



University of HUDDERSFIELD

University of Huddersfield Repository

Sarshar, Marjan, Amaratunga, Dilanthi and Haigh, Richard

Structured process improvement in facilities management organisations using the SPICE FM approach

Original Citation

Sarshar, Marjan, Amaratunga, Dilanthi and Haigh, Richard (2002) Structured process improvement in facilities management organisations using the SPICE FM approach. In: CIB Working Commission W70 - The 2002 Global Symposium, 18-20th September, Glasgow. (Unpublished)

This version is available at <http://eprints.hud.ac.uk/22730/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

Structured Process Improvement in Facilities Management Organisations using the “SPICE FM” Approach

Sarshar, M., Amaratunga, D. and Haigh, R.

School of Construction and Property Management, Bridgewater Building, The University of Salford, Salford M7 9NU, UK. Tel: +44 (0) 161 295 5317, e-mail : M.Sarshar@salford.ac.uk

Abstract:

Facilities Management is a newly emerging and fast growing business sector. Currently there is limited research in process improvement in this sector. This paper discusses SPICE FM, a research project, which developed a process improvement framework for FM. The paper explains the SPICE FM framework, research methodology and well as a case study in implementing the framework.

Background

This paper provides an overview of the SPICE FM research project¹. SPICE FM sets out to develop a process improvement framework for FM organisations.

Facilities Management (FM) is a term, which encompasses a wide range of activities involved in the effective management of built assets. It involves the total management of all services that support the core business of the organisation. Alexander (1996) identified FM as the process by which an organisation ensures that its buildings, systems and services support core operations and processes as well as contribute to achieving strategic objectives in changing conditions. Understanding of process initiative aspects of FM behaviour in particular, remains relatively undeveloped. To date little data is available to assess how extensively the use of process thinking has diffused in FM organisations, what factors have influenced this diffusion, and how they affect the overall organisational performance. To this extent, SPICE FM's aim was “to develop a structured organisational learning framework for facilities organisations”. It investigated if some of the existing organisational improvement frameworks used in other business sectors could be integrated and tailored to create a comprehensive FM solution. In particular the research investigated two existing frameworks, namely (i) SPICE; and (ii) the Balanced Scorecard.

SPICE (Sarshar 2000), is a process improvement framework for construction organisations. However, a shortcoming of SPICE was that the process improvement framework did not have clear links with business strategy and business priorities (Finnemore 2000). SPICE FM attempted to address this shortcoming by integrating SPICE with a major business strategy framework, namely the Balanced Scorecard.

The Balanced Scorecard (BSC) (Kaplan 1996) is a strategic management framework developed by Harvard University. BSC is a conceptual framework for translating an organisation's vision into a set of performance indicators distributed among four perspectives: financial, customer, internal business processes and learning and

¹ SPICE FM was a two year research project sponsored by EPSRC (Engineering, Physics and Science Research Council) and the DETR (Department of Environment, Transport and the Regions) in the UK.

growth. The BSC is used with a large amount of success in a wide range of industries. This paper will provide a short overview of BSC in later sections.

This paper is based on the SPICE FM study and attempts to identify critical processes and process improvement concepts in FM. Further, it will address the following issues:

- Introduces the concepts of SPICE FM research;
- Illustrates the methodology of the research; and
- Discusses the outcomes of the research.

Process Improvement in Facilities Management

Facilities management (FM) is a distinct management discipline, which is concerned with the overlap between “people, process and place” in an organisation (Akhlaghi, 1994). Barrett (1995) defines FM as, “an integrated approach to maintaining, improving and adapting the buildings of an organisation in order to create an environment that strongly supports the primary objectives of the organisation”. Understanding business organisation, managing people, managing premises, managing services, managing the working environment and managing resources are some of the core competencies of FM, therefore, the recognition of FM as a business process has been emphasised. Hinks (1998) suggests that since FM is a co-ordinating process-based function, a high level of management process capability is central in improving FM capability.

Most FM organisations have a culture that is focused on tangible short-term business results. In such a culture managers are naturally inclined to emphasise issues that are tangible, visible or measurable and resist activities that do not contribute to short-term tangible results. FM managers often view process and organisational improvement activities as low priority. A major problem here is that tangible and visible results are usually backward looking. They indicate how the organisation has performed in the past, rather than project how the organisation is likely to perform in the future.

Improving process capability via process evaluation techniques affects FM because of the composite nature of the FM function. Lack of specific theories and models on FM process improvement have resulted in borrowing many of the methods and tools from manufacturing processes. There is clearly a need in FM for frameworks projecting a customer-oriented view of the organisation to replace the departmental isolated view of FM processes.

Research Methodology

For SPICE FM it was important to ensure that the integration between the BSC and SPICE were not “shoe horned” for FM organisations. Lillrank (1995) identified that the transfer of innovation across geographical and industrial boundaries is not a linear one, but rather concepts very often need to be re-packaged, modified or tailored to suit the new environment. The research used “testing out” methods (Starke 1995) to

ensure that the above frameworks fitted well together and also suited facilities organisations.

A study was made of the various research methodologies in order to select a suitable approach and the nature of the how and why questions to be posed during the research and the involvement of both qualitative and quantitative data, pointed to the use of the case study methodology. According to Yin (1994) this approach is ideally suited for areas where knowledge building is in its formative stages with few prior studies to build on. In this sense, case studies have an important function in generating hypotheses and assessing existing theory (Feagin et al 1991; Starke 1995).

During the case studies, the SPICE FM questionnaire, semi-structured interviews, analysis of archival records and documentation were the research tools to collect quantitative data. This approach is particularly suited and valuable in building up relationships among elements to be analysed and in testing the model built during the exploratory stage of the research work.

The SPICE FM Process Improvement Framework

The SPICE FM process improvement model promotes continuous process improvement based on many small, evolutionary steps. It provides a system for initiating and implementing continuous improvement. SPICE was based around a successful process improvement framework in the software industry, namely CMM (Capability Maturity Model) (Paulk 1994).

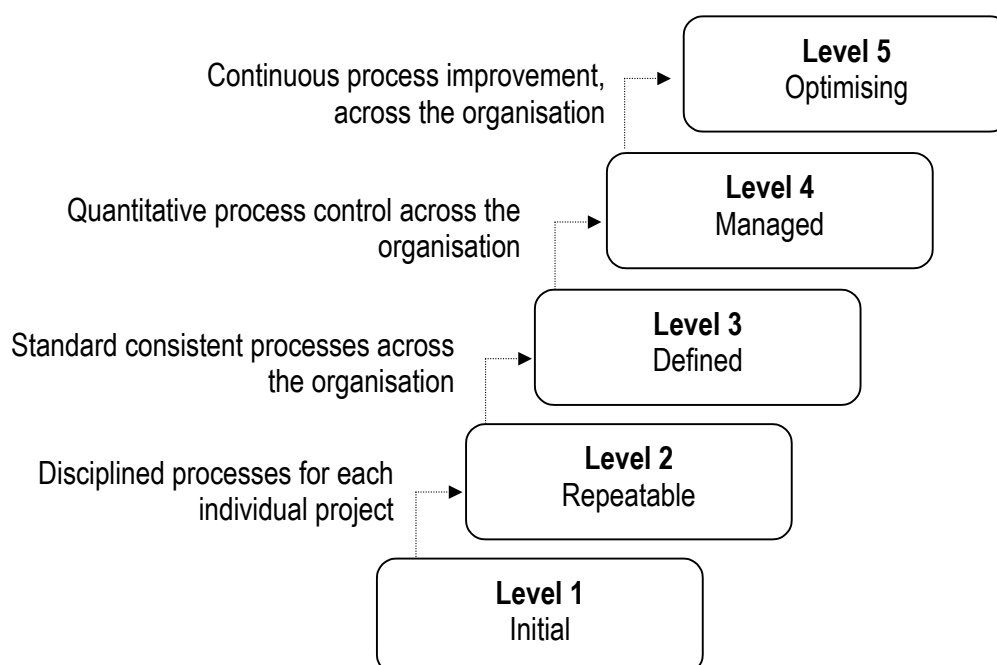


Figure 1 SPICE framework

The model divides these evolutionary steps into five maturity levels, as shown in Figure 1. These levels lay successive foundations for continuous process improvement (Sarshar 2000, Paulk 1994, Zahran 1998). The maturity levels form a scale for measuring the capability of a facilities management provider's individual management processes, and its overall process capability. Each level of maturity consists of a set of key processes. When an organisation is successfully applying each key process, it can stabilise an important part of the service delivery process. The five levels provide guidelines on how to prioritise efforts at process improvement.

For each level, the model specifies a number of "key processes". By following the steps in the model, an organisation can achieve effective and continuous improvement based on evolutionary steps.

An organisation can only be at one level of the model at any one time. If an organisation is at level 1, but implements some of the key processes of level 3 or 4, it is still considered a level 1 organisation. This is because each level lays successive foundations for the next. The model shows that the organisation has little to gain by addressing issues at a higher level if all the key processes at the current level have not been implemented.

Organisations at level 1 have little process focus. They achieve high capability in managing service delivery, at level 2. Level 3 focuses on knowledge management and best practice sharing across the organisation. The model then introduces statistical controls and measurement in levels 4 and 5. Sarshar (2000) and Paulk (1994) provide more detail of the concepts behind each level. The SPICE FM research project only investigated the applicability of Level 2 of framework.

A level 2 organisation has established policies and procedures for managing and delivering customer requirements. Service performance standards are established and service delivery is co-ordinated to minimise disruption to the core business. During service delivery, continuous service monitoring ensures that performance standards are met (Sarshar 2000).

Tailoring SPICE Level 2 Key Processes for FM organisations

Each level of SPICE is characterised by a number of Key Processes. The research tailored the Level 2 Key Processes from the construction SPICE to the needs of facilities organisations.

Based on literature search the research team developed a first draft of the FM Key Processes. These were first shared in a workshop with nine FM industrialists. Based on their input, the Key Processes were slightly modified. The applicability of these processes was then tested via four case studies. The studies were all conducted in the Facilities Directorate of a major local hospital, and are reported in Construct IT (2001). The model was improved in an iterative manner, based on the learning from the case studies.

Table 1 illustrates the results of the conversion of construction SPICE Level 2 Key Processes to FM.

SPICE (construction) Key Process	SPICE FM Key Process
Briefing and Design Mgt.	Service Requirements Mgt.
Project Planning	Service Planning
Project Tracking	Service Performance Monitoring
Sub-contract Mgt.	Supplier & Contract Mgt.
Project Change Mgt.	Not applicable
Risk Mgt.	Risk Mgt.
Team Co-ordination	Service Co-ordination
Health & safety management	Health & safety management

Table 1- SPICE Level 2 Key Processes

The major difference of construction with FM is that FM is service-oriented, whereas construction is project-oriented. Some of the major processes in construction, such as “project change management” are not applicable in service-oriented organisations. “Briefing and design management” in construction is the process of capturing client requirements. Therefore this translated into “service requirements management” in FM. “Subcontractor Management” has been translated into “Supplier and Contract Management”. Some FM organisations, especially the FM providers hire contractors and are in charge of service management activities. The Key Processes were evaluated in case studies. The case studies demonstrated that the modified Key Processes are applicable, and the general concepts of process maturity within SPICE and CMM are applicable. In order to identify the capability of these Key Processes, in an organisation, they are tested against a number of process enablers.

Process Enablers

How can the manager ensure that key processes are performed “appropriately”? Zahran (1998) differentiates between “incomplete processes” as opposed to “disciplined processes”, and lists a number of characteristics for these. Paulk (1994) also lists a number of “key management features” for a complete and coherent process. Based on these philosophies, SPICE has developed a number of “process enablers”.

Process enablers are generic characteristics, for any disciplined process. They focus on results, which *can be expected to be achieved* from a key process. This is a forward-looking approach, which indicates process capability *before* a process takes place. They provide detail of features, which a key process must possess in order to yield successful results. Ensuring that all the process enablers are in place, improves the performance and predictability of key processes. Process enablers are common across all the key processes. SPICE process enablers are briefly listed below [Sarshar 2000]:

- **Commitment** - This criterion ensures that the organisation takes action to ensure that the process is established and will endure. It typically

involves establishing organisation policies, and senior management commitment.

- **Ability** - This describes the preconditions that must exist to implement the process competently. It normally involves adequate resourcing, appropriate organisational structure, and training.
- **Verification** - This verifies that the activities are performed in compliance with the process that has been established. It emphasises the need for *independent, external* verification by management and quality assurance.
- **Evaluation / Measurement**- This describes the basic internal process evaluation and reviews and some measurement mechanisms.
- **Activities** - This describes the activities, roles and procedures necessary to implement processes. It typically involves establishing plans and procedures, performing the work, tracking it, and taking corrective action as necessary.

The Process Enablers are identical in SPICE and SPICE FM frameworks. The case studies demonstrated that no change is required to the Process Enablers.

It was important to link the SPICE FM framework to business directions. SPICE FM identifies process immaturities in organisations. As a result a number of improvements are prioritised in each organisation. In order to focus on key improvements, the improvements had to be linked to business priorities. The SPICE FM research achieved this goal by aligning the model with the BSC.

Introduction to BSC- The Strategic Challenge

An increasingly popular technique for measuring performance criteria that are not immediately linked to bottom-line profits, but will have an impact on future profits, is the Balanced Scorecard (figure 2). The BSC encouraged managers towards “a fast but comprehensive view of the business” (Kaplan and Norton, 1992) – likened to dials in an aeroplane cockpit – in terms of financial, customer, internal business and innovation and learning perspectives. “The BSC integrates traditional financial measures with operational and softer customer and staff issues, which are vital to growth and long-term competitiveness” comments Newing (1995). In addition, while traditional financial measures report on what happened during the last period, without indicating how managers can improve performance in the next, the scorecard functions as the cornerstone of the organisation’s current and future success (Kaplan et al, 1993).

The BSC measures are built around the following four perspectives:

- **Customer** – what do existing and new customers value from us?
- **Internal processes** – what processes must we excel at to achieve our financial and customer perspective?

- **Learning and growth** – can we continue to improve and create future value?
- **Financial** – how do we create value for our shareholders?

The four perspectives of the scorecard permit a balance between short-term and long-term objectives. While the multiplicity of measures on a Balanced Scorecard seems confusing to some people, properly constructed scorecards contain a unity of purpose since all the measures are directed towards achieving an integrated strategy.

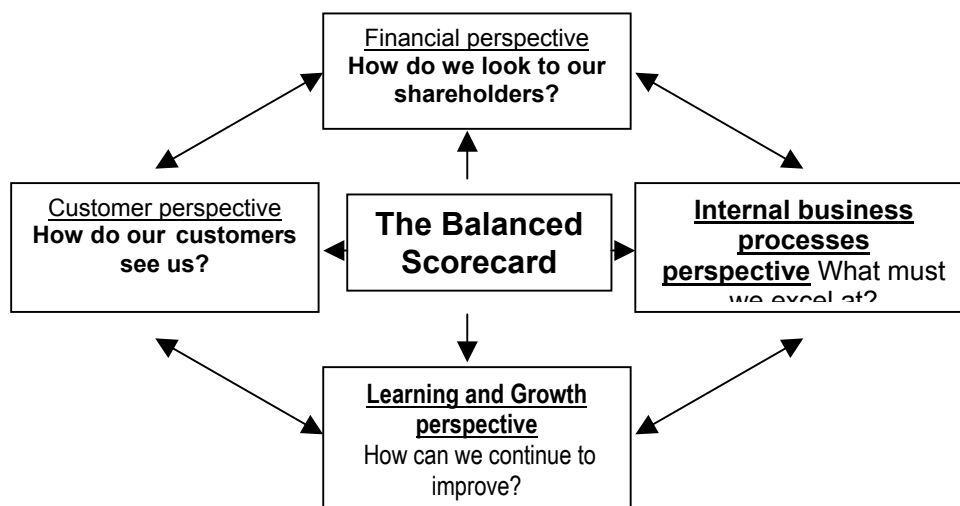


Figure 2 – Different Segments of the Balanced Scorecard (Source: Kaplan and Norton, 1996)

Amaratunga (1999, 2000) has explored the applicability of the BSC to the FM sector. The methodology has proven applicable and of significant value. The SPICE FM research team conducted two detailed case studies to identify if SPICE FM can be used in conjunction with BSC, in order to provide a more holistic business improvement methodology for FM organisations. One of the studies is explained below.

Detailed SPICE FM Case Study

This case study was in a facilities directorate at a NHS Trust in the North West of England. The NHS recognises the Trust as a national and international centre of excellence in healthcare and research. However, as a large and complex organisation, with a turnover in excess of £150m, the Facilities Directorate plays an important part in ensuring the Hospital's effectiveness.

At the commencement of the study, the Directorate's senior management were concerned about staff morale. This was due to the impending transfer of many of their services to the private sector under the Private Finance Initiative. Furthermore, management were concerned about the inability of the Directorate to implement its

plans and strategic directives at an operational level. Consequently, they were keen to see the results of the study. Four vital services of the department were chosen to participate in the study: catering; operational estates; domestics; portering.

Strategic awareness and performance assessment

The development of the Balanced Scorecard at the Central Manchester NHS Trust Facilities Directorate attempted to pull together current measures, the Patient Environment Assessment measures and new measures drawn from the NHS plan, into a Balanced Scorecard using its four perspectives.

An essential component of the directorate's strategy was the establishment of facilities performance targets, against which the performance of the facilities can be monitored and measured. The development of a BSC provided a results oriented approach for evaluating the Trust's facilities management system. The BSC looked beyond compliance and evaluates performance and operational effectiveness.

Customer	Internal processes	Learning and growth	Financial
Quality	Healthcare in partnership	Development of Facilities	Value for money
Service partnership	Operational services	Staff development and training	Achieving the financial recovery plan
Timeliness	Risk Management	Service Delivery Innovation	

Table 2: Critical success factors

A BSC was developed to act as an effective communication strategy. Table 2 lists some of the critical success factors identified against the BSC's four perspectives. Key indicators provide real focus and these can be cascaded to a departmental level, particularly important is a large organisation such as this. Regular reporting of the measures in this format could provide the information necessary to keep the Directorate on track and to take corrective action rather than having to wait until after the event to realise that things have not gone according to the plan. Based on the above critical success factors, appropriate performance targets were drawn to ensure:

- Improvements in the quality of the operation over time;
- Improvements in statutory compliance, reduction in risk, and achievement of controls assurance standards;
- Changes in the revenue cost of the operational estate over time;
- Improvements in the utilisation of the estate over time; that is, condition appraisal in seeking out underused and surplus estates; and
- Improvement in the quality of the environment for patients.

The facilities directorate has further taken several steps to encourage support for Balanced Scorecard activities by:

- Making a commitment at the senior management level;
- Incorporating the issues identified through the BSC development programme to its business plan;
- Offering training in improvement techniques;
- Establishing a reward and recognition system to foster performance improvements;
- Breaking down organisational barriers; and
- Co-ordinating with the entire trust and responsibilities of other directorates;

Process capability findings

To ensure the process capability finding's accuracy, it was necessary to secure a representative sample of staff to participate in the study. Due to the size of the directorate, the assessment team held workshops with operational staff, thus allowing larger numbers of staff to participate, whilst not requiring an extension to the overall duration of the assessment. Figure 3 summarises the directorate's process capability against the SPICE FM model.

The directorate's management accepted that improvement in their monitoring systems was vital in order to review their performance against national targets established within the NHS Plan. Furthermore, effective monitoring systems will provide management with an effective tool to supervise the transition of services to the private sector under the Private Finance Initiative.

In addition to generic matters, the assessment highlighted some service specific process issues. Each of the services had its own capable processes for determining service requirements, planning delivery and managing suppliers. For example, a national patient charter established clear guidelines for menus and choice in the catering service. These broad requirements were further defined in standards for food hygiene, patient feeding, nutritional requirements and purchase specifications. These complex standards had been translated into clear operating systems for use by staff on a day-to-day basis. Furthermore staff attended regular training to ensure they remained aware of important issues.

After reviewing the findings, the results were summarised in a process capability matrix, as shown in figure 3. The matrix depicts the Key Processes along one axis and the Process Enablers along the other. The cells are filled with traffic light colours to demonstrate if the Key Process is performed adequately.

The directorate's management were satisfied that they represented an accurate reflection of the department's current capability. The directorate is now addressing many of the issues raised. Table 3 demonstrates the relevance of the issues to the department's critical success factors and highlights the subsequent actions.

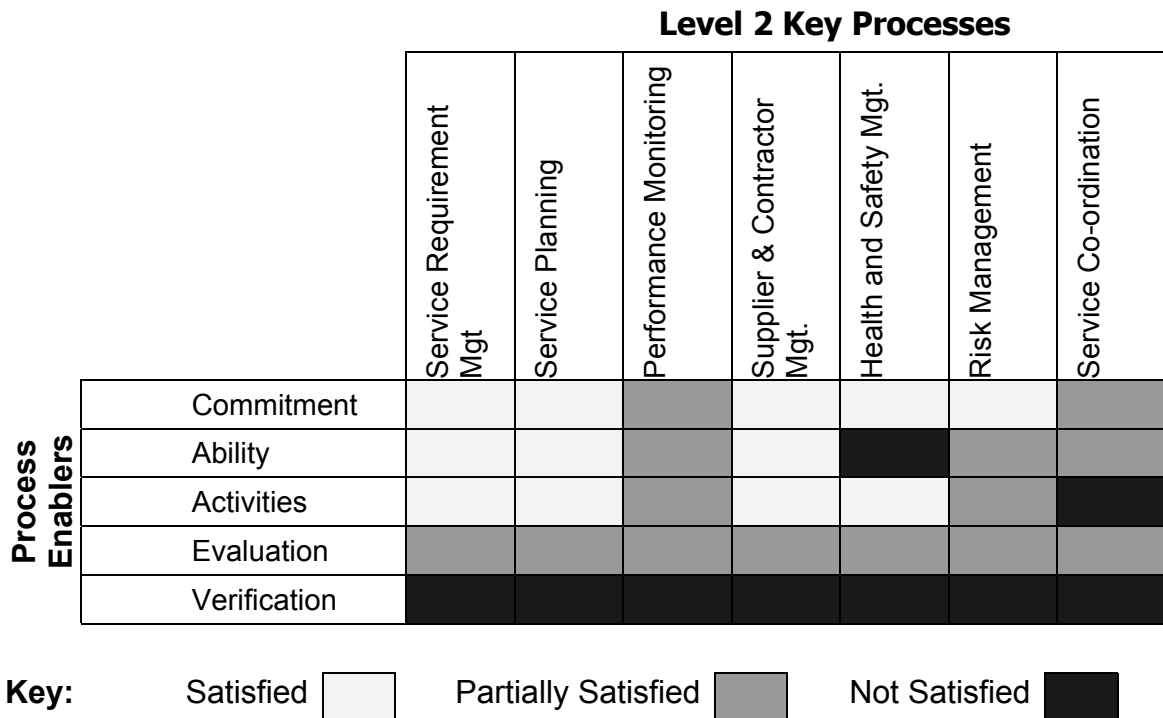


Figure 3: The directorate's process capability profile

The department's perspective

“The size of our operations at the Trust makes it difficult for our senior management team to understand the problems faced by our operational staff. We like the approach that SPICE FM takes in trying to bridge the gap between our strategy and day-to-day operations, commented the Facilities Development Manager on the SPICE assessment.

Following the assessment, they have appointed a member of the staff to take the actions forward. The Trust see this as the start of a continuous change process and hope to use the SPICE FM tool again in the coming months to monitor the progress.

Areas identified for improvement	Critical success factors addressed	Suggested actions
Service performance monitoring	Quality	Develop an integrated facilities questionnaire for distribution to customers.
	Timeliness	Appoint a dedicated resource to undertake monitoring activities and drive through resulting actions
Service co-ordination	Service partnership	Develop service performance standards between different facilities service streams
		Establish a dispute resolution mechanism
Health and safety management	Staff development and training	Develop an induction programme for new domestic staff that addresses health and safety

Table 3: Strategically aligned process improvement opportunities

Summary

Despite large investments and considerable achievements, FM is a field that remains under-researched, supported by an inadequate knowledge base, with few secure methods and techniques of its own to underpin best practice. FM recognises the need for process improvement as a means to improve its service delivery but lacks a clear set of guidelines to direct their improvement efforts and benchmark with other organisations.

SPICE FM, a research project at Salford University, has developed a structured learning framework that provides FM organisations with the capability to implement their vision. The framework aligns a process maturity model with the Balanced Scorecard, which is a strategic management system. Thereby, it creates an environment where improvement priorities are directly linked to the strategic business directions of the core business. SPICE FM provides organisations with:

- A method for developing and implementing strategy;
- A method for measuring the maturity of current business processes;
- A five level framework for achieving step-by-step improvements.

The framework has been tested in a number of case studies. This paper has examined the SPICE FM framework, as well as the research methodology used by the team. It has further reported a detailed case study at the Facilities Directorate of a UK hospital.

References

- Akhlaghi, F. (1994), History and development of facilities management from the definitive document of the postgraduate programme in facilities management, Sheffield Hallam University.
- Alexander, K. (1996). Value Management. In Alexander, K. (Ed). (1996). *Facilities Management - Theory and Practice*. New York: E & FN Spon.
- Amaratunga, D., Baldry, D., Sarshar, M., "Balanced Scorecard- A Universal Solution to Facilities Management", *International Journal of Facilities Management*, Vol. 2, Issue 3, 2000.
- Amaratunga, D., Baldry, D., Sarshar, M., "Assessment of Facilities Management Performance – What Next", *Facilities Journal*, Vol.18, No.7/8, pp.293-301, December 1999
- Barrett, P.S. (1995), *Facilities Management Towards Best Practice*, Blackwell Science, London.
- Becker, F. (1990), *The Total Workplace*. Van Nostrand Reinhold. New York.
- Cassell, C. & Gillian, S. (1994), "Qualitative research in work contexts", in Symon, G. & Cassell, C. (Eds.) *Qualitative methods of organisational research*. London: Sage publications.
- Construct IT (2001), "SPICE FM: A Process Improvement Methodology for Facilities Organisations", Construct IT Publications, UK, 2001.
- Davenport, T.H. (1993), *Process innovation – reengineering work through information technology*, Harvard Business School Press, Boston, MA.
- Feagin, J., Orum, A. & Sjoberg, G. (Eds). (1991), *A case for case study*, Chapel Hill, NC: University of North Carolina Press.
- Finnemore, M., Sarshar, M. "SPICE and the Balanced Score Card", Bizzare Fruit Conference, Salford University, Feb 2000.
- Hinks, J. (1998), "A conceptual model for the interrelationship between information technology and facilities management process capability", *Facilities*, Vol.16, No.9/10, pp.233-245.
- Kaplan, R.S. & Norton, D.P. (1996), *The Balanced Score Card*, Massachusetts, Boston, Harvard Business School Press
- Letza. S.R. (1996). 'The design and implementation of the balanced business scorecard: Analysis of three companies in practice', *Business Process Re-engineering & Management Journal*, Vol.2, No.3, pp. 54-76.
- Lillrank, P. "The Transfer of Management Innovations From Japan", *Organisation Studies*, 971-989. (1995)
- Morris, R. (1999) Balanced scorecard – Rail renaissance, *Accountancy Age*, 21 Jan.
- Newing, R. (1995) Wake up to the balanced scorecard!, *Management Accounting*, March, 22-23.
- Nutt (1999) Linking FM practice and research, *Facilities*, Vol. 17 No.1/2, pp111-117
- Paulk, M., Weber, C., Curtis, B. and Chrissis, M. (1994) *The Capability Maturity Model: Guidelines for Improving the Software Process*, Addison-Wesley, Massachusetts.
- Saiedian, H., Kuzara, N. (1995) SEI Capability Maturity Model's Impact on Contractors. *IEEE Computer*, January.
- Sarshar, M., Finnemore, M., Haigh, R. (1999) SPICE: Is the Capability Maturity Model Applicable in The Construction Industry, 8th International Conference on Durability of Building Materials and Components (CIB W78), May 30 - June 3, Vancouver, Canada
- Sarshar, M., Haigh, R., Finnemore, M., Aouad, G., Barrett, D., Baldry, D. and Sexton, M., (2000), SPICE: A business process diagnostics tool for construction projects, Vol 7, No 3, pp241-250.
- Starke, R.E., "The Art of Case Study Research", Thousand Oaks, Cali; London, Sage, 1995.
- Yin, R.K. (1994), *Case Study Research: Design and Methods*, New Bury Park, London: Sage publications.
- Zahran, S. (1998), *Software Process Improvement: Practical Guidelines for Business Success*, Addison-Wesley.