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# Investigation into the key barriers to achieving UK "Construction 2025" Strategy targets

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ABSTRACT

The "Construction 2025" is a United Kingdom (UK) Government Strategy introduced in 2013 to improve the construction industry in the United Kingdom by meeting outlined performance targets by 2025. However, with only a few years left to reach the targets, it is unclear how much industry is advancing to meet them. This paper reviews the progress to achieve the Strategy targets. The data collected from 96 UK construction professionals was utilised to assess the key barriers to achieving the UK "Construction 2025" Strategy targets. Results indicate that industry professionals are uncertain about reaching the reduction in overall cost and time targets by 2025. However, they are more positive about reducing greenhouse gas emissions and the trade gap. In terms of the key barriers, the results revealed a reluctance to adopt change, lack of implementation of new technology, fragmentation in the industry, and failure to adopt modern construction methods as the key barriers to the Strategy targets. The research is the first attempt at a comprehensive assessment of the progress and barriers to the UK "Construction 2025" Strategy. The results reinforce the call for government initiatives to transform the industry.

KEY WORDS
**United Kingdom, construction industry, Construction 2025, strategy, barriers**

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## Introduction

The United Kingdom (UK) construction industry contributed GBP 117 billion (i.e., 6 %) to the UK's economy in 2019. It is responsible for 2.4 million (7 %) jobs in the UK (Rhodes, 2019). The Confederation of British Industry's (2020) research shows that every GBP 1 spent on UK construction creates GBP 2.92 value to the UK. The global market has become more competitive after the 2008–09 economic crisis (Smiley, 2016). As a result, the UK Government formed industrial strategies with several major industries,

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creating long-term strategic alliances with different industry sectors to impact growth significantly. In 2013, the UK Government introduced the Government Industrial Strategy "Construction 2025" to achieve specific targets by 2025 and five key themes crucial for the future of the British construction industry (HM Government, 2013). The Strategy aimed to significantly reduce cost, time, greenhouse gas emissions, and the trade gap by 2025 compared to the respective benchmarks by delivering much faster buildings and infrastructure with better carbon and energy performance and greater life value (Hansford, 2015).

After publishing the Strategy, there was much criticism against its targets. Gruneberg (2018) addressed the flaw in the method of reaching these targets, which is neither clear nor transparent. Green (2013) argued that most construction professionals do not think the Strategy would succeed as the previous initiatives failed to reach the targets. Gruneberg (2018) also believed that failure to achieve all of the "Construction 2025" Strategy targets would give an unjustified impression of the construction industry's failure.

The progress of the Strategy targets was not examined in any of the previous research. While a few studies have focused on various aspects of the Strategy (Smiley, 2016; Gruneberg, 2018; Green, 2013), none have evaluated the key barriers to attaining the targets. This study focuses on the literature review of the progress of the "Construction 2025" Strategy targets and investigates the potential barriers. The main aim is to identify the key barriers hindering the progress of the Strategy targets to reach the specified target by 2025.

# 1. Literature review

Buildings provide housing, protection, and a sense of community for households and are a vital source of wealth, with construction goods totalling GBP 3 620 billion (CIOB, 2020). The construction industry is crucial in creating the nation's wealth.

The construction industry employed over three million workers across the UK in 2013, with output totalling GBP 112.6 billion (approx. 7 % of UK GDP and equivalent to 10 % of total UK jobs). Hence, the Government developed industrial strategies with various major industries, developing long-term strategic partnerships with industry sectors. Furthermore, the UK government backed the construction industry, which was expected to be a key driver of potential growth in the UK economy, creating more value-added and employment. A good strategy could enhance an industry's competitive position and add customer value (Mongkol, 2021). In July 2013, the Government published the "Construction 2025" Strategy: a partnership between the Government and the industry. The Strategy outlined how the UK would place itself as a global leader in construction (HM Government, 2013). The Government and the construction industry jointly aspired to achieve the following four targets by 2025 (HM Government, 2013):

1. A 33 % reduction in both the initial cost of construction and the whole life cost of assets based on the 2009/2010 benchmarks.

2. A 50 % reduction in the overall time from inception to completion for newly built and refurbished assets, compared to 2013 levels.

3. A 50 % reduction in greenhouse gas emissions in the built environment versus a 1990 baseline.

4. A 50 % reduction in the trade gap between total exports and total imports for construction products and materials (using 2012's trade gap of GBP 6 billion as the starting point).

This Strategy (HM Government, 2013) has also set out five non-specific aspirations, which are based on the following five key themes: People: An industry that is known for its talented and diverse workforce; Smart: An industry that is efficient and technologically advanced; Sustainable: An industry that leads the world in low-carbon and green construction; Growth: An industry that drives growth across the entire economy; Leadership: An industry with clear leadership from the Construction Leadership Council (CLC).

## 1.1. Progress of the "Construction 2025" Strategy targets

The core of implementing a strategy is to follow a schedule and milestones. The lack of control over the implementation process can lead to failure (Ivančić et al., 2021). The CLC was responsible for monitoring and measuring the progress of the Strategy's targets. However, the CLC members admitted that they do not monitor or measure these goals (Construction Index, 2017). Moreover, CLC did not publish any document — no annual assessment and no performance evaluation — informing how the industry is doing to meet the Strategy targets.

#### 1.1.1. 33 % reduction in both the initial cost of construction and the whole life cost of assets

According to Latham (1994), if his report's guidelines were followed, a 30 % savings could have been achieved by 1999. In Egan's report (1998), one of the ambitious targets was to reduce construction costs by 10 % annually. The UK government was looking into the construction industry to see how it could experiment with pre-fabrication and procurement methods like those used by European builders. In Belgium, Holland, Germany, and Scandinavia, many clients claim buildings are 20–30 % cheaper than in the UK (Symonds et al., 2015). As a result, the Government Construction Strategy (GCS) 2011–2015 programme was launched in 2011 with the primary goal of lowering the cost of public sector building by up to 20 % by the end of the Parliament in 2015 (Cabinet Office, 2011). While the Strategy aimed to save GBP 8.8 billion a year by the end of the Parliament, the GCS 2016–2020 found that only GBP 3 billion was saved over 2011–2015. By the end of the Parliament, the GCS 2016–20 predicted productivity gains of GBP 1.7 billion, much less than the GCS 2011–2015 (IPA, 2016). This reflects the challenge of lowering costs on which the industry must focus. No sufficient data has been published regarding the target's progress after 2015.

#### 1.1.2. 50 % reduction in the overall time from inception to completion for newly built and refurbished assets

The CITB (2018) surveys indicate that 63 % of projects were completed on time or better in 2018, whereas in 2013, it was 45 %. However, in 2018, only 53 % of the projects completed the design phase within the time agreed upon at the start of that phase. A major limitation in assessment is the unavailability of sufficient data to illustrate the progress of the target.

#### 1.1.3. 50 % reduction in greenhouse gas emissions in the built environment

The UK is leading the world in carbon reductions, with the Government pledging to achieve net-zero emissions by 2050 (National Federation of Builders, 2019). UK construction accounts for 10 % of the total country's emissions, and the whole built environment impacts 47 % of all emissions through the built assets (Committee on Climate Change, 2019). The Green Construction Board (GCB) (2013) has created the Low Carbon Route map for the Built Environment to meet the UK Government's goal of reducing greenhouse gas (GHG) emissions by 80 % by 2025 compared to 1990 baseline levels. The "Construction 2025" Strategy aimed to cut emissions by half by 2025 compared to the 1990 baseline. Therefore, the target for 2025 is an integral part of the Low Carbon Routemap. The UK has been successful in reducing emissions (Priestley, 2019). In 2018, emissions were 43.8 % lower than in 1990, indicating that the country has met its first and second carbon budget goals and is on track to meet the third, ending in 2022 (BEIS, 2019). This seems to be the only target that can be met compared to others (Construction Index, 2017).

#### 1.1.4. 50 % reduction in the trade gap between total exports and total imports for construction products and materials

In 2013, the UK exported GBP 6 billion in building materials and components while importing GBP 12 billion, resulting in a GBP 6 billion trade deficit (ONS, 2013). Exports have risen steadily since then, reaching GBP 7.7 billion in 2019. On the other hand, imports have risen as well, reaching GBP 17.8 billion. After introducing the "Construction 2025" Strategy, the trade deficit has not been reduced but has widened from GBP 6 billion to more than GBP 10 billion (ONS, 2019).

### 1.2. Barriers to the "Construction 2025" Strategy targets

Considering the factors that impacted the UK construction industry in the last ten years, industry reports and recent studies have been reviewed to identify potential barriers to the "Construction 2025" Strategy targets.

According to Bingham (2013), these targets' representation implies that the industry is too expensive and idle. Steer (2015) referred to these as "random goals" and mentioned the industry's scepticism about meeting them. Gruneberg (2018) argued that the targets are not clear and transparent. Furthermore, the targets have distorted how construction projects are delivered, shifting the focus away from what is expected of the sector and towards achieving unattainable and conflicting targets. The contradictory nature of the targets would result in not achieving all the targets and could reflect the construction indus-

try's failure and incompetence (Gruneberg, 2018; Bingham, 2013).

A CITB (2019) report indicated that the UK construction industry would face a shortfall to match the demand. Based on Farmer's (2016) review, the industry could see as much as a 25 % decline in its available labour force within a decade, mainly due to the retirement of older workers. Arcadis' (2017) report indicated that the UK construction industry needs to employ over 400 000 people each year to meet housing and infrastructure demands. Meanwhile, the impact of Brexit will widen this gap even more (Mohamed et al., 2017). Brexit might result in a loss of up to 214 000 EU employees in the construction industry in the UK (Arcadis, 2017). The shortage of skills and labour would mainly impact the reduction in time and cost targets.

For several decades, the construction industry in the UK has been warned that it must modernise to improve (Latham, 1994; Egan, 1998; Farmer, 2016). The white paper on housing released by the Government in 2018 reiterated this barrier, highlighting innovation, modernisation, and productivity problems (Ministry of Housing, Communities & Local Government, 2018). The construction industry seems trapped in conventional and dysfunctional structures and techniques (Farmer, 2016). Even today, most construction firms still rely on very traditional production approaches. Nazir et al. (2020) argued that modular housing could resolve the UK's affordable housing crisis. The McKinsey & Company report (2019) highlighted two critical benefits of modular methods for construction clients: a 50 % cut in time to complete projects and reduced costs of up to 20 % (Steinhardt and Manley, 2016). Modular methods of construction (MMC), like offsite construction, offer the potential to reduce construction time and cost (Miles and Whitehouse, 2013). According to Azman et al. (2012), pre-fabrication can solve major problems in the UK construction sector, such as a skilled labour shortage, expedited completion, higher costs, and transportation issues. Also, prefabricated buildings have lower embodied and operational carbon emissions than traditional buildings (Teng et al., 2018). However, the UK has been slower to embrace the technique. Only around 10 % of Britain's housebuilders use MMC (Savills, 2020).

Construction News (2020) stated, "We build too slowly, too expensively, and with too little reliability". Rogers (2018) and Madanayake and Çidik (2019) believed digitalisation could solve the construction productivity problem. Between 2013 and 2020, BIM adoption increased significantly, from 39 % to 73 % (NBS, 2020). Meanwhile, Raza et al. (2019) argued that BIM efficiently reduces carbon emissions if used effectively in the building design phase. However, since these technologies are regarded as costly, their adoption is limited.

Sarhan and Fox (2013) argued that the wide adoption of lean construction management principles would improve quality and efficiency. However, their study also revealed a lack of adequate lean awareness and understanding, top management commitment, and cultural and human attitudinal issues as the main barriers to adopting lean management in the UK. Meng (2019) suggested that integrating lean construction with the supply chain would make lean construction more effective and accelerate lean transformation. An integrated supply chain will increase the industry's productivity and reduce waste (Al-Werikat, 2017; Magill et al., 2020).

Both Latham's (1994) and Egan's (1998) reports mentioned the lack of collaboration as one of the main barriers to the industry's growth. Also, the "Construction 2025" Strategy report (HM Government, 2013) addressed the lack of collaboration and knowledge-sharing as one of the industry's weaknesses. Oraee et al. (2019) showed that collaboration is fundamental for improving the industry's efficiency, resource utilisation, increasing profit and enhancing quality. The lack of collaboration surrounding the construction industry's activities has been closely attributed to the industry's poor efficiency, such as delays and cost overruns, as construction processes frequently take place sequentially, and parties usually operate in isolation with limited interfaces between them (Riazi et al., 2020).

The "Construction 2025" report (HM Government, 2013) highlighted the higher degree of fragmentation as a threat to the UK construction industry's growth. It arises from a high proportion of self-employment and many small and micro-businesses driving the industry. The Government Construction Strategy 2016–2020 (IPA, 2016) reported that the industry was dominated by 956 000 SMEs, which accounted for 99 % of businesses. Most of the work is done by small enterprises, with only 25 % going to the top 20 main contractors. In Sweden, on the other hand, the top three companies are responsible for 40 % of the work (Construction News, 2019). Naoum et al. (2010) identified the fragmentation of the construction industry as the main barrier to innovation. The industry's fragmentation causes the industry to underperform, such as delays, cost overruns, low sat-

isfaction, etc. (Riazi et al., 2020). The Government oversight of the construction industry is distributed across many departments, each taking responsibility for a different policy. The Department of Business, Innovation, and Skills (BIS) is responsible for the "Construction 2025" Strategy (HM Government, 2013), whereas the Infrastructure and Projects Authority (IPA) is responsible for the "Government Construction Strategy 2016–2020" (IPA, 2016). This indicates some fragmentation in the governance structures adopted to manage the major delivery of programmes. The depreciation of the British pound causes price increases in imports, forcing companies to raise their prices to avoid lower profit margins (Elcheikh et al., 2020). While a lower pound increases export competitiveness, it does not guarantee economic growth because exporters may raise their prices to maximise profits, resulting in unchanged export volumes. However, a weaker currency could improve competitiveness between British firms (Competition & Markets Authority, 2020).

The "Construction 2025" report (HM Government, 2013) addressed the challenges of inefficient procurement, which leads to high construction costs and increased GHG emissions. Ivalua's (2019) report revealed that inefficient procurement processes cost UK firms almost GBP 2 million per year. The industry and clients need to change the procurement routes to transform the industry (Marshall, 2020).

After considering the challenges that the industry faced over the last decade and analysing their impact on the revolutionary industrial Strategy, the study identified thirteen potential barriers to the "Construction 2025" Strategy targets: the contradictory nature of the "Construction 2025" Strategy targets, skilled labour shortage, reluctance to adopt change, failure to adopt modern construction methods, lack of implementation of new technology, lack of implementation of new methods of management, failure to adopt sustainable building design and construction strategies, lack of collaboration and limited knowledge sharing, fragmentation in the industry, the weakening value of

Tab. 1. Respondents' characteristics

| Characteristics | Percentage |
|---|---|
| **Construction Experience** | |
| less than a 1 year | 9.30% |
| 1 to 5 years | 21.90% |
| 6 to 10 years | 18.80% |
| more than 10 years | 50.00% |
| **Professional Role** | |
| Architect | 11.00% |
| Building Surveyor | 8.00% |
| Civil Engineer | 5.00% |
| Construction Manager | 7.00% |
| Design Manager | 4.00% |
| Director | 16.00% |
| Project Manager | 26.00% |
| Quantity Surveyor | 12.00% |
| Site Manager | 4.00% |
| Other | 7.00% |
| **Awareness of the "Construction 2025" Strategy targets** | |
| Aware | 69.00% |
| Not aware | 31.00% |

Note: 96 participants; all categories add up to 100 %.

the pound sterling, lack of trust in the supply chain, traditional procurement approaches, and poor record of tackling climate change.

## 2. Research methods

A questionnaire survey was used to obtain a generic view of industry professionals' perceptions about the attainment level of performance targets and barriers to achieving them. The questionnaire consisted of two main parts:

Part 1. Collect data on the demographic profile of the respondents.

Part 2. Use a 10-point Likert scale, which allowed the respondents to express their perception of the probability of achieving "Construction 2025" targets. The more the value tends towards 1, the more it is considered "Highly Impossible"; and the more it tends towards 10, the more it represents "Highly Possible". Additionally, respondents were asked to use the same 10-point Likert scale to rate 13 factors identified as potential barriers to the "Construction 2025" Strategy targets.

A Cronbach's alpha test was calculated to assess the research instrument's reliability. The result (0.862) indicates a good internal consistency of the questionnaire.

The questionnaire was deployed via an online survey using Qualtrics. The questionnaire was distributed to UK construction professionals through the online professional network LinkedIn platform between March–April 2021. A total of 96 respondents completed the survey. The respondents' characteristics are shown in Table 1.

## 3. Research results

### 3.1. Possibility of achieving the strategy targets by 2025

A one-sample t-test was run to compare the mean scores to a test value of 5. The test results, indicating respondents' opinions on the possibility of achieving "Construction 2025" Strategy targets, are shown in Table 2.

Results show the respondents' perception of the likelihood of achieving the targets. All mean values are close to 5 (the middle of a scale), indicating high uncertainty among respondents. Construction industry professionals in the UK are unsure if the industry can achieve a 33 % reduction in costs and a 50 % reduction in time by 2025. The uncertainty in the reduction in time and cost targets reflects the opinions of many industry professionals, who believe the target is a tall order for the industry (Gruneberg, 2018; Green, 2013; Bingham, 2013). Additionally, no clear data has shown the progress of these two targets since 2013.

However, results demonstrate that respondents are more positive in their view of a 50 % reduction in greenhouse gas emissions, with mean values significantly above 5. It reflects the UK's successful history in reducing emissions by 43.8 % from 1990 to 2018 (BEIS, 2019).

Tab. 2. Possibility of achieving "Construction 2025" Strategy targets

| S/N | Target | Mean | Standard deviation | t-value | p-value |
|---|---|---|---|---|---|
| 1 | A 33 % reduction in both the initial cost of construction and the whole life cost of assets | 5.06 | 2.27 | 0.27 | 0.79 |
| 2 | A 50 % reduction in the overall time from inception to completion for newly built and refurbished assets | 5.12 | 2.51 | 0.49 | 0.63 |
| 3 | A 50 % reduction in greenhouse gas emissions in the built environment | 5.85 | 2.56 | 3.27 | 0.00* |
| 4 | A 50 % reduction in the trade gap between total exports and total imports for construction products and materials | 5.49 | 2.14 | 2.23 | 0.02* |

Note: statistically significant values p<0.05 have been marked with an asterisk.

The respondents are also positive about a 50 % reduction in the trade gap. However, the mean value, close to the middle of a measure scale, shows an uncertainty. Brexit could impact this target, as 62 % of materials imported by the UK construction industry come from EU countries (Construction Index, 2021). However, it is difficult to assess the full impact of Brexit on the industry.

### 3.2. Barriers to the "Construction 2025" Strategy targets

Thirteen factors were listed as potential barriers to attaining the strategy targets. As previously, the one-sample t-test was run to compare the mean scores of a barrier to a test value of 6.5. A higher test value has been chosen to identify barriers perceived as a considerable obstacle to successfully implementing the "Construction 2025" Strategy targets. The list of barriers and results of the one-sample t-test are shown in Table 3.

The results reveal four statistically significant barriers to the "Construction 2025" Strategy targets: reluctance to adopt change, lack of implementation of new technology, fragmentation in the industry, and failure to adopt modern construction methods.

A principal component analysis was run to observe any relationships and correlations in the whole data set. To verify the adequacy of the data for factor analysis, the Kaiser–Meyer–Olkin (KMO) test and Barlett's test of sphericity were used. Results are shown in Table 4.

The KMO measure of this study, with a value of 0.819, and significant Bartlett's test results (Table 4) suggest the adequacy of the data for the factor analysis (Field, 2005; George and Mallery, 2020).

The data collected was subject to principal component analysis (PCA) with Varimax rotation. The choice of the principal components was made using criteria of the variance explained by the principal components and the criterion of a scree plot (Cangelosi and Goriely, 2007). Table 5 shows eigenvalues,

Tab. 3. Barriers to the successful implementation of the "Construction 2025" Strategy targets

| Barriers | Mean | Standard deviation | t-value | p-value |
|---|---|---|---|---|
| Reluctance to adopt change | 7.22 | 2.63 | 2.67 | 0.00* |
| Lack of implementation of new technology | 7.08 | 2.53 | 2.25 | 0.02* |
| Fragmentation in the industry | 7.05 | 2.40 | 2.25 | 0.02* |
| Failure to adopt modern construction methods | 6.98 | 2.30 | 2.03 | 0.04* |
| Failure to adopt sustainable building design and construction strategies | 6.92 | 2.25 | 1.85 | 0.06 |
| Shortage of skilled labour | 6.90 | 2.82 | 1.41 | 0.16 |
| Lack of implementation of new methods of management | 6.85 | 2.23 | 1.55 | 0.12 |
| Lack of collaboration and limited knowledge sharing | 6.76 | 2.29 | 1.11 | 0.27 |
| Traditional procurement approaches | 6.76 | 2.35 | 1.08 | 0.28 |
| Poor record of tackling climate change | 6.70 | 2.37 | 0.85 | 0.39 |
| Lack of trust in the supply chain | 6.27 | 2.26 | -0.99 | 0.32 |
| Weakening value of the pound sterling | 5.92 | 2.15 | -2.65 | 0.00* |
| Contradictory nature of the "Construction 2025" Strategy targets | 5.89 | 2.13 | -2.77 | 0.00* |

Note: Statistically significant values p<0.05 have been marked with an asterisk.

Tab. 4. Kaiser–Meyer–Olkin (KMO) and Barlett's test of sphericity results

| | | |
|---|---|---|
| Kaiser–Meyer–Olkin Measure of Sampling Adequacy | | 0.819 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 530.666 |
| | Df | 78 |
| | Sig. | 0.000 |

cumulative eigenvalues, and the explanatory power — the percentage of variance explained — of a particular principal component.

A threshold of at least 70 % of explained variability has been used to establish the number of selected principal components (Jolliffe, 2002). Four principal components have been extracted. The variance of each component has been visualised on a scree plot (Fig. 1).

The plot shows a drop for Component 1 and Component 2. The line stabilises from Component 4 onwards, indicating that the first four components collectively account for most of the total variance in the dataset. Four principal components, cumulatively explaining 70.23 % of the variance in the dataset, have been extracted. Table 6 presents the results of the rotated component matrix.

Tab. 5. Eigenvalues and cumulative variance explained by principal components

| Component | Initial Eigenvalues | | |
|---|---|---|---|
| | Total | % of Variance | Cumulative % |
| 1 | 5.229 | 40.224 | 40.224 |
| 2 | 1.580 | 12.156 | 52.380 |
| 3 | 1.429 | 10.991 | 63.371 |
| 4 | 0.892 | 6.862 | 70.233 |
| 5 | 0.722 | 5.557 | 75.790 |
| 6 | 0.625 | 4.805 | 80.595 |
| 7 | 0.484 | 3.727 | 84.321 |
| 8 | 0.462 | 3.556 | 87.877 |
| 9 | 0.423 | 3.254 | 91.131 |
| 10 | 0.371 | 2.857 | 93.989 |
| 11 | 0.323 | 2.486 | 96.475 |
| 12 | 0.276 | 2.123 | 98.597 |
| 13 | 0.182 | 1.403 | 100.000 |

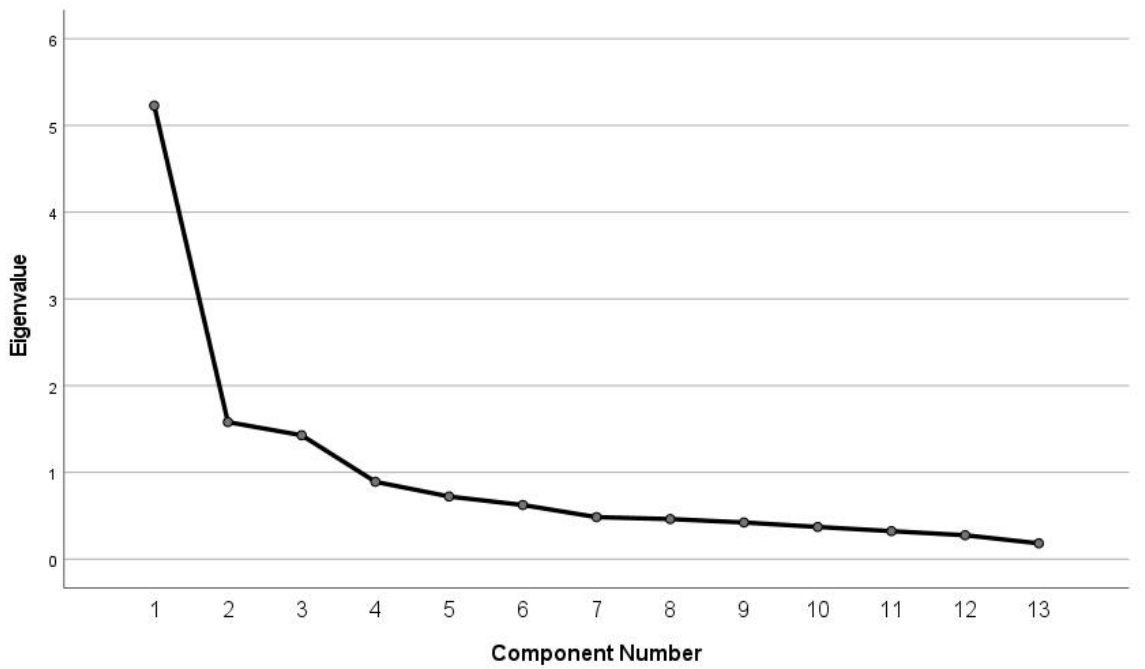


Fig. 1. Scree plot

Tab. 6. Component loadings matrix — varimax rotation normalised

| Barriers | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Contradictory nature of the "Construction 2025" Strategy targets | 0.228 | -0.248 | 0.244 | 0.785 |
| Shortage of skilled labour | 0.859 | 0.061 | 0.039 | 0.127 |
| Reluctance to adopt change | 0.705 | 0.155 | 0.379 | -0.171 |
| Failure to adopt modern methods | 0.312 | 0.720 | 0.090 | 0.063 |
| Lack of implementation of new technology | 0.237 | 0.739 | 0.314 | -0.307 |
| Lack of implementation of new management methods | -0.018 | 0.729 | 0.346 | 0.078 |
| Failure to adopt sustainable building design and construction strategies | 0.415 | 0.560 | 0.262 | 0.289 |
| Lack of collaboration and limited knowledge sharing | 0.695 | 0.402 | 0.102 | -0.169 |
| Fragmentation in the industry | 0.553 | 0.133 | 0.554 | 0.214 |
| Weakening value of the pound sterling | -0.263 | 0.404 | -0.024 | 0.752 |
| Lack of trust in the supply chain | 0.195 | 0.251 | 0.762 | 0.116 |
| Traditional procurement approaches | 0.115 | 0.288 | 0.824 | 0.038 |
| Poor record of tackling climate change | 0.494 | 0.464 | 0.275 | 0.063 |

Note: underlined loadings are >0.60.

To interpret factors, only loadings offering statistical significance at 0.05 level have been used. Following Hair et al. (2019) guidelines for identifying significant component loadings based on sample size, the cut-off point for interpretation purposes is all loadings greater than 0.60. Component loadings greater than 0.60 have been underlined (Table 6).

Since component loadings represent the correlation between the original variable and its factor (expressing the influence of each original variable within the component), the following components' labels are proposed:

Component 1 accounts for 40.2 % of the total variance explained and reports high loadings for three variables (shortage of skilled labour, reluctance to adopt change, lack of collaboration and limited knowledge sharing) related to the industry's hermetic and unappealing nature.

Component 2 comprises three variables (failure to adopt modern methods, lack of implementation of new technology, lack of implementation of new management methods) representing reluctance to adopt innovation, which explains 12.15 % of the dataset's variance;

Component 3 indicates inefficient procurement systems (with two variables: lack of trust in the supply chain and traditional procurement approaches), explaining 10.99 % of the variance;

Component 4 accounts for 6.86 % of the total variance in the data set representing economic/government support factors.

## 4. Discussion

It has been almost 25 years since Latham (1994) and Egan's (1998) report called for the industry to modernise and be more collaborative. However, construction professionals still report the old problems of the industry's conventional approach. Half of the variance in the data set (Component 1 and Component 3) is explained by variables that could be attributed to the traditional, labour-intensive approach to the construction process. Interestingly, Component 2, an indicator of the approach to innovation, explains only 12 % of the variance in the data. Despite the industry being slow in adopting MMC (panelised MMC accounts for around 10 % to 15 % of builds while volumetric MMC accounts for less than 2% of current builds (CITB 2019)) respondents do not see the slow adoption of MMC as one crucial barrier to achieving "Construction 2025" targets. ONS report (ONS, 2021) indicates 43 000 vacancies in the construction industry in July–September 2021, which is the highest level in the records. It is believed that

adopting MMC will significantly reduce labour pressure and might contribute to the reduction of GHG (Lords' Science and Technology Committee, 2018; CITB, 2019). Recent government guidance (HM Government, 2020) promoting standardised and interoperable components and enhanced BIM interoperability, clearly incentivising MMC adoption, may provide the industry with more certainty to invest in new technologies. Undoubtedly, MMC will not be adopted as long as consumers continue to demand a traditional building; therefore, a demand-led change is crucial to accelerating the use of MMC (CITB, 2019).

The industry is now on the verge of the fourth industrial revolution, with digitisation significantly impacting the work itself and how the industry collaborates (RICS, 2020). Digital technologies are regarded as costly; therefore, their adoption is limited. At least 60–70 % of construction companies are not engaging with any digitalisation at all, which is hampering them in a competitive market (Construction News, 2019). The industry should be encouraged to invest more in IT technologies and become more digital, as it can lead to overall improvements in productivity. Interestingly, COVID-19 has accelerated the digital adoption in the industry (RICS, 2020) and changed some work models. It is expected that the industry will continue to transform. Without an innovative approach to business models and more value-adding processes, the UK construction industry will still be criticised for being inefficient and outdated (Baran, 2007).

## Conclusions

This study has reviewed the progress of the "Construction 2025" Strategy targets of the UK construction industry and has ascertained the progress of those targets based on the views of construction professionals. The analysis indicates that none of the targets is on course to be met by 2025. However, UK construction professionals are more positive in their view of a 50 % reduction in greenhouse gas emissions and a 50 % reduction in the trade gap by 2025.

The analysis also reveals three significant barriers to achieving the "Construction 2025" Strategy targets: the industry's hermetic and unappealing nature, reluctance to adopt innovation and inefficient procurement systems. The UK's construction industry seems trapped in conventional and dysfunctional structures and techniques, obstructing rapid change by 2025.

It is recommended that a more robust and comprehensive approach to analysing the industry's attainment of targets is implemented through tailored KPIs. There should also be mechanisms for measuring and reporting them. Further Government initiatives are required to address some barriers, particularly incentives to adopt MMCs and technologies and digital innovation using similar initiatives, such as the UK's national BIM strategy and the Transforming Construction Programme.

## Literature

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