

# SERVICE OPERATIONS: THE QUESTION OF PRODUCTIVITY AND QUALITY MANAGEMENT

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## ABSTRACT

The present research aims to classify a wide range of service sectors in terms of productivity management challenges while also taking account of quality considerations and to find the most useful indicators of productivity management challenges in services. Based on an empirical approach, nine widely recognised service dimensions and ten different, but interrelated, aspects of productivity management are studied in twelve service sectors. The ‘Degree of Front Value Added’ dimension is found to be the most relevant indicator for productivity management challenges in services. Three service clusters, with each cluster being characterised by specific productivity (and quality) related issues are introduced. The interaction between productivity promotion and quality improvement is discussed and a simple model is presented that explains why services can be different in this regard.

Key Words: Service – Productivity – Quality

## INTRODUCTION

The first International Research Workshop on Service Productivity was organised and run in 1994. The event was followed two years later by a second workshop. Although the two events presented interesting and valuable work in the area of service productivity, there have as yet been no follow-up workshops. It seems that one of the reasons for this long interruption is the difficulty and the vagueness of the concept of productivity in services that is noted by many authors (Kupers, 1998; Van Looy *et al.*, 1998; Vuorinen *et al.*, 1998; Gummesson, 1994; Adam 1996). The controversy surrounding opinions about the nature and importance of service productivity is obvious from a review of the relevant academic literature. According to Levitt, “The key to productivity in the service sector is to focus on the similarities between manufacturing and services”. This well-known statement may be said to represent a manufacturing-based view of service productivity (Levitt, 1972). Opposed to this is the view expressed by Jones and Hall: “It is not productivity, it’s *servicity*” (Jones and Hall, 1996). While these two views may be regarded as extremes, there exists a wide range of opinions in-between. The complex nature of service productivity is partly due to the difficulty of conceptualising productivity management in services in a way that takes account of its interaction with other managerial challenges, in

particular quality management (Parasuraman, 2002; Gummesson, 1998, Gronroos, 2000). This paper presents and discusses the main results of an empirical study on productivity management in service industries. The aim of the study is to compare a number of different UK service sectors in terms of productivity management challenges and to find appropriate indicators for specific challenges in different service sectors. As will be discussed in the next section, the notion of 'service dimensions' is a vital element in this. Given the important role of quality in service productivity – to the extent that some authors have even proposed including quality in the definition of productivity, (Murdick, 1990 ; Heap, 1992) – the study also considers some quality-related issues that are relevant in this context. Whether there is a trade-off between the service productivity and quality is another topic that is addressed.

### **METHODOLOGY AND THE USE OF SERVICE DIMENSIONS (SDs)**

Service (operations) dimensions have been used by many authors for the purpose of classifying service operations. In most cases, the researchers' aim is to define one or more operational features of services (referred to as Service Dimensions) as a tool for studying the essential differences between various service operations. This kind of research can be limited to suggesting a suitable classification of the services and discussing the managerial implications of such a classification (E.g. Lovelock, 1983); or it can be extended to define the most appropriate position of services based on the proposed service dimensions (E.g. Chase 1981, 4Silvestro 1992). Considering the generic nature of the present research, the notion of SDs is found to be an appropriate approach and tool for this study. Even so, there are a number of important differences between the present work and the other research. These include: (1) determining which are the most relevant SDs by means of an empirical investigation rather than choosing SDs on the basis of theoretical considerations; and (2) letting experts in the service sectors studied measure the SDs with a measurement tool specifically developed for this purpose (Shafti *et al.*, 2000).

The analysis methods can be summarised as a combination of quantitative and qualitative techniques. Through a review of the relevant academic literature, a number of key aspects of productivity management (taking account of quality considerations) are chosen. Each aspect of productivity itself consists of a number of 'options' that may differ in importance among different service sectors. For example, one of the productivity aspects (PAs) consists of 'Productivity Improvement Problems', and in this PA there are the following options: 'Technology', 'People', 'Methods' and 'Climate'. The list of PAs are given later in table 1 Twelve important service sectors within the UK are selected for a field study in which two independent experts in each sector are being interviewed (with the exception of Auto-Repair services where only one expert was available). The interviews are semi-structured: first, each expert ranks the options relating to each of the PAs in terms of their relevance for his/her specific service sector; second, the expert is asked to discuss in detail the reasons behind these rankings. All experts also fill out a questionnaire in which, for each SD, they each find the best position for their respective service sector on a scale ranging from 'low' to 'high'. In all, nine popular SDs have been selected from the literature – comprising the six SDs that are covered in the work by Silvestro *et al.* (Silvestro, 1992), plus Schmenner's degree of customer interaction (Schmenner, 1986), the degree of intangibility (Lovelock, 1983) and the degree of the customer's inability to evaluate the service quality (Kay, 1995). In those cases where there are different types of

businesses within one service sector, a specific type has been chosen in the interest of consistency. For instance, no-frill airlines are excluded from the airlines and hotel services only consider four-star hotels. The experts were carefully chosen to be people at high managerial levels with extensive experience in more than one service organisation in their respective service sector. Taking into the account the notion of ‘frame of reference’ (Hesse, 1996), the terminologies used in the interviews and the questionnaire were discussed with the interviewees in detail to make sure of a consistent understanding of the concepts. On the rare occasions that there were significant differences of opinion between two experts from the one sector, the interview notes were fed back to each expert for clarification in order to reach agreement between them. The questions asked were pitched at a high strategic level, and were sufficiently general to avoid bias due to subjectivity (caused by either the professional background of the experts themselves or the specific nature of the organisations for which they worked) as much as possible.

Correlation analysis based on ‘Kendall’s Tau’ is used to find the association between each of the SDs and the options in nine of the PAs across the service sectors (the tenth PA, ‘Quality Characteristics’, was studied only to gain more insight into the meaning of quality for each service sector). Qualitative analysis has been used to explore the differences between the service sectors in terms of productivity management challenges and the existence of a potential trade-off with quality.

## RESULTS

Although the data resulting from the measurement of SDs are ordinal data and it is, therefore, not technically correct to add up the scores for different SDs, a cumulative bar chart is still a good way of summarising the SD measurements in the twelve service sectors. Figure 1 shows the results (please refer to the ‘Guide to Abbreviations’ that follows). As expected, the two professional services in the survey (Consultancy and Legal Services) along with Hotels and the University sector have the highest scores across all the SDs. Department Stores, Fast Food and Power Utilities have the lowest scores. The results from the main analysis of the data are presented in two sections: quantitative and qualitative analysis.

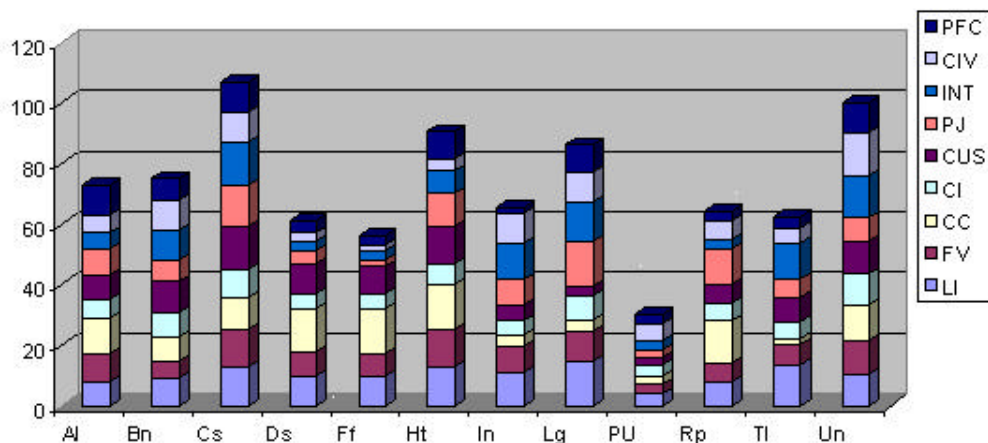


Figure 1: Accumulated measurements of SDs for the twelve service sectors

**Guide to Abbreviations:****Service Sectors:**

Al: Airlines, Bn: Banks, Cs: Consultancy, Ds: Department Stores, Ff: Fast Foods, Ht: Hotels, In: Insurance, Lg: Legal Services, Pu: Power Utilities, Rp: Auto-Repair, Tl: Telecommunications, Un: Universities

**Service Dimensions:**

LI: Labour Intensity, FV: Front Value Added, CC: Customer Contact, CI: Customer Interaction, CUS: Customisation, PJ: Personnel Judgement, INT: Intangibility, CIV: Customer Inability to Evaluate the Service, PFC: Process Focus

*Quantitative Analysis:*

As part of the quantitative analysis, the data associated with the SDs and the data associated with the rankings for the options related to the PAs were tested for the existence of a relationship. The correlation analyses based on Kendall's Tau and Spearman's Rho led to almost the same outcomes. Where there were some minor disagreements, the results of Kendall's Tau were preferred due to the size of the data and the large number of ties in the data. The analysis showed a number of significant (equal to or less than the 5% level for a two tailed test) and highly significant (equal to or less than the 1% level) associations. It is interesting that no PA is found to be associated with the SD of Labour Intensity. In other words, the results of this study show that Labour Intensity is not an appropriate indicator for how the form and nature of productivity management challenges might differ across various services. Similarly, the SD of Customer Contact is less than helpful as an indicator. In comparison, the dimensions of Front Value Added, Personal Judgement and Process Focus are more relevant as indicators of the specific form and nature of productivity management challenges.

Given that in many cases more than one SD is associated with a PA, certain criteria are used to choose the most useful SDs. These are 'Somer's d' for strength of prediction, 'Fisher's test of independence', coverage of options and coverage of the SD scale. Coverage of options refers to the number of options related to one PA that are associated with an SD. Obviously the more options covered by an SD, the better is the SD as an indicator for that PA. Coverage of the SD scale refers to the fact that the collected data for a few of the SDs have not covered part of the middle range of the scale and, therefore, the association between the measurements of these gaps with the PAs is unknown. The SDs that have a better cover of the measurement scale have priority.

Applying the above criteria to the results of the correlation analysis, each of the nine SDs – with the exception of Labour Intensity and Tangibility – are found to be reasonable indicators for certain PAs. While the length of this paper does not allow for a detailed presentation of the results, Table 1 shows a summary. The PAs denote the rows and the SDs the columns. Small dots indicate an association between the SD and one or more options related to a PA. Large dots indicate associations that are preferred based on the above-mentioned criteria. The figure shows that among the nine SDs, the SD of Front Value Added, first introduced by David Maister (Silvestro 1992, Maister 2000), is associated with a higher number of the PAs. Figure 2 demonstrates how this SD, along with the SD of Customer Contact, can be used as an indicator for the form and nature of Productivity Improvement Problems in services. (The options related to this PA were listed earlier). Note that, within this PA, the option of Technology has no association with the two SDs. A summary of the use of the SD of Front Value Added as an indicator for productivity management challenges with quality considerations is given in figure 3.

Table 1: Association between SDs and the options within PAs

	LI	FV	CC	CI	CUS	PJ	INT	CIV	PFC
P or Q prioritisation								●	
P vs. Q trade off									
P policies				●	•				
P factors						•		●	
P problems		●	●		•				
P approaches		●		•	●	●			
P measurement		●							
Q gaps		●							
Q costs		•							●

P: Productivity Q: Quality • : Association ● : Chosen association

*Qualitative Analysis:*

The aim of the qualitative analysis in this research is to explore and compare the dynamics behind the productivity management aspects of the service sectors studied and also to investigate the notion of a trade-off between productivity and quality in these services. The analysis consists of putting the data in Microsoft Access, taking benefit from the Queries function, and using techniques like descriptive and pattern coding, casual mapping and display tables/lists – within case and across case - (Miles and Huberman, 1994) to recognise the similarities, differences, trends and patterns within the qualitative data.

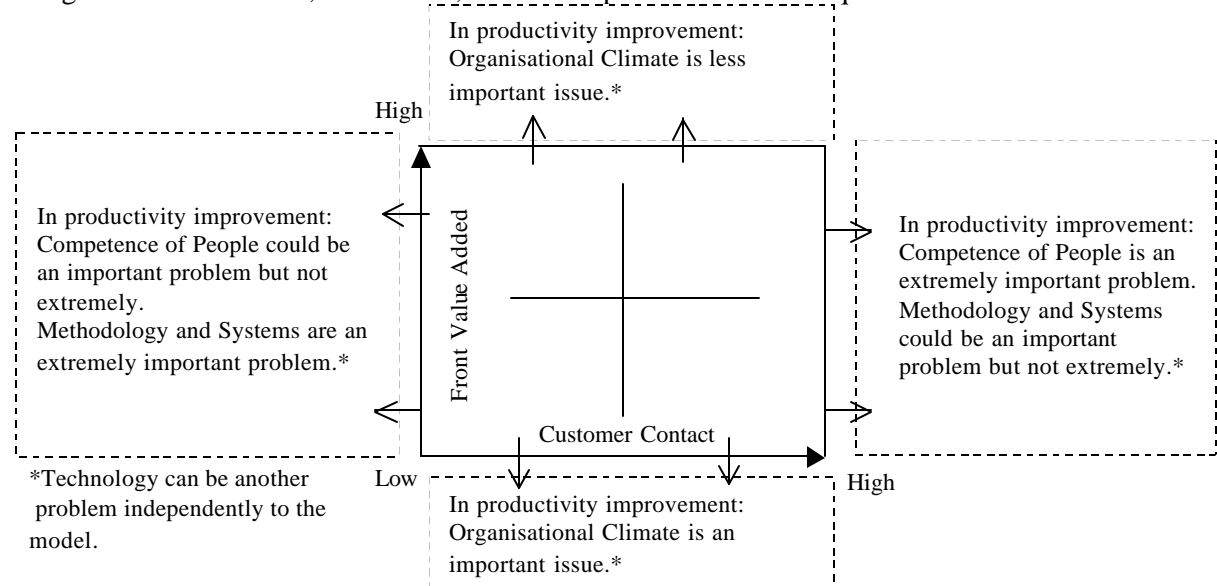


Figure 2: SDs of CC and FV as indicators for productivity management challenges.

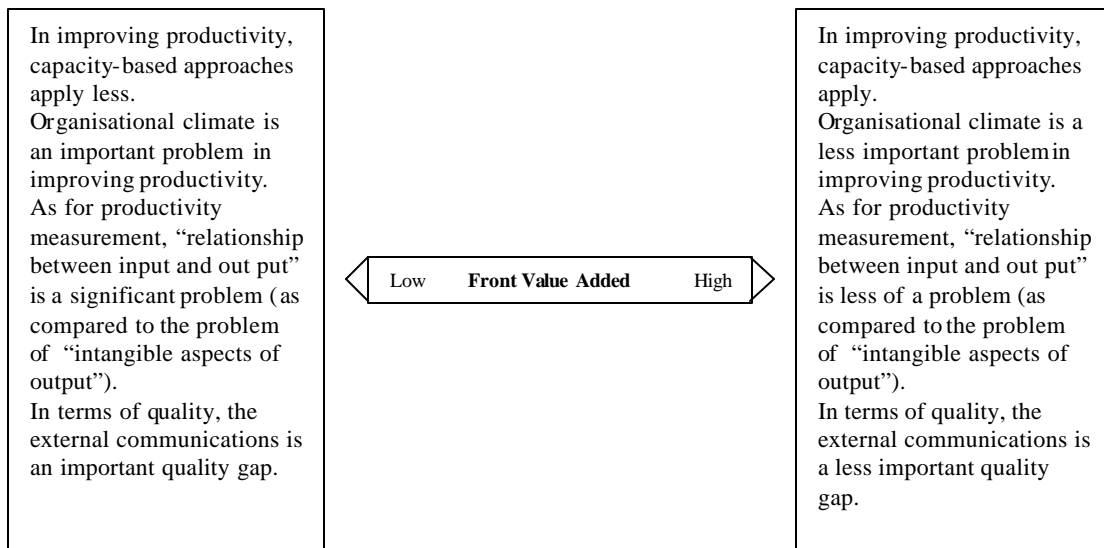


Figure 3: Summary, SD of FV as an indicator for productivity management challenges.

The cross-case displays reveal three different types of ‘attitudes’ in services with regard to productivity management issues. These three different attitudes can be used to classify the service sectors studied into three different categories. These are:

- ‘Factory Climate’: The operations in these service sectors are very close to manufacturing operations. Among the twelve service sectors studied, Fast Food demonstrates a factory climate.
- ‘Professional Climate’: The operations in these service sectors very much rely on the role of the professionals in the front line, with lots of room for personal judgement. Among the twelve service sectors studied, Consultancy Services and Legal Services demonstrated a professional climate.
- ‘Changing Climate’: These are the service sectors in which – because of recent technological advances and increased competition – significant and rapid changes are currently taking place. Telecommunications, Power Utilities, Banks and Insurance are in this category.

It seems that the other service sectors that were studied in this research have a combination of two or all three of the above climates. Department Stores, for instance, demonstrate a mixture of characteristics of Factory and Changing climates. Universities are demonstrating a mixture of characteristics of Professional and Changing climate. Auto-Repair services are demonstrating a mixture of characteristics of Factory and Professional climates, while Airlines demonstrate a mixture of characteristics of all three climates. Table 2 summarises the advantages and disadvantages of each of these climates in terms of productivity improvement. Further research is needed to explore if service sectors with a Changing Climate will eventually move towards either a Factory or Professional Climate, or if it is possible to consider the Changing Climate sectors as a unique cluster on its own. It is worth mentioning that all of the results of the qualitative analysis can be traced back to the raw data (i.e. interview content). In the Original manuscript, this is demonstrated using appropriate codes.

Table 2: Advantages and disadvantages of the three recognised service climates

Cluster	Advantages	Disadvantages
<b>Factory Climate</b>	<ul style="list-style-type: none"> <li>- Standardisation</li> <li>- Standard customer expectations</li> <li>- Easy measurement</li> <li>- Low appraisal and external costs</li> </ul>	<ul style="list-style-type: none"> <li>- Human conflict</li> <li>- High prevention cost</li> <li>- Less customer focus for measurement</li> <li>- Overspecialisation</li> <li>- Loyalty and motivation problems</li> </ul>
<b>Professional Climate</b>	<ul style="list-style-type: none"> <li>- Less prevention and appraisal costs</li> <li>- Team working</li> <li>- Good human relation between back and front office</li> <li>- Good motivation</li> </ul>	<ul style="list-style-type: none"> <li>- Not defined customer expectations</li> <li>- Difficulties in measuring intangibility</li> <li>- Inflexibility and scarcity of experts</li> <li>- Low motivation of supporting staff</li> <li>- Balancing back and front office</li> </ul>
<b>Changing Climate</b>	<ul style="list-style-type: none"> <li>- Technological advances</li> <li>- Growth</li> <li>- Easy to compete for the new comers</li> </ul>	<ul style="list-style-type: none"> <li>- Marketing gap</li> <li>- Staff difficulty (moral, loyalty)</li> <li>- High prevention cost</li> <li>- Rapid change of customer expectation</li> </ul>

In terms of a trade-off between productivity and quality, all the experts agreed that in the long term there is no trade off. There were differences, however, about the existence of short-term trade-off. While in some service sectors – like Fast Food, Auto-Repair Services and Insurance Services – no significant trade-off was recognised between productivity and quality, in most of the other sectors a short-term trade-off was said to exist because of cost effects. By investigating the context of each interview using the Microsoft Access Quiries function, facilitated by the coding system used, a concept was identified that could be the reason for the lack of a trade-off between productivity and quality in some services. This concept could be called the ‘Common Element between Productivity and Quality Improvement Efforts’. It seems that in those services where there is a common element between productivity and quality improvement efforts, there is less of a trade-off or even no significant trade-off –between the two. Three such common elements were explored and are introduced here:

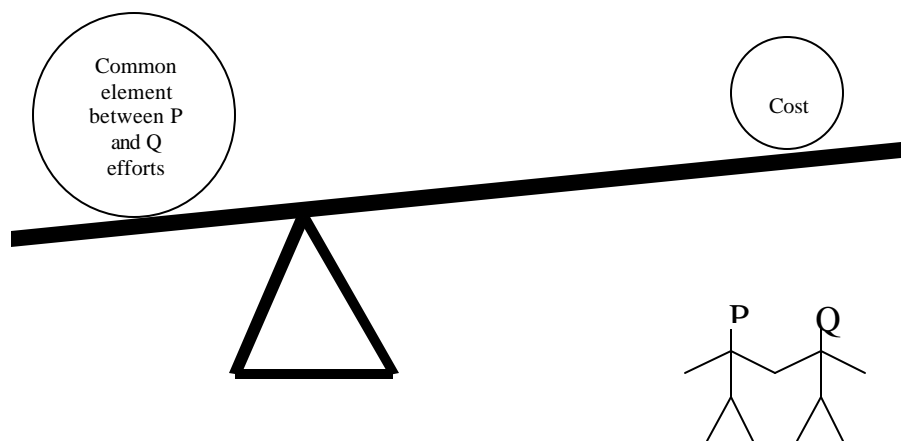
- *Speed*: In Fast Food the main aim of productivity improvement efforts is to maintain or increase the speed of the operations. According to the experts that were interviewed in this sector, speed is also the most important element of quality from the customer point of view (as is obvious from the title of the service, i.e. ‘Fast’ Food). This implies that quality and productivity improvement efforts are closely integrated in fast food services.

- *Standards*: In Auto-Repair Services (those that operate under recognised standards) productivity is maintained and improved by following the service standards as closely as

possible. In this sector, customers perceive a standard service as a high-quality service. This means that both quality and productivity improvement efforts can be focused on standardisation.

- *Defect-less Product*: In Insurance Services the main purpose of productivity improvement plans is to reduce the number of faulty products (services). According to the relevant experts, a defectless service is also one of the main elements of quality that customers are looking for in insurance services. This shows, again, a good match between productivity and quality improvement efforts.

The above logic is demonstrated in Figure 4 where it is shown that productivity and quality can jointly pass the trade-off barrier (caused by cost effects) only if there is a significant common element between productivity and quality improvement efforts.



*Figure 4: Overcoming trade of between productivity and quality in services. (Trade off barrier can be lifted up by a common element between productivity and quality efforts, giving permission to both productivity and quality to be improved hand in hand).*

## CONCLUSIONS

The present paper has presented some of the final results of a research project on the application of service dimensions in studying the differences between productivity management challenges across twelve service sectors in the UK. The research methodology was mainly empirical in nature: unlike the work of many other researchers, the appropriate SDs were introduced only after analysing the relation between a number of candidate SDs and managerial challenges in the area of productivity improvement. The results show that the relation between SDs and such managerial challenges are not as straightforward as is suggested in ideas like the Service Process Matrix (Schmenner, 1986). Each SD can be used as an indicator for a specific set of managerial challenges only. Among the SDs, the degree of Front Value Added has turned out to be the most relevant dimension to act as an indicator. Relating to the classification of services, having found the relevant SDs, it is now justifiable to classify the services based on these dimensions. However, this paper has proposed a pragmatic classification of services based on their attitude (climate) in the context of productivity management. Taking note of the importance of quality in any productivity improvement effort, the present research also included relevant aspects of quality and their interaction with productivity. It was found



that among the services studied, for those with a common element between productivity and quality improvement efforts any trade-off between productivity and quality improvement is less significant. The present research has also explored the logic for prioritising between three productivity improvement policies, when quality is included in the definition of productivity.

The generic nature of the present research allows one to argue for the reliability of the results for service sectors not covered in the field study and/or outside the UK. The results of this research project will be helpful for practitioners, both as tools and as useful insights. As tools, the notion of SDs can be used for designing new services, and to analyse and control the dynamics of productivity management in an existing service operation. Using the SDs recognised as relevant in this research, it is possible for managers to think of how to reposition their service strategically in order to replace undesired managerial challenges with desired ones (based on the capabilities of the organisation). As useful insights, the proposed classification of services linked to empirically determined managerial challenges can provide a structured way for the top managers of service organisations to understand the causes of advantages and disadvantages for their business operations. As both tools and insights, the research brings clarification in the areas of the potential productivity/quality trade-off and productivity improvement policies. By searching for and focusing on a 'common element' for productivity and quality improvement efforts, it is possible to reduce any trade-off significantly.

Because of the generic nature of the present study, it is reasonable to consider detailed follow-up studies in specific areas of productivity management and/or in specific service sectors/organisations. This could further develop the results of this research in different levels of service productivity management, and explore new areas in this regard.

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