

ORGANISATIONAL CULTURE AND CLIMATE: ELUSIVE PIECES IN THE HEALTHCARE TECHNOLOGY MANAGEMENT PUZZLE

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Abstract: South Africa is in the process of implementing a multi-billion rand National Healthcare Insurance strategy, the objective being cost effective healthcare service delivery to all South Africans. The implementation and use of innovative e-health technology systems to support service delivery are deemed to form an important element of the strategy. The objective of this paper is to research the organisational culture and climate implications associated with the deployment, use and management of the innovative technologies concerned. In this regard a complex adaptive system, in contrast to a traditional scientific management, approach in dealing with culture change is specifically explored. The research methodology constitutes a multi-disciplinary literature review and it is suggested that the findings emanating from the study could serve as a source of information and reference for the technology and healthcare practitioners involved. A key finding emanating from the research is that the traditional scientific management approach in dealing with culture change may not be all that effective and it is suggested that a complex adaptive systems perspective may be of more value and ought to be considered.

Key phrases: *complex adaptive systems, e-health, electronic medical records, healthcare informatics, National Healthcare Insurance (NHI), organisational culture and climate*

1 INTRODUCTION

“If we consider this idea that culture is a whole way of life, then we have to acknowledge that technology is always already a part of everyday life: it’s there in the cars we drive, the pens we write with, the oven in which we cook our food. Technology is not something separable from everyday life and it is not separable from culture” (Wise 2006:2).

The introductory quotation attests to the nature of the concept culture as being “a whole way of life” (Wise 2006:1,2 citing Williams), which in a sense resonates with the frequent definition attributed to the concept, namely “the way we do things around here” (Du Plessis 2010:43; Trompenaars & Prud’Homme 2004:14-15). The South African government is currently embarking on a fourteen year R255 billion National Healthcare Insurance (NHI) initiative (Department of Health 2011:37), which could be conceptualised as constituting a whole new way of life or ways of doing things within the clinics and hospitals concerned.

Nowhere will this transformation in the healthcare system be more pertinently experienced than in the implementation of innovative new technologies to support healthcare service delivery as called for by the Department of Health (2012a:44, 46

& 2012b:16-17). It is claimed by Yadin and Jahnke (2004:73) and also expected by the Department of Health (2012a:44 & 2012b:16-18) that the appropriate deployment of technology will significantly contribute to a substantial improvement in the quality of healthcare delivered, the containment of cost, and an increased access to services offered by the healthcare system. However, the organisational culture implications involved in the design, implementation, use and management of the new technologies to support healthcare service delivery are not pertinently addressed in the Department of Health (2011:4-59, 2012a:7-28 & 2012b:16-18) policy and strategy documents.

2 SIGNIFICANCE OF THE CONCEPT ORGANISATIONAL CULTURE

The importance of the concepts organisational culture and climate stems from the fact that they serve as perceptual and behavioural determinants (Imran, Saeed, Anis-ul-Haq & Fatima 2010:3337; Weeks 2010:47; Willcoxson & Millett 2000:92; Wise 2006:4). Therefore, by implication it can be expected that they would have a significant influence on the introduction, use and management of technological systems within healthcare institutions. In a sense, this can be inferred from the observation of Tuan and Venkatesh (2010:148), who in researching the impact of organisational culture on innovative technology adoption in private hospitals found that the more successful hospitals in innovative technology adoption were those that fostered a culture of rich communication between the medical and management personnel. The researchers also found that in some hospitals where the culture did not support creativity and innovation that the individual attitudes also reflected this culture (Tuan & Venkatesh 2010:149). The researcher cites the following staff response, emanating from interviews conducted, in support of this contention: “we don’t want to make any change, because it means we have more work to do” (Tuan & Venkatesh 2010:149).

A shortage of medical practitioners, as experienced in many South African hospitals (Breier 2008:6; Hawker 2012:1; Mars 2011:3), would imply significant workloads and if the technology is perceived as generating more work with little or no real benefit to the staff concerned, such a climate and culture determined response could therefore seem to imply a very turbulent road ahead for the NHI initiated healthcare technology implementation.

Imran *et al.* (2010:3337) follow a similar trend of thought in claiming that within an organisational context, organisational culture, resource factors and climate of the organisation are conditions determining individuals' performance. With this in mind, the need to ensure that the culture and climate within healthcare institutions support the implementation and usage of technologies, assumes very definite significance. The question is: *How can this be achieved in practice?* Brown (1995:130), Jaskyte (2004:154,156) and McCormick (2008:79-83) are researchers who tend to advocate a traditional view of being able to actively and intentionally manage the concept to realise a desired or envisioned culture, while acknowledging that it is extremely difficult to achieve this in practice. In some instances, it would seem that there are management practitioners who have bought into the idea that culture can be intentionally managed and as noted by Trompenaars and Prud'Homme (2004:34) with a consequence of spending significant amounts of resources on consultants to assist them in establishing a new desired culture.

The more traditional view would seem to be contradicted by a more contemporary complexity theory approach in dealing with the concept, where it is suggested that it is a naturally evolving *living system* or as suggested by Wise (2006:2, citing Williams) in the introductory quotation, a *way of life*. It is a view endorsed by McCormick (2008:78) in claiming that "culture for the most part develops in an evolutionary unmanaged process". In a similar vein, Hawkins (1997:434, citing Nodoushani) articulates a postmodernist view of culture as not constituting a strong unitary meta-narrative, but of celebrating ambiguities and a multiplicity of conflicting views. Seen in the context of the NHI initiative (Department of Health 2011:4-59 & 2012b:17), it is suggested that a complex-adaptive systems view of culture and climate change will have significant implications in terms of technology management.

With the above discussion in mind, in the ensuing sections the concepts organisational culture and climate as well as the management thereof are explored with reference to their impact on the implementation, use and management of technology within a contemporary South African healthcare setting. A multi-disciplinary literature review serves as the basis for the discussion and the insights gained. It is suggested that the findings stemming from the literature study could

serve as a source of information and reference for healthcare professions, managers and technologists in dealing with the design, implementation and management of technologies to support healthcare service delivery.

3 THE CONCEPTS CULTURE AND CLIMATE: A HEALTHCARE TECHNOLOGY PERSPECTIVE

Cameron (2004:3) draws a distinction between the concepts organisational culture and climate. The researcher argues that climate refers to “more temporary attitudes, feelings, and perceptions of individuals” that can change quickly and dramatically, while culture constitutes an enduring, slow to change, core characteristic of organisations, (Cameron 2004:3). An important conclusion that may be derived from the researcher’s contention is that the climate of the institution can change far more dramatically within a relative short time compared to the culture of the institution.

Denison (1993:4) suggests that both concepts entertain the possibility of a shared collectively defined social context that emerges over time as institutions struggle with the dual problems of adaption and individual meaning. Of pretence here is the researcher’s contention that both concepts are socially construed. Cameron (2004:3) also refers to the culture of an institution as being a “socially constructed attribute”, which serves as the “social glue” binding an organisation together. Denison’s (1993:4) conclusion does not contradict Cameron’s (2004:3) observation as the distinction made is one of climate being individually orientated, while culture relates to a shared characteristic of the institution’s social setting.

An institution’s climate is contended by Castro (2008:2) to be “based upon its employees’ feelings and perceptions of the organisation’s practices, procedures and reward systems” or in a more general sense the employees’ work environment. Within the context of this paper, this would imply the work environment within a particular healthcare facility. Castro (2008:2) further claims that it “is assumed to influence their motivation and behaviour”, thereby confirming the preceding contention of the concept as being a behavioural determinant. Of particular relevance within the context of this paper is Castro’s (2008:2) observation that the climate “in organisations plays an integral role in how amenable (or hostile) organisations are to change”. Therefore, it can be inferred from the researcher’s contention that within a negatively experienced work environment individual healthcare professionals would be less willing to adopt

and make use of new innovative technological systems, while the converse could also be true. The work environmental conditions, as seen from the individual's perspective, therefore assume a critical dimension in managing technologically driven change within healthcare institutions.

Castro (2008:13, citing Greenberg & Baron) describes organisational culture as referring to the expected behavioural patterns that are generally exhibited in the organisation and involves assumptions, values, expectations, and the core characteristics that are valued by members in the organisation or more specifically the organisational structure that is rooted in the shared institutional values, beliefs and assumptions. Denison (1993:5) in discussing the concept of culture draws attention to the frequent distinction made in the literature between overt surface manifestations of the concept, such as artefacts, symbols, rituals or practices, and the underlying cultural attributes that give rise thereto.

These attributes essentially constitute the values, beliefs, norms, assumptions, expectations, principles and ethics that come to be shared by members of a group, department, clinic, hospital or even the medical community and consequently, as contended by Denison (1993:5), are manifest in institutional artefacts and behaviour. Cameron (2004:3) concurs that it is the taken-for-granted shared cultural attributes that in fact characterize organisations and asserts that in practice most people are unaware of the institution's culture until it is challenged, until they experience a new culture, or until culture is made overt through its behavioural or artefact manifestation.

Aarons and Sawitzky (2006:289) and Cullinan (2006:1) note that the turnover of healthcare professionals in public sector health services is of an on-going concern, impacting not only on the costs of recruitment and training, but also the quality of services provided. According to Aarons and Sawitzky (2006:289) the turnover may be attributed to factors such as a high stress environment, lack of support and low salaries, all aspects that correlate with the preceding description attributed to the concept of climate. However, the researchers also suggest that organisational culture is equally important because "shared beliefs and norms affect employee perceptions, behaviors, and emotional responses" (Aarons & Sawitzky 2006:290).

Von Holdt and Murphy (2006:1, 3) describe South African public sector hospitals as being “stressed institutions” due to staff shortages and unmanageable workloads. The hospitals at which the researchers conducted their research study were found to have acquired a culture of bureaucracy and incompetence. The researchers contend that “it is our experience that disempowered and unaccountable management structures gives rise to a specific management culture in the public hospitals. The administration of rules and regulations has become more important than managing people and operations or solving problems and ensuring decent service delivery” (Von Holdt & Murphy 2006:11).

The cultural description would seem to resonate with what Deal and Kennedy (1982:119) define to be a process culture and Handy (1976:179) defines to be a role culture, namely one of bureaucracy where rules, procedures and regulations are the order of the day and employees get virtually no feedback. Deal and Kennedy (1982:119) contend that memos and reports that employees write seem to disappear into a void and there is little recognition or acknowledgement of achievement. In effect, it is a world of red tape with no innovative risk taking. Von Holdt and Murphy (2006:12) similarly allude to the hospitals’ culture as “a culture of ‘management by memo’. Managers believe their task has been completed once they have communicated a change of rules or procedures by means of memorandum” with little or no cognisance of the practical implications thereof in terms of healthcare service delivery.

The implementation of innovative new technology within the healthcare sector undoubtedly implies a sense of risk taking and innovative solution development for the complexities encountered (Tharp 2008:1). The preceding process or role culture description would therefore tend to stand in direct conflict with the culture required for implementing innovative new technologies in South African hospitals. Without active staff involvement and adoption of the new technological systems, it is suggested that the project will be fraught with difficulty. For instance, Doktor, Bangert and Valdez (2005:2) claim that the “successful adoption of an e-health strategy requires a more organic and less mechanistic organisational culture”. More specifically it is stated by the researchers that “organisations with cultures that

encourage participation, two way communication and decentralize decision making are often characterized as being more organic” (Doktor *et al.* 2005:3).

Bali and Naguib (2005:1367, 1370), based on their research, claim that the implementation of telehealth technologies has major social, ethical and organisational culture implications that need to be taken into consideration in view of their behavioural determinant implications. The researchers, however, fail to more specifically allude to the nature of the culture required. In researching the connection between organisational culture and a work environment that enhances hospitals’ ability to adapt, Park and Kim (2009:22.33) on a rather general basis conclude that a culture that emphasizes, flexibility, teamwork and cooperation can be more effective than a hierarchical culture that stresses work process and rules.

In this regard it is important to note that Lluch (2011:852) claims that in practice healthcare institutions tend to reflect a hierarchical tradition. However, research relating to technology implementation within healthcare settings conducted by Ariffin, Yunus and Embi (2008:50) reveals that studies undertaken did not consistently demonstrate that a particular type of organisational culture was associated with improved outcomes. Factors that apparently were seen as being associated with improvement interventions within a healthcare context were teamwork innovation, and risk-taking (Ariffin *et al.* 2008:54).

A study of eight multispecialty medical groups in the United States by Nembard, Singer, Shorttell, Rittenhouse and Casalino (2012:200, 211) reveals a multiplicity and diversity of cultures within the groups concerned, but with a strong orientation towards rational and patient-centred cultures. Nembhard, Singer, Shorttell, Rittenhouse and Casalino (2012:211) suggest that the preponderance of rational cultures contrasts with evidence from hospital research suggesting the dominance of hierarchical cultures as previously alluded to by Lluch (2011:852). The distinction between the two, however, appear to be marginal as a rational culture is described by Nembhard *et al.* (2012:202) as valuing stability and control much like hierarchical cultures. In contrast, the implementation of innovative technology within a healthcare context would seem to require participative cultures with an emphasis on creativity, change, adaptability and a sense of flexibility (Fuhi 2012:Internet; Zuckerman 2012:1).

A research study undertaken by Nowinski, Becker, Reynolds, Beaumont, Caprini, Hahne, Peres and Arnold (2007:S175, S180) in relation to the implementation of an electronic healthcare record system and the organisational culture implications, revealed that elements of the institution's culture changed as the system was implemented and came into operation. This finding would seem to support the contention of organisational culture being emergent in nature and consequently constituting a complex adaptive system.

The implementation of the system brought with it structured standardised processes, workflows and decision support tools that appeared to allow less rather than more flexibility and consequently gave rise to emergent cultural attributes associated with an emphasis on productivity, uniformity, performance and procedure compliance (Nowinski *et al.* 2007: S175, S181). This finding would not seem to support Park and Kim's (2009:22.33) conclusion previously alluded to, namely that a culture that emphasizes, flexibility, teamwork and cooperation could be more effective. A more structured environment was found to positively correlate with quality indicators resting on compliance with standard processes Nowinski *et al.* (2007:S181).

The complexity of healthcare and the introduction of innovative technological support systems has shown a significant increase and according to Walshe and Smith (2011:6) "more and more, healthcare organisations use care pathways, treatment plans and clinical guidelines to bring some structure and explicitness to the healthcare process". The cultural attributes of a healthcare culture are deeply imbedded in an altruistic belief in the social value that emanates from the professional activities of healthcare professionals and this is manifest in their social mission that often does not make sense in business or healthcare management terms (Walshe & Smith 2011:6).

The introduction of innovative technology systems, that necessitate significant systemic changes, need to take into consideration the changes that this will require in terms of well entrenched traditional professional healthcare values, beliefs, norms and similar cultural attributes. If they come in conflict with the entrenched social healthcare ethic of the practitioners' concerned resistance to change can be expected. The most challenging part of developing and implementing healthcare

technology systems, according to Buchan (2011:322), will be overcoming the culture barriers.

Barriers encountered in implementing health information technologies (HIT) were researched by Lluch (2011:849) and concluded that despite the apparent advantages to be derived from the implementation of the technologies concerned they have been beset with difficulty in implementation. Two factors in particular arise from the research study as acting as barriers, namely cultural issues and technical skills of healthcare professionals (Lluch 2011:854). As a consequence "HIT remain underused by healthcare professionals who still struggle to integrate them into their practice" (Lluch 2011:850). The researchers confirm that healthcare organisations, such as hospitals, come with a long legacy of clinical experience and traditions and new generations of healthcare professionals are expected to conform to the culture rather than embrace new changes (Lluch 2011:850).

It is argued by Lluch (2011:852) that the current healthcare hierarchical system does not encourage teamwork involving different tiers of the healthcare organisation system deemed essential for effective technology implementation and utilization. Further, Lluch (2011:854) notes that cooperation with other healthcare professions in particular needs to be so organised that it does not conflict with the autonomy that healthcare professions have come to accept. Clinicians, according to Lluch (2011:854) expressed fears that the increasing use of HIT systems will lead to depersonalising healthcare. Clearly, the ingrained culture that exists would seem to act as a barrier to the introduction and use of innovative new technologies.

The introduction of innovative new healthcare technology systems within a healthcare setting entails a fundamental change in healthcare services and managing the transition is multidisciplinary and faceted in nature. The cultural aspects involved are dealt with under the banner of socio-technical transformation by Ludwick and Doucette (2009:26) who, while advocating physician leadership of the change management process, stressed that "a team approach is critical during design, development and implementation phases". Their research findings suggested that most often the staff, not the physician, has the best knowledge of existing and optimized processes and

different team members bring alternative perspectives and important skills to bear on the implementation of the new systems (Ludwick & Doucette 2009:26).

Not only does the culture of the institution form a key aspect to be considered but the climate changes also assume relevance as new implementations engender a sense of anxiety and aggravation to staff. Stressed by the researchers are a host of contextual issues that are people related and important factors in the change management process, such as changes to long established practices in the way things are done, an increased dependence on computer systems eroding decision making capacity, increasing levels of clinician accountability, and concerns relating to provider-patient relationships. The complexity of the socio-technical changes and the complex cultural aspects that need to be dealt with is suggested by Ludwick and Doucette (2009:26) and it necessitates an incremental adaptive approach in managing the change management process. At the core of the problem are organisational culture and climate concerns.

A review of the implementation of electronic health record systems in five countries was undertaken by Deutsch, Duftschmid and Dora (2010:211) in order to gain an insight into the problems encountered. Notably, a common trend encountered was the difficulty experienced in terms of healthcare practitioners' acceptance of the relative systems concerned, as may be seen from the ensuing extract, (Deutsch *et al.* 2010:217):

“The most significant critical area for which problematic cases were registered in all countries is the acceptance of the HER solution and the required change management in the processes and cultures of the involved persons. This is especially true for the problems reported in all countries, resulting from the doctors being poorly convinced of the HER solution and its personal added value for them.”

The trend that emerged from the research would appear to support the contention that changing the well-established values, beliefs and in general ways of how to do things in implementing new healthcare processes and systems, associated with the introduction of innovative technological systems, is a complex process and if not correctly dealt with results in resistance to change. A key assumption made in the

decision to implement innovative technologically based systems within the healthcare sector is that they are essential for improving quality and efficiency of service delivery, (Nowinski *et al.* 2007:S174). However, increasingly it would appear that the successful implementation and utilization of the technological systems concerned necessitates a very fundamental realignment of the culture and climate within institutions to ensure user acceptance of the systems concerned. This brings into question the issue of how best to deal with the culture and climate change management process. This is briefly explored in the ensuing discussion.

4 CULTURE AND CLIMATE CHANGE MANAGEMENT: A TRADITIONAL VERSUS A COMPLEX ADAPTIVE SYSTEMS APPROACH.

“It will appear that the UK government’s 10-year programme of reform for the NHS is a tacit acknowledgement that cultural transformation cannot be wrought overnight on an organisation with such well established practices and values” (Scott, Mannion, Davies and Marshall 2003:114).

The foregoing statement attests to the difficulty encountered in practice to engender a fundamental change in culture within a well-established healthcare institutional environment. Bennet and Bennet (2004:10) also note that culture transformation constitutes a very fundamental barrier that institutions frequently face and that many theories and processes exist in relation to culture change, yet, according to the authors most offer no guaranteed solutions. Similarly, Munck (2002:23) concurs that transforming an organisation’s culture constitutes one of the most fundamental challenges confronting an institution, as people’s natural inclination is to hold on to whatever feels familiar, even if confronted with better alternatives. However, it is claimed by Bennet and Bennet (2004:11) that before an organisation can adopt new practices to significantly change the way it conducts its business it must be willing to admit that current practices are inadequate, which in essence implies a need for a fundamental paradigm shift.

Scott *et al.* (2003:112), in analysing culture change management, identified two fundamental conceptualisations of the concept, namely, culture as an attribute or something the organisation *has* and culture as existing in or reproduced through social interaction resulting in something the organisation *is*. The conceptualisations of the concept embody the very core of two very different approaches in dealing with

culture change. As alluded to in the introductory discussion the more traditional view, often reflect in the literature, is one of being able to actively and intentionally manage the realisation of a desired or envisioned culture, although it is also acknowledged that in practice it is rather difficult to achieve (Brown 1995:130; Jaskyte 2004:154,156; McCormick 2008:79-83).

It is confirmed by Langan-Fox and Tan (1997:275) that “more often than not, an emphasis in the organisational culture literature is on changing and managing organisational culture in order to meet organisational objectives and strategies”. It would seem that Schermerhorn, Hunt and Osborn (2008:364) tend to support a rather different view in describing organisational culture as a “system of shared actions, values and beliefs that develops within an organisation and guides the behaviour of its members”. Trompenaars and Prud’Homme (2004:34) similarly suggest that one needs to understand culture as a meaning giving system of society; it then becomes a current and for ever evolving force that can best be experienced in active engagement. Implied in the definition is the notion of culture as attributes that develop or emerge within the institution and providing it with a shared sense of meaning. It is clear that this latter view stands in contrast to the former more traditional scientific management view of being able to actively and intentionally manage the realisation of a desired culture.

These two contrasting views of organisational culture underscore the approaches adopted in dealing with culture transformation within healthcare settings and as stressed by Scott *et al.* (2003:113) that if cultures develop spontaneously as the emergent model suggests, how they change would be a key question as it would impact on the change management process adopted in implementing technological systems within healthcare settings. The complex adaptive or emergent approach by implication assumes a “cultural lag” or “strategic drift” and Scott *et al.* (2003:114) highlight the need to reduce dissonance between the prevailing healthcare culture and the broader contextual changes that are assuming relevance. In the context of this paper this would constitute the cultural attribute changes that emerge in response to the deployment and use of the specific technology systems concerned.

The traditional intentional culture management paradigm has its genesis in an era of reasonable stability and predictability where scientific management principles came to be accepted. The underlying premise within a traditional manufacturing context was one of ensuring that the institution's strategy and culture were in alignment and consequently it was assumed that just as in the case of all manufacturing systems the culture of the institution could also be predetermined and intentionally managed. Hough, Thompson, Strickland and Gamble (2008:297) describe this approach as one where the organisation's vision provides a clear picture where the organisation is at present and where it would like to be, strategy providing the means to realise the vision.

In this regard and very importantly, Hough *et al.* (2008:301) further pertinently states that "the organisation's culture should support the overarching strategy". The purpose of developing a culture strategy is therefore directed at ensuring strategy and culture alignment. McCormick (2008:x) very pertinently stresses that "culture is, in reality, a critical foundation piece for any organisation, and it is more than a theory – it is a manageable entity". Culture according to McCormick (2008:xi) can be architecturally designed by creating a set of core organisational values that define expected behaviours, which then serve as a frame of reference for hiring and developing staff. Thus, it is a management approach which assumes that cause effect relationships can be determined and outcomes consequently can intentionally be managed.

Martin (1995:455,461) is another researcher who views organisational culture as being able to adapt and undergo sudden quantum-change shifts. Martin (1995:455) claims that most mature corporations have the wrong culture for the present era, as it was set in place before the age of empowered teams and Kaizen practices and therefore suggests the need for an enterprise engineering approach that pays specific attention to the need for culture realignment. The picture that emerges is one of an essentially manufacturing era where practices such as total quality management, enterprise reengineering, and Kaizen were the order of the day and culture was seen as being able to be realigned to support such practices.

Consequently the management paradigms established during this predominantly manufacturing era become entrenched in what may now be termed to be traditional management theory and practice. It is therefore emphasised that traditional management and cultural paradigms need to be analysed and seen with the context in which they originated, namely one dominated by scientific thinking and practice.

Schermerhorn *et al.* (2008:376) supports the view that “early research on culture and culture change often emphasized direct attempts by senior management to alter the values and assumptions of individuals by socializing them”. The researchers, however, acknowledge that “this unified approach of working through values may not be either possible or desirable”. Trying to change people’s values from the top down, it is suggested by Schermerhorn *et al.* (2008:376) does not seem to work well. Using Cisco Systems as a case in point they claim managers realised that maintaining a dynamic, change-orientated culture is a mix of managerial actions, decisions about technology, and initiatives from all employees Schermerhorn *et al.* (2008:376).

The key aspect to take note of here is the realisation that culture transformation stems from an inclusive process that inherently includes all employees. This has very definite implications when it comes to the design, implementation and use of new technological systems directed at enhanced healthcare service delivery. Kimball (2005:4), in researching culture transformation in healthcare, confirms that for the culture to change there must first be an awareness of the need for change that is reflected by current normative behaviour and social structures. Stressed by the researcher is that the shared need experience creates understanding and trust that serve as a foundation for change, namely the existence of a shared “cultural worldspace” (Kimball 2005:4). This statement has resonance in Munck’s (2002:29, 30) assertion that people need to truly want the change in the first place.

Far from the planned, ordered and well managed view of the traditional culture transformation, Kimball (2005:11) describes the process as being fluid, unpredictable, filled with obstacles and surprises. Ideally the existence of a “burning platform” or significant threat could set the scene for the need for an innovative technology solution and consequently a shared experience in the design, implementation and use of the system. Of pertinence therefore in the emergent culture transformation process is the

social interaction dynamics that takes place within the institution. The social connotation and its associated complexity, as claimed by Brown (1995:5), are reflected in the politics of negotiation that takes place within institutions. The outcome of such negotiations, contended in this paper, is manifest in the cultural attributes that emerge and consequently shape the culture of the institution. To quote Bennet and Bennet (2004:151) in this regard, the emergence is not random but rather the result of interactions that settle down to internal coherence and patterns.

In the research conducted by Kimball (2005:15) the participants interviewed were asked to rank the three most important elements of a successful culture transformation process and the majority identified leadership commitment and support, the need for a shared vision and values, and involvement and ownership at all levels. When a critical mass acquires a new shared identity and experience the result, according to Kimball (2005:21), is nothing less than a social epidemic, it has reached a tipping point, new habits and identities begin to take root. Participants interviewed by Kimball (2005:24) almost without exception described the culture as one continuing to evolve, with many contending "it becomes a way of life".

The complex adaptive system view of culture as emerging patterns implies that management would need to identify, as suggested by Snowden (2002:107), those patterns deemed to be favourable and those that will inhibit the implementation and use of innovative technologies, including the implementation of the associated healthcare systems changes required for effective healthcare service delivery. The favourable patterns need to be stabilised, while those hindering the process will need to be disrupted (Snowden 2002:107). However, it needs to be noted that each of these interventions can give rise to new culturally determined emergent behavioural patterns that were not intended, as even small changes in initial conditions can have dramatic consequences as a result of the non-linear interactions that take place (Cilliers 1998:4).

Axelrod and Cohen (1999:8), following a similar trend of thought to that expressed in the preceding discussion, stress that when multiple populations of agents are adapting to each other (as would be the case in implementing healthcare technology systems) the result is a co-evolutionary process, the outcome of which is uncertain.

Kimball (2005:11) similarly confirms that the culture transformation process is hardly linear, but essentially unpredictable and consequently no two culture transformation journeys are identical. This notwithstanding, Axelrod and Cohen (1999:8) very pertinently state that “while complex systems may be hard to predict, they may also have a good deal of structure and permit improvement by thoughtful intervention”. What adds to the complexity of these interventions is that most mental representations or mindsets are often deeply embedded below the surface of conscious thought (Pfeffer 2005:125) and the interventions themselves can raise awareness and stimulate unexpected emotions that certainly complicate the culture transformation process.

The translation of the narratives accompanying the interactions that takes place, as a result of the culture interventions, can become misinterpreted giving rise to unintended and unexpected sets of new cultural determinants. Therefore, in a sense institutions become interpretation systems of participants who provide meaning for each other via their everyday interactions and negotiations (Browing & Boudès 2005:32). Therefore, Browing and Boudès (2005:32) suggest a case of true intended meaning being lost in translation of narratives regarding perceived, as opposed to objective, reality of management intention. Pfeffer (2005:125) in fact advocates that in spite of the apparent complexity and difficulty involved, changing the way people think is still the most powerful means to ultimately change behaviour, which in terms of implementing innovative healthcare technology solutions is deemed to be particularly pertinent.

The preceding discussion could in a sense be captured in Seel’s (2000:2) description of culture formation, namely “the emergent result of the continuing negotiations about values, meanings and proprieties between the members of that organisation and with its environment”. Snowden (2005:2), in following a similar trend, suggests that “culture is the patterning of our interaction with our environment”. With this in mind it is argued that the culture and climate within a healthcare institution emerges from the interaction taking place between all the relevant participants involved. As noted by Kimball (2005:16), the healthcare institutions leadership has a key role to play in participating in and shaping the negotiations and discourse that takes place

on a day-to-day basis and consequently in shaping the culture and climate that emerges. It is a contention that gives meaning to Lessem and Schieffer's (2009:118) contention that "*when we understand culture as the meaning giving system of a society then it becomes a current ever evolving force which can best be experienced in active engagement with today's human beings as well as with local nature, not with yesterday's historical beings*".

5 CONCLUSION

Within the South African healthcare context, with the accent on making use of innovative technology based solutions for effective service delivery, it can be expected that organisational culture and climate considerations will in future assume far greater relevance. With this in mind the research findings emanating from the literature study could serve as a source of information and reference.

An important conclusion derived from the literature study is that a complex adaptive systems approach for dealing with culture and climate, as behavioural determinants impacting on the design, implementation and use of healthcare technology systems, may be more effective than traditional culture management practices. Involving all the relevant role players involved is deemed essential and as noted by Kimball (2005:16) leadership commitment and support through active participation and engagement in the discussions, negotiations and dialogues that take place on a day-to-day basis forms a critical ingredient in influencing the emergent culture transformation process.

By implication, it would imply that the healthcare professionals and technologists working as a team in the design and implementation of the systems concerned have acquired an understanding of complex adaptive systems theory and its application in ensuring that the emergent culture is one that supports the implementation and use of the technology concerned. Central to the process is one of identifying the emergent cultural patterns and facilitating the development of positive patterns, while actively disrupting the negative emergent patterns.

The objective of organisation change management with the accent on making use of innovative technology based solutions for effective service delivery within the South African healthcare context is defined as being an attempt to nurture a culture and

climate within healthcare institutions that will support the implementation and use of the technology systems concerned.

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