Case Study Title: Digitalisation of Systems and Processes

Company Overview | MANNINGS CONSTRUCTION | manningsgroup.com

Mannings Construction Group is an innovative main contractor and design build partner, with a reputation for delivering value engineering solutions and fast-track projects since 1975. The Group employs 80 full time staff across Ireland and the United Kingdom and has set the standard in delivering high-quality construction projects across the retail, logistics, tech, pharma, health, mixed-use, office and residential sectors.

Projects range in scale and value from minor refurbishment projects (often completed outside normal working hours to avoid disruption to client operations), to large-scale high-tech projects including a €70 million 77,000m2 logistics facility in Co Dublin (ninth largest building in the world by volume when completed).

Mannings Construction Group's ability to embrace new technologies and implement innovative solutions including 'Invisible Methodology' has resulted in high levels of repeat business and client retention. Mannings' partnership approach and ongoing ability to innovate whilst delivering projects within budget, programme and to the highest quality standards has been the foundation for the firm's success over the past forty-five years. The firm brings the values of collaborative working and integrity to the fore on every project. We take those values and combine them with innovative construction technologies to deliver client satisfaction, time after time.

Figure 1: Multi-storey carpark and retail units for Quintain

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Overview & Background to the Lean Initiative

In April 2020, as the Covid-19 Global Pandemic was wreaking havoc across the world, and the construction industry was beginning to experience the impact of nationwide lockdowns resulting in the shut-down of many construction projects, the Directors of Mannings Construction Group made a conscious decision to use the 'down-time' to embrace the principles of Lean Construction in order to increase operational efficiency and eliminate unnecessary waste for the benefit of the company and its clients.

Education and Inclusivity

In order to implement a new 'Lean way of thinking', a series of training sessions commenced, and staff in all regions of the business participated in Lean Six Sigma training. 'Lessons Learned' workshops were scheduled following completion of projects in Ireland and the UK, with mandatory attendance for all team members. An external consultant with expertise in Lean construction was appointed to chair the workshops and improvements were implemented company wide.

Last Planner Workshops were scheduled in advance of new projects commencing onsite, as the next stage in supporting lean integration within the business progressed. The Mannings site management teams were instrumental in securing maximum 'buy-in' and commitment from the supply chain. Mannings Construction Group provided further training for the wider project team including stakeholders and subcontractors, and all parties involved with the project became engaged and supportive participants in the Lean approach, working towards a common goal: to eliminate waste and secure the best project outcome as a team.

Lean Initiative Undertaken – Lean Thinking, Tools, Techniques

Digitalisation of the Business

Following the success of the Lean Six Sigma training, and Last Planner and Lessons Learned workshops, the Directors made a commitment to further strengthen the operational excellence strategy by adopting a new digitalisation strategy that would support the firm's recent investments in new technologies. One of the key objectives of the digitalisation strategy was to improve systems and processes resulting in enhanced efficiencies and elimination of waste. The aim was to deliver a visible, accessible, and user-friendly management system that would yield improved project outcomes, utilising the

principles of Lean Construction, on a continuing and ongoing basis. In March 2021, the company created a new role of Chief Information Officer (CIO) to manage the digitalisation of the business and the creation of this role was a key element in the rapid transformation that followed over subsequent months. In addition to the primary objectives, the CIO identified a further key element: the development of business intelligence data that could be displayed on dashboards and reports to inform better decision making, including tracking project dates and utilisation of resources.

The developed digitalisation strategy incorporated the following components:

1. Business Intelligence Dashboards
The dashboards provided an overview of current operations, allowing the management team to analyse and review current and upcoming activities, leading to improved project planning and delivery. The project tracker provides up-to-date information about current tenders, contracts awarded / not yet commenced, and projects currently onsite.

2. Utilisation of developing software and technologies
The integration and utilisation of new technologies, including timelapse camera and project management software on projects such as the €29 million multi-storey carpark and retail units in Adamstown, Co Dublin. This has been of value for the entire project team.

The vehicle recognition and analytics capability and access to live and recorded views has transformed how the project team track deliveries and issue instructions. The Snap mail function allows the site manager to send up-to-date images to project stakeholders in an instant, and the capability to compare before and after images provides for easy identification of live services subsequently covered during the build, avoiding costly mistakes. Live view functionality provides an option for virtual site visits and progress onsite can be monitored anytime, anywhere.

Site managers now use image markup to provide visual verification and issue location-specific instructions to subcontractors. Scan and zoom camera technology and the ability to download reports including weather conditions, specific vehicular traffic, visual verification, video analytics and timelapse videos have been of benefit to the team and crucially have promoted collaborative working.

The feedback from Mannings staff and subcontractors who are using the developing technologies has been hugely positive and has contributed to the process of continual improvement of the digital platform. The gains are apparent and often immediate, greatly reducing waste in transportation, inventory, motion, waiting, overprocessing, overproduction, defects, and skills.

3. Streamlined Processes and Systems
As with the adoption and utilisation of developing technologies, the Mannings team has embraced and reaped gains through the digitised integration and streamlining of systems and processes. The implementation of online digital forms such as works permits including hot works, working at heights, crane inspection forms and vehicle inspection forms has resulted in an elimination of unnecessary paperwork and quicker issuing of permits and inspections. Online site diaries track and record project progress via a centralised, accessible cloud-based platform and the management of snagging has become more efficient and effective.

The reduction of paper and motion waste has been obvious for all involved and the element of human error has been mitigated. Completed online forms are saved in PDF format on the Common Data Environment (CDE) and managed in line with GDPR requirements.

The simplified and more efficient induction process incorporates a digital site induction process using DocuSign. Subcontractors receive an email form to complete and can attach supporting documentation prior to arriving onsite. Site specific inductions are shorter and targeted, resulting in less waiting time for all operatives. Standardisation of site-specific health and safety information boards across all sites increases the impact of key health and safety messaging.

Figure 2: Onsite Software Training

4. Common Data Environment (CDE)
The utilisation of a Common Data Environment provides a centralised storage platform with search functionality. Information is accessible for the entire project team including the client, design team, project management team members and subcontractors. Drawings, specifications and other project data is easily accessible in real-time, and information is easy to attain on mobile devices meaning drawings and information can be viewed on location avoiding unnecessary walking to and from site offices and printing of documents. The gains from utilizing the CDE include the reduction of transport, motion, waiting, over-production, over-processing, and defect waste.

Figure 3: Remove access to live data

Lean Initiative Improvements & Impact

The streamlining of systems and processes, and an openness to receiving and integrating feedback, has transformed how the company operates.

The Directors decision to appoint a Lean Champion and provide an additional resource to further develop bespoke application-based solutions and train staff, demonstrates their commitment to Lean Construction and positive support for the digitalisation of the business.

In addition to the elimination of paper-based site management in favour of digital site management using mobile devices, the team on projects throughout Ireland and the UK are working closely with suppliers to further maximise efficiencies in project delivery.
On the Adamstown project, the redesign of concrete floor slab configuration to provide a reduced number of slabs, resulted in considerably less deliveries to site, less handling of materials, more efficient craneage operations onsite and reduced crane duration.
Adoption of cloud-based platform and other technologies such as the facial recognition and vehicular traffic monitoring software, replacing previous onerous and time-consuming paper-based systems on projects has added to the rewards gained on the Mannings' Lean journey.

Digitalisation of the Business to date, has positively impacted and benefitted all departments within the business, reducing wastes and creating a positive and more engaged team.

Figure 4: Mobile Device Accessibility

Figure 5: Video Tutorials

Summary and Lessons Learned

The project teams have undoubtedly embraced and benefitted from the firm's digitalisation strategy and elimination of the various wastes has become a visible gain for the Mannings' teams, however 'Selling' change to a busy team has been a challenge for the digitalisation team, and they have had to adapt accordingly to find new ways of communicating the benefits to bring about the transformation.
Onsite group training and one-to one training with Mannings team members and subcontractors, training videos that can be easily downloaded and viewed, interactive newsletters uploaded to online platforms, showcasing recently implemented examples of lean integration, are all examples of how the digitalisation team communicate with the project teams to promote positive engagement.

We need to continue monitoring and reviewing systems and encouraging everyone to participate in suggesting areas of improvement. Training is a key element as is having a solid support structure in place. Selecting the solution that aligns with the organisation is key and taking the time to discuss problems with the team, influences the digital solutions to be introduced.

As Colm Delamere, Managing Director says, "Lean thinking is driving our digitalisation journey." Digitalisation of a business, as with Lean Construction, must be considered an evolving journey. In Mannings Construction Group, there will always be an appetite for further improvement and opportunities to continually improve efficiencies and eliminate waste.

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