Process thinking in facilities management: an analytical view

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PROCESS THINKING IN FACILITIES MANAGEMENT: AN ANALYTICAL VIEW

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ABSTRACT: Facilities Management (FM) processes are those extending over different functions and having customers as well as suppliers, therefore the FM organisational perspective should focus on the core and critical FM processes. In contrast to functional definitions, a process perspective in FM is clearly focusing on the tasks and activities that are taking place in the FM organisation. The emphasis should be on how the work is done, rather than the functional emphasis on what is done within the organisation. Most FM organisations have a culture that is focused on the service they provide. In such a culture people are naturally inclined to emphasise issues that are tangible, visible or measurable. In such organisations people are likely to resist activities that do not contribute to short-term tangible results. Due to fast changes in the market place, and customers' increasing expectations, task oriented or functional thinking has therefore become outdated. Many facility managers now believe in process thinking. Some of the most important FM processes to describe and analyse are those which tend to enhance customer satisfaction. This paper will discuss some of the important FM processes identified through a series of case studies carried out as part of a major research study.

Keywords – Facilities Management, Process Thinking

1 PROCESS THINKING IN ORGANISATIONS

There is a great deal of variety concerning the definitions of processes. In the management literature the term "process" is frequently defined as a set of related activities. This basic definition often carries with it elaborating text referring to outputs, value and customers. Paul (1987) describes a process as the logical organisation of people, materials, energy, equipment, and procedures into work activities designed to produce specified results. A process is a set of linked activities that takes an input and transforms it to create an output, and it should add value to the input and create an output that is more useful and effective to the recipient (Johansson et al, 1993). Davenport (1993) describes a process as a specific ordering of work activities across time and place, has a beginning and end, and clearly identified inputs and outputs. The concept of process is familiar to many as the central element in the input-process-output paradigm. In this context, process refers to the patterned, purposeful interactions between a system's inputs and its processes. In spite of many definitions they follow similar directions to emphasise the nature of a structured set of activities designed to produce a specified output (Tinnila, 1995).

2 PROCESS THINKING IN FACILITIES MANAGEMENT

Facilities Management (FM) processes are those extending over different functions and having customers as well as suppliers, therefore the FM organisational perspective should focus on the core and critical FM processes. In contrast to functional definitions, a

process perspective in FM is clearly focusing on the tasks and activities that are taking place in the FM organisation. The emphasis should be on how the work is done, rather than the functional emphasis on what is done within the organisation.

An FM organisation's transformational processes and its transactional processes define the organisation from the process perspective. These basic processes are themselves parts of a larger loop of activity, some of which are transformational and some of which are transactional in nature. FM organisations' business processes are typically divided up into some commonly accepted business functions:

- Managing service quality;
- Managing service planning;
- Managing property services;
- Managing information;
- Managing contract management;
- Managing FM finances; and
- Managing administration

Most FM organisations have a culture that is focused on the service they provide. In such a culture people are naturally inclined to emphasise issues that are tangible, visible or measurable. In such organisations people are likely to resist activities that do not contribute to short-term tangible results. Due to fast changes in the market place, and customers' increasing expectations, task oriented or functional thinking has therefore become outdated. Many facility managers now believe in process thinking. Belief in itself is not sufficient, and the problem has been how they should implement this thinking in their FM organisations (Hinks, 1999).

FM processes are primarily an analysis of the FM organisation's internal processes which focuses on the internal business results that lead to financial success and satisfied customers' expectations. Internal FM processes are the mechanisms through which performance expectations are achieved. Customer-based measures are important but they must be translated into measures of what the FM organisation must do internally to meet its customers' expectations. Therefore, managers need to focus on those critical internal operations that enable them to satisfy customer needs (Kaplan and Norton, 1992). Key processes are monitored to ensure that outcomes will be satisfactory. FM organisations should decide what processes and competencies they must excel at and specify measures for each. The measures should also link to top management's judgement about key internal processes and competencies to the action taken by individuals that affect overall corporate objectives (Kaplan & Norton, 1996). This linkage ensures that employees at lower levels in the organisation have clear targets for actions, decisions, and improvement activities that will contribute to the organisation's overall mission (Olve, et al, 1999).

3 INTERNAL PROCESSES WITHIN FACILITIES MANAGEMENT ORGANISATIONS – RESEARCH METHODOLOGY

In order to explore some of the most important FM processes to describe and analyse and which tend to enlarge customer satisfaction, a review of the literature was the initial step and this included an in-depth examination of literature relating to process management applications in organisations in general and in FM organisations in particular. Further, authors agreed the "case study" is the research strategy that matches better with the characteristics of the study. The preference of the case study strategy derives from the fact that the main research question in this work is in the form of "what". These allowed an

in-depth investigation of the concepts of process thinking in FM in its real life context. A multi-dimensional case study survey across a number of sectors was carried out. Due to space limitations information relating to above organisations is not presented within this paper. {See Amaratunga (2001) for more information on individual case study organisations} This selection was influenced by evidence from the literature survey that management perceptions of the role of facilities can vary considerably according to the type of business and the environment of the particular business sector.

Within any FM organisation, there are a number of internal FM processes that require focused management attention to ensure requirements and expectations are met as effectively as possible while accommodating cost efficiency issues. Preceding sections identify different FM internal processes identified through this study.

4 CRITICAL SUCCESS FACTORS TO SUPPORT PROCESS CULTURE WITHIN FM

Each critical success factor exposed relating to FM internal processes through this study is briefly summarised below.

4.1 Operational Service Efficiency

The FM *operational processes* represent the short wave of value creation in FM organisations, deal with the delivery of the service to the customer and stress efficient, consistent, and timely delivery of existing services to the customer. The operational process remains important and FM organisations should identify cost, quality, time and performance characteristics that will enable it to deliver a superior service to its customers. Gronroos (1990) defines service efficiency as understanding the capacity of the organisation to deliver the actual service to the required quality together with new service offerings.

One of the case studies believed that FM *operational efficiency* should become central to the operation of the FM function and emphasised that the effect of all FM processes upon delivery of the core business should be optimised. Some of the FM motivators within the organisation were:

- To improve facilities efficiency so that every pound saved means that more money is available for, in this case, the maximisation of care for patients,
- To shift the focus on to quality of facilities so that excellence is guaranteed to all facilities users, and
- To increase the confidence in the FM process by demonstrating the positive impact that good FM can have upon the health care process.

4.2 Contract Management

It is important to understand the many ways in which a FM organisation deals with its outsourcing FM contracts. A growth trend in outsourcing is noted thus: “More and more people working in and for organisations will actually be on the payroll of an independent outside contractor” (Featherstone, 1999). Ownership and the use of facilities are diverging and the organisations therefore are outsourcing their activities and concentrating on their core business. The specialist contractors performing such outsourcing tasks, perhaps naturally, support the view that outsourcing is both beneficial and a growing trend. There are a number of contracting options which range from encompassing all services from one contractor or single separate services spread amongst many suppliers.

The contracting out strategy varies from organisation to organisation. Although there are advantages and disadvantages to contracting out in general, and in specific types of contracting, it is unknown which, if any, contracting strategy contributes to better performance. The reason as to why it is likely that certain activities are outsourced first is summed up by the Property Help Line (1994): "*Currently many companies are arguing that maximum effort must be directed to core business. Concentrate on these elements of the business that you are most skilled at doing, and from which you derive profit and contract out any peripheral activities as long as doing so will not threaten business integrity*".

However, not all organisations share the above view of "collapsing in-house service to a minimum", particularly those which place great value on retaining as many in-house FM services as possible. Bell (1998) refers to the need to strike a balance between in-house and outsourced FM services: "a number of recent market surveys indicate that clients continue to combine in-house, external or both approaches to suit their needs. In general terms, "non-core" services are more likely to be provided by contractors than directly employed staff, while functions perceived to be more strategic still tend to be kept in-house".

By adapting criteria laid down by Lee (1992), the main considerations to be taken into account when determining the advantages and scope of in-house and outsourced FM services primarily revolve around cost, quality and convenience. However, the traditional boundaries of FM services which either lend themselves to in-house delivery or outsourcing are constantly being re-defined. Many external contractors are becoming as convenient as in-house contractors and many in-house service providers are now as cost effective as external contractors.

Given this changing business climate there are several reasons for the adoption of a contract management approach in FM:

- *Reduced costs* - through the consolidation of the contractor base, as fewer contract relations will mean lower costs;
- *Increased value* - to increase the value received by the end customer, for example, through the bundling of products and services into single packages with many FM providers delivering FM services to meet client's specifications; and
- *Integration* - to integrate all organisations and business units involved in the FM chain into focusing their efforts on the ultimate customer.

One of the case study organisations had a programme titled: "business management oversight process review" for its contractors and the frequency depended on the organisation's past performance and evaluation of the organisation's self-assessment level. This assessment frequency was supported by the contract management memorandum issued as part of this system and field personnel serve on a general team of contract management professionals to verify the results of the self-assessment. These results contributed to the annual determination of the contractor's compliance with laws and regulations and the terms and conditions of the contract, and the efficiency and the effectiveness of the contractor's management systems. Over a yearly period, the cumulative results of the contractor's self-assessment of the business systems, together with day-to-day operational awareness activities, and annual on-site reviews, if required, formed the basis for determining the contractor's business systems status.

The importance of contract management in the FM setting has been further emphasised by the introduction of PFI (Private Finance Initiative) types of contracts within the National Health Service (NHS). PFI is the model of Public Private Partnerships in the NHS (NHS Executive, 2000). Recognising the capacity of NHS as the major client for FM services within UK, PFI initiatives now play a major role within FM procurement trends. PFI is a key policy for improving the quality and cost effectiveness of public services. It enlists the

skills and expertise of the private sector in providing public services and facilities (NHS Executive, 2000b). It is not simply about the financing of capital investments but also exploiting the full range of private sector management, commercial and creative links. PFI schemes involve creating partnerships between public and private sectors and is about building long-term and mutually beneficial partnerships between public and private sector partners. Where capital investment is required, there is increasingly a role for a private sector partner in the provision of facilities.

Typically for a large scheme, the private sector partner will be a consortium whose members may include a construction organisation and a FM provider, amongst others (NHS Executive, 2000b). The private sector partner obtains finance for the project, constructs the project, and provides services to the hospital as specified in the contract agreed between the Trust and the private partner. The terms of the contract set out the range of service to be provided and the performance standards required of the consortium.

FM within another case study was well positioned to support the integration of all its contractor base within the entire supply chain, reinforcing the performance links between facilities operations and those of the core business in order to improve the overall performance of the business.

4.3 Risk Management

Risk is an inherent element within the decision-making process, and risk management may be seen as the ongoing process by which choice between alternatives is logically determined (McFadzean, 1993). The traditional role of risk management in organisations is often closely linked with the business insurance function, which focuses on pure risks and which will lead to a physical or financial loss. The new paradigm of risk management is more holistic and assumes a preventative role in which potential crises are considered (Barton and Hardigree, 1995). Therefore, good risk management awareness and practice at all levels is a critical success factor for any organisation.

Each FM process has been described with reference to the organisational need for the service and assumes that each decision about facilities has a business implication. This strategic FM focus must therefore focus on the management of uncertainty over time.

The extent of the business risk borne by the FM organisation is very significant in all organisations. Risks are managed continuously within FM organisations - sometimes consciously and sometimes without realising it. Increasing legislation and litigation has raised senior management awareness of the need for effective control. A range of facilities related risks is identified in Table 1 (Alexander, 1996):

Table 1. The range of facilities risks [Source: Alexander (1996)]

Organisation	Risk of loss of business
Human use	Risks to human life
Environment	Risk of environmental failure Risk to the environment
Physical	Risk to property Risk to physical failure
Financial	Risk of financial loss and viability

The aim of facilities risk management is to contain, reduce, transfer and avoid the risks and constraints, both known and unpredictable, that facilities can impose on the operations of an organisation. Facilities risks can also be assessed in terms of (Nutt, 1999):

- The types of potential risk, both hard and soft;

- The significance and degree of risk within each area;
- The effectiveness of existing risk management arrangements; and
- The contingency measures that are in place to respond to unpredictable risks if they occur.

At one case study organisation planning for risk involved considerable foresight and application ahead of the time when the risk may first occur. This implied that the integration of the risk management process was required at the inception of any facilities service. The development of risk management policy statements, a clear list of responsibilities for risk, and the establishment of a business continuity and disaster recovery plan were seen as essential where sustainability of performance was dependent upon complex systems, technology and the physical product support of key FM personnel.

At another, the risk management process involved the following stages: identification, analysis, control and financing of risk. Risk identification further involved a comprehensive analysis of all present and future risks in the facilities business operation. These risks included organisational and managerial risks and a better understanding of "management risk" including the knowledge of the law and legal relationships, human factors and communications.

Risk management is an integral part of the long-term approach of FM (Alexander, 1996) and it aids long-term survival. The key skills required for effective risk management within FM are risk awareness and effective communication to which should be added the ability to prioritise risk control measures.

4.4 Supply Chain Management

Supply chain management is a strategic concept for viewing the supply chain as a single entity, with each linkage adding value, building strong relationships and reducing uncertainty as information and material flow is monitored and managed, and is seen as a way of creating new knowledge through management of both the tacit and explicit knowledge within and across the supply chain (Nelson, 2000). This is in line with Nonaka's (1991) view of the knowledge-creating organisation as that which taps into the "tacit and often highly subjective insights, intuitions, and hunches of individual employees" and makes those insights available for testing and use by the company as a whole.

The facilities supply chain consists of networks of organisations that cross industrial and international boundaries externally, (as well as internal functional and organisational barriers), to produce value in the form of products and services for the ultimate customer.

Why is supply chain management important for FM? As a predominant management philosophy in the retail and manufacturing sectors, supply chain management is already taking hold and is helping to achieve the dual goals of cost reduction and customer service and it is already affecting the FM industry as the issues achieve greater strategic recognition. There are many success themes and variables concerned with the adoption of a supply chain management approach in FM (Figure 1) (Ball, 1997):

- *The internal level of the supply chain* – which is internal to the organisation such as management, internal processes and internal integration; and
- *External level* – external to the organisation, including information, communication and external integration

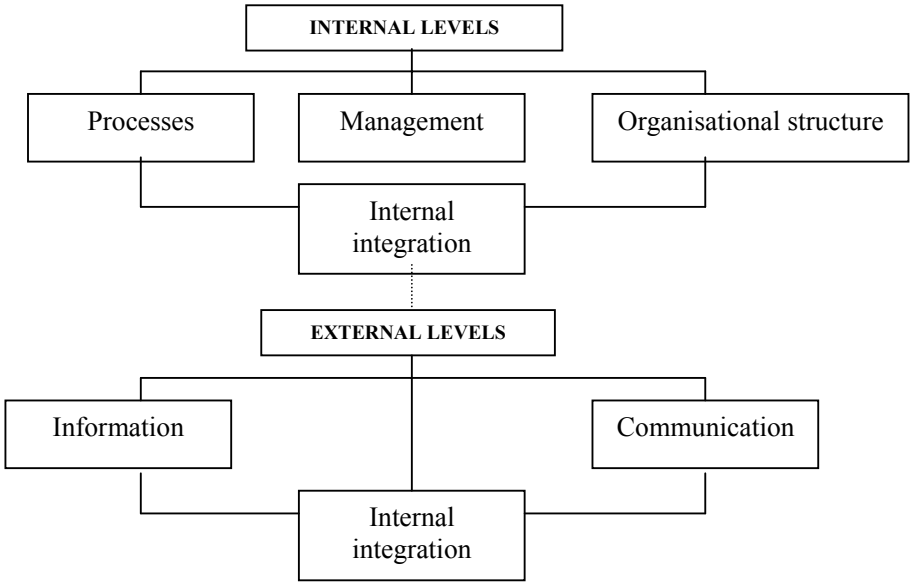

Figure 1. Success themes in supply chain management in FM organisations [Source: Ball (1997)]

Internal integration of processes, management and organisational structure is an attempt to achieve a closely integrated, customer focused material flow. This involves the reduction of traditional boundaries and a need for facilities managers to communicate the supply chain management message. Indeed, it would appear that there must be internal partnerships and infrastructure in place for supply chain management to be successful.

Success at the external level is concerned with those themes that cover the "entire" supply chain, from source of supply to point of consumption, including information, communication and external integration. Truly effective supply chain management must go further than merely the point of consumption and include continuous feedback mechanisms as well as regular client contact (Ball, 1997).

Contracting out of elements within the FM supply chain is a topical issue, subject in some quarters to considerable debate and confusion. Outsourcing has arisen in part from the desire of organisations to concentrate on core competencies.

To a FM organisation, the value of supplier partnerships, with non-core services providers in a FM setting, depends on creating better external (and in some cases internal) relationships and contracts. What makes FM services and suppliers suitable for partnerships?

One of the case studies had identified that supply chain relationships may not last, or even they may fail, for a number of reasons including: lack of management attention, the threat of future competition, lack of common standards, etc. Therefore supply chain management as an internal FM process required a high level of management and financial commitment to partnerships throughout the FM supply chain.

4.5 Workforce Management and Employee Competence

Taylor's scientific management theories are still much evident in many of the work practices involved with delivering FM services. For example, the workforce is trained to implement tasks which manage design, measure and control. Cleaning and security personnel undertake specific work routines, requiring little creative input, in a mechanically organised

manner. The unregulated UK private security sector is characterised by high staff turnover and a variable quality of service.

The continuing move towards an externalised workforce presents a new challenge for FM. The hiring of contract labour either directly or through FM contractors will need to focus on competency based employment with emphasis on selection techniques which identify: temperament, assets, ability and desire.

At one particular case study organisation, there was less emphasis on job descriptions and standardised work hours and more focus on project teams, payment for results, flexible, part time and multi-skilled working. On the other hand, large FM organisations were becoming smaller and facilities managers had responsibility for fewer directly employed staff, but those that did remain were increasingly needed to be seen to improve not only the performance of their in-house teams but also that of the externalised workforce. The shift from internal to external labour may in itself not lead to a reduction in accommodation requirements.

There are FM organisations which have adopted a separate human resources focus within FM. Today's consensus is that fundamental changes to the nature and organisation of work are underway, led by wave after wave of technological advance (Nutt, 1999). These changes are profoundly altering the ways in which people work and the support facilities that are required. Therefore, the main FM objective in the employee context is to support the effective deployment of human resources.

In justifying the use of employee competence as a critical success factor within FM, another case study organisation explained that it would like to emphasise that employees were a resource and that human-resource capital and FM business process capital, for examples, were mutually reinforcing. The principle was the belief that people make the difference. The organisation insisted on integrity and respect for personal values and believed that their success depended on incorporating different cultures and people who make learning a life long experience. Further, senior management had been involved in setting goals for individual divisions and project groups. Experience within the organisation had shown that appropriately set and defined targets contributed both to motivation of employees and the eventual success of the organisation. This culture had been incorporated into their performance measurement initiatives.

4.6 Work Environment

Information concerning the work environment must be an integral component of the FM control system. The need for a dependable system of environmental performance measurement is rooted in the following realities (Fisher et al, 1992):

- Business activity has an ecological and social as well as economic impact;
- Business is increasingly held liable for environmental costs, as proven by the growing number of regulations, incentives and penalties;
- Environmental management often results in improvements through direct cost reduction or indirect increases in goodwill;
- Lower levels of management have become increasingly empowered as a reliable environmental reporting and performance measurement system is needed to provide information for making decisions and monitoring performance; and
- Allocation of scarce corporate resources towards solving work environment related problems requires persuasive evidence of the relative benefits of doing so.

A survey published by Healey and Baker (cited in Madeley, 1996) in 1994 revealed that the priorities of staff and facilities decision makers are different. More recently there has been a growing realisation that measures aimed at the soft issues related to people in the

organisation could make a measurable impact on improving performance (Then, 1994). Herzberg's motivation hygiene theory, (Herzberg, 1959) proposed that workers might be simultaneously satisfied by intrinsic rewards and extrinsic factors such as the work environment. In manufacturing environments, technology is seen as a factor of production, but in the service industries such as FM it is seen as a tool, and will not in itself deliver savings in manpower (Madeley, 1996).

Within a case study, in order to ensure that the workplace environment posed minimal occupational risk, the steps were taken to develop a positive health and safety culture and to control risks. FM organisations achieving success in health and safety, measure performance against predetermined plans and standards, and assess their implementation and effectiveness in order to identify the need for possible remedial action. Monitoring activities also signalled management's commitment to health and safety objectives in general and was an essential part of developing a positive health and safety culture.

4.7 Capital Asset Management

Asset utilisation is a concept developed by the Japanese to give an indication about its usage so that operations could be ranked or compared (Madeley, 1996). Measurement of facilities assets or critical resource utilisation is important in order to maximise the contribution of services to the achievement of services schedules and plans. The measure can be easily understood and drilled down to determine areas for improvement or the causes of problems. It aggregates some of the most common FM operational measures into an index that allows facilities managers to review performance more effectively.

The information available to an organisation concerning its "good" and "bad" assets is invaluable in guiding the organisational decisions from acquisition and disposition to construction and maintenance. As the real property portfolio of each organisation is considerably different from any other portfolio each organisation needs to develop and maintain information specific to that organisation's property structure.

Analysis of asset utilisation should look at each of the contributing performance criteria in turn to identify variations in FM performance over time. This analysis identifies the root causes of poor performance and highlight where improvement efforts are required.

The establishment and maintenance of effective life cycle management of assets and facilities services to meet the organisation mission were important areas that one of the case study organisations looked at. Physical inventories of equipment, sensitive property and stock were conducted in accordance with the approved property management systems.

4.8 Facilities Management Culture

Like people, organisations possess personalities. They harbour values, attitudes and beliefs about the way that business should be done and the manner in which stakeholders are perceived and respected (Madeley, 1996). Culture is capable of change, influenced by strong leadership, procedures and policies, together with formal hierarchies for organisation, communication and reward.

Although organisational culture evades close definition it may be strongly felt in successful organisations. For example one of the case studies had a strong business, customer focused culture, which pervaded the entire organisation. Facilities were constructed as stage sets and the organisation believed in quality, create clear priorities, rules and processes, some of which, although seemingly insignificant, were fundamental to the success of the organisation.

As identified above, culture of an organisation is a key determinant for

corporate success and a strong influence upon the way that FM transacts its business. At this particular organisation the way in which FM was able to respond positively by reinforcing the cultural recipes or delivering beneficial change was seen to be an enabler for corporate performance. In order to do this, facilities managers understood the core values and preferred way of doing things within the various entities. Understanding the subtle differences between various subcultures and the ability to service disparate needs was a precursor to winning cooperation and implementing strategies.

FM has a positive role to play in enabling the above transformation either by supporting the organisation as part of the holistic drive for change or by acting as a catalyst, leading the way for others to emulate. Facilities reflect the organisation's attitudes and behaviour and are an intrinsic part of the culture of the organisation.

5 DISCUSSION

Concentrating on the internal processes involved in a FM organisation can help to align the behaviour and activities of the participating teams towards a common goal. It makes the various teams' behaviour more consistent and uniform, which in turn improves their capability and leads to better results and improved supply chain relationships. Without this focus and alignment towards common goals, the activities of the different team members could start to contradict each other, thus damaging the effectiveness of the team as a whole.

Due to fast changes in the market place and clients' increasing expectations, task oriented or functional thinking has become outdated. Many managers in FM now believe in process thinking. But belief in itself is not enough, and the problem has been how they should implement this thinking in FM organisations. Identification of critical success factors and related performance measures will provide a good basis for such initiatives within FM organisations. The analysis often includes identification of the resources and capabilities which the organisation needs to upgrade. However, increasingly links between the organisation's internal processes and those of other collaborating organisations are so close and this requires consideration here as well.

6 CONCLUSION

The objectives of the internal business processes perspective collectively assure that an effective FM programme is established within the core business to:

- Support customer needs;
- Provide efficient life cycle management (accountability, utilisation and disposition) of direct operations of FM; and
- Maintain oversight of entities that have FM programme responsibilities.

Within the FM organisation there are a number of internal business processes that require focused management attention to ensure requirements and expectations are met as effectively as possible. This study had identified the following as some of the FM internal processes that exist within most of the FM organisations: operational service efficiency, contract management, risk management, supply chain management, workforce management and employee competence, work environment, capital asset management and facilities management culture.

The process of deriving process definitions for the internal FM processes represents one of the sharpest distinctions between the current thinking of FM and traditional FM

systems. Fortunately, most FM organisations today have moved beyond using activities and functions as their primary method for organisational evaluation and control and they are trying to supplement them with FM processes.

7 REFERENCES

Alexander, K. (1996). *Facilities Risk Management*. Strathclyde: Centre for Facilities Management, University of Strathclyde.

Amaratunga, D. (2001). *Theory Building in Facilities Management Performance Measurement: Application of Some Core Performance Measurement and Management Principles.* Unpublished PhD Thesis. The University of Salford, UK.

Ball, S. (1997). Facilities Management and Supply Chain Management. In Alexander, K. (Ed.) *CFM Best Practice 97*. Strathclyde: Strathclyde Graduate Business School.

Barton, L. & Harigree, D. (1995). Risk and Crisis Management in Facilities: Emerging Paradigms in Assessing Capital Incidents. *Facilities*. 13(9/10). Pp. 11-14.

Bell, J. (1998). *Outsourcing*. Barbour Index Facilities Management Compendium. UK. Pp.19-21.

Davenport, T.H. (1993). *Process Innovation – Re-engineering Work through Information Technology.* Boston, USA: Harvard Business School Press.

Featherstone, P. (1999). *The Application of Effective Facilities Management Techniques to Best Optimise the Provision of Community Health Services within Community Health Care Premises*. Unpublished MPhil thesis. The University of Salford.

Fisher, J. (1992). Use of Non-financial Performance Measures. *Journal of Cost Management*. Spring. Pp.31-38.

Gronroos, C. (1990). *Service Management and Marketing*. Massachusetts: Lexington.

Herzberg, F. & Mauser, B. & Snyderman, B.B. (1959). *The Motivation to Work*. John Wiley.

Hinks, J. & McNay, P. (1999). The Creation of a Management-by-Variance Tool for Facilities Management Performance Assessment. *Facilities*. 17(1/2). Pp.31-53

Johansson, H.J., McHugh, B., Pendlebury, A.J. & Wheeler, W.A. (1993). Business *Process Re-engineering: Breakpoint Strategies for Market Dominance*. Chichester: Wiley.

Kaplan, R. & Norton, D. (1992). The Balanced Scorecard – Measures that Drive Performance. *Harvard Business Review*. January-February. Pp.171-179

Kaplan, R.S. & Norton, D.P. (1996). *The Balanced Score Card.* Massachusetts, Boston: Harvard Business School Press.

Lee, R. (1992). *Building Maintenance Management*. Oxford: BSP Professional Books.

Madeley, A. (1996). *The Performance of Organisations and Facilities Management: An Exploration into the Opportunities Afforded for Facilities Management to Contribute Toward Corporate Performance*. Unpublished MSc Dissertation. University of Strathclyde.

McFadzean, E. (1993). *Auditing the Risk Management Process: Quality Managed Facilities*. Strathclyde: Centre for Facilities Management, University of Strathclyde.

Nelson, M.M.L. (2000). *Supply Chain Philosophies and Approach*. Unpublished Report. The University of Salford.

NHS Executive (2000). *Public Private Partnerships in the National Health Service: The Private Finance Initiative*. London: Department of Health, HM Stationary Office.

Nonaka, I. (1991). *The Knowledge-creating Company: Harvard Business Review on Knowledge Management*. Boston: Harvard Business School Press.

Nutt, B. (1999). Strategic Management: Strategic Decision Four Competing

Directions for the Future. Paper presented at the *Conference on Futures in Property and Facility Management*. London. Pp.27-35.

Olve, N., Roy, J. & Wetter, M. (1999). *Performance Drivers: a Practical Guide to Using the Balanced Scorecard*. Chichester: John Wiley & Sons.

Paul, G.A. (1987). *Quality Process Management*. Englewood Cliffs, NJ: Prentice-Hall.

Property Help-line, The (1994). *The Guide to Better Decisions in Facilities Management: The Facilities Handbook*. Surrey: CML Data Ltd.

Then, D.S.S. (1994). Property, People and Technology. *Facilities Management*. October. Pp.6-8.

Tinnila, M. (1995). Strategic Perspective to Business Process Re-design. *Management Decision*. 33(3). Pp.25-34.