

**Project Management Methods**

**Coursework Portfolio Submission for BNV7130-A-S1-2021/2**

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## **1. Introduction**

In this essay I will cover professional ethics, implementation of total quality management (TQM) and the use of BIM in time management. The main reason I have chosen these topics is because they are relevant in each phase of a construction project. I will present the topics in the order listed above.

## **2. How can Professional Ethics be applied in the Construction Industry?**

The Royal Institute of Chartered Surveyors (RICS) defines five global professional and ethical standards. These are acting with integrity, always providing a high standard of service, acting in a way that promotes trust in the profession, treating others with respect, and taking responsibility (RICS, 2022). Despite laws, regulations, and guidelines from RICS and other professional bodies, unethical practices and challenges are still present within the construction industry (Chilipunde and Kaima, 2015). Adnan et al. (2012) make a viable point that unethical practices can take place during any/every phase of a construction project. This is because the construction industry contributes massively to the economy of a country and since there is a high exchange of capital investments amongst various parties, unethical behaviour can take place at any point.

Vee and Skitmore (2003) have grouped unethical practices into four types of actions which are conflict of interest, unfair conduct, collusion, fraud and bribery. Something as simple as taking contractors out for an activity, with a hidden intention of receiving a competitive quote can be classed as fraudulent and unethical. To combat this sort of behaviour, organisations tend to have policies in place that define their stance on professional ethics. It is evident that policies alone are not sufficient to ensure ethical conduct as the construction industry is still classified as the most fraudulent industry worldwide (Transparency International, 2005). The construction industry has received this classification because ethical misconducts such as bid shopping, employing illegal immigrants and administering incorrect wages are still very prevalent in the industry. As evidenced by Adnan et al. (2012) the detrimental effect of this behaviour can result in wasted tender expenses, increased project expenses, quality being compromised, economic impairment, and reputational risk.

According to Mason (2009) better ethical standards within the construction industry can only be achieved by reducing the chances of individuals even entertaining the idea of benefiting at someone else's expense. Mason (2009) suggests a way to do this would be to make unethical conduct a breach of law. This seems like the right approach as heavier penalties will help encourage better ethical practices amongst professionals (Rahman et al., 2014; Oyewobi, et al., 2011). Some academics (Adeniyi et al 2018 and Akinrata and Ogungbile (2018) cited in Paul et al. (2021) go as far as suggesting professionals being banned from practice if they are caught behaving unethically. This may seem like an extreme measure but

could be effective in reducing unethical behaviour as people are more likely to behave ethically when they know their immoral actions could lead to losing their job and not being able to practice elsewhere.

There are various issues with applying professional ethics in the construction industry. Brien (1998) claims that ethical failures can be traced back to the culture embodied in the organisation and a lack of leaders encouraging ethical practices among their teams. This is problematic as employees are likely to behave unethically if their management team holds unethical values (Netscher, 2017). To combat this, leaders need to implement their own preventative measures and behave ethically themselves (Stansbury and Stansbury (2018). If employees see their leaders applying best practices, they are most likely going to follow.

Vee and Skitmore (2003) make an important point on how professional bodies such as RICS and CIOB need to play a part in enhancing the integrity of professionals within the construction industry. These professional bodies already play a part in enforcing regulations. However specifically enforcing integrity is a challenge as this ethical standard is very subjective and means different things to different people. Although it would be impossible for organisations to measure each of their employees' integrity, it is vital for them to set the foundation on what integrity means to them as a business and ensure that vigorous training is given for this to be embodied. Research shows that organisations which provide consistent training and regular ethical awareness workshops for their employees are likely to see a reduction in unethical behaviour (Olatunji, 2007; Rahman et al., 2014).

While the code of conduct defines unethical behaviour, reporting such behaviour is not reinforced widely. This is a challenge since some employees may choose to ignore fraudulent behaviour rather than report it and potentially face significant consequences for doing so. Therefore, measures such as whistle-blower protection and reducing incentives for corruption need to be implemented to make it safer for those that wish to report unethical behaviour (Oyewobi, et al., 2011). In the UK, individuals can anonymously report unethical practices to the Competition and Markets Authority (2022) and help contribute to reducing corruption in the industry. Construction companies need to make this measure known amongst their employees for there to be a positive impact and wider recognition.

### **3. How can TQM be implemented in Construction Companies?**

Defining quality is tough as the term has various definitions and is subjective. Quality can be viewed in various ways and therefore there is no one universal definition (Howarth and Greenwood, 2017). Deming (1986) defines quality as a "predictable degree of uniformity and dependability at a low cost with a quality suited to the market" whilst Baird et al. (2011) cited in Pambreni et al. (2019) defines it as "an integrative organisational wide philosophy that aims to continuously improve the quality of products, services and processes to meet

customer expectations." Both definitions highlight the subjectivity of quality and this itself presents problems.

TQM is an approach that was developed following seven theorists that had their own views on quality management (Howarth and David, 2017, p.7). Griffith et al. (2000) cited in Howarth and David (2007) summarises the concept of TQM as "a philosophy for achieving a never-ending improvement through people." TQM looks at adopting a management system that promotes the quality of a company's product and creates consistency through procedures applied. The construction industry is known to suffer from issues such as workmanship defects, cost and time overrun. Therefore, as supported by Androwis et al. (2018) the effective implementation of TQM can help increase the quality of projects as well as reduce cost and time.

Zehir et al. (2012) states eight dimensions of TQM that positively contribute to an organisation's performance. These are leadership management, employee management, fact-based approach to decision making, customer focus, supplier involvement, continuous improvement system approach to management, and process management. Expanding on one dimension of TQM highlighted by Zehir et al. (2012), TQM places customer focus at the heart of what an organisation does. This ensures quality is not compromised and customer needs are met. A higher customer satisfaction means better rating and recommendations, and effectively implementing TQM can help achieve this.

Although TQM has various benefits such as better customer satisfaction and cost savings, the construction industry encounters various problems in implementing TQM. An obvious challenge is that quality has a different definition for each organisation. This is because construction companies procure different materials and apply quality standards they deem appropriate. To one business quality may include capital cost, number of defects and profit. To another, it might include construction time, productivity and accidents. This shows the difficulty in quantifying quality and benchmarking companies against each other. To tackle this problem, organisations need to first define what quality means to them, understand customer expectations and then produce high quality against that. This is supported by Sun and Kim (2013) who highlight, when there is a better understanding of customer expectations and quality standards, there will likely be a lower cost and the need for remediation works.

Another challenge is the lack of tangible benefits associated with implementing TQM (Pambreni et al., 2019). Haupt & Whiteman (2004) touch on the difficulty of assessing benefits if you can't even measure the results. For example, if one construction site is implementing TQM and another isn't, if both sites achieve the same targets, it becomes difficult to determine whether the implementation of TQM is beneficial. To resolve this issue and measure the benefits, TQM needs to be split into hard and soft elements. Pambreni et al. (2019) define hard elements as representing management tools and techniques and soft elements as including workforce commitment, shared vision, customer focus, and team

working. It's clear that both the soft and hard elements need to be in place for TQM to succeed but focus needs to be given to them separately. Through successful implementation of these elements, quality improvement and TQM can be promoted.

Lack of commitment from senior management can limit the successful implementation of TQM in construction companies (Howarth & Greenwood, 2017; Haupt & Whiteman, 2004). This is problematic because in most companies the senior management team tend to focus on the bigger picture which is hitting build programmes and making a profit. Without their commitment, teams operating under them are likely to not implement TQM effectively. Therefore, to successfully implement TQM, senior management need to believe in the process and ensure that employees in the organisation also do. This can be done by establishing a quality standard that can be measured quantitatively. Weekly or monthly updates from the senior team on quality scoring can be a motivation for employees. Moreover, if senior management set values and systems to meet customer expectations, employees will most likely work to that standard.

Several pieces of literature identify organisational culture as a hindrance to TQM (Howarth & David, 2017; Prajogo & McDermott, 2005; Hoonakker et al., 2010). The problem is that every organisation has a different attitude so reaching one universal method of applying TQM is not possible. Thus, to better implement TQM an organisational standard can be set through an employees' work ethos. This may take time to implement, but through repeating quality standards in manuals, job descriptions and team conferences, TQM can start to be more effective.

Once there is support from senior management to implement TQM and good organisational culture, employee empowerment would be the next key practice for successful implementation. Following Islam and Haque (2012), we can say that when employees have confidence and are empowered, they can take ownership in improving the customer experience and achieving the standard of quality the organisation wants. To empower employees, training is essential. The issue is that usually employees are given too narrow training resulting in poor implementation of TQM (Howarth and David, 2017). As supported by Harrington et al. (2012) we would suggest those involved in the TQM process need to receive training in problem-solving techniques, quality awareness, and communication skills. With the correct training, employees will be able to perform better and provide high-quality products, and the TQM process can be significantly improved.

Zehir et al. (2012) and Pambreni et al. (2019) both identify supplier management as a hindrance. Managing subcontractors and suppliers is a huge problem for construction companies as the level of control over external teams is limited. For example, receiving damaged goods on site is a common occurrence for many companies and sometimes the end product can lack in quality hugely. This is a problem due to the waste involved with receiving damaged goods and lack of customer satisfaction when they receive a lower

quality product than expected. The impact of this issue can be reduced by organisations maintaining a close relationship with their suppliers and setting strict quality standards. From this, organisations will be able to ensure quality supplies are provided resulting in a reduction of the usual quality concerns. By organisations having a proper procurement process with correct scheduling and communication methods, there will be an improved quality result for the customer, less waste for the organisation and a better implementation of TQM overall (Islam and Haque, 2012).

#### **4. How can BIM be used in time management? What are the challenges in the process?**

Construction projects are known to have various delays, with each delay having a domino effect on the other. Project managers (PM) are tasked with managing these delays and the most common method used for this is the critical path method (CPM). Despite CPM being the most common method, Building Information Modelling (BIM) has been suggested as being more effective.

BIM modelling is a combination of technology that allows professionals within a project to collaboratively work together (Miettinen and Paavola, 2014). The National Building Specification (2021) defines BIM as "a process for creating and managing information on a construction project throughout its whole life cycle." This technology allows for information to be exchanged in an accurate and timely manner, allowing for scheduling of works and planned communication across a wide range of people. It is likely for multiple parties to be carrying out numerous tasks at the same time which are interlinked (Gibbs et al., 2013). Egan (1998) cited in Gibbs et al. (2013) claims that a trade-off between cost, quality, and time is common, and over a third of projects are not completed on time. This is where BIM comes in, helping projects stay on track. Thus, BIM allows parties to make changes, and for their changes to be known instantly by all other parties involved.

BIM is an important technology because it allows collaboration amongst stakeholders and significantly reduces the time needed to distribute information. Having an integrated 5D BIM model allows for immediate updates to the schedule and budget when any design changes occur, resulting in a time saving. The project schedule, team, and budget can also be organised using BIM, and clashes can be detected, delivering a big time-saving (Bryde et al., 2013).

Despite the few benefits listed above, there are still many challenges with BIM being used for time management. One of the primary limitations to BIM is the lack of skills and ability in using the technology (Azhar et al., 2008). It can be difficult for users to interpret information and understand what the BIM model is presenting. Consequently, as Ajam (2021) states, the non-user-friendly format could potentially deter professionals from using BIM. This is a problem because if all members of a project team are not utilising BIM technology then it is

highly likely for information to be missed by someone. This could result in project delays and create further issues. To resolve this, staff need to be trained to work efficiently with BIM. Training will help users feel more comfortable with the technology however, this could lead to a further problem which is a lack of funding. Providing staff with training is an issue if a construction company does not have the money or time. Moreover, smaller businesses are more behind than larger businesses with BIM implementation, and financing training for staff could be very challenging. Therefore, although training is beneficial, a construction company must consider if it has the sufficient funding for it.

This process does not address the wider need of cooperation between stakeholders. Eadie et al. (2013) makes a convincing argument that successful implementation of BIM can only be achieved through the exchange of information with multiple stakeholders. The problem is larger projects will always have multiple stakeholders involved, and if even one of them decides not to cooperate, this can cause conflict and increase the duration of a project. The solution to this issue would be to introduce all key stakeholders into the BIM model early on and keep them in the loop from the beginning. This will also help prevent stakeholders from being overwhelmed with data or missing information if they are introduced into the workflow later.

Even if everyone on a project team can use BIM efficiently, manual input will always be required. This is a great limitation to BIM as the project manager must still decide the length of each activity and sequence. Dixit et al. (2019) also reinforces the need for the model to be updated regularly to make sure it is up to date. This is problematic as the BIM model will be based on many assumptions such as the contract price. These assumptions are likely to change a few times with the returned tenders potentially being negotiated. With there being many different milestones in a construction project, it can be unclear which data to put in the model. This is an issue firstly if incorrect information is put in the model or not exchanged successfully, it can cause huge project delays and costs. Secondly, since inputting data in BIM is a manual heavy task, there is a chance for information to be missed or duplicated. Moreover, the BIM mobile interface doesn't help in reducing the issue as it can be difficult to update, creating further time delays. The solution to this would be to have a dedicated project team member that is responsible for updating BIM at key intervals and keeping stakeholders in the loop (Dixit et al., 2019). A BIM project execution plan can also be created which includes an overall programme and ensures design and construction teams are aware of their responsibilities (Eadie et al. 2013).

Lastly, a big limitation in implementing BIM for time management is technological barriers. A lot of existing systems used for BIM do not support the openness of data, which is essential for BIM collaboration (Georgiadou 2019). With BIM not being sufficiently standardised yet, the interoperability issues amongst different BIM software packages affects collaboration and time saving from being at its peak optimisation. This is a huge problem because if the software programme is unable to exchange information between various applications, then there will be numerous data entry and less time saving (Azhar et al., 2015). For example, as



highlighted by McAuley (2016) extracting information from BIM to a computer-aided facility management software can cause the system to crash. To resolve this, there needs to be more standardisation of internal data systems, allowing better collaboration amongst users (Sinclair, 2012). A coding system or applications to transfer data can be developed. Once businesses are more acquainted with BIM and there is more standardisation of the internal framework there will be a better time saving.

## **5. Conclusion**

Having looked at a few challenges with implementing professional ethics in the construction industry, it is evident that a code of conduct is not enough. Unethical practices take place far too often and although several measures can be adopted to curb unethical practices in the construction industry, it is easier said than done. It is very difficult to implement in practice as companies are relying on various parties to behave ethically. Even if professional and ethical standards are defined and applied within the construction industry, it is up to individuals whether they behave morally or not. Despite the challenges presented, actions such as penalties, ethical workshops and training, and effective senior leadership can contribute to making the construction industry less fraudulent and unethical.

The limitations discussed regarding TQM are not exhaustive, and there are further barriers that effect this process such as lack of skilled workers, turnover in a company, and unrealistic (Hoonakker et al., 2010). Therefore, for successful implementation of TQM in a construction company, the issues at hand need to be dealt with.

Lastly, some of the challenges associated to BIM within the industry are highlighted within the National Building Specification Report (2014) and can be dealt with by construction companies investing in training to use the system, better leadership, and creating applications to transfer data. BIM is yet to be implemented widely in the industry, and despite the current challenges, with the right investments and further studies done on it's successful implementation, BIM could create a time saving. This time saving may not be as vast as companies expect due to all the manual input that's still required; thus, BIM implementation would be a more time effective option for larger companies rather than SME's.

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