

IMPLEMENTING STANDARDISATION IN MEDIUM-SIZED CONSTRUCTION FIRMS: FACILITATING SITE MANAGERS' FEELING OF FREEDOM THROUGH A BOTTOM-UP APPROACH

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ABSTRACT

Construction projects are often referred to as unique and construction processes often described as inefficient. The amount of waste in projects is claimed to be in the range of 10-80% depending on the definitions of waste and the methods used to study them. There is a general understanding that the proclaimed uniqueness of construction projects is a reason for the claimed inefficiency and it is suggested that the processes in construction should be more standardised to increase the efficiency and reduce waste in accordance with the lean principles.

Another characteristic of construction projects is that site managers are usually given the authority to run a project as if it were their own firm, effectively running a company within a company. They value the freedom to run projects their own way and to develop ways of working with which they are comfortable and do not always consider their colleagues' experiences.

Construction firms must accordingly struggle with finding efficient ways to standardise in order to avoid the perception of dealing with unique projects while simultaneously retaining what makes the organisation special and provides them with a competitive edge. This can result in construction firms implementing modern management principles that site managers are expected to accept without considering their need for individuality.

This paper discusses the challenges faced by construction firms' need for standardised activities and processes to reduce waste and increase efficiency, while simultaneously emancipating site managers so that they continue to find freedom, value and motivation in their work.

Based on interviews with eight site managers in three medium-sized Swedish construction firms, the indications are that processes should be developed slowly with a bottom-up approach.

KEY WORDS

Lean principles, standardisation, construction projects, management, processes, freedom.

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INTRODUCTION

It is generally accepted that construction projects include uncertainty that is not only related to the product but also to the processes and the organisational structure. The number of specialists, customer-supplier relations, components not fitting each other, new regulations, variable weather conditions, and ambiguous views and values of top management are only a few of the uncertainties that site managers have to manage during projects. These uncertainties lead to variations in project processes and ultimately reduced customer value and satisfaction (Santos et al., 2002). One strategy for increasing customer value and satisfaction in construction projects is to reduce the uncertainty and increase the reliability and continuity of the construction process (Gadde and Håkansson, 2001; Samuelsson, 2006).

To increase reliability it has been suggested that greater standardisation of products, processes, and project organisation is required (Santos et al., 2002; Josephson and Samuelsson, 2009). Site managers, who view increased standardisation as a further erosion of their freedom to run projects their own way, however often perceive standardisation negatively. They consider that the construction process is already sufficiently standardised by having designated roles for project personnel, standard forms of contract, governmental rules and regulations, standard procurement methods, and, to some extent, standard work processes.

When implementing lean principles in construction organisations it is important to balance standardisation of activities with site managers' motivation. In order to increase the understanding of what processes should be standardised without negatively influencing the site manager's feelings of individually choosing how to manage projects, interviews were conducted with site managers in three Swedish construction companies based in the Gothenburg area. Companies with a turnover between SEK 200 and 600 million were chosen based on their interest in the subject.

The purpose of this paper is to discuss the need for firms to balance the call for standardisation of activities and processes to reduce waste and increase efficiency, while simultaneously considering site managers' desire for freedom to find value and motivation in their work. For the purposes of this paper, standardisation is considered to be the structured planning and operational sequence of activities that have been learnt from experience as being the most effective processes for reducing waste and increasing customer value.

CHARACTERISTICS OF CONSTRUCTION PROJECTS

A construction project is a temporary organisation comprising different contractors and subcontractors, which aims to accomplish specific tasks, such as the production of houses, industrial buildings, highways, or office block, in order to fulfil a need. During a construction project it is common for the project organisation to change with many of the organisations involved at the beginning of the project not participating all the way to the end. Different firms within the project have different fields of expertise, relevant at various stages of the project life cycle. According to Dubois and Gadde (2002), a construction firm's prevailing organisational interdependencies are a result of needing only a few areas of expertise at any given time.

The reliance upon suppliers in construction projects has made construction firms dependent on the resources of other organisations. There are often many different subcontractors with different or similar skills, working simultaneously on a project.

This suggests that operations on the supplier's side have a greater effect on contractor's organisational costs than the actual price paid to the suppliers (Gadde and Håkansson, 2001).

Site managers are often individually in charge of construction projects and run them as if they were their own firms. Since they have different backgrounds and experiences, site managers manage projects differently. This lack of standardised approaches to similar projects may cause confusion among workers and subcontractors and thus increase waste (Womack and Jones, 2003; Liker, 2004). What might be acceptable for a subcontractor or worker to do on one project might be unacceptable in another. This differentiation hinders both 'know-how' and 'know-why' (Knauseder, 2007) and underlines the effect that site managers can have on the final product and hence their impact on value for the customer. Josephson (1994) suggested that this differentiation could hinder development of standardised processes in the construction industry.

Information flow throughout the organisation as part of knowledge building is an important subject that is also related to lean principles (Liker, 2004). To increase knowledge within organisations, standardised methods of problem solving should be created (Nonaka et al, 1998). However, individualism and 'own firm' thinking together with the presumption of uniqueness built into contemporary construction projects does not encourage information flow (Santos et al., 2002; Knauseder, 2007).

Shorter time spans for projects and new technical solutions have increased the complexity of construction projects (Gadde and Håkansson, 2001). As projects become more complex, the traditional focus on optimisation of single transactions in projects where cost and price, not value, are the major means of measuring success must change (Dubois and Gadde, 2000; Samuelsson, 2006; Knauseder, 2007; Simu, 2009).

STANDARDISATION

The lack of standardisation can be viewed as one of the reasons for the inefficiency of the construction sector (Santos et al., 2002). Womack and Jones (2003) suggested that standardisation of processes can be a means of reducing costs and saving time. Santos et al. (2002) suggested that standardisation should be viewed as an approach aimed at waste reduction by the critical disentanglement of processes to reduce their variability. Ungan (2006) maintained that reduced process variability also contributes to decreased uncertainty in complex construction projects. Information flow can be increased by using processes as instruments to encourage homogeneous practices through knowledge sharing regarding the end product and new, more efficient ways of controlling processes within the project can be performed regarding both quality and safety (Santos et al., 2002). It is further suggested that by introducing increased standardisation in construction projects root causes of production problems can be identified and routines can be established that lead to more consistent operations, increased efficiency and hence easier process control for site managers (Ungan, 2006).

It is however important not to neglect the literature that expresses scepticism of increased standardisation in construction. It is often suggested that standardisation hinders or prevents innovative influences (Kondo, 2000; Gudmundsson, 2004). Increased standardisation of processes on construction projects may reduce the feeling of freedom that site managers appreciate.

The definition of standardisation and especially standardisation of processes is not viewed as forcing individuals to standardise exact actions, routines or wear cloths in specific sizes. Some room for variations in basic processes is identified as essential to allow individual differences. Josephson (1994) suggested that two working processes never can be performed in exactly the same way and that this automatically leads to different results. However, the value for the costumer should be in the idea that the quality of a project will be independent of the site manager, subcontractors or suppliers active in the project or process.

Although good relations between the main contractor and subcontractors is especially important in construction projects, long time collaborations between contractors, suppliers and subcontractors are rare (Knauseder, 2007). This can be related to the traditional heavy focus on price in the construction industry. Womack and Jones (2003) and Liker (2004) argued that firms have to realise the potential advantages of closer collaboration, and claimed that reducing indirect costs by standardising processes and products often requires stronger and longer cooperation with a few chosen suppliers and subcontractors. It is also important that the whole construction process be the main focus for all participants in a construction project and that the interests of individual subcontractors trying to maximise their short-term profits should be secondary to this focus. This can be exemplified by the sub-optimisation of subcontractors by site managers when scheduling project activities as continuous work in the planning charts and not specifying the dates that subcontractor services are really required.

STRUCTURE OF THE INTERVIEWS

The interviews were conducted with employees at the level of production manager within three firms. The respondents were site managers in medium sized Swedish construction companies based in Gothenburg. The interviews were explorative and semi-structured with a phenomenographic approach of a qualitative nature in accordance with Holme and Solvang (1997); Yin (2003); Chen and Partington (2006) and Åkerlind (2005). A phenomenographical approach is beneficial when the perspectives on specific phenomenon are sought from individuals in a certain area. The interviews were open-ended and based on principal and follow-up questions to encourage interviewees to further articulate their thoughts on the subject. The aim was to conduct each interview within a time-span of two hours, however in the event they varied from 100 to 130 minutes. The qualitative phenomenographic approach was undertaken to make sure that the interviewers affected the interviewees as little as possible and to get a holistic view of the phenomenon (Holme and Solvang, 1997; Åkerling, 2005). The focus of the interviews was on the respondents' perspective and understanding of the phenomenon of standardisation and their perception of the related issues surrounding it, rather than limiting answers to them interviewers understanding of how standardisation can be used in construction projects. According to Åkerlind (2005) this is important in the phenomenographical approach since the goal is to gather categories of descriptions to differentiate between empirically interpreted views from the hypothetical experiences of the interviewees.

In order to get as much information from the interviews as possible they were all recorded. At least two interviewers were present during the interviews and all took notes during and after the interviews. Directly after the interviews, the interviewers discussed their thoughts and ideas amongst themselves.

During the interviews, interviewers deliberately avoided using the words 'standardisation' and 'lean' as much as possible in order not to subconsciously create biased answers from the interviewees, although a few respondents used the terms of their own volition.

Data analysis was undertaken using a non-hypothetical explorative approach emphasising the respondents' perceived understanding of phenomenon regarding standardisation in construction. This approach is viewed as effective if individual views are of interest in accordance with the reasoning of Yin, 1994 and Silverman, 2004. The process of analysing the data was highly iterative, and there was acceptance of new aspects and viewpoints throughout the writing-up process. Different focuses and perspectives were utilised to maintain a holistic approach to the different perspectives on standardisation presented during the interviews.

RESEARCH FINDINGS

The interviews produced a number of issues relating to standardisation, the four most common of which are discussed below.

The perceived uniqueness of the construction projects: It was apparent from the interviews that neither the concept of lean construction nor the concept of standardisation has been particularly well received at the site manager level. Respondents who used these terms expressed suspicion of them, which was explained by the uniqueness of the projects and the unique characteristics of the industry. One site manager stated "*If you only have one try at a product, old tried out methods are to be preferred.*" All respondents claimed that projects are generally planned, organised and performed differently and much depends on the site manager's individual thinking of how the project should be managed. Consequently, it was perceived that site managers had different ways of working, since every project is considered unique.

No demand for standardised processes was expressed by any of the interviewees and the different approaches of site managers were neither viewed as an area that required improvement or change. Rather, individual methods were considered to be beneficial when dealing with different people, subcontractors and types of project. In spite of this view, all three firms have implemented a number of solutions related to the product, the process and the organisation that to some extent increased standardisation.

Two of the organisations have created suggestions for standardised project processes including organisation of the site and form filling procedures. According to the interviewees, these suggestions have not been seen as means of getting site managers to work in a more standardised manner but rather to make the sites look more organised, often in order to create a favourable impression to clients. Furthermore, the suggestions are perceived as tools or guidelines to ease the burden on site managers, which according to the literature is a significant part of the standardisation concept and lean principles.

As an example of product standardisation, one site manager explained that he was working with fewer product choices in his current project since the types of inner walls he could choose from had been reduced from eight to three. "*I get an architect's drawing with a list of wall types and soundproofing then I try to arrange them into as few a groups as possible. Everyone benefits from this, because it is less messy.*" He

further claimed that even if some of the walls get a little bit more soundproofing than specified, which implies more expensive, it minimizes the risk of human errors. He said: *“Setting out the different walls is one thing, but we are not more than humans. When working on the site with music in the ears, the risk that it is going to go wrong is far less when there are fewer wall types.”*

Some examples of implemented standardisation are a standard arrangement for materials storage on site, and a standard document detailing the stages of the project at which papers need to be signed and to whom they should be sent. If dividing the projects into individual project processes, the processes themselves are not viewed as unique by the interviewees. Even when site managers discover effective methods to perform certain processes, the perceived uniqueness of the industry and of each project does not encourage them to share their experiences.

The short-term focus on profitability: A majority of the respondents mentioned consequences of having a short-term perspective. They claimed that *“the bottom line is the only thing that matters for top management”* when referring to financial issues. It was also claimed that no attention was given to projects that delivered *“black numbers”* (those projects that make a profit). The only question asked from top managers was *“what went wrong”* never *“what went right.”* The prevailing culture in construction was described as not giving a pat on the shoulder or words of encouragement when everything goes according to plan or exceeds expectations, but blaming individuals for faulty decisions if red numbers appear on the balance sheet. This short-term focus suggests that touchable costs, such as the price of gypsum board, are focused upon to save money for the projects instead of focusing on untouchable costs, such as wasted resources on contractual agreements, to save money for the entire organisation. This could be one reason why there is so little collaboration between contractors and suppliers, even though the lean literature suggests that collaboration between organisations can reduce organisational costs and imply long-term benefits, collaboration between organisations is suggested as a way to reduce the waste of resources and thus reduce costs.

Personal preferences versus organisational guidelines: Although there was awareness amongst respondents of organisational strategies, goals and visions, the idea of what they actually mean in a practical sense varied. The interviewees saw them as either voluntary guidelines or as mandatory procedures. These differences are exemplified by supplier agreements that all three of the contractors that the respondents worked for had signed with specific suppliers but that not all the site managers chose to honour. The site managers considered it more convenient to use the closest located supplier, the one who *they* perceived delivered the best service, or simply the one that they used before the agreement with the new supplier was signed. One of the respondents told how surprised he was when he came to his current site with the ambition to follow the management’s guidelines only to be told that no one followed them. *“The only ones using the new agreement are the ones who used the supplier prior to the agreement being signed”* he stated and opined that this is an issue for the management to handle. *“In my opinion the management is too weak, they surrender,”* he concluded.

The respondents discussed the possible effects of neglecting management’s guidelines. As one of the major concerns, trust from the suppliers was mentioned: *“Not following the agreements will kick back on us when we eventually decide to*

follow the agreements. Then, the suppliers will not give us any benefits at all since they know that we are not using agreements anyway."

The failure of existing feedback systems: When discussing communication and feedback most respondents admitted knowing about the various formal systems of knowledge transfer that existed in their firm. These formal systems were, however, generally viewed as too difficult or too time consuming to be useful. In this respect, the awareness and ease of access to other site managers' previous experiences was viewed as beneficial among the interviewees. Another reaction to formal systems of knowledge transfer within firms was that they are unnecessary since the firm deals with unique projects and therefore knowledge transfer between projects is not value adding.

DISCUSSION AND CONCLUSION

Learning is one of the key focuses from a lean construction perspective as it can help to discover standardisations that do not challenge site managers' need for freedom to run projects their own way. For information interchange to be successfully implemented and assessed in organisations, it is imperative that site managers accept and use it. The competition built into the site manager's role as described by Simu (2009), with a culture of hiding experiences instead of sharing them, is unhelpful in this aspect. Even though rivalry between site managers was not one of the issues raised by the interviewees, the interviewers noticed a certain feeling of competition. As an example, one of the interviewees suggested that it would be interesting to compare site managers' performance to see how big the differences actually are. This indicates a desire to show top management that there are differences between individual site managers.

The blame for an unprofitable project is usually transferred down to the responsible site manager who then needs to defend his/her decisions to the top management and to other project managers (Simu, 2009); some might argue that this blame culture is due to the uniqueness of the industry.

If rivalry and not learning is encouraged by the organisation culture, finding the most beneficial standardisations is close to impossible. Furthermore, Womack and Jones (2003) and Liker (2004) suggested that if workers are not encouraged to express their opinion over improvements to work processes it will be difficult to find better ways of working.

Liker (2004) stated that different ways of undertaking projects need to be reviewed to find the most efficient way to achieve results. As explained earlier, site managers tend to do things their way not always considering the rules decided by top management. This behaviour has also been identified by Santos et al. (2002) who claimed that construction companies often fail to implement and maintain standardised practises due to a lack of teamwork between top management and site management. The requirements regarding freedom presented in the interviews can be seen as another example of how different organisational cultures encourage project teams to work. Opinions over collaboration between production management and top management vary from claims of a lack of governance from top management to too much governance. However, it was clearly implied by the respondents that top management should only get involved when issues are referred to them by the site manager.

The prevailing culture of today encourages site managers to do things ever faster in traditional ways since top management is satisfied as long as every project makes a profit. However, Womack and Jones (2003) argued that instead of speeding up existing processes, the parts of those processes that do not add value for the customer should be reduced or illuminated, or better still more beneficial alternative processes should be found. Nevertheless, since a preferable way of implementing standardisations into organisations is by letting site managers choose and try different methods to solve similar problems, the short-term gain culture is inhibiting alternative processes from evolving.

Even though the perceived uniqueness as well as the short-term gain culture is inhibiting major standardisations, examples in this paper have shown that contractors have implemented several concepts of standardisation, which do not in any way decrease the site managers' feeling of freedom. However, these implementations are not seen as standardisations as such by the respondents. This is perhaps a sign that the concept of standardisation is what makes site managers hesitant more than actual implementation of the concept. Furthermore, the site managers in the three medium-sized Swedish construction companies have clearly shown that they are not averse to changes, as long as they have evolved from their own experiences or they are clearly relevant to issues with which they are concerned. Consequently, in order to deal with the challenges posed by the need for standardisation and site managers' need for freedom, standardisation of processes should be developed slowly with a bottom-up approach.

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