

CHANGE IN SOUTH AFRICA CONSTRUCTION: LESSONS FROM LEAN THINKING

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ABSTRACT

The philosophy that Lean construction teaches has produced changes in the construction process and methodology. The change is evident in people that form the major input in a project undertaking. As such, shedding traditional approach to work, especially craft construction requires a new way of thinking on the part of skilled and semi-skilled workers in construction. This change is necessary to reverse the ills in the industry.

Hence, change in South Africa is a must due to a number of performance related issues that have made media headlines in the form of fatalities and project time overrun, to mention a few. Thus, after the review of the related literature, this qualitative study examined 'how a lean thinking induced change in the mind-set of workers can be used to improve performance in South African construction.' The outcomes of the study show that most of the contractors lack a structured way to motivate their workers in terms of 'waste consciousness' that would change their approach to task execution. The culture and thinking of the workers thus is in need of rejuvenation in order for them to continually engage in refining their contributions to project goals. The South African construction industry should thus find ways to eliminate 'the wheels' of repeated mistakes that have hitherto engendered poor performance.

KEYWORDS

Construction, Change, Lean thinking, Motivation, South Africa

BACKGROUND

The democratic South Africa made a lot of changes in the running of a business. The construction sector is not excluded from this transformation. These changes have placed more pressure on the sector to improve its performance (CIDB, 2004). However, due to the people intensive nature of construction, transformation has been slow. One of the challenges is to develop people working in the sector to provide quality services to clients. The advocated change requires people to perform work correctly in the industry. The change is necessary as the South African construction is marginalised by a lack of proper skills, motivation, leadership and underperforming people, which fuel the wastes encountered in the sector (Emuze and Smallwood,

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2011). Such under performance engenders low productivity, rework, defects and profitability in the construction industry (Love et al., 2008). In this context, people refer to site management and general workers in the construction industry.

Given that lean construction emphasises the weeding away of wasteful activities through competence, motivation and other behavioural attributes (Alwi et al., 2002), this dilemma was examined through the lean philosophical approach. To take the study forward, a problem statement was formulated. The statement states that “resistance to change has marginalised transformations that would enhance business and project performance in South Africa construction.”

The problem statement was thereafter broken down to questions, which sought responses to the factors responsible for resistance to change, and how lean thinking could enhance the motivation of people in South African construction. In essence, the reported study explored how the lean philosophy can engender change with respect to people in South African construction.

AN OVERVIEW OF LEAN APPLICATION IN CONSTRUCTION

The lean construction philosophy views a project as a promise delivered by people working in a network of commitments. Smooth work flow is dependent on having the parties to a project keep promised that they made concerning the project. When waste is weeded out from a process, work flow becomes more predictable, performance increases and projects can be completed more rapidly (Lichtig, 2006). According to Forbes and Ahmed (2011), lean construction departs significantly from traditional project management practice since processes are actively controlled, and metrics are used in planning system performance to assure reliable workflow and predict project outcomes. With lean methods, performance is optimized at the project level, whereas current project management approaches reduce total performance by attempting to optimize each activity (Ballard and Howell, 2004).

Traditional construction approaches reward individual crew performance – crews may focus on their tasks to the detriment of other crews. In a lean approach, all involved disciplines are rewarded for completing major sections of the project. Lean construction has therefore complimented traditional construction management by producing successful capital projects in Brazil, Finland, Germany, and Singapore (Abdullah et al., 2009). The illustration that can be found in the work of Mossman (2009) clearly shows the noted benefits of lean construction application in some of the countries mentioned by Abdullah et al. (2009).

Based on the benefits indicated in Table 1 and many more that are not mentioned here, an increasing number of firms have implemented lean construction practices in an attempt to improve performance in construction projects (Alarcon and Calderon, 2003). Most companies, and also some researchers, have reported satisfactory results from this implementation. Fernandez-Solis et al. (2013) noted that benefits include increased work flow reliability, improved supply chain integration, reduced project delivery time, improved communication among project participants, fewer day-to-day problems, and improved quality of work, among others. According to Forbes and Ahmed (2011), lean thinking is a new way to manage construction because its principles and techniques have formed the basis for a new project delivery process. The flow attributes of lean processes facilitates waste reduction and value maximisation that should redefine the way people think about, and carry out

construction activities (Novak, 2012). This argument is not to say the implementation of the concept has not witness a bit of resistance in some countries. After all people will always resist change if they think it will cause them to lose something of value (Smit et al., 2011).

Table 1: Experienced benefits of lean construction

Benefits	Countries
Improved project delivery methods	Japan, UK, USA
Supporting the development of team work and transfer the responsibility on the supply chain	Finland, Japan, Korea, USA
Managing uncertainties in supply	Brazil, Finland, Japan, UK
Continuous improvement within projects	Germany, Singapore, UK
Efficient use of resources	Brazil
Delivery of products and services that enable clients goals to be met	Korea
Delivery of products and services on time and within budget	Finland, Germany, Singapore
Delivery of custom products instantly without waste	Brazil, Finland, UK
Reduction on direct cost and time in transportation and communication	Brazil, UK
Well informed business case design at all project level	USA
Improved quality control and minimisation of risks	Korea
Minimisation of conflicts that can dramatically change budget and schedule	Germany, Singapore, UK
Improved reliability, accountability, certainty and honesty within the project environment	Germany, Singapore, UK
Reduced owners design related request eliminate wastes	Portugal
Mitigation and reduction of project risk factors	Egypt

Sources: Mossman (2009); Martins and Cachadinha (2013: 1005); Issa (2013)

The resistance to change is a human response, and therefore management should take the necessary steps to counter it through education and communication; participation and involvement; facilitation and support, and negotiation and rewards (Smit et al., 2011). Thus, for lean to be successfully implemented, certain concepts must be applied to suit each organisational goal. These include:

- Awareness: Lean awareness and enlightenment campaigns are necessary to sensitize stakeholders within the construction industry of the opportunities and benefits of lean implementation within the industry. These campaigns can be handled by the collaborative efforts of lean construction experts within and outside a country (Suresh, Bashir, and Olomolaiye, 2012).
- Policy: Both the awareness and enlightenment programmes would have to align with each organisational policy for effectiveness. An organisational policy typically describes the principles that guide decisions, procedure and protocol within the organisation (Othman, 2011). The policy should establish why the organisation supports lean principles and tools, and the policy should also show how and what areas should be applied and in what projects (Simonsen and Koch, 2004; Othman, 2011).

- Training: The first step towards the effective implementation of lean construction process is training (Othman, 2011; BRE, 2011). Paton et al. (2008) noted that training is very important in the implementation of lean as it involves teaching stakeholders and practitioners of the lean tools and techniques available to them.
- Application: The implementation of lean techniques within organisations requires high level commitment and involvement of top management (Alarcon, and Seguel, 2002). Thus, its implementation calls for a high level of participation between clients and all the stakeholders in creating conditions and policies that would encourage and support its practical implementation. This can be achieved by engaging downstream players in upstream processes and / or vice versa (Howell, 2011)

Further, lean has driven efficiency through the deliberate consideration of material and information flow and value generation in a system (Abdelhamid et al., 2008; Womack and Jones, 1996). The focus on flow and value is not an easy shift in construction; however motivation and skills of people in the construction industry will ensure that performance is enhanced by introducing new principles that can be found in the philosophy of lean construction. More so, Morrey et al. (2013) contend that lean cannot be defined in isolation of context as it can be adapted to suit the needs of a business and its culture and objectives.

An article “Lean and the True Root of Motivation” (Bigelow, 2011) stated that the basic elements of motivation are challenge, achievement, recognition, responsibility and advancement. Each and every job should have challenges that develop and test the skills of the employee. If the employee demonstrates increasing levels of skills, he/she should be given additional responsibilities which would lead to advancement within the company. Lean thinking also utilizes performance metrics as a way of measuring continuous improvement. Lean thinking asks that you think differently about your business processes and use your employees to seize upon new opportunities to improve performance, and foster employee skills (Coleman, 2008).

METHODOLOGY

The setting of this study is the eastern region of the Free State province of South Africa. Participant of the study include construction businesses in the specified location. Fifteen (15) construction organisations were identified by utilising the online Register of Contractors in South Africa and the list of Engineering Council of South Africa members that are situated in Eastern Free State. All of the 15 firms agreed to take part in the study. The primary data were thus obtained by identifying qualifying construction firms and contacting them by e-mail and telephone. Interviews were requested and scheduled with applicable 15 representatives that were deemed to have relevant experience in the industry. In depth interviews were conducted, over a period of two weeks, at the offices of the participants. The interviewees were all part of the management structures of their respective construction firms. Interviews, generally, were between 30 and 40 minutes in duration and were all conducted in English. All interviews were tape recorded and transcribed accordingly.

The interview protocol comprised of three themes with four questions each. The themes are used to present the results in the next section. Each interviewee was asked about their experience and perception of the numerous themes of the study. Information with regard to lean thinking, performance levels, resistance to change, skills development and motivation form the main crux of the discussions. The education levels of the interviewees range from a diploma to an engineering degree, and construction industry experience ranges from four to thirty years. The job titles of the interviewees range from junior quantity surveyor to managing director. The interviewees were employed by five contracting firms and ten consultancies. The information, gathered during the interviews, was scrutinised by following Creswell's (2012: 193-194) approach to phenomenological analysis and representation of data. Thematic analysis was employed for the data analysis by identifying and analysing patterns within the qualitative data (Gray, 2014). Each theme was compiled after initial familiarisation with the data, generation of initial codes, searching for themes and review of identified themes (Gray, 2014). Thereafter the identified themes were defined and named. Transcripts were examined and significant statements were selected prior to the compilation of the findings that are presented in the next section of this paper.

OBSERVATIONS FROM THE INTERVIEWS

When the interviewees were requested to indicate whether their firms have implemented a 'lean thinking' strategy, it is notable that ten of them gave a negative response, while 5 of them were affirmative in their responses. This observation shows that awareness may be low among the interviewees and the specific region in South Africa. In other words, the findings suggest that the firms need to change processes to accommodate 'lean thinking' as a strategy. The perceptions of all of the interviewees relative to the phenomenon are herein presented thematically.

THEME 1: THE EFFECT OF LEAN CONSTRUCTION ON EMPLOYEE PERFORMANCE

Although an increase in performance due to technological investments can be measured in traditional accounting terms, the influence on individual employee productivity in most jobs is difficult to measure. The influence of human resources on productivity however can be measured in terms of what people do on the job. The majority of the interviewees indicate that proper performance management system is lacking in South African construction despite the view that the implementation of a strategy to enhance performance is critical to the industry. Interviewee 2 indicates that official strategy is seldom used by employers as most firms only, "try to eliminate mistakes that were made on past projects". This situation was also observed from the transcribed views of interviewee 3. The majority of the interviewees agreed that continuous improvement strategy is not implemented to advance performance in the construction industry. The construction industry in the region should thus implement a course of action, which will ensure continuous achievement of project targets. This includes all the activities leading to the identification of the objectives and plans of a firm and this is concerned with relating the resources of a firm to priorities in the larger construction environment. However, an interviewee noted that strategizing is important as firms are finding it increasingly necessary to change their approach to business because of emerging uncertainties in the environment.

The elimination of wastes in construction to enhance performance will still be a topic to be debated for a very long time as interviewee 1 indicated that there is a thin line between the elimination of waste and the de-motivation of people in South Africa construction. Lean construction and lean thinking is still a new concept as interviewee 6 said, “the question in South Africa today is: are we ready for such a change”? The interviewees are divided almost equally with regard to whether the elimination of waste will enhance performance in South Africa, where the need for jobs is high.

The majority of the interviewees agreed that improved morale and empowerment will enhance performance in the construction industry. Interviewee 1 argued that improved morale in the workplace and the fact that employees are empowered, will give a sense of ownership and self-esteem. These elements enhance performances in the workplace. Interviewee 13, a quantity surveyor, support the abovementioned argument by stating that, “certainly the higher the morale of employees, the higher the performance”. By empowering people in the workplace and giving them the authority to work and operate on their own, performance can be enhanced. Twelve out of the 15 interviewees indicated that empowerment of people and an increase in morale will enhance performance in South African construction.

THEME 2: THE FACTORS RESPONSIBLE FOR RESISTANCE TO CHANGE

People inherent aversion to change is caused by the uncertainty created by the possibility of losing a job. One interviewee perceive that lean construction is yet to overcome the notion that it is new buzz word, and as such, as an approach to change, which is driven by effectiveness and project performance, may create atmosphere of job insecurity among construction workers in South Africa. Interviewee 4 however argued that people who perform well will survive in the industry despite the need to change methods and procedures. Interviewee 11 supported the argument of interviewee 4 by saying “initially job losses will balance out through the supply and demand equation”. The majority of the interviewee’s indicated that job losses will occur initially, but those who perform well will be retained and the supply and demand for labour will balance out initial job losses

In addition, an interviewee indicates that no lean related training has been provided to him because the concept is relatively new in South Africa. Interviewee 6 argued that it is still too soon for lean to drive the desired change in South African construction. Rather, the interviewee opined that “the industry should come up with a strategy to train people, before implementing the philosophy”. All of the interviewees indicated that they have not undergone training for the application of lean thinking principles. In brief, almost all the participants were of the opinion that since the construction industry follows a systematic approach that links training to strategic business goals and objectives, lean construction driven change is only possible through consistent training in concepts and principles that lean construction advocates.

THEME 3: LEAN THINKING ENHANCES MOTIVATION AND SKILLS OF PEOPLE

Interviewee 5, a contractor, argued that money is not a motivator in the workplace in South Africa. This statement is complemented by interviewee 9 who stated that a reward system in an organisation only contribute to motivation until the employees needs are satisfied. The majority of the interviewees argued that a reward system may not necessarily motivate the people in an organisation. In order to motivate

employees therefore, firms should establish self-managed work teams to enhance motivation. Interviewee 8, a consultant with twenty years of industry experience, state that self-managed work teams should be established to set teams on the growth path. This has a motivating effect on the employees in an organisation.

Interviewee 15 argued that teams are formed to give employees an opportunity to express themselves by taking responsibilities for their work outputs. These increase motivations as employees see themselves as part of the organisation. The majority of the interviewees indicate that self-managed work teams are formed to enhance motivation, although the size of a firm might make the establishment of effective self-managed work team an uphill task. It is the overall view of the interviewees that lean thinking is still a new concept in the South African construction context, and as such, training is a prerequisite for its proliferation and eventual change capabilities. Essentially, the interviewees in the study were of the opinion that there is a lack of a visible strategy to implement lean thinking as a concept that could improve the morale and skills of construction workers in South Africa.

DISCUSSION

This study reveals that lean thinking could enhance motivation and skills in the construction industry. Lean thinking does this by looking at motivation factors. For these reasons, there is a need to increase lean construction awareness in South Africa construction. The increased awareness should influence the recognition of the need for the elimination of wasteful activities and the elevation of this need into the corporate cum business strategy of construction enterprises in South Africa. Once the reduction or elimination of non-value adding activities becomes a strategic goal in an enterprise, it should be relatively easy for lean construction training and education to proliferate in the industry. The advent and use of the outcomes of the trainings by site management and construction workers should start a change initiative that would enhance the performance of firms and the industry in South Africa. An illustration of the proposed analogy is indicated in Figure 1. Figure 1 suggests that concepts rooted in awareness, need recognition, business strategy, training and education have the potential to effect changes in work methods and decision processes for the good of organisational goal attainment.

From the findings of the study, it can be concluded that there is a need for a relevant strategy to enhance performance and motivation levels of construction workers in South Africa. And based on the reviewed literature, the lean construction philosophy would be an appropriate philosophy to influence such a strategy.

A process with the correct objectives and a cultural change together with a renewed focus on internal relationships 'within and between' firms (Perera et al., 2011) appears to be the way forward in South Africa. There is an evident need to change the mind-set of people in construction before a lean driven transformation can take root in the sector. Similar to Australia, lean adaptations in the construction industry lag that of the countries mention by Mossman (2009). According to Perera et al. (2011), most construction workers are yet to accept the need for a change since the current level of wastes is seen as normal in the industry. In addition, construction workers need to be convinced about the utility of the tools and techniques of lean in the industry. The different levels of lean awareness within the structure of the industry as is the case in Australia (Chesworth et al., 2011) have to be addressed in

the case of South Africa. While the smaller firms in Australia appear to have expected awareness, this is not the case in South Africa based on the observations of this study.

CONCLUSIONS

The introduction and implementation of lean principles has had an incontrovertible effect on the construction industry on the global scale. The literature shows that it affects every fragment of the sector by enhancing workflow and the performance of people in construction. The behavioural change of people in construction through lean thinking weeds out wastes and improves productivity in the workplace. For instance, the concept allows the establishment of self-managed work teams that would set high standards to meet organisational objectives.

However, this exploratory South Africa study shows that lean is yet to make enough in-roads that would lead to changes in the construction sector. Factors responsible for the status quo were observed in the study. It is apparent that construction workers that are used to the dated craft construction / ways of construction production would resist the change because of perceived job losses that accompany efficiency driven initiatives. The interviewees that took part in the study mention that trust and misunderstanding will cause resistance to change when workers are not fully in agreement with the purpose for change. In other words, the interviewees contend that people tend to resist change because they fear they will not be able to develop the new competencies necessary to perform future activities well. As a result of these perceptions, the proposed framework in Figure 1 should be explored to ameliorate the situation in South Africa.

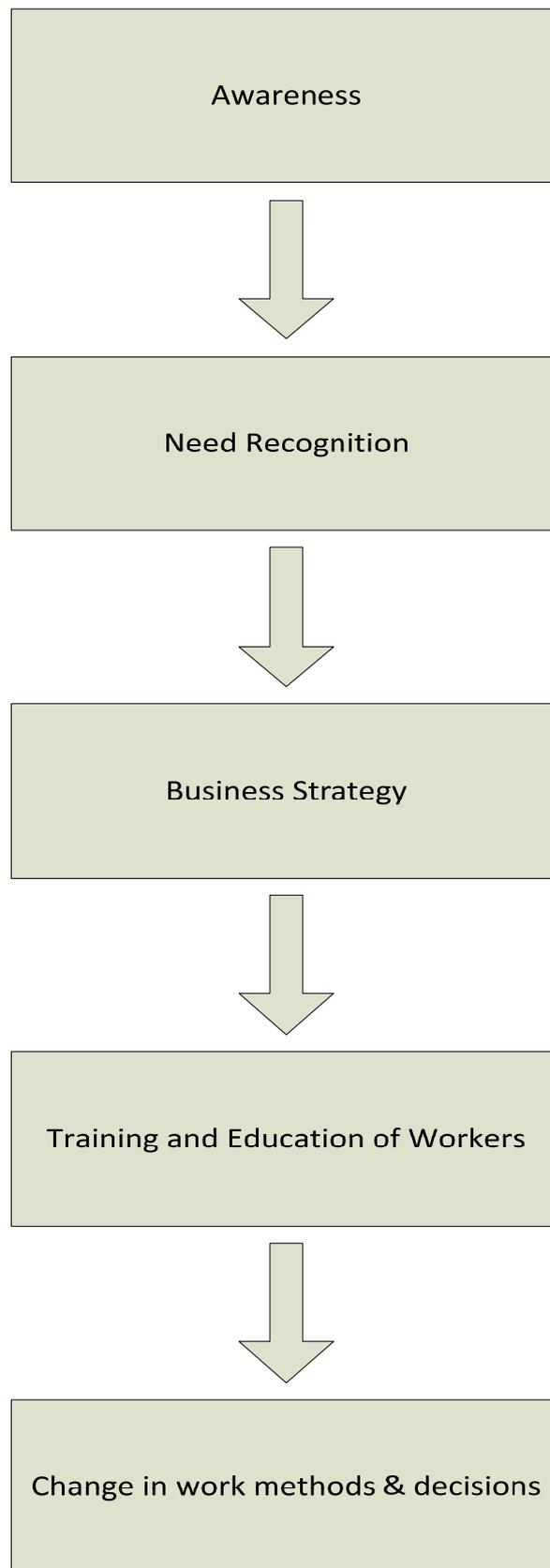


Figure 1: Pathway for lean thinking driven change in South African construction

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