

CULTURAL LEARNING DURING BRIEFING: A FACILITIES MANAGEMENT PERSPECTIVE

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Background: Outsourced Facilities Management (FM) has been noted to be problematic in terms of understanding clients' needs. An understanding of these needs inevitably requires an understanding of the hospital's organisational culture, where the 'value' for FM rests. Method: Using a hospital partnering project as a case study, it investigates the process of learning about culture, an approach which has traditionally been treated as a black box. Nonaka's concept of externalisation helps portray cultural learning as the process of interpreting project-related knowledge by the Hospital and FM groups. Laukkanen's Comparative Cause Mapping method further compares the groups' interpretations over time. Result: It was found that a majority of interpretations on project-knowledge were collectively learned, largely supported by early exposure to those differences. Unlearning and non-learning were also evident where the groups' previous anticipation of those problems was inadequate, or when the emerging problems impinged upon their own goals and interests. Conclusion: Early collaborations between the groups through partnering approach and "creative chaos" in the form of problems and disagreements at the initial briefing stage provide opportunities for cultural learning. With this, sound technical knowledge and openness created a trusting environment that persuaded compromise were factors supporting cultural learning.

Keywords: cultural learning, externalisation, hospital briefing, partnering, strategic facilities management,

INTRODUCTION

Outsourced FM is problematic in understanding clients' needs (Price 2004, Shohet and Lavy 2004). This becomes an important consideration for Facilities Management operating at a strategic level, where capability to understand client's needs to achieve better facility outcomes is critical. This may be particularly challenging for FM in the hospital sector because hospitals are extremely complex organisations that involve elaborate organisational arrangements among the various professionals (Mintzberg 1997, Shortell and Kaluzny 1999). This fragmentation and complex organisational and political landscape means that there are many complicated communication interfaces and pressures for the FM group to deal with in understanding their clients' needs. Cultural, systems, and operational differences between FM and Hospital groups can mean that clients' needs are not effectively and accurately captured, causing a mismatch between the design and the intended use of the building (Kaya 2004). The impacts of such mismatches can be enormous, including higher maintenance and operational costs, poor value for money, and even higher death rates in hospitals

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(Kirkham and Boussabaine 2000, Okoroh *et al.* 2002). To help address them, it is widely accepted within strategic management literature that the need to fully understand clients' organisational goals and objectives are critical (Daake and Anthony 2000, Viljoen and Dann 2000). The challenge involved in understanding the hospital's needs and in designing appropriate facility strategies ultimately points to the importance of understanding the hospital's organisational culture which represents the shared basic assumptions and meanings among members of an organisation and serves as a common language for understanding an organisation's environments and goals (Sackmann 1992, Schein 1992). In other words, organisational culture contains explanations for the underlying causes of behaviour, which includes that of organisational goals, objectives and, more specifically, facility needs. The practical implication of adopting this perspective is that it helps determine what the rules are, and to find out how the members of a culture see and describe their world and thus to deal with practical concerns in order to understand, diagnose, and alter the way an organisation is working. This is especially important in the context of FM, in which the opportunity to learn about a client's needs (ie in the briefing process) is relatively restricted prior to the delivery of facility outcomes. This new perspective also argues that 'value' for FM rests on developing capabilities to capture cultural knowledge through better cultural learning practices. It also advocates a higher level of awareness, receptivity and sensitivity towards cultural issues as a measure for higher competitive advantage. This paper seeks to explore the process of cultural learning between the Hospital and FM groups over time and the factors that influence such process.

CULTURAL LEARNING THROUGH EXTERNALISATION

The process of learning has largely been explored from a social constructivist perspective, which suggests that organisations continually strive to make sense of the world through conversations and the interactions between people as they negotiate meanings within their community (Martin 2002). It represents an important point of departure from the traditional view of learning as occurring only in individuals' heads, by shifting the focus of learning to the social arena in which it takes place. Cultural learning can therefore be conceptually framed as being a social construction of meanings and understandings through the daily interactions between organisational actors, during which their version of meanings becomes fabricated (Burr 1995). This view is valuable for understanding cultural learning in the hospital context because it emphasises the importance for the FM team of managing the social environment by recognising that the interactions during the process can themselves be seen as contexts which present opportunities for both groups to learn about each other.

Externalisation, as suggested by Nonaka (1994), is best suited for conceptualising cultural learning as proposed in this study because it acknowledges the central role of 'culture', being a form of tacit knowledge, and its conversion to an explicit form (ie "externalisation" process). A thorough review of this process and in-depth study of Nonaka's Knowledge Creation theory is presented in Chandra (2007). Externalisation is the process of articulating tacit knowledge as explicit knowledge, and creating new explicit concepts from tacit knowledge. When tacit knowledge is made explicit it becomes crystallised (Nonaka *et al.* 2001). Therefore, for the individual articulating the tacit knowledge, externalisation involves interpreting the tacit knowledge and making sense of it for the purpose of not only sharing it with others, but also of obtaining some clarity of it for themselves. This portrays the process where FM and hospital groups interpret cultural knowledge and articulate it in the context of facility

requirements in order to refine the brief. Explicating such knowledge further clarifies the meaning of the tacit knowledge and is an important opportunity for the FM group, being from different cultural backgrounds and mindsets, to prevent misunderstandings or misinterpretations of the tacit knowledge. In explicating tacit knowledge, individuals may encounter imbalance, inconsistency or contradictions to their existing mental models, which often leads to the discovery of new meanings (Nonaka *et al.* 2001)

“Interacting ba” represents the externalisation process by which individuals share their mental models with one another, and reflect on and analyse their own mental model. The conversion of tacit knowledge into explicit knowledge takes place through dialogues and reflections, where individuals are given the opportunity to express and articulate their mental models (Nonaka *et al.* 2001). Such a process involves the use of language as the tool for individuals in explicating tacit knowledge, which is thus the key indicator for an effective externalisation process. In the FM context, such process is best captured in the briefing process whereby the briefing team collectively interpret tacit cultural knowledge into explicit language in order to capture client's needs and translate them into appropriate design. For example, they may interpret their cultural knowledge when explaining about their facility needs, thus providing justification for their requirements during the briefing meetings.

METHODOLOGY

This study focuses on an Australian partnering project, which involved a major redevelopment within an existing hospital precinct, and whereby the managing contractor was engaged prior to the design stage rather than later in the process as in the traditional method of contracting. In measuring cultural knowledge interpretation, it was first necessary to identify ways to capture the range of cultural interpretations of facility-related knowledge and to establish a basis for comparison between the Hospital and FM groups' cultural interpretations. As these cultural interpretations are largely a cognitive process, a cognitive mapping technique called “Comparative Cause Mapping” (Laukkanen 1994) is used - more specifically, its focus on comparative techniques allows for a deep and focused way of mapping and comparing groups' minds (Mohammed *et al.* 2000, Nadkarni and Narayanan 2005). Cultural interpretations between Hospital and FM groups can be captured by looking at the 'content' property of the map. The content of a cause map captures the interpretations of a key concept, capturing the meanings of the texts and the richness of meanings that an individual (or group) perceives as being relevant to a particular key concept (Eden *et al.* 1992, Nadkarni and Narayanan 2005).

Data on cultural interpretations was collected through an observation of the start-up workshop as the initial briefing meeting between the hospital and FM groups, which was then thematically analysed in order to identify the key themes (or key concepts). From this, five key themes that emerged were as follows:

- Success of the project (eg. a purpose-built facility for patients and staff, positioning of the hospital for future delivery of services).
- Partnership arrangement (eg. a good partnership process, no disputes and no variations to avoid re-workings, a process that can be emulated).
- Communication process (eg. a collaborative process leading to a facility that meets needs, to have everybody's knowledge and experiences shared)
- Budget for the project (eg. designing within budget: a balance of needs and costs, achieving the project on time and on budget, producing good facilities).

- Physical disruptions during the project (eg. a smooth transition, manageable and beneficial impacts on staff).

Following the Comparative Cause Mapping method, these key concepts formed the basis for the next step of data collection, involving semi-structured interviews, from which cultural interpretations of these key concepts between the hospital and FM groups were obtained, measured, and compared. Some examples of the interview questions pertaining to success (key theme) include: In your view, what will be a successful project? What determines a success? Interviews were first conducted at the beginning of the briefing stage (Stage 1) following the Start-Up workshop. The process was repeated months later where the design documents were signed to mark the final negotiation process (Stage 10). These interviews were recorded, transcribed, and then coded using NVivo software. After an iterative process of codes standardisation, the codes were then counted for their frequencies. These numeric results were transferred to SPSS software to be statistically analysed for their significant differences (between the Facilities Management and Hospital groups in Stage 1 and 10) using Chi-squared Test of Independence to obtain Fisher's Exact Significance results (with $p \leq .10$) as summarised in Table 1.

RESULTS

These patterns of statistical differences (Table 1), when translated into the context of cultural learning during hospital briefing, reveal learning, unlearning, or non-learning. Learning is deemed to have occurred when the differences were significant in Stage 1 but then became similar over time. In contrast, unlearning is deemed to have occurred when differences were more insignificant in the early stages than they were towards the later stages. Non-learning, however, is deemed to have occurred when the differences in the early stages remained over time.

Table 1: Summary of Chi-Squared Fisher's Exact Significance Test results and their implication for cultural learning (Adapted from Chandra (2007, 156))

Key concepts	Variables	Chi-squared results of the differences in interpretations of key concepts between Hospital and FM groups		Nature of cultural learning
		Stage 1	Stage 10	
Success	Benefit to patients	.028 (Significant)	.038 (Significant)	Non-learning
	Having enough space	.015 (Significant)	.245 (Non-significant)	Learning
	Functional facilities	.015 (Significant)	1.000 (Non-significant)	Learning
	Quality facilities	.004 (Significant)	.047 (Significant)	Non-learning
	Builder team making profit	.109 (Non-significant)	.047 (Significant)	Unlearning
Partnership	On budget	.015 (Significant)	1.000 (Non-significant)	Learning
	Power in design	.018 (Significant)	.162 (Non-significant)	Learning
	Contractor as information filter	.147 (Non-significant)	.051 (Significant)	Unlearning
	Better management project risks	.018 (Significant)	.250 (Non-significant)	Learning
	Continuity of project knowledge	.004 (Significant)	1.000 (Non-significant)	Learning
Communication	Open communication	.020 (Significant)	1.000 (Non-significant)	Learning
	Good relationship	.065 (Significant)	.326 (Non-significant)	Learning
Disruption	Affecting patient care	1.000 (Non-significant)	.044 (Significant)	Unlearning

A further analysis of the results indicates that eight variables were associated with learning (having enough space, functional facilities, on budget, power in design, better

management of project risks, continuity of project knowledge, open communication, and good relationship) between the hospital and FM groups; three variables with unlearning over time (builder team making a profit, contractor as information filter, and affecting patient care), and two variables with non-learning (benefit to patients, and quality facilities). To explore the patterns of cultural learning and highlight the factors influencing such learning, it is now necessary to present detailed discussions on each significant variable.

DISCUSSION

Learning

It was noted that the early exposure to differences or ‘gaps’ in the hospital and FM groups’ interpretations of the key concepts in Stage 1 presented opportunities for learning because these differences triggered attempts to obtain facility-related knowledge among the groups. For example, the FM group provided much technical knowledge relating to facilities, during which process they also displayed openness and honesty in their dealings with the clinicians to promote a trusting relationship. In other words, early exposure to differences allowed the FM group to create a trusting environment, which participation and compromise by the hospital group members.

Success: Having enough space

The interpretation of success as “having enough space” was found to be significantly different between the hospital and FM groups in Stage 1, but not in Stage 10, indicating that learning had taken place. It reveals that the difference in understanding of this dimension of success in Stage 1 was due to the clinicians’ emphasis on success as having enough space. This was evidenced in the interviews in that, according to the clinicians, the existing design guideline was inadequate (Clinician 03, Stage 1). However, in contrast, the contractors seemed to stress the importance of the guideline and an adherence to it: “there are certain things that you have to design within that guideline” (Contractor 01, Stage 1). Therefore, the difference seemed to stem from the conflicting perspectives on the boundary that set their expectations. In Stage 10, however, these differences in perceptions between the hospital and FM groups decreased, indicating that the groups had collectively agreed on and learned a definition of success. This apparent learning was mostly a result of the clinicians having changed their opinions and showed compromise: “{The contractor} has interacted in a manner that is appropriate and a positive way. Obviously, when we asked for the things that are not affordable or that we have to make compromises and also for the reasons of practicality” (Clinician 03, Stage 10). As such, learning seemed to be largely influenced by the participants’ willingness to compromise, which may have emanated from more complex social circumstances, such as good management by the contractors and/or the emerging acceptance (or passivity due to the feeling of powerlessness) of the clinicians.

Success: Functional facilities

A significant difference was noted between the hospital and FM groups’ opinions in Stage 1 but this difference decreased by Stage 10 to become insignificant. The difference in Stage 1 resulted from the Hospital group perceiving success as providing functional facilities for the hospital. By contrast, the FM group emphasised producing “the quality of health care that the users want” (Contractor 01, Stage 1), rather than functional facilities, reflecting the contractors’ high expectations about the project

outcome. However, in Stage 10 the FM group seemed to lower their expectations in line with budget considerations, adopting the term “functional” in lieu of “quality”. This may have been the result of the emerging challenges faced by the group to meet the hospital’s expectations: as one contractor pointed out, the challenge for a successful project was “managing the user’s expectations, in terms of what they want, and I think the key challenge there is that we are finding is that a lot of the facility briefing information is not clear-cut” (Contractor 07, Stage 10). This suggests that there was a gap between the contractors’ previous perceptions of the hospital’s needs and the actual requirements. As such, the hospital group’s expectations (representing cultural information) and the existing budget constraints (representing technical information) seemed to result in the contractors altering their understanding of the project outcomes and, at the same time, addressed the gaps in their perceptions.

Success: On budget

The groups’ responses regarding success as being “on budget” were found to be significantly different in Stage 1 and not in Stage 10. In Stage 1 the Hospital group seemed to be indifferent to the budget issue relating to the project but had begun to consider it by Stage 10. Interviews with the clinicians indicated that they had suspected budget constraints in Stage 1, but nevertheless regarded the issue as being outside their responsibility: “Budget isn’t particularly our problem” (Clinician 04, Stage 1). However, as the issue of budget had become more prominent by Stage 10, the clinicians seemed to be receptive to the constraint and prepared to compromise: “obviously when we asked for the things that are not affordable ... we have to make compromises” (Clinician 03, Stage 10). Changes in the clinicians’ response seemed to be largely influenced by the contractors’ handling of the issue, with open management and technical knowledge, in which trust emerged: “{The contractor} has interacted in a manner that is appropriate and positive... {the original plan} has been changed to swinging doors because apparently the cost and {practical} reliability of a very very large sliding door is not feasible” (Clinician 03, Stage 10) and “very honest and transparent” (Clinician 02, Stage 10). This suggests that for cultural learning to occur during briefing, good management that is honest and open is required, backed-up with a sound technical knowledge to ‘educate’ the hospital group.

Partnership: Power in design

The difference of the groups’ interpretations regarding partnership as having “power in design” in Stage 1 seems to have been the result of the clinicians being mostly unaware of the partnership procurement method – as they responded in the interview as follows: “I don’t know heaps about it” (Clinician 06, Stage 1), “I don’t think I understand how they all fit into one another” (Clinician 08, Stage 1), and “I feel that I am very much down the line” (Clinician 08, Stage 1). In Stage 10, however, the difference between the hospital and FM groups’ perceptions was no longer significant – perhaps due to increased awareness on the clinicians’ part as well as the reduced emphasis on the issue of power in design as they experience the partnership. As it was pointed out: “People are doing the job they have to do ... More often than not, people wouldn’t know that the alliance partnership was there” (Consultant 01, Stage 10).

Partnership: Better management of project risks

“Better management of project risks” was found to be significantly different between the hospital and FM groups in Stage 1 but not in Stage 10. As previously noted, most of the clinicians were unaware of what partnership meant and how that was different to other types of procurement. Furthermore, they felt that it was beyond their role to understand it. In Stage 10 the difference was no longer significant, which was largely

influenced by the FM group placing less emphasis on better management of project risks in the later stage. This was because better management of project risks was no longer their priority, as reflected in the following statement: “it {partnership} hasn’t made any difference to the way I thought I would work” (Consultant 02, Stage 10).

Partnership: Continuity of project knowledge

The interpretation of partnership as a “continuity of project knowledge” was also found to be significantly different between the hospital and the FM groups in Stage 1, but not in Stage 10. In Stage 1, the difference was perhaps because the clinicians were not particularly aware of the specifics of partnering. In Stage 10, however, the contractors did not focus on the benefits of continuity of project knowledge any longer and understand the diminishing relevance of continuity of project knowledge to their current practice. As such, learning not only occurred as members gained knowledge about partnership, but also when they removed the context for learning, as it was no longer relevant. This is consistent with Nonaka et al (2001) assertion that context needs to be actively created, or in this instance, un-created (by not maintaining it).

Communication: Open communication

The interpretation of openness in communicating was found to be significantly different between the hospital and FM groups in Stage 1 but not in Stage 10, which was due to a majority of the hospital group’s concerns relating to their involvement in the process. In particular, the clinicians expected that they would have the opportunity to express their opinions: “It {the opinion} may not be right and it may be incorrect, but so long as the person who wants to express that opinion can express the opinion; and if the opinion is wrong, it is demonstrated to that person” (Clinician 02, Stage 1). On the other hand, as reflected in the interviews, the contractors were more concerned about the operational issues of communication, such as communication structures and hierarchy, which formed part of the contractors’ responsibility and control. As such, the difference in the groups’ interpretations of communication in Stage 1 seemed to be caused by a difference in the perceived ability to control events. In Stage 10, however, the difference no longer existed due to a change of opinion among the hospital group members. Such cultural learning was apparently due, as the interviews indicated, to the fulfilment of the hospital group’s expectation and hence trust: “{The FM group} communicates well, and clearly, and consistently” (Clinician 03, Stage 10).

Communication: Good relationship

This was significantly different between the hospital and FM groups in Stage 1 because the FM group was focused on the issue of the relationship involved in the partnering arrangement. As one contractor put it, the partnering arrangement would succeed if the hospital and FM group maintained a good relationship: “Relationship is the paramount thing within this delivery; we have to keep the relationship right” (Contractor 01, Stage 1). However, this difference no longer existed in Stage 10, revealing that the FM group shifted their focus away from good relationship as a means of effective communication. This appeared to be due to the knowledge that the communication strategies being implemented were successful.

Unlearning

The examples presented in this section reveal that the groups ‘unlearned’ about certain variables relating to the key concepts, as they were faced with emerging problems. Unlearning was likely to result where the groups’ previous anticipation of those problems was inadequate, or when the emerging problems impinged upon their own goals and interests.

Success: Builders team making profit

The interpretation of success in the “builder’s team making a profit” only emerged as significantly different between the groups in Stage 10, not in Stage 1. More specifically, the contractors were more focused on getting a financial return in the later stage of the project than they were at the start. This might have been affected by the emerging issue of budget overrun in Stage 10, when a gap between the user groups’ expectations and the available budget was identified. During the interviews in Stage 10 the contractors also pointed out the challenge that “I want to give the users the best that I can, and on the other hand, I have got to be conscious that {we have} got to make money on the job” (Contractor 06, Stage 10). Furthermore, at the outset it was highlighted that “the budget continues to be the driving factor” (Contractor 03, Stage 10). Such emerging differences between the hospital and the FM groups seemed to appear when their previous anticipation of meeting the hospital’s expectations impinged upon their own goals and responsibility to meet those expectations.

Partnership: Contractors as information filter

It was also found that the groups’ interpretations of “contractors as information filter” were significantly different only at the later stage of the project. As the project progressed, the consultants experienced difficulties in communicating directly with the hospital as “there are barriers to achieving effective communication because of us working for a contractor rather than working for the client – so there is another layer in the middle” (Consultant 01, Stage 10). Such unlearning seemed to result from the emerging problems that were encountered by the consultants, which were previously not anticipated. Such problems seemed to trigger unlearning – that is, an alteration to the consultants’ previous understanding of partnership.

Disruption: Affecting patient care

Unlearning was also reflected in their interpretation of disruption as “affecting patient care”, a difference which emerged only in the later stage of the project. In Stage 10 the hospital group was concerned about the effect of disruptions on patient care, such as “while we are decanting people, there are disruptions to services” (Planner 06, Stage 10); “the workflow is not that good” (Clinician 11, Stage 10). On the other hand, the interviews revealed that the FM group managed such disruption through communication: “Most of the disruptions we typically try to work out what they are going to be, which we have done I think quite well to date. We go on and talk to the people” (Contractor 05, Stage 10); “let them know of what’s going on, most people are generally understanding” (Contractor 07, Stage 10). This indicates that the FM group were aware of such disruptions but there was an emerging gap between the group’s expectations, understanding, and anticipation of the disruptions. As one consultant pointed out: “{the hospital} understand it, but they don’t know what the implications are” (Consultant 01, Stage 1).

Non-learning

Non-learning seemed to relate to the direct responsibility of the relevant groups to protect their particular interests, and the fact that such interests were not shared with the other groups throughout the briefing process. This highlights the distinct roles and responsibilities of the hospital and FM groups, which were felt strongly and preserved by members of those groups, because such distinctiveness defined their identity.

Success: Benefit to patients

The groups’ responses to success as bringing “benefits to patients” remained significantly different both in Stage 1 and Stage 10, indicating non-learning of the

groups in their interpretation of this concept. These differences indicate that the groups' specific roles and interests seemed to determine their interpretations of success. The results also show that these differences prevailed over time. As one clinician commented: "They {the FM group} have their interests and we have ours, and their interests stop the day they hand over, and that's when our interests start, and there is no crossover" (Clinician 10, Stage 10). The lack of shared goals, therefore, was shown as an impediment to learning during hospital briefing, due to the subjective differences in the groups' roles and interests.

Success: Quality facilities

Non-learning was also reflected in the group's responses to their understanding of "quality facilities" as its interpretation was significantly different from that of the hospital group in Stage 1 and continued to be significant in Stage 10. In Stage 1, the contractors referred to offering the best quality within the project constraints, and particularly relating to the given budget: "...if we maintain the budget and still give the user groups what they want" (Contractor 03, Stage 1). In Stage 10, the contractors maintained the objective of getting the best possible quality within the given budget and the targeted profit margin. This intentional choice of the word (ie quality) was perhaps due to the contractors' understanding that it was their responsibility to deliver the project outcome. The hospital members, on the other hand, tended to use the word 'functional facilities' and 'fit for purpose'. Again, the differences of the interpretation between the Hospital and the FM groups seemed to relate to their particular interests, which rested within their sphere of responsibilities.

CONCLUSIONS

This paper has explored the process of cultural learning by measuring cultural interpretations between the Hospital and FM groups over time and presented the contexts for learning, unlearning and non-learning around the key concepts. The analyses showed that the groups had gained learning about a majority of the differences in their cultural interpretations of the key concepts. It was found that the early stage of the briefing process presented an opportunity for cultural learning, during which differences in cultural interpretations were proactively introduced. This is similar to the idea of 'creative chaos' as suggested by Nonaka *et al.* (2001), involving an early introduction to the diversities in perspectives and to conflicts among the hospital and FM groups. These differences in the early stage of the briefing process seem to have encouraged the exchange of cultural interpretations, where the FM group shared its technical background knowledge and the hospital group information about its clinical operations. The exchange of cultural interpretations, subsequently yielded trust and understanding, and thus a willingness to compromise. The early engagement of the FM group, therefore, promoted cultural learning as the groups encountered, assessed, and solved problems collectively. From a learning perspective, this reflects a social construction of reality. Impediments to cultural learning (ie unlearning and non-learning) were experienced in the awareness of gaps in expectations and reality, which were triggered by emerging problems as briefing continued. These variables related to the builders' team making a profit, the contractors acting as an information filter, and disruptions affecting patient care. Non-learning was shown in the groups' understanding of success being the benefit of patients on the one hand, and quality facilities on the other hand, where there was no cross-over of interests between the Hospital and FM groups pertaining to those variables. The groups thus interpreted most cultural knowledge similarly insofar as such knowledge represented a level of sharedness of the groups' interests.

REFERENCES

- Burr, V (1995) *An introduction to social constructionism*. UK: Routledge.
- Chandra, V (2007) *An investigation of cultural learning during the hospital briefing process from a Facilities Management perspective*. PhD thesis. Sydney: Faculty of the Built Environment, University of New South Wales.
- Daake, D and Anthony, W P (2000) Understanding stakeholder power and influence gaps in a health care organization: An empirical study. *Health Care Management Review*, **25**(3), 94.
- Eden, C, Ackermann, F and Cropper, S (1992) The analysis of cause maps. *Journal of Management Studies*, **29**(3), 309-324.
- Kaya, S (2004) Relating building attributes to end user's needs: *the owners-designers-end users equation*. *Facilities*, **22**(9/10), 247-52.
- Kirkham, R J and Boussabaine, A H (2000) Developing a framework for whole of life costing in the National Health Service estate. In: Akintoye, A (Ed.), *16th Annual ARCOM Conference*, 6-8 September 2000, Glasgow Caledonian University. Association of Researchers in Construction Management, **2**, 567-76.
- Laukkanen, M (1994) Comparative cause mapping of organizational cognitions. *Organization Science*, **5**(3), 322-343.
- Martin, J (2002) *Organizational culture: Mapping the terrain*. Foundations for organizational science, California: Sage Publications.
- Mintzberg, H (1997) Toward healthier hospitals. *Health Care Management Review*, **22**(4), 9
- Mohammed, S, Klimoski, R and Rentsch, J R (2000) The measurement of team mental models: We have no shared schema. *Organizational Research Methods*, **3**(2), 23-65
- Nadkarni, S and Narayanan, V K (2005) Validity of the structural properties of text-based causal maps: An empirical assessment. *Organizational Research Methods*, **8**(1), 9-40.
- Nonaka, I (1994) Dynamic theory of organizational knowledge creation. *Organization Science*, **5**(1), 14-37.
- Nonaka, I, Konno, N and Toyama, R (2001) Emergence of Ba: A conceptual framework for the continuous and self-transcending process of knowledge creation. In: Nonaka, I and Nishiguchi, T (Eds.), *Knowledge emergence: Social, technical, and evolutionary dimensions of knowledge creation*. New York: Oxford University Press, 13-29.
- Okoroh, M I, Gombera, P P and Ilozor, B D (2002) Managing FM (support services): Business risks in the healthcare sector. *Facilities*, **20**(1/2), 41-51
- Price, I (2004) Positioning facility management. *Facilities*, **22**(13/14), 353-8.
- Sackmann, S A (1992) Culture and subcultures: An analysis of organizational knowledge. *Administrative Science Quarterly*, **37**(1), 140-62
- Schein, E (1992) *Organizational culture and leadership*. 2nd ed. Jossey-Bass.
- Shohet, I M and Lavy, S (2004) Healthcare facilities management: State of the art review. *Facilities*, **22**(7/8), 210-20.
- Shortell, S M and Kaluzny, A D (1999) Organization theory and health services management. In: Shortell, S M and Kaluzny, a D (Eds.), *Health care management*. 4th ed. Albany: Delmar Thompson Learning, 1-33.
- Viljoen, J and Dann, S J (2000) *Strategic management: planning and implementing successful corporate strategy*. 3rd ed. Australia: Longman Business & Professional.