COMPANY OVERVIEW

Roadbridge

COMPANY WEBSITE
www.roadbridge.ie

Roadbridge has been in operation since 1967, and is a Limerick-based global civil engineering contractor specialising in the international delivery of complete infrastructure projects across all sectors and for a broad range of clients and contract conditions. We have built our reputation on working collaboratively with our clients, offering them a quality service and product with genuine added value. Roadbridge is a fully resourced contractor. We have the experience, capability and a proven track record in delivering major projects safely, on time, and within budget. We employ over 700 people worldwide and are known as a great employer.

OVERVIEW & BACKGROUND TO THE LEAN INITIATIVE

AUTHORS

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As part of its continuous improvement programme, Roadbridge introduced the concept of Lean across the organisation through the "Our Lean Path" initiative. As part of this endeavour, we engaged with LBSPartners and several programmes were undertaken through our Limerick Head Office as a starting point.

This case study examines the analysis undertaken in our Estimating and Purchasing Departments that we felt could lead to less time wasted in the tendering and estimating process and make our entire process more efficient. It was discovered that the estimating process was being hampered by very manual processes, leading to a lot of time spent waiting for quotations to be received from suppliers. This information should be easily available through our "EVision" ERP System, which is populated by the site administration staff across our projects.

When the ERP was analysed, it was discovered that the pertinent information from orders on projects was not being entered fully, and thus information was being lost that could otherwise provide a valuable resource to the estimating team.

LEAN INITIATIVE UNDERTAKEN – LEAN THINKING, TOOLS, TECHNIQUES

In order to arrive at solutions to this problem, we decided to use the A3 Problem Solving Method for this undertaking.

Current Condition
As a starting point, we looked at the current conditions around a typical large tender being carried out at our Head Office. In conjunction with the estimators involved in the process, a round-table discussion took place, where we developed a process map of the programme. Next, that process map was converted into a form of value stream map so that it could be determined where the delays were coming into each tender. Then, from the value stream map of the process, we found that on a typical 88-day large tender process up to 23 days (i.e. 26% of the time) were spent waiting on information to be received from our supply chain

in order to correctly price the project. This result came as a surprise to all involved, even the personnel closest to the process, as it highlighted just how much time was wasted. This result helped to develop a sense of urgency within the team to make a change.

When investigating why the estimating team had not been using the ERP to source this information from our live projects, particularly for repetitive standard construction materials, it was discovered that the estimators were having issues logging onto the system initially, which led to the practice of using manual excel spreadsheets in isolation rather than a collective system. Those who were using the ERP complained that the information was neither accurate nor detailed enough, and thus they got into the habit of not using the system. At all times throughout this process, it was stressed to those involved that this analysis was going to be carried out in a blameless and collaborative fashion, which encouraged open and frank discourse. This was an interesting part of the process, as it was a major paradigm shift from our more traditional siloed approach to working.

An analysis of the information being inputted was carried out so as to determine the extent of the issue within the ERP. During 2018, we conducted a Pareto Analysis on the numbers of order entries by item type. The item type is a pre-populated items library for the user to utilise to enter information in a standardised format. Once we had created the Pareto, we then determined the 80/20 rule to see where the largest numbers of orders were arising.
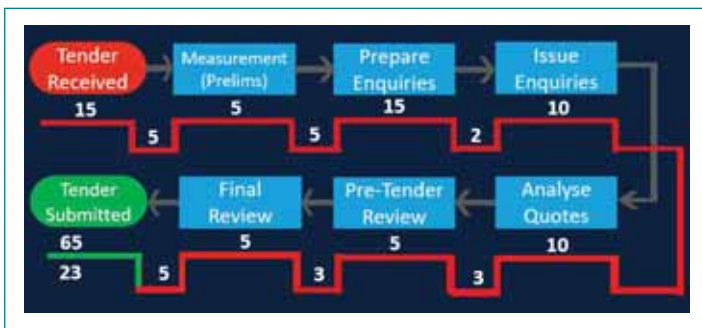

Figure 1. Large Tender High-Level Process Map

Figure 2. Pareto Analysis of Order Entries by Item Type

The Pareto showed us that there were four types of order entries making up the top 80% of orders during 2018.

ENTRY %	ITEM TYPE	ITEM DESCRIPTION
29.39%	CRFM00007	C16/20 Concrete (20N strength concrete)
25.65%	CRBS00023	Clause 6F2 Stone
12.19%	MATR00001	Materials
9.12%	CRFM00019	C35/45 Concrete (45N strength concrete)

Table 1. Findings from the Pareto Analysis of Order Entries by Item Type

The entries for concrete and stone make perfect sense as they are a prime constituent of any civil engineering project, but the MATR00001 entries warranted further analysis, particularly as it accounted for 12.19% of entries. It was then discovered that this item type had begun to be used as a miscellaneous item, and, rather than entering the correct detail for purchase orders line-by-line, the information was being added in one line, as MATR00001, which told the person looking at the order nothing unless they could see the attached invoice from the supplier. The accounts team at Head Office would only add the invoice later, and so it was not always available.

A further Pareto Analysis was conducted on the projects where the 'MATR00001' item type was being used the most, to see which projects were the worst offenders and where our efforts to provide a solution would need to be focused. This Pareto highlighted that there were six projects that contributed to 80% of the orders being incorrectly added to the system.
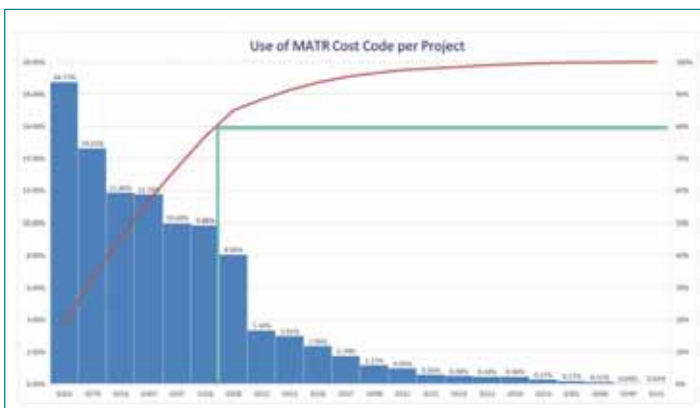

Figure 3. Pareto Analysis of MATR Cost Code Per Project

Goals/Targets

Once the extent of the issue was established, it allowed the team to develop a Gantt Chart for the implementation of a solution and for the setting of targets. The targets that were set for the programme were as follows:
- To reduce wasted estimating time over an 88-day tender by 15 days.
- To reduce the use of the MATR00001 item type code to 5% from 12.19% by February 2019.
- To increase confidence in the data being produced by the ERP and utilise this information in a tender submission.

Root Cause Analysis

In consultation with the estimators at Head Office and with several site administrators, a Root Cause Analysis and a Cause & Effect Analysis were undertaken. This was carried out as a team event at Head Office, and again it was stressed that all views could be discussed openly and honestly in a blameless environment.

Figure 4 highlights the results of the Five Whys Root Cause Analysis, showing that the root cause in this case was insufficient site administration staff in place on these busy projects.

Figure 4. Five Why Analysis on Estimators Not Using the System

Cause & Effect Analysis

As an added exercise, and to determine if the same root cause would surface, the group also carried out a Cause & Effect Analysis, followed by Cause Screening, and this analysis flagged the same issues.
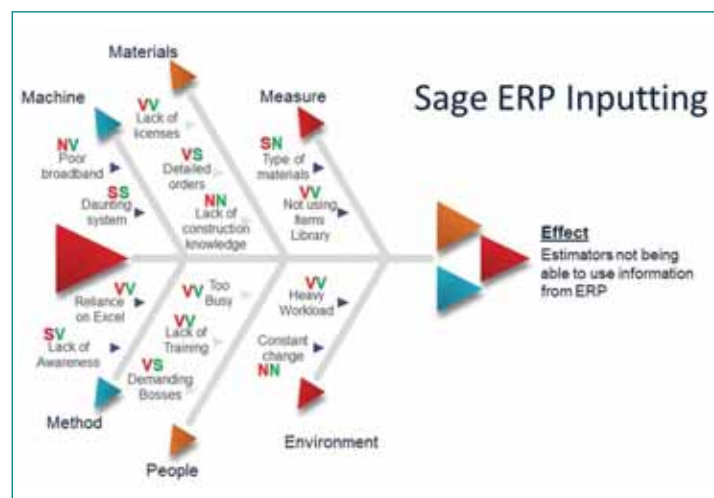

Figure 5. Cause & Effect Analysis

Countermeasures

With several key issues identified, we could make plans for implementation of action plans to solve the problems. The team, in consultation with the estimators and site administrators, developed a countermeasure sheet and assigned actions and action dates. Some of the suggested actions were ultimately rejected as ideal solutions; however, the process of opening communication was a valuable exercise in and of itself.

One of the first actions was to generate a live report from the ERP in an excel format that the estimators could use, rather than navigating the system. This meant that they could do an initial analysis of the costs within the system for particular materials quickly and see if they had sufficient information to proceed. The estimators favourably received this solution. The team then met every two weeks to ensure that action occurred in line with the programme and that progress occurred towards achievement of the aims of the exercise.

By bringing together the site administrators, head office accounts team, and estimators, we could follow through the entire process of raising orders at site level and demonstrate how that information flowed through to provide important information for the estimators. It gave all parties involved a better overview of how their actions became a vital part of the data chain and a better understanding of one another's roles. Several even commented on the fact that they had worked for years in the same office with others in the team, yet they had little or no appreciation for the actual roles played by their colleagues.

LEAN INITIATIVE IMPROVEMENTS & IMPACT

Some of the quick wins and achievements included:
- The countermeasure sheet highlighted a deficiency in the number of available licences for the system, so personnel were getting frustrated at not being able to login. This led to an automatic log-out of a user if they were idle for a period.
- To ensure that the numbers of concurrent users was not an issue, the ERP system licencing was split into UK and Ireland licences.
- The Head Office Finance team provided additional training on the use of the items library to all site administrators.
- System user training manuals were developed and made available through use of a cloud-based system.
- Extra administration staff are now hired for new projects as the initial mobilisation is one of the busiest periods for creation of purchase orders.

However, the biggest improvements were noted during a follow-up analysis of a value stream map for a tender. By being able to utilise the system effectively, the target of reducing estimating time by 15-days was well and truly beaten as it was discovered that up to 33-days could now be saved as a result.

Using this information, we calculated that this could lead to a saving in associated cost of €11,000 per estimator over a tender. There are four estimators at Head Office and three more in our regional offices, meaning a potential saving of €231,000 per year in time if each estimator were engaged in three large tenders per year. Ultimately, this also means that the team can tender for more work as they have extra time available, potentially leading to extra projects won in a typical year. This more than covers the cost of hiring one to two new site administrators who ultimately end up adding value to the system themselves. The site administration staff are now aware of the part they play in the wider organisation and how the information they input can flow through to assist in the winning of future work.

During 2018, a decision was made by the Board to move to a new ERP system during 2019, and, by highlighting the incorrect usage of the system during 2018, it means that inefficient information will not be transferred over to that new system.

Overall, this continuous improvement process has highlighted to us the need to challenge our actions and the habits we fall into constantly. It was a great exercise to undertake and showed how data can be analysed effectively to reduce waste and increase efficiency. It also highlighted the need to include those working at the actual Gemba of the particular process being examined, and that priority has to be given to making the process improvement meaningful for them.