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IMPACT OF OPERATIONS MANAGEMENT ACTIVITIES ON OPERATIONAL PERFORMANCE IN SERVICE ORGANISATIONS

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Abstract

Recent years have witnessed a surge of interest in the impact of operations management related activities on the operational performance in service organisations. This recognition, has in turn, placed an emphasis on the question of where and how operations management related activities have influenced the operational performance of service firms. Our paper is an attempt to address this question. Drawing from the responses of mostly operations managers and operations directors of a sample of 190 firms based in Australia, our empirical results suggest that the performance of a service firm is influenced significantly by the antecedents of operations scheduling, service process, and logistics capabilities. Also, through multiple regression analysis, we found that operations scheduling and service process have a strong bearing on the firm's efficiency. We discuss the key contributions of our paper and offer some implications for future research on the operational performance of service firms.

IMPACT OF OPERATIONS MANAGEMENT ACTIVITIES ON OPERATIONAL PERFORMANCE IN SERVICE ORGANISATIONS

INTRODUCTION

Services continue to drive many an economy, particularly for those of the developed nations (see for example, Vargas and Manoochehri (1995)). Indeed, services provide the single largest opportunity for revenue generation and maintaining margins (Brechbühl, 2004), and they continue to provide a pivotal role in the next cycle of economic development. In Australia, where this study is positioned, the service sector accounts for more than three-quarters of the economy's output and provides for four out of every five new jobs (McLachlan *et al.*, 2002). Service firms today are recognised as good sources of comparative advantage. As such, the field of service operations management (SOM) has been recognised as an intriguing management area which straddles across traditional disciplines such as human resource, marketing and operations (Chase, 1996). Indeed, judging from the proliferation of scholarly output (e.g. Pannirselvam *et al.,* (1999); Johnston (1999)), SOM has been receiving much attention by academics and practitioners alike, with the ardent belief that a strong focus on OM related activities can provide that competitive edge in service organisations. Hence, it is timely to investigate the key OM activities prevalent in service organisations, and their impact (if any) on operational performance in a service organisation.

The motivation of our study is that the traditional OM activities have been prevalent in the service industry, having evolved from the manufacturing sector. For instance, in order to gain competitive advantage, manufacturing firms have embraced, among others, traditional production methods and activities such as just in time (JIT), total quality management (TQM), Zero Inventory Management (ZIM), and the theory of constraint (TOC). So, this paper seeks to examine if the impact of operations management on performance which has been studied in the manufacturing sector can also translate into the service sector. This point is important given that more and more services today tend to operate like manufacturing, with standardised products and processes, commonly termed as mass services. As such, it is instructive to explore if services firms (either in service scape, climate, or process design) can benefit or have benefited from the strategic adoption of certain operations management techniques and practices which have originated in the traditional manufacturing realm.

In this paper, we provide a conceptual model of the proposed relationships between variables representing OM activities and operational performance. The proposed model is based on the literature survey and case study experiences. The objective of our study is to specifically identify the broad classes of such OM activities and ascertain their specific impact on certain aspects of operational performance for a typical service organisation.

Therefore, this study makes two key contributions to the extant literature on operational performance of firms in the service industry. First, we show through exploratory factor analysis that certain broad classes of OM related activities as borrowed from the manufacturing sector have a positive influence on the operational performance of firms in the service industry. Next, through multiple regression analysis, we argue and show the relationship of these activities.

The rest of the paper is organised as follows. In what follows, we briefly outline the research literature on service firms, operational performance and OM activities, and how OM activities have impacted operational performance in the manufacturing sector. We then develop a conceptual model. In the following section, we describe the data collection, the measures used, and demographics of our sample. Finally, we present the results and discuss their implication for research on the operational performance of service firms.

THEORETICAL BACKGROUND

There have been numerous discussions in the literature concerning the nature of service firms (see for example, Buzacott (2000); Lovelock and Yip (1996)). Mills *et al.* (1983) claim that such firms are different from manufacturing firms and as such require new models to deepen our understanding of them. At the same time, there are others who contend that any differences that exist are only in the degree but not in the kind (e.g. Bharadwaj *et al.* (1993); Schneider (2004)). For instance, Schneider (2004) argues that OM scholars have been instrumental in understanding the relationship between service operations (such as maintenance scheduling, space allotments and so on) and revenue. Indeed, he claims that "OM has been far more concerned with (the) direct effects on revenues in service organisations than other disciplines" (p. 16). Nevertheless, research in operations management addressed specifically to service organisations has been relatively sparse, especially those that deal with the impact of OM activities on operational performance. A content analysis of the OM literature suggests that there are eleven distinct activities – aggregate planning, forecasting, facilities layout, facilities location, job design, inventory control, product or service design, quality and control, maintenance, production control, and inventory control (see Pearson, *et al.* (1990) for more details).

Pearson *et al.* (1990) in their study of OM activities of small, high growth electronics firms, have highlighted the fact that the Japanese have been able to produce on the traditional pillars of manufacturing i.e. time, cost, quality and service. The notion of operational performance can be traced to the need to increase effectiveness by improving business activities and processes. However, these imperatives become even more critical when applied to services. The reason for this, as justified by numerous other researchers, is that most services are produced and consumed simultaneously (Kellogg and Nie, 1995). This imposes great challenge on the service process structure (Buzacott, 2000). Indeed, Buzacott reiterated the need to handle the variety and complexity of different customer requirements with the speed and efficiency of performing the required (operational) tasks.

Thus far, the literature suggests that the breadth of empirical studies on service organisations emphasise the need for effective operational practices than the analysis of the practices or activities themselves (Nie and Kellogg, 1999; Vargas and Manoochehri, 1995; Wright and Mechling, 2002). None of these studies examined the impact of OM activities on the operational performance of the firm. In this regard, we argue that it is important to investigate whether OM activities can be used strategically as competitive resources to enhance organisational performance in service firms as they do in the manufacturing sector. This is because services are inherently different from manufacturing products with respect to a number of key aspects. Nie and Kellogg (1999) suggest that services have unique characteristics that are not found in manufacturing, most notably being customer contact, intangibility, inseparability of production and consumption, heterogeneity, perishability, and labour intensity. The implications of these characteristics can invariably affect the effectiveness of certain OM activities in determining performance. For example, since services are perishable, any unused capacity is lost and cannot be stored or restored for a later use. This leads to difficulty in managing demand, capacity, and scheduling in service operations. Also, the intangibility and heterogeneity of services make the quality of services more difficult to monitor and control. Hence, the purpose of this empirical study is to fill the gap currently existing in the empirical research on service organisations, by evaluating the impact of OM activities on the operational performance of service organisations for a particular country, so as to provide a set of valid constructs for future such studies in the Asia Pacific region.

RESEARCH METHODOLOGY

The sample for this study was drawn from 190 firms based in Australia, encompassing the various service sectors (based on the statistical industry classification), such as transport, wholesale/distribution, retail, banking, hospitality, health care, information technology, education,

and the professional services. The respondents were mainly operations managers or those with primary functional responsibilities related to the daily operations of the firms in question.

Survey Instrument

The survey instrument was drawn from previous studies in the area with two major aspects being the main focus, namely, the operations management activities and the operational performance of the firm. The operations management activities incorporated 21 items such as service design, resource and capacity planning, work scheduling, work measurement, quality control, inventory control, procurement and purchasing, technology management, and facility location. The operational performance measures comprised 13 items including quality, innovation, delivery, responsiveness, speed, service recovery, cost reduction, and productivity.

Demographic Description

Several demographic variables are presented below, namely the breakdown of the various service sectors covered in the study (Table 1), the organisational size in terms of the number of employees (Table 2), and the job position of the respondents (Table 3). While Table 1 shows that there is a fairly even level of representation in the sampled sectors, Table 2 suggests that the responses could be dominated by the small firms (20-99) and large firms (200 or more). Given that more than two-thirds of the job positions (see Table 3) are skewed towards operations, and the service organizations have adopted the production approach and allotted the responsibility for operational decision within the organization to such personnel, can only suggest that service organizations are cognizant of the importance of operations management related activities and the latter's impact on operational performance of the firm.

Table 1: Service sectors of the respondents

Service sectors	Number of firms
Wholesale / Distribution	31
Transportation	26
Retail	13
Professional Services	12
Banking / Finance	11
Utilities	11
Health Care	10
Hospitality	8
Property	8
Entertainment / Leisure / Tourism	7
Repair / maintenance	7
Communications	6
Construction	5
Education	4
Information Technology	4
Insurance	3
Non-profit (including government)	3
Research services	2
Broadcast	2
Building supply and equipment	2
Others	15
Total	**190**

Table 2: Organisational size based on the number of employees

Number of employees	Number of firms
less than 10	2
10 – 19	14
20 – 99	62
100 – 199	32
200 or more	79
Total	**189**

Table 3: Position of the respondents

Positions of respondents	Number of firms
Operations Manager / Director	126
General Manager	26
Finance Manager	6
Customer Service Manager	3
Divisional / site / plant / area Manager	12
Others	17
Total	**187**

DATA ANALYSIS

Factor Analysis

An Exploratory Factor Analysis (EFA) using Principal Components Analysis (PCA) and Promax rotation was used to develop the necessary factors. Promax rotation was chosen instead of varimax rotation because the extracted factors were not expected to be orthogonal, meaning that firms would not just emphasise only on one aspect of operations whilst neglecting the others. An eigen-value greater than one was used to determine the optimum number of factors extracted. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for this analysis was 0.85 with 59.24% of their variance explained. The Barlett test for sphericity was also significant at $p<0.000$. The initial findings indicated that six factors were extracted from the operations management activities. Two items (project control and service design) were shown to either low loadings on the extracted factors or 'non-clean' loadings between two or more factors. This suggested that these items did not fit adequately into any of the factors and therefore were removed. We label the six factors as *scheduling* (4 items), *measurement* (2 items), *process* (5 items), and *logistics* (2 items). A similar method was applied to the performance measures. Three factors were extracted from 10 operational performance measures. The KMO measure this analysis was 0.82 with 58.88% of their variance explained. The Barlett test for sphericity was significant at $p<0.000$. Only one item was excluded (i.e. customer retention) due to non-clean loadings. The three extracted factors were labelled as *service* (3 items), *features* (4 items), and *efficiency* (2 items).

At the same time, a reliability analysis was conducted using Cronbach's alpha. Since this study by nature is exploratory, a minimum threshold alpha value of 0.6 is deemed acceptable (Nunnally, 1978). Two factors, *facility* and *support*, fall short of the minimum criterion despite their strong factor loadings. Consequently, these two factors were removed from the subsequent analyses. The complete results of EFA and reliability analysis are presented in Table 4.

Table 4 Exploratory factor analysis and reliability analysis

Factors	Items	Factor loading	Cronbach's alpha
Scheduling	Work scheduling	0.79	0.69
	Resource capacity planning	0.73	
	Staff scheduling	0.69	
	Maintenance	0.67	
Measurement	Work measurement	0.87	0.68
	Job design	0.87	
Service Process	Process control	0.81	0.79
	Quality control	0.77	
	Data processing and communication	0.74	
	Technology management	0.69	
	Customer services	0.69	
Logistics	Procurement and purchasing	0.88	0.70
	Inventory	0.88	
Service	On time delivery	0.87	0.77
	Responsiveness	0.81	
	Processing time / speed	0.80	
Support	Back office management	0.79	0.40
	Customer waiting line (queue)	0.63	
	Forecasting	0.62	
Facility	Facility layout	0.83	0.56
	Facility location	0.83	
Features	Innovation (novelty)	0.75	0.61
	Brand image	0.74	
	Quality (conformance to specification)	0.67	
	Service recovery	0.57	
Efficiency	Cost reduction	0.86	0.63
	Productivity	0.86	

Bivariate Correlations

As a preliminary analysis between the four factor scores of OM activities (*process*, *measurement*, *scheduling*, and *logistics*) and the three factor scores of performance measures (*service*, *features*, and *efficiency*), bivariate correlation was conducted and the result is presented in Table 5. As shown in the result, the correlations between the four operations management activities are significant at $p<0.01$. This reflects, as would be expected, that firms normally implement these operations activities in a relatively holistic manner rather than emphasising one aspect over the other. It is also important to note, however, the correlation coefficients are still at a moderate level, and, therefore, should not raise any serious concerns on multicollinearity among the independent variables. It is also interesting to note that logistics does not seem so closely related to the other three OM activities. The relationships between the four OM activities as the independent variables and the three performance measures) as dependent variables are also significant at $p<0.01$, except for that between *logistics* and *service*.

Table 5 Correlation between factor scores

	Process	Measurement	Scheduling	Logistics	Service	Features	Efficiency
Process	1.00						
Measurement	0.48	1.00					
Scheduling	0.53	0.53	1.00				
Logistics	0.29	0.24	0.32	1.00			
Service	0.49	0.26	0.44	0.12*	1.00		
Features	0.53	0.32	0.30	0.20	0.44	1.00	
Efficiency	0.39	0.45	0.42	0.24	0.38	0.43	1.00

All correlations are significant at $p<0.01$ except that denoted with asterisk (*)

Multiple Regression Analysis (MRA)

Table 6 shows the three multiple regressions of the four OM activities regressed on the three performance measures. The result indicates that *process* proves to be the strongest predictor as it significantly relates to *service* and *features* and its relationship with *efficiency* is very close to be significant. This is followed by *scheduling* which is shown to be a significant predictor to *service* and *efficiency*. *Measurement* is only significantly related to *efficiency*, and *logistics* is shown to be significantly related to none of these performance measures. The R^2 values of the three equations are close to 0.30 which indicates acceptable explanatory power of the variance of the dependent variables (Samson and Terziovski, 1999).

Table 6 Multiple regression analysis

	Service		**Features**		**Efficiency**	
	Std. Beta	Sig.	Std. Beta	Sig.	Std. Beta	Sig.
Process	0.39	0.00	0.48	0.00	0.14	0.07
Measurement	-0.07	0.36	0.09	0.27	0.27	0.00
Scheduling	0.30	0.00	-0.01	0.90	0.17	0.04
Logistics	-0.08	0.27	0.04	0.56	0.08	0.25
	$R^2 = 0.30$		$R^2 = 0.29$		$R^2 = 0.27$	

DISCUSSION OF KEY FINDINGS

Overall, our present results seem to suggest that the construct service process forms the most influential activities set which has an impact on all three performance measures. If we treat the various items in this predictor construct and reclassify according to Lovelock and Yip's (1996) classification, namely, data control and communication (information processing), technology management and process control (possession processing), customer services (people processing), then this result is consistent with their work. Next, our results seem to imply that the managing the service process right has an important bearing on the service performance and hence determines the service system structure (see Schmenner (1995)).

Service *process* is also the only variable which significantly predicts *feature* performance. This suggests that the traditional operations management related activities such as quality standard and service recovery form an integral part of the performance of service firms which focus solely on 'good' features to win and retain customers. This provides a further confirmation on the importance of managing service processes to achieve high quality and innovation performance. At the same time, *process* also significantly relates to *service* performance which reinforces its

importance in determining not only delivering what customers needs but also delivering on a timely basis.

It is also interesting to recognise the significant impact of operations *scheduling* on *service* performance, which appears intuitively consistent with practice. Good service operations scheduling is still considered critical in ensuring generally accepted service performance measures such as on-time delivery (as in being reliable in the eyes of the customer), allowing the service firm to be responsive and thus maintaining sustainable competitive advantage, offering the best processing time so as to meet the customer's expectation especially in areas where more customer touches can lead to a high variability level in the service time. Thus, our study here supports the argument of Schneider (2004) and others who have argued that the goal of service production is to manage variability in customer delivery. In addition, *scheduling* is also shown to be impacting on *efficiency* performance. This, again, reflects what is commonly expected in practice where good scheduling minimises wastages of time and other resources.

Measurement, on the other hand, proves to be the strongest predictor of *efficiency* performance. This is also consistent with the intent of the activities which are focused on designing jobs and measuring their capacity, commonly known as time and motion study. Despite the many critiques which have been thrown against these practices, their importance in determining productivity which in turn will affect cost efficiency is still paramount here.

Logistics is found to be the weakest predictor in service operations and this could be linked to the fact that many services cannot be stored or made to stock, due to their perishability nature. Finally, we note that all three operations management activities were directed towards efficiency through the path coefficients. This suggests that, *ceteris paribus*, operations managers accept and appreciate the need to focus on productivity gains to manage the service operations. This concurs with the empirical findings of Vargas and Manoochehri (1995) who found that service firms are cognizant of the importance of operations-related tasks, and their correspondent impact on firm performance. Further, this reinforces the conventional wisdom that the productivity of services needs to be on par with that of the manufacturing sector, hence the stress on efficiency of the service process.

As mentioned by Johnston (1999), we are entering into the fourth stage of service management improvement, where tools and frameworks are used by academics and practitioners to help improve service management. So, in terms of managerial implications, the following is proposed. First, depending on whichever framework service organisations choose to use (and there are a lot to choose from), the right emphasis must be accorded by the operations managers to the respective OM tasks and activities so as to drive the appropriate operational performance measure. For instance, if a service firm chooses to focus on highlighting its features such as innovation, brand image and service recovery, then the necessary service process ingredients must be given due recognition and weight when designing the service infrastructure and system. Some of these items as mentioned in an earlier of this paper would encompass superior customer service, reliable data or information processing and communications, the optimal use of the right service operations technology to manage the flow of customer requests and processing the internal data necessary to ensure speedy customer service, and be perceived as being externally focused. Also, improvement goals must be proactively directed towards this end. Put simply, managers and service champions need to re-focus their service operations towards traditional operational issues and approaches (Johnston, 1999).

CONCLUSIONS

As services become an increasingly important sector in world trade, it is incumbent on academicians to develop and test appropriate theories that relate specifically to the operational performance of such firms. In today's competitive business environment, top management of service organisations must pay careful attention to the implementation of OM related activities so

as to improve the operational performance of their firms for reasons of productivity. As such, we have posited that traditional OM activities developed for and tested with manufacturing firms can be assumed to apply equally in service organization settings. This article represents an initial attempt at developing an operational performance framework for service firms and hopefully will lead to further work in this area.

This study has found that managing the service process right is imperative to ensuring good operational performance (and hopefully improved effectiveness of the business). The survey results also indicate that logistics is the weakest predictor due to the high variability found and expected of service firms compared to manufacturing outfits. Nevertheless, the analysis performed in this paper continues to point toward the need for efficiency improvement through better utilisation of OM related activities.

As in all research, this piece of empirical work has its limitations. First, the results are limited by the size of the sample. Using a larger sampling frame can potentially allow us to include the *facility* and supports constructs into our current discussion and compare this finding with the work of others (e.g. Kellogg and Nie (1995)). Second, the study is country specific. Service organisations residing in Australia's neighbours in Asia may behave differently and therefore rely on a different set of OM activities to drive higher operational performance. Third, as noted earlier in the paper, different researchers hold different views on the nature of service organisations. Therefore, there is a need to re-define the content of service operations management, specific to either geography or typology (for example, Schmenner's (1986) matrix). Nonetheless, we believe that the value of this paper is to yield valuable insights for researchers and practitioners concerning the linkages between manufacturing and service organisations, and the impact of OM related activities on the operational performance of service firms.

Moving forward, future studies can focus on the differences such as geographic location, industry type, and the length of OM practices within service organisations, as well as the influence of larger client firms on the operational practices of smaller service organisations. We defer these discussions to another paper.

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