

DIFFUSING CULTURAL AWARENESS AND MATURITY IN LEAN MANAGED ORGANIZATIONS

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Lean construction is a management philosophy intended to reduce waste and maximize productivity. Despite some examples of ‘successful’ lean implementation in industry our understanding and interpretation of how the lean concept is diffused within an organization varies. From a cultural perspective the lean construction organization is dichotomously interpreted as either positive and empowering or negative and conflicting scenarios. Both interpretations are representative of end-result cultural awareness. Diffusion theory however, tells us that organizational culture is a dynamic construct, in which culture during implementation processes can be interpreted as positive and negative. Consequently, the adoption of an innovative process such as lean management should be considered as an ongoing implementation process whereby the organizational culture evolves. Diffusion theory assists in explaining how and why organizational cultures mature and evolve as a result of implementation processes. Therefore the aim of this paper is to describe a lean cultural maturity model underpinned by diffusion theory. The purpose of the maturity model is to provide an understanding of organizational cultural awareness associated with the lean phenomenon. The model utilizes cultural and diffusion constructs as a foundation to explore the dynamic nature of culture and how the method of implementation is uniquely diffused within organizations to mature culture

Keywords: cultural awareness, cultural maturity model, diffusion theory, lean construction.

INTRODUCTION

The success of the Toyota production management system introduced to the world, including construction, the concept of lean thinking – reducing waste while maximizing productivity (Koskela, 1992, 1993; Howell, 1999). Such success in adoption has led to the emergence of lean managed organizations. Processes of implementation, however, are not well defined, particularly in understanding the link between implementation and culture. Cultural representations of lean implementation are typically one-dimensional highlighting overwhelming acceptance towards implementation. However, such representations are directed by deductive research approaches with which a problem is ‘identified’ or ‘discovered’, then strategically ‘eliminated’ through lean implementation. Such approaches fail to understand how the culture of the organization evolves and matures throughout and beyond the process of

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implementation. Such one-dimensional representations of the implementation process and culture associated with lean neglects to consider or acknowledge the reasoning behind how and why culture ‘matures’. This provides the gap in which to explore organizational culture maturity.

The development of a culture maturity model will assist in the investigation of emerging conflicting ideas present within current literature regarding lean implementation and construction culture. The purpose behind the development of the cultural maturity model is to present a new way of understanding how and why the culture of construction organizations mature as a result of lean implementation, while understanding the processes behind lean implementation. Underpinning the model is a theoretical framework supported by Rogers’ diffusion theory, constructivist propositions and cultural constructs. Before the model can be developed, issues concerning cultural maturity need to be identified and discussed within the context of construction, more particularly lean construction.

LEAN MANAGED ORGANIZATIONS

Lean managed organizations have emerged as a direct result of the lean movement, first emerging in the 1970s through the Toyota production management system (Liker, 2004). Characteristically, the main difference between lean managed and non-lean managed organizations is the philosophical uptake of *rethinking* and *re-evaluation* ideals through *collaboration* and *continuous improvement/learning* (Lee, *et al.*, 2007). As a basis for a collaborative environment lean managed organizations build upon existing culture by focusing the organization towards a learning environment influenced by trust, leadership, commitment and open and free flowing communication networks (Coffey, 2000; Davey, *et al.*, 2000; Buch and Sander, 2005; Orr, 2005). However the maturing process which occurs within organizations during the implementation of lean is blurred, this blurring of research and understanding forms the investigative contexts.

DEFINING CONTEXTS: INTRODUCING CULTURAL CONTEXTS

Traditionally, discussions’ concerning construction culture have been discussed from the ideas and writings of Hofstede. Hofstede’s interpretation of the culture environments of construction is influenced by ideals of national culture, underpinned by five dimensions, power distance; individualism vs. collectivism; masculinity vs. femininity; uncertainty avoidance; and long vs. short term orientation (Hofstede, 1983, 2001). Interpretations concerning construction culture have since moved beyond Hofstede’s simple contextualization towards the acceptance culture as a maturing entity (see Waard, 2001; Fuller and Vassie, 2002). Table 1, highlights cultural platforms present within construction.

The analysis and categorization of cultural platforms (in Table 1) shows a tendency towards interpreting the facilitation and process of culture more as a means of an ‘outcome’ of implementation, ‘procedure’ of change or a way to ‘categorize’ attitudes. The one-dimensional approach of cultural interpretation suggests culture is a static and as such is simply an extension of organizations. Hofstede uses this stance to describe the relationship between national and organizational cultures. Hofstede’s interpretation is based around five ‘key’ dimensions of culture, those of power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty

Table 1: Cultural Platforms of Construction

| Platform | Understanding | Structure | Claim | Interpretation |
|---|---|---|---|---------------------|
| Understanding Culture (Hofstede) | Culture is nationally based | Represent/influenced by five dimensions | Orientations of culture/cultural differences can be explained/understood (Hofstede, 2001; CIB TG23, 2001) | Static |
| Cultural Maturity (Duffy) | Business evolution and cultural maturity | Maturity represents change implementation | 3 agents investigate/test | Static |
| Cultural Maturity (Fuller and Vassie) | Maturity assessed through partnership agreement alignment | Maturity tested by analysing scaled responses of individuals | Four organizational zones investigate/test | Static-Evolutionary |
| Cultural Quality (Rooke <i>et al.</i>) | Develops a EFQM Excellence Model | Organizational groups graded against select criteria of the EFQM Excellence Model | Generated data used as an industry benchmarking product | Static |
| Behavioural Science (Waard) | Company/structure understood in terms of behavioural sciences | Company structure interpreted as a series of concentric circles | Culture interpreted/ explored through assumptions | Static-Evolutionary |
| Culture Change: SCM (Root) | Cultural change tool | Supplier network can be used as a tool to “engender cultural change by shifting the perspective away from project processes to wide business processes” | Relationships are facilitated across businesses where organizations are ‘permanently’ engaged using existing supplier network models. | Static |

avoidance and long vs. short term orientation. Underpinning Hofstede’s model of ‘national’ cultural thinking is the ideal of management, particularly in the role nationality plays in political, sociological and psychological behaviours within the organizational system (Hofstede, 1983). Although offering insight to political, sociological and psychological elements present within culture, the problem of Hofstede’s interpretation of organizational culture is identity. Identity as a problem arises particularly in Hofstede’s assumptions that within each ‘nation’ a uniformed ‘national culture’ exists (McSweeney, 2002). Issues of identity are also present in underpinning other current model interpretations of culture (see Duffy, 2001; Rooke *et al.*, 2001); however these models of cultural understanding are also assuming that changes within the culture of an organization are influenced by the implementation of ‘tools’ and ‘techniques’ of change, and as such model towards this assumption (see Root, 2001).

Considering elements of identity (and other behaviours/attitudes) within cultural maturity are Waard (2001) and Fuller and Vassie (2002). The basis behind their modelling of cultural maturity is to identify culture as a representation of evolutionary change within the organization. Central to the exploration of cultural maturity is the exploration of culture being more than an additional entity but as an entity impacted by elements of the organization, particularly attitudes or behaviours, structures and relationships. Although the models are representative of new ‘evolutionary’

understanding into culture the models however, are still representative of the static approach and interpretation of culture through the facilitation of culture as a process, rather than a ‘maturing’ as such. This is evident particularly in.

- Interpreting culture as a ‘collective’ or ‘collection’ of attitudes.
- Ranking and ‘guiding’ organizations to a particular cultural ‘outcome’.
- Analysing cultural change on scales of ‘maturity’ and ‘immaturity’.
- Viewing cultural change as ‘generalist zones’ of ‘understanding’; and
- Viewing cultural change as a series of ‘centric’ circles.

Another issue underpinning current interpretations of construction culture is the idea that the maturing of culture can be used as a mechanism or tool in which to generalize future cultural experiences within similarly structured organizations. Particularly in the way specific strategies are implemented and adopted within the organizational framework as a process. Current models and interpretations investigating elements of cultural change, maturity or evolution highlight and box discussion into identifying the ‘what’ (strategy/change) and then final ‘solution’ (outcome) of innovation implementation. The method of approach assumes the suggestion that change within the culture of an organization occurs once remaining the same until the next change. Although models address the ‘what’ well, the tendency to neglect or further explore elements of ‘how’ (the process of implementation) and ‘why’ (how the process and strategy/change impacts the organization) reinforces that static approach. The ‘how’ and ‘why’ elements of cultural maturity are essential in understanding evolutionary ideas.

Underpinning the development of a new perspective of cultural maturity (evolutionary based) is the need to address and understand the how and why elements impacting the organization, with the context of current cultural maturity platforms. It has been noted before that one of the main processes in understanding cultural change within the organization is to simply isolate the contexts and propose a simple implementation strategy of.

1. Identifying a ‘what’ (the strategy).
2. Implementing the ‘what’; and
3. Stating a cultural ‘solution’ of the ‘what’.

The isolation of such implementation related contexts neglect to consider how other organizational contexts such as structure, current and past cultures, behaviours (attitudes) and processes change and interact with the implementation of the ‘what’ (strategy) to evolve and mature (not ‘change’) organizational culture. This seems to be a common occurrence within non-theory based cultural (maturity) interpretative research (such as Duffy 2001, Root 2001, Hofstede 1983, 2001 etc.), approaches underpinned by theory or a context of theory (such as Waard 2001 and Fuller and Vassie 2002) appear to use elements of theoretical understanding as a basis to explore how culture is interconnected to participants within the organization. The theory based approach although effective in current interpretations of cultural maturity again seem to address culture as a (static) ‘outcome’ of a wider organizational strategy of implementation, which is typically interpreted as being a standard ‘outcome’ which is applicable across multiple organizations.

PROVIDING A DIRECTION: CULTURAL MATURITY FOR LEAN

When undergoing the adoption of innovation or ‘new’ management strategies within construction, investigations into the process interpret implementation as one-dimensional. The one-dimensional approach focuses on.

- Structural contexts of the ‘process’ more specifically simply stating the ‘what’ characteristics of the implementation; and
- Cultural contexts of the ‘outcome’ more specifically stating the implementation of ‘what’ had an either/or ‘outcome’ within the organization.

A similar understanding is presented when discussing lean adoption or strategizing within a construction industry perspective. Within this context a structural perspective of lean implementation is seen as an approach based on the philosophy of ‘adoption mean success’, a cultural perspective of lean supports general understandings of culture and is interpreted as an outcome of the implementation process. The presentation of cultural ‘outcomes’ within lean support the generalized structural philosophy of ‘adoption means success’ with cultural outcomes identified more so as positivist than negative in presentation.

The one-dimensional approach undertaken of lean implementation investigations within construction organizations further complicates ‘cultural understanding’ by applying a specific ‘outcome’ of lean implementation experienced within one organization across multiple organizations. The application of an end-result outcome of implementation across multiple organizations tag implementation as a ‘generalized’ cultural reaction of lean. This approach towards understanding lean implementation and strategizing is similar to current models of cultural maturity which use the process of implementation also as a means or tool to justify an end outcome for the organization. These models or processes further neglect to consider (in detail) how other internal and external factors of the organization (such as structural, behavioural and organizational characteristics) affect the process and implementation of lean strategizing. Not exploring the context and reasoning behind cultural outcomes creates the problem of misinterpreting, misrepresenting and neglecting the role that culture and the nature of culture within the organization and how this then influences change or the need to adapt to change(s). Key to the problem is the perceived assumption that the process of implementation (and hence outcome) is similar across is similar across multiple organizations (structures are generally deemed to be the same). Construction organizations are structured differently usually influenced by a number of internal and external factors (such as work practices, management and culture). This difference between construction organization structures therefore assumes solutions specifically designed for the industry impact organizations differently based on a number of pre-existing and unknown factors. A new method is proposed which investigates not only elements of the current one-dimensional interpretive approaches but also identify and abstract organizational specific structural, cultural and behavioural (attitudes) characteristics influencing the evolution of organizational cultural maturity.

Isolating the focus of organizational culture particular towards the analysis of specific elements present within the organization (structural, cultural and behavioural) offers the ability to investigate how these elements interconnect to evolve, influence and mature the culture of construction organizations. The research in particular is investigating whether a ‘lean culture’ emerges with the implementation of lean and if

so can organizations be identified (before the implementation process) be identified as enablers of lean strategizing. The main point of contention underpinning research is the pre-conceived notion that construction organizations are similarly structured in the approach taken and as such the implementation and reaction to lean strategies is deemed similar. A theoretical approach towards understanding cultural movements within the organization is needed particularly in understanding the processes of lean implementation from the perspective of organizational groups within the firm. The presentation of a new perspective of lean culture, more specifically the evolution and maturing of culture will enable for an exploration of how and why organizational groups react to specific occurrences of change. The development of the model needs to be supported by a relevant theory which addresses structural, cultural and behavioural elements within the organization; Rogers' diffusion theory has been selected as theory supporting cultural maturity and evolution.

Underpinning the development of a new maturity model for cultural change within construction are some research specific elements. Elements of the maturity model specific to this research are.

- The need for the embedded concept to be identifiable as a form of innovation.
- If so diffusion theory (i.e. the diffusion of innovation) needs to be identified as the facilitation platform to interpret and understand movements.
- Model needs to be flexible in the approach and analysis of cultural attitudes; and
- Model needs to acknowledge that construction organizations are different (structurally, culturally and behaviourally) and as such will experience innovation implementation differently.

CONTEXTUALIZATION: CULTURAL MATURITY MODEL

Analysis of current models and platforms within construction culture research with a focus on the maturing of culture identified a majority of researchers to view and interpret culture as a static outcome of the implementation process. Two cultural platforms in addressing maturity discussed organizational changes within the confines of a theoretical base linking the contexts of 'what' (the strategy) to the basic ideas of exploratory contexts of 'how' and 'why' culture changes. Although the models produced a static end-result outcome of cultural change within the organization, it did introduce considerations of whether theory based research better assists in understanding cultural movements within the organization which leads to evolution and maturing of culture.

In order to address and interpret the evolution of cultural maturity within construction organizations, potential implementation strategies need to be identified as both an embedded concept of the investigation as well as a concept of an appropriate theory base. Although lean has been previously investigated from an innovative perspective (Koskela, 1993; Davey *et al*, 2000; Koskela and Vrijhoef 2000, 2001) the strategies and process behind adoption have not been clearly identified and defined. The lack of definite impacts of lean implementation as a form innovation within construction organizations has fuelled discussion surrounding theory transferability, particularly in understanding impacts behind lean adoption (Dauber, 2001; Winch, 1998, 2003; London and Kenley, 2001). Rogers' diffusion theory offers a springboard mechanism allowing the interpretation of the processes present which guide the adoption of

innovation, particularly in categorizing groups as innovators, early adopters, early majority, late majority and laggards. The assessment of cultural movements based on characteristics specific to the organization and behaviours of groups and individuals within the organization will enable the firm to be mapped within the context of cultural, behavioural and structural perspectives (based on movements). The cultural, structural and behavioural movements will assist in identifying (evolutionary) strengths and weaknesses present within the organization and assist in the identification of the organization being an enabler of specific innovation forms.

The purpose of the cultural maturity model is to provide a theoretical framework guided by diffusion theory to map cultural, structural and behavioural movements of the organization during and after processes of lean implementation. The cultural maturity model is guided by diffusion theory contexts which assist in providing a framework in which to explore culture when lean implementation occurs. Figure 1 (next page), presents the model of cultural maturity. Unlike other representations and models of cultural maturity a staged approach is undertaken which assesses particular contexts of the organization (structured around element Rogers' diffusion theory such as communication, social systems and time) and organizational groupings to explore how and why organization's culture mature. A phase approach is utilized as a means to explore this ideal of cultural maturity within lean managed organizations, allowing an evolutionary understanding to cultural maturity to emerge. Five phases underpin investigative nature of the model.

1. Context: cultural starting point, provides a brief background on the organization, investigative focus on the who and what.
2. Structure/social systems: contextualized diffusion construct – assists in identifying organizational social systems and structures, investigative focus on the who/what/how and why.
3. Working relationships/communication: contextualized diffusion construct – assists in establishing communicative structures and relationships of the social systems (i.e. networks), investigative focus on the who/what/how and why.
4. Working environment/perceptions/experiences: contextualized diffusion construct – investigates how and why individuals/groups within the organization react to the process and their understanding of the process, investigative focus on the how and why; and

Cultural Maturity: contextualized investigative construct, contextualizes previous stages to explore the maturing of culture, investigative focus the what/who/how and why.

CONTEXTUALIZATION: MODEL VALIDATION

The cultural maturity model (see figure 1, above) presents a theoretical based framework in which to explore how/why lean managed constructions organizations mature throughout and beyond the implementation process. It is evolutionary in nature and is guided by theoretical principles, namely the use of diffusion theory and the elements of time, communication and social system will assist in establishing the implementative processes associated with lean which are not commonly understood.

The presented cultural maturity model is only a preliminary representation of a way to understand the process associated with interpreting cultural maturity. The model needs

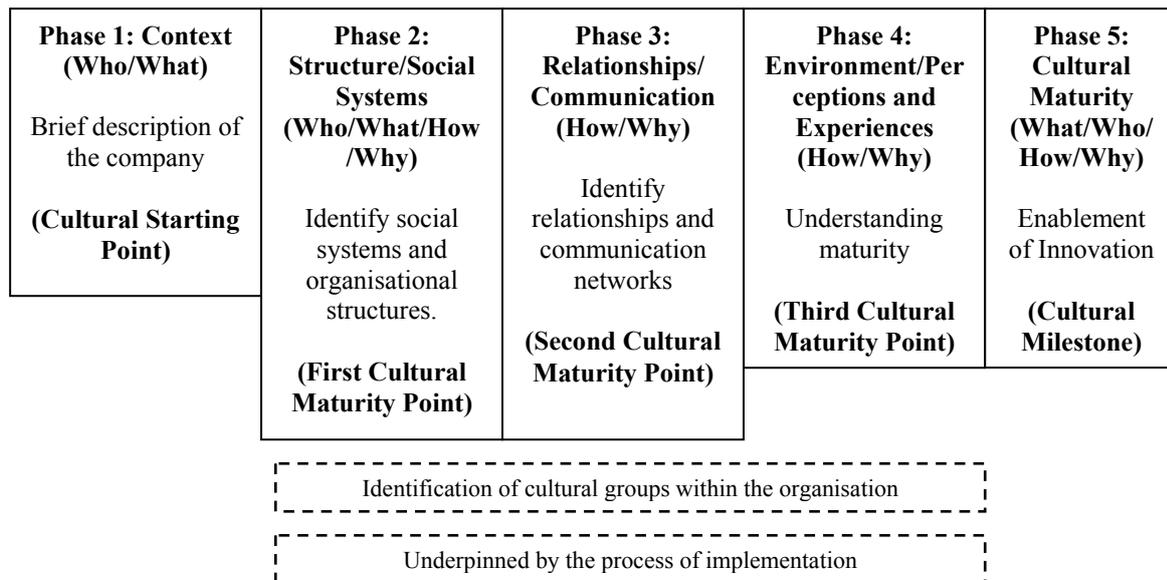


Figure 1: Investigative model – organizational cultural maturity

to be validated and tested against the collection of data, the data to be collected in terms of the research is focused towards all levels of lean managed construction and construction related organizations. The process of data collection sees individuals and individuals working within team environments asked a series of questions centred on the five elements forming the model (communication, organization, process, culture and management). Each interview will be analysed and tested against the model as a means to identify each journey and experiences of individuals, with these journeys/experiences to be correlated collectively to present the overall cultural maturing journey of the organization.

CONCLUSIONS

The paper has set out to explain and present a theoretically and evolutionary based investigative framework in which to explore, understand and diffuse cultural maturity in lean managed organizations. Characteristically, a lean managed organization is centred on an ideal of a maturing learning culture, which is influenced by elements of trust, collaboration, commitment and leadership. The purpose of the cultural maturity model is about understanding how and why the culture of organizations undergoing the lean implementation process reacts in particular and unique ways by exploring not only the present organizational culture constructs but also the attitudes of individuals and groups working within the organization. Viewing and interpreting lean implementation and lean managed organizations in line with cultural maturity will help in understanding how the process influences acceptance/rejection of innovation, why this acceptance/rejection occurs and the resulting maturity within the organization.

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