Knowledge management best practices for engineering and construction

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method GRID

Knowledge is any organisation's biggest asset, but in construction and engineering, the culture of knowledge management is specifically important due to the information-, regulation- and process-saturated nature of the industry.

Codifying, storing and disseminating knowledge enables enterprises to consistently work alongside industry standard processes, enhances assurance and drives operational efficiency through easy access methodologies.

Knowledge management (KM) is a discipline that is increasing in popularity and cultural importance as major projects and team infrastructures grow in complexity and information overload overtakes clarity. In this whitepaper, we discuss the field of knowledge management in more detail and its role in operations, project delivery and people management, so you can better achieve operational best practice.

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The history and development of KM in construction and engineering

“Knowledge is power”

Knowledge has been a valuable asset to humans for as long as it has existed. Managing knowledge is a complex, elaborate and hard-to-define practice.

The term knowledge management (KM) is thought to have become mainstream in the late ‘80’s in a keynote speech from Karl Wiig and has been effectively facilitated by the emergence of purpose-built tools.

The evolution of communication technologies continued to transform the field of knowledge management, offering more mediums in which to collect, organise and store knowledge in an accessible format.

Reinventing the wheel

> **Construction and engineering are extremely knowledge-rich, process imbued, industries. Within these sectors, there are a wealth of regulations that must be followed, standardised methodologies and frameworks, and accountabilities between roles and responsibilities that must be defined.**

With no solidified knowledge management system, there has often been a disassociation between research, learnings, application, and evolution. This causes the same mistakes to be repeated consistently, or best practice to continually be redefined unnecessarily. Sometimes there is also active resistance towards sharing intellectual property and overall knowledge transfer. As a result, organisations are seeing poor communication, productivity, and collaboration between teams.

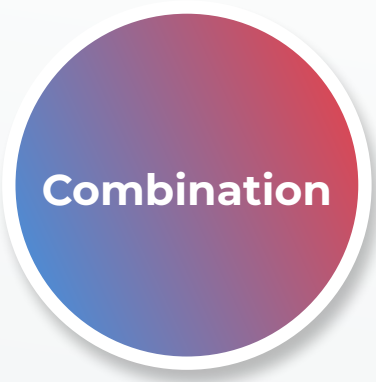
Through the absence of a structured KM culture, organisations are consistently having to ‘reinvent the wheel’ or rely on high risk processes with every project.

Channelling knowledge through the SECI model

To effectively conceptualise knowledge in both its implicit and explicit forms, Ikujiro Nonaka and Hirotaka Takeuchi published a paper that provided a SECI framework designed to support practical knowledge management. In this framework, knowledge is considered as both an object (evidence and documentation) as well as a process (best practice and task visibility), as cited in Leading Issues in Knowledge Management.

The four components of the SECI model that propose how knowledge types can be combined and converted into applicable and repeatable practices in project delivery are as below.

This is the transfer of tacit knowledge from person to person through interaction, practice and observation.



Combination entails taking an existing format of knowledge such as a document, book or video, and converting it into another format, a report for example.

This is the conversion of tacit knowledge to explicit knowledge. Converting implicit knowledge into a more comprehensible context allows information to then be easily shared, or externalised.

This stage is when explicit knowledge will be learned and retained, internally, by individuals. This kind of information will help to strengthen inferred knowledge, applying experiential knowledge to practical situations.

The importance of KM in the construction and engineering industry

The overall aim of knowledge management is to transform individual knowledge into organisational knowledge, which can then be utilised to standardise or improve and assure project delivery and empower consistent performance across teams and for clients.

Today, knowledge management is a key discipline for AEC businesses because of:

Increase in pace

Society is progresssively working at a faster pace. A KMS helps people continually adapt their processes and update their teams in accordance with regulation and more, without compromising on delivery or assurance quality.

Globalisation

Globalisation has resulted in organisations having more international sites, multilingual teams and greater cultural awareness. Knowledge management enables businesses to collect and disseminate knowledge despite these physical and cultural barriers, and to maintain a single source digital golden thread, without losing important resources in translation.

Higher turnover

A more transient workforce can create problems with knowledge loss and lack of continuity in the transfer of knowledge. KM is a way to ensure individual knowledge can be retained as corporate knowledge, consistently embedded in workforces to be utilised by remaining teams and training for new hires and delivered to clients.

Digital technology

Digital technology is contributing to an inundation of information. Employees are expected to filter through this information, process it, and make decisions in almost real time. Having a streamlined system of knowledge can ensure you have only the most relevant information at your disposal, as and when you need it.

A strategic asset

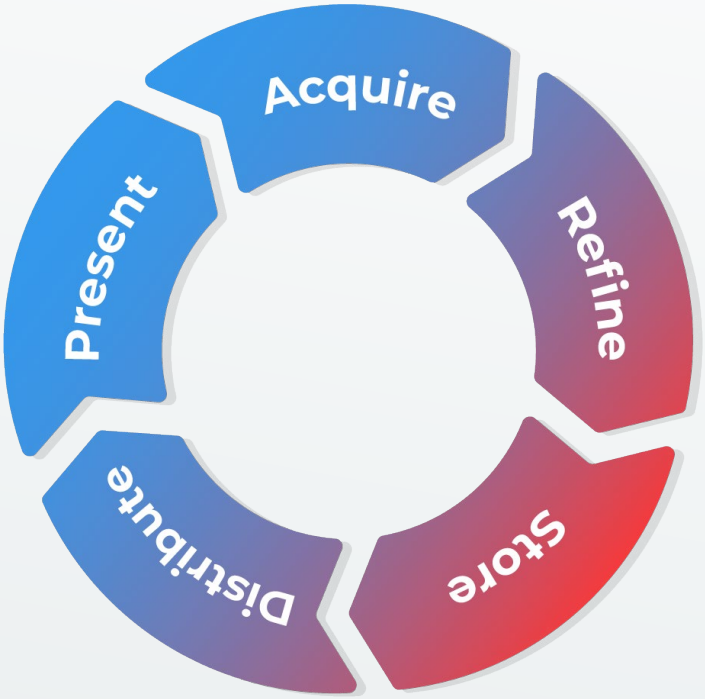
Knowledge is an intellectual asset which can add strategic value to businesses. When knowledge is used systemically, it can empower operational practices, delivery and organisational expertise.

In a nutshell, an integrated knowledge management platform will help to strengthen working relationships, encourage connected assurance, support decision-making and promote long-term organisational development.

The knowledge management lifecycle

Knowledge management is something that must be approached as a dynamic cycle, as opposed to fixed steps. KM is a continuous cycle that requires ongoing attention and maintenance. As a vital element of all tasks and processes, it becomes a living, breathing part of everyday project delivery and the programme lifecycle.

There are various models that have been constructed by different scholars to articulate the cycle of knowledge management.



When implementing knowledge management, you should centre it around a strategy rooted in a comprehensive KM lifecycle framework and employ a team member to take responsibility for encouraging proper adoption amongst co-workers. A familiarised framework works to effectively channel repeatable and reliable KM practices.

Common knowledge management challenges

When executed in the right way, knowledge management can be a powerful practice for your business. However, this discipline often conjures up a range of common challenges that organisations need to be aware of.

Lack of a framework

As touched upon in the previous section, to be used to its full benefit, an organisation's knowledge management should adhere to a framework. A clear service-delivery framework will effectively align people and processes, enabling confident and connected knowledge sharing.

Reluctancy from employees

As with any change, it can take a lot of resources to ensure employees become familiar with the change and adopt it with best practice. If employees are not comfortable with an operational shift, they may also lack motivation to share their knowledge, use the resources at their disposal, and integrate with a new system.

Maintaining accuracy

Regulation of who instils what on a knowledge management system is crucial. Verification and moderation processes will help ensure that the knowledge being shared and extracted is accurate, up-to-date and true.

Storing knowledge

When an organisation begins to identify its knowledge, knowing how, or where, to compartmentalise it can be a challenge. Whether this is attempting to 'store' implicit knowledge, or to store documented explicit knowledge, the way you organise knowledge, and its navigability, can entirely dictate its effectiveness.

Sharing and disseminating

Disseminating knowledge is the final, crucial, step. Storing knowledge in a way that the right people can easily find, view and share it is necessary for it to become a useful asset.

The consequences of poor knowledge management

There are a number of negative consequences that often manifest when KM is not taken seriously:

Redundant effort

A knowledge management system streamlines processes and reduces the need for certain tasks to be repeated. In the absence of knowledge management, effort, time and money can be wasted on unnecessary duplication.

Lack of cultural change

Knowledge management is an evolving discipline, one that can adapt to business change and growth. Not implementing these methods can deprive employees of information and any innovation that comes with this kind of discourse.

Scaling difficulties

As an organisation grows, so does its knowledge. Without knowledge management, organisations wanting to scale may bring inefficiencies or poor quality processes along with them, while also losing the ability to effectively collaborate, communicate, maintain consistency, and collectively develop.

Client dissatisfaction

Organisations not practicing knowledge management will be more likely to introduce inconsistencies in the quality of their delivery, alongside slower or less efficient service, with staff not having access to repeatable knowledge.

Other disadvantages of not implementing knowledge management include:

- Slower access to information
- Delayed delivery processes
- Weaker decision making
- Hiring and training difficulties
- Loss of knowledge
- Inconsistent processes
- Falling behind the competition
- Reduced productivity

How to improve knowledge management

Knowledge management in the construction and engineering industry is best mediated through a knowledge management system (KMS). A good system will empower your KM processes, optimising them, as opposed to being a burdensome responsibility.

Embrace technology

Technology-empowered systems can play a significant role in your knowledge management processes. This is especially so with the digital 'golden thread' of information, a concept that was born from the Hackitt Report that followed the Grenfell Tower fire. These systems help to administer knowledge simply and effectively, based on up-to-date information.

Encourage collaboration

Knowledge transfer is empowered by communication between people. Encourage your teams to socialise, collaborate and support one another as you implement knowledge management processes.

Understand your organisation's relationship with its knowledge

Knowledge management will only be beneficial if you apply the right framework for your industry and organisational needs. Identify how your firm interacts with knowledge, including how it obtains, stores and shares it.

Define your objectives

Set a solid foundation for your operational objectives and ensure that teams are aware of and align with these.