a service operation can avoid having to deal with frequent breakdowns.

Delegating/subcontracting: by delegating to the manufacturers the display of merchandise on the shelves, some supermarkets are reducing the needed level of flexibility of their staff.

Focusing: the classic case of Shouldice Hospital, for instance shows that, by focusing on the treatment of inguinal hernias in relatively healthy patients, the need for flexibility of staff and facilities is reduced, allowing Shouldice to compete better on price.

Coordination/integration: by coordination and integration with internal customers downstream (e.g. process design), the product design department of companies (a service provider) can reduce the probability that they are required to change the product design in the future because of a possible unknown constraint in a downstream operation.

The changes which, for some reason, 'pass through the control filter' will be dealt with by flexibility characteristics. We propose seven types of service operations flexibilities:

Design flexibility: the ability to introduce new services ('why don't you do brakes too instead of only engine tuning?')
Package flexibility: the ability to offer varied services within a period of time ('I need to have all my car's main systems checked, can you do it before this evening?')
Delivery time flexibility: the ability to anticipate the service delivery to requirement ('can you do it for tomorrow instead of next week?')
Delivery location flexibility: the ability to offer the service in a variety of places ('can you fix my machine in Brazil within this period?')
Volume flexibility: the ability to change service output levels - ('can I take 15 more people?')
System robustness flexibility: the ability to remain operating effectively despite changes affecting inputs and process - ('the bank computer system is down, what shall I do now?')
Customer recovery flexibility: the ability to recover the customer after something goes wrong ('my suitcase got lost and I am getting angry, what can you do for me?')

Conclusion

The amount of control and the amount of flexibility used by an operation in order to manage unplanned changes is, to a certain extent, a managerial choice. Although not the only consideration to be done, there are trade-offs to be considered between control and flexibility. It is important therefore that managers have a good understanding of the costs of controlling the unplanned changes and the costs of developing flexibility.

This issue still needs further development. Some considerations can be done on the convenience of emphasising control or flexibility at least as a function of the type of unplanned change. At least one attribute of the unplanned changes should be taken into account: who is affected by the changes. The following 2X2 matrix can be drawn:

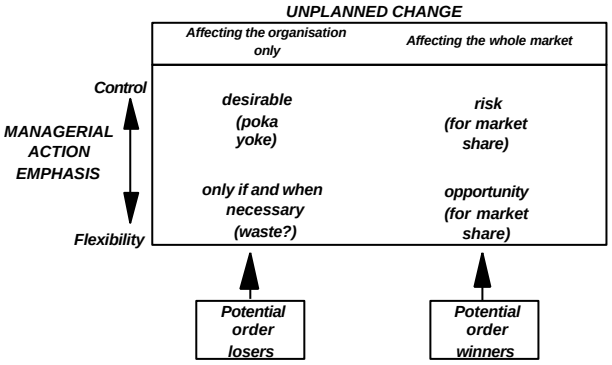

Figure 2 - The relationship between flexibility, control and unplanned change types

Unplanned change affecting the organisation only: it seems plausible that this type of change be dealt with by developing control. Unplanned changes which affect only the company under analysis

should be controlled whenever possible. They are potential order losers. Poka yoke-type mechanisms should be used to make sure that these changes do not negatively affect the operation's competitiveness. If it is impossible or not viable to control 100 per cent of the changes, some flexibility should be necessary. This is the case of a bank's ATM: if its availability changes (by a breakdown), the only company in jeopardy is the bank itself. Therefore, preventive maintenance should be emphasised. However it may be impossible to avoid all breakdowns. In this case, some robustness flexibility should also be provided (good corrective maintenance, for instance, to make the ATM up and operating again quickly).

Unplanned change affecting the whole market: in this case, the changes represent both the potential of jeopardy and opportunities for all in the market. Because all competitors are affected, the ones which can respond better will be better off. The company may even choose to try and encourage the changes in order that the potential to respond to them is highlighted. Burger King is now advertising that they can respond to special customers' orders. By doing this they are trying to increase the level of changes required by the fast food customers in order to highlight the company's possible better ability to cope with changes than McDonald's.

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