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Formed in 2006, Modubuild specialises in the delivery of internal modular fit-out and high-tech modular off-site buildings. With significant year-on-year growth, the company has focused its business model towards high-tech manufacturing, Biopharma, Pharmaceutical, and data centres.

Headquartered in Kilkenny, the company operates on an international basis with offices in Manchester, Brussels, Amsterdam, and Helsinki. With Lean thinking central to the company's operations, Modubuild has constantly evolved and applied CI and VSM to its operations. Working a hybrid model of directly employed and seconded labour personnel, Modubuild employs close to 300 staff across all regions.

Author

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Overview & Background to the Lean Initiative

This organisational improvement initiative, using Lean thinking and practices, was carried out as part of the author's action research dissertation on the Waterford Institute of Technology (WIT) Executive MBA programme, and supervised by WIT's Darrin Taylor (LCi Capability Development Lead).

The Lean initiative focused on the improvement of the Tendering Process within Modubuild. The CI culture within Modubuild sees new systems and processes developed by the company to facilitate and improve company functions. It was recognised by senior management and acknowledged by department members that the tendering process had not evolved with the companys growth and it therefore required examination and improvement.

An obvious concern for the company was the use of Quantity Surveyors (QS) within the tendering stage because the assignment of QS personnel to the tendering process removed them from value-adding in the areas where they offer optimal value, namely, project commercial management.

A time impact analysis (TIA) of the QS team identified that some QS personnel were spending up to 80% of their working week within the tendering function, thus reducing their optimal value-add to project commercial management. Process mapping and reviews identified various wasteful activities and needless reworks within the tender process. Furthermore, increased client-driven tender deliverables required increased user input. These factors led to extended tender preparations that resulted in frequent tethering on the edge of submission deadlines.

Review of the pertinent data saw the company completely remove the QS from the tendering function. This saw the company create a newly formed and dedicated tendering team. In the creation of the new team, it was vital that personnel understood their role and responsibilities. The department lead worked to ensure that workload was delegated to personnel with the requisite skillset to enable optimal value-add to the process. The new tendering team was resourced from several existing employees plus some new recruits.

Lean Initiative Undertaken – Lean Thinking, Tools, Techniques

The team implemented Lean thinking and practices throughout the initiative. Firstly, the author, as process owner, needed to make considerations that the tendering team would consist of some existing employees and some new starts. Therefore, the change improvement process required some personnel to alter their work methods and new members to understand the existing process, but to be aware that the process would ultimately change.

To ensure that both new and existing personnel were content and understood the improvement process, it was essential for an appropriate change model to be adopted. Research into change models yielded some successful outcomes; however the use of Kotter's change model was chosen over other models as it allowed greater flexibility throughout the process for alterations to the change action and it is aligned with Lean philosophy, and people, empowerment, collaboration, and small wins are integral to both.

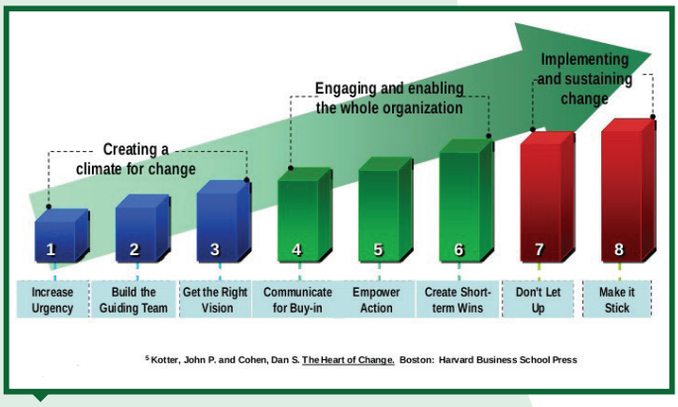

Figure 1. Kotter's Change Model

The success of the initiative hinged on the development of accurate data and not on inference, personal sentiment, or bias. Furthermore, it was essential that the data collection methods reflected the needs of the improvement process. The current state analysis allowed the team to create an illustration of the current state and formed a foundation for the entire intervention. Cognisant of the mapping session and its importance in shaping the direction and success of the intervention, it was important for everyone to discard any prejudgements or bias. Furthermore, it was important to remove any perception of Senior Management bias that might have been interpreted by team members.

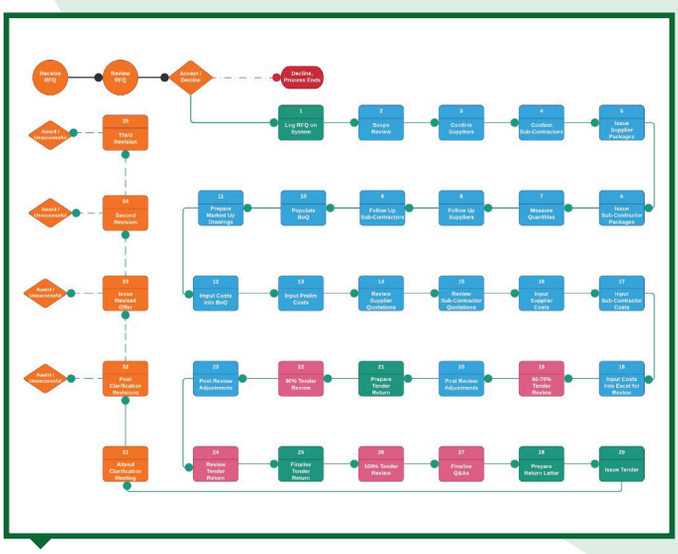

Figure 2. (Then) Current State Map

Consistent with the core Lean tenet of gemba, everyone was involved and had a voice in the mapping process. It was essential for culture and for a successful implementation that every team member felt part of the improvement and that they formed a fundamental part of the process mapping activities. In its totality, the then current state tendering process involved 33 high-level steps and approximately 150 sub-steps. From this, a workload analysis was developed to provide an understanding of which person took ownership of specific tasks. This identified that a disproportionate volume of workload – 53% – was being carried out by a commercial estimator (previously QS), whilst the workload allocated to others was substantially less. Furthermore, the commercial estimator had responsibility for completing 82% of the 150 sub-tasks.

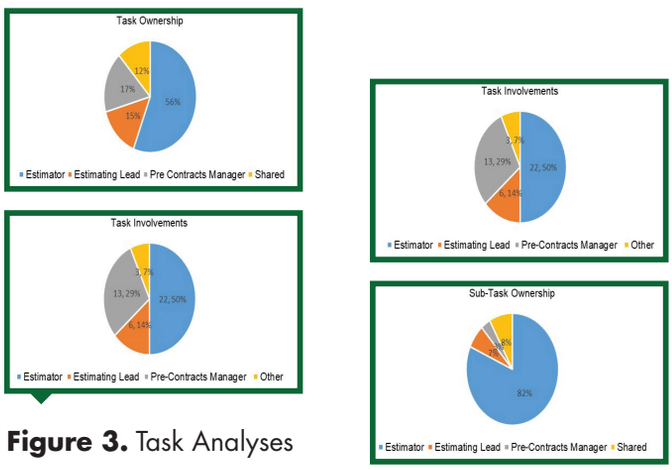

Figure 3. Task Analyses

The next part of the intervention was to carry out a Waste & Why analysis of the tendering process using the 8-Waste categories of TIMWOODS. Using the process map, 25 wastes across multiple tasks and sub-tasks were identified, three of which were identified as NVA and which were completely removed from the process, and one step was identified as NNVA – a form of duplication – and this was subsequently removed.

Additionally, a skills analysis was performed which offered helpful insight into the extant skills within the team. This enabled the process owner to develop a detailed understanding of the team, and how to more efficiently allocate task ownership to personnel who offered greatest value-add to the process. Furthermore, the skills analysis provided important data around areas where the gaps lay within and offered areas for upskilling and empowering of personnel with new tools and knowledge.

The data obtained from the process mapping session highlighted the need for end-to-end improvements of the tendering process. The data collection and diagnostic stage of the intervention offered concerning metrics and evidence that the existing delegation model was outdated and inefficient. Maintaining compliance with Lean philosophy, the process owner ensured the team were central players in development of the overall solution.

In order to ensure the team understood the need for, and supported, the change, it was imperative for the process owner to convey the benefits of the intervention and how it would have a positive impact on each individual. Any resistance to change was temporary, and, by presenting the actual data to them, it encouraged personnel to support the improvement process. This was a critical stage in the context of the change model – particularly in the transition from steps 1 through 3 (creating a climate for change) and

on through steps 4 to 6 (engagement and enablement).

The climate for change was created through the acceptance of the issue, and user engagement was at the forefront through the data collection stage. This made steps 1 to 3 quite simple to complete; however, to ensure momentum through steps 4 to 6, it was key to maintain user input and collaboration.

In designing a suitable delegation model, the team chose to work with the RACI form of delegation. The RACI matrix offers delegation of task ownership and responsibility using four criteria: i) Responsible; ii) Accountable; iii) Consulted; and iv) Informed. This model allowed full traceability through the tender life cycle. Furthermore, if awarded the project, it allowed the construction management team to know the relevant person to contact with queries about the tender, which subsequently led to more efficient communication and information transfer.

Figure 4. RACI Matrix – Roles & Responsibilities

Delegation of workload to personnel with the requisite skills was the basis of the improvement. In doing so, it was crucial to understand the skills of the team and the positions of those involved. Understanding these parameters enabled the matrix to be soundly populated in an efficient manner.

The skills of each team member were apparent from the skills and knowledge analysis. This made it somewhat simpler to allocate tasks to those who added greatest value in terms of know-how and the skills required to execute the specific task.

Positive delegation shares some common traits with the Lean principles that formed a steadfast element of the intervention. This was particularly so around empowerment and using delegation to determine a classification for delegation and priorities within a process.

Furthermore, in the delegation of workload and drawing from the Katz Management Skills Matrix and Maslow's Hierarchy of Needs, the process owner ensured that the delegation phase took cognisance of position and the needs of each person. It was imperative for task accountability not to exceed a person's position, and, in balancing this, it was critical for morale that the needs of each person were considered.

Lean Initiative Improvements & Impact

The expected outcomes of the intervention were the design of a template to provide role clarity, reduction in the workload of the commercial estimator by delegating certain tasks to others; review of the existing process; and reallocation of workload to team members. In line with these objectives, the expected impact was achieved. The success of these objectives resulted in improved efficiency throughout the department.

The process map provided the data pertinent to the subsequent analysis. The post-intervention process map offered essential data that has enabled successful delegation. Moreover, the initial process map allowed for a detailed waste and why analysis, as well as skills and knowledge analysis.

Initial review of the process map identified 35 steps. The first round of NVA analysis resulted in the removal of four NVA steps, with one step being identified as a duplication. A second analysis carried out by all department personnel saw the removal of a further five steps. Additionally, some steps were re-positioned as sub-tasks. The outcome of this analysis provided a streamlined process map containing 20 steps. This represented a total reduction of 12 steps and a removal of 35 per cent of the prior process.

The implementation of the RACI matrix has proven to be very successful. While this intervention is underpinned by Lean principles, the efficient delegation of workload through the RACI template has further enabled personnel to better understand their position and role. Furthermore, it has removed role ambiguity and improved work and communication flow. Additionally, tenders are completed on schedule.

For Lean to be successful, it is important that employees feel valued, and, throughout the intervention, the voice of the internal customer (employees) has been at the forefront of key decisions. The completion of the RACI matrix was no different. During the delegation phase, the whole team discussed and were responsible for delegation of task ownership. The employees involved understood the need for efficient delegation and the purpose to remove certain tasks from the process.

In all, there are now 20 steps to the process containing 30 key tasks that are central to tender completion. These tasks are, for the most part, allocated and accountable to personnel within the department and there is a wider input from other department leads who are consulted and informed regarding certain decisions.

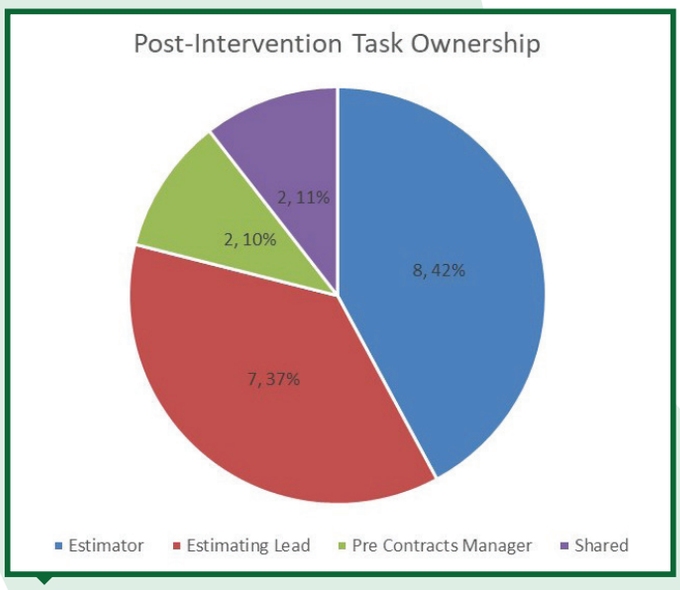

Figure 5. Post-Intervention Task Analysis

There have been various unexpected impacts during this action research project (ARP). The success in delivering the expected impacts brought much satisfaction to the process owner and team; however, it has been the unexpected impacts that have had the greatest effect on the company. These impacts have been apparent at the gemba, through the people who are directly involved and visible through the improved department performance. Additionally, from a financial perspective, the impacts have been considerable to the business.

An example of an unexpected impact was the identification of reduced project commercial management. This finding has enabled the recruitment of a dedicated tendering team. In further developments, it has been agreed by senior management that the new tendering department has been a success. The improved work and communication flow coupled with role clarity has ensured personnel are working efficiently and effectively. Flow is streamlined, with a specific owner who has responsibility or accountability of the allocated task. The dual function of the QS and time allocation towards tendering caused concern. Using the pertinent data, the QS was completely removed from tendering. This enabled the QS to focus on project commercial management, ensuring the projects are run on budget and protect profit margin.

It is no coincidence that removing the QS from the tendering function coincided with improved project financial prudency and resulted in improved project financial reporting and performance.

The practical impact of the improvement has been the introduction of workload delegation through the RACI matrix to inform personnel of their responsibilities. The implementation of a standardised format for delegation has resulted in improved efficiencies across the tendering process. The core objective from the outset was to reduce the NVA tasks that were being carried out by the commercial estimator and to delegate ownership of these tasks to personnel who added most value. Additionally, the intervention has enabled CI and for the complete removal of various wastes.

It is difficult to measure whether the intervention has enabled faster completion of tenders. It certainly has created a work environment with improved information flow, timeline awareness, reduced role confusion, less ambiguity, and simplified decision-making. Furthermore, workload allocation is now spread efficiently across the team, with tasks delegated to personnel who bring greatest value add. Critically the intervention has enabled the creation of a fit-for-purpose delegation model and allowed for a detailed process review. These alterations to the SOP, coupled with efficient delegation of tasks, has allowed personnel to apply greater attention to their work and subsequently allowed for improved due-diligence, consistency, and quality, with reduced errors and rework.

Prior to the intervention, revisions were not measured and were accepted as part of the job. Since carrying out the waste and why analysis, personnel have been acutely aware of the need to remove or at least reduce reworks. The large volume of rework was primarily a result of defective or insufficient information being received from the client and the quotation proceeding with a list of assumptions and qualifications. Subsequently, the client raised queries and requested clarifications which resulted in a tender being revised. Following detailed review of tender packages, personnel are now empowered to raise RFIs from clients. Prior to this improvement, personnel did not believe that they had the responsibility nor the authority to issue queries to clients – they believed this was a task only to be carried out by the PCM.

This intervention was completed in May 2020, and the Modubuild CI journey continues based on its impact and learnings which have enabled the wider organisational development of an enthusiastic team of proactive problem solvers seeking enhanced value both internally as well as for our partners and clients.

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