PlanGrid

Digital Foundations: Solving construction's productivity puzzle

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Foreword

Construction is at the heart of life in the UK. The industry provides not only the places we live and work, but the buildings central to our culture – from schools and hospitals to football grounds and theatres.

Construction also helps improve the efficiency of other sectors, and subsequently plays a pivotal role in tackling the national productivity puzzle.

Productivity in the industry itself, however, has stagnated. While the manufacturing sector has almost doubled its productivity in the last 20 years, construction productivity has not improved since the early 1990s.[1]

The slow adoption of technology in construction is a key issue with regards to productivity. During my time as a construction engineer, I realised that like so many others my company simply wasn't using technology to help us build better.

We were missing out on opportunities to reduce mistakes, save time and ultimately make workers' lives easier – and like many in the industry, it was holding us back.

There is an incredible appetite among businesses, industry leaders and government to improve productivity in the UK construction industry.

That is why we have commissioned this survey alongside *Construction Manager* to hear the views of 235 industry professionals on the ground, to understand their biggest frustrations and where the solutions might lie.

It is clearly a challenging time for UK construction. Professionals point to squeezed access to labour (38%), reduced government spending on infrastructure projects (21%) and increasing wage demands (18%) as the biggest hurdles in the sector for the 12 months ahead.

However, it is also a fantastic opportunity for construction companies to set themselves up for success in the future – and to boost the UK economy in the process.

I hope you enjoy the report.

Tracy Young
CEO and Co-founder, PlanGrid

Issues with Accuracy

Productivity in the UK construction industry has stagnated over the last 20 years, with output per hour remaining the same in 2015 as it was in 1994.[2]

According to construction professionals, a key obstacle to productivity is the accuracy and the speed of the information project teams can access.

Two-fifths (42%) of respondents say that the most significant factor affecting productivity in their business is lacking the information needed to make confident decisions.

This shortage of data leads to errors on jobs. In fact, two-thirds (68%) say that the main cause of unnecessary time on projects is rework or dealing with mistakes that have already been made.

Three-quarters of construction professionals have lost faith in the quality management system[3] across the board, according to a study from the Chartered Institute of Building.

Loss of data accuracy is being further exacerbated by the tendency for clients to change project requirements late in the construction process. As a result, firms frequently have to update plans and drawings and then communicate new versions to the whole project team on-site.

These changes can lead to delays and even errors if team members are working from outdated information. In fact, 8% of respondents say that version control has the biggest impact on their productivity.

Inaccurate and inconsistent information is a major drain on the sector worldwide. Every year construction firms globally lose $9bn just from working with outdated plans.[4]

When deadlines are tight, contracts are complex and access to labour is challenging, accuracy is key to maintaining productivity – but at present, misinformation is holding businesses back.

What do you believe are the biggest factors affecting productivity in your business?*
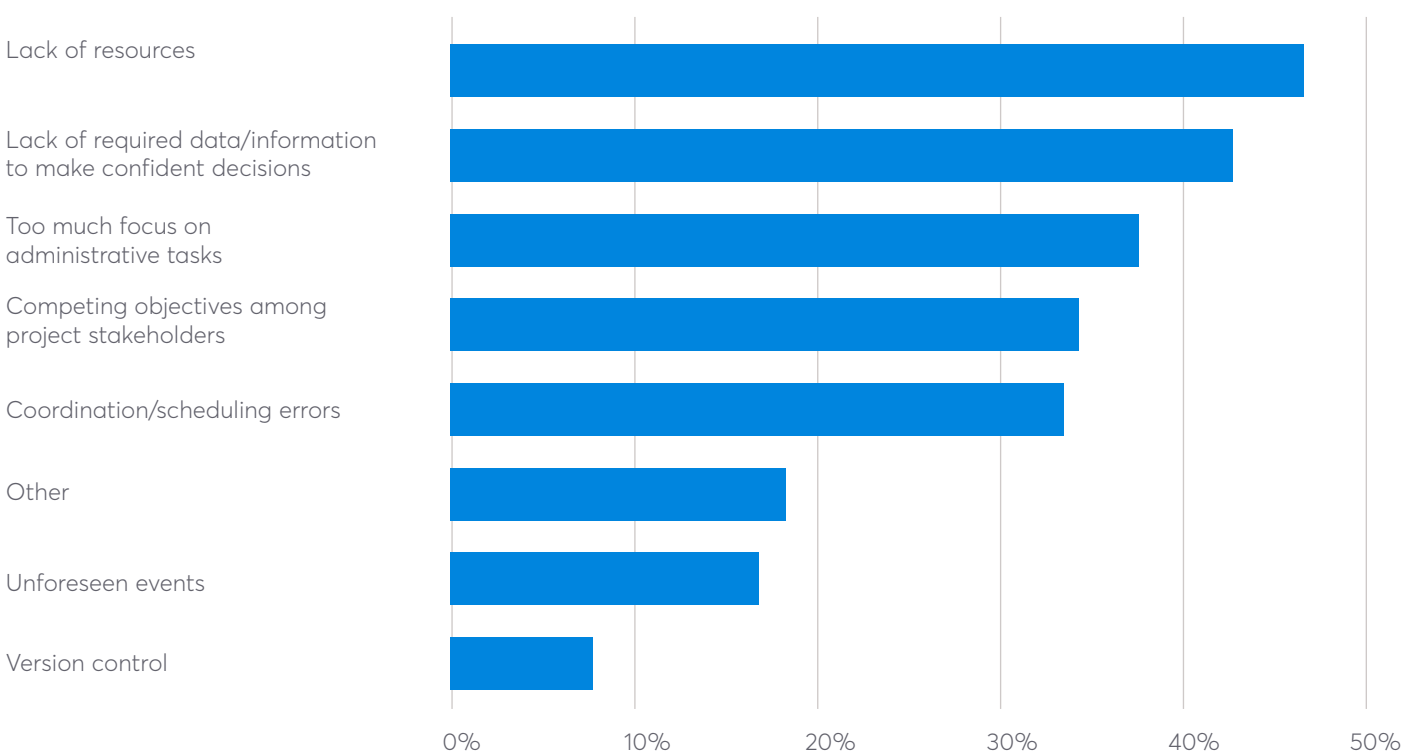
* Respondents selected up to three answers

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"Dealing with avoidable errors is not only a waste of time – it's incredibly disheartening for the team involved and even potentially damaging to client relationships. UK construction firms are clearly finding mistakes to be a drain on their productivity, as well as the overall profitability of jobs.

Improving timely access to information, and the accuracy and consistency of that information, will help to improve productivity. Using digital tools can also enable firms to build up a database to track and identify the most common errors and institute changes in processes where needed.

And when the brief alters, being able to mark up and agree on a clear change order early in the process will help to avoid delays in payment and simplify that all-important client relationship."

— **Rob Elvidge**
Managing Director, EMEA Operations, PlanGrid

CUSTOMER CASE STUDY

Jerram Falkus

Jerram Falkus is a family-owned construction business, founded in Shoreditch, London in 1884. Project Leader Martin Hickey observed that many projects in the business were delayed due to production issues on-site. The company's existing system meant that teams were not always getting the right information in their hands at the right point in time.

Drawings could take up to a week to make their way into the hands of site management and subcontractors, while there was not an efficient way to communicate mark-ups or record changes made on-site. In fast-track programmes, teams could be working from out of date information, resulting in costly delays and errors and increasing the potential for rebuilds.

Using a cloud-based platform means that up to date drawings can easily be shared, helping the company to deliver projects on time, on budget and with minimal defects.

Collaboration Complications

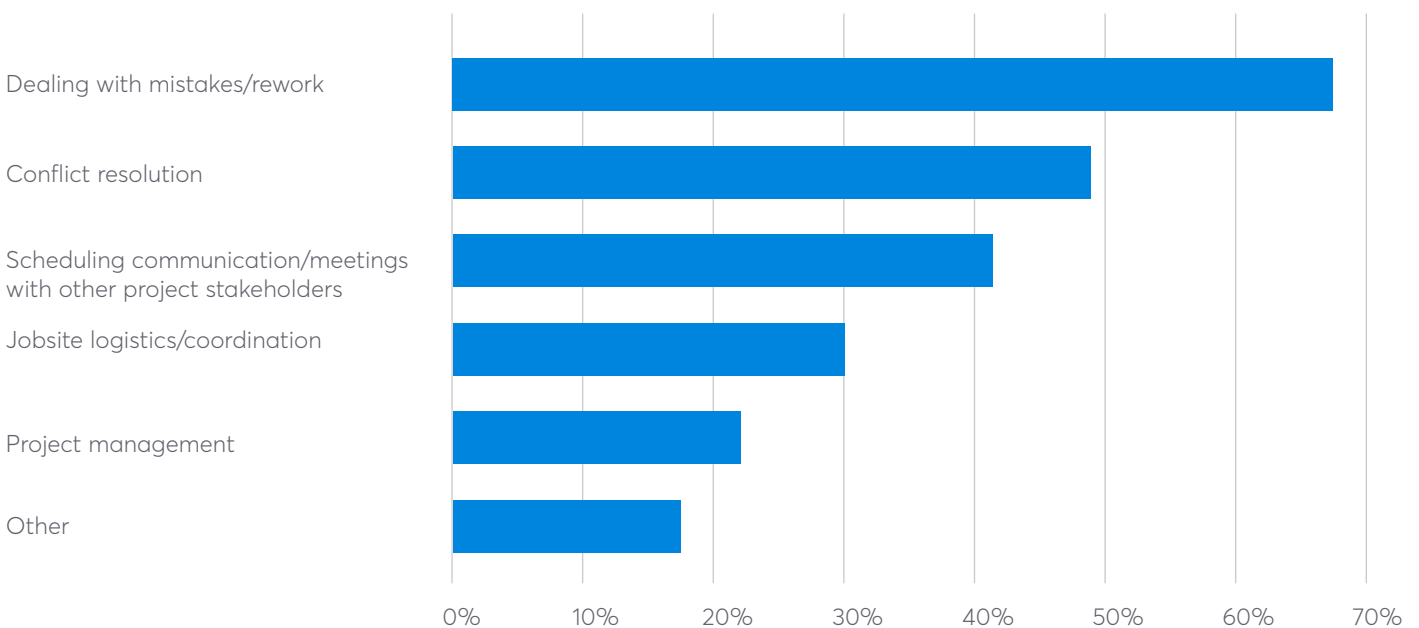Collaboration is more important than ever for the UK's construction firms.

Increasing specialisation and the rise of new approaches like integrated project delivery (IPD) mean that businesses must work closer together and more frequently. Relationships between general contractors and subcontractors can be fundamental to projects' success, if properly facilitated and managed.

Coordination can be time-consuming, however, and industry professionals point to this as a particular drain on productivity.

For instance, scheduling communications and meetings with other project stakeholders (42%) and jobsite logistics and coordination (30%) are both highlighted as taking up unnecessary time on building projects.

Worse still, problems with communication can cause tension and even conflict with partners. One third (33%) say that competing objectives among project stakeholders is the biggest factor impacting their business' productivity.

Half of all respondents (49%) even identify conflict resolution as taking up the most unnecessary time on their projects – the second most popular answer. This is particularly concerning for the long-term development of the sector, as collaboration will be fundamental to realising novel construction strategies, such as off-site manufacture (OSM).

The UK government has adopted a 'presumption in favour' of OSM for its projects and highlights the advantages of the approach for improving the sector's productivity.

However, a recent House of Lords report suggested that uptake of the model was hindered by an industry that appears 'fragmented and lacking in trust.'[5]

Of course, margins are key to the profitability of any job for those involved. With stakeholders often competing for such thin margins, perhaps it's not surprising that relationships between firms can sometimes become adversarial; however, conflict is a major drain on productivity.

Collaboration must be an area of focus to improve firms' performance.

Which of the following take up most unnecessary time with building projects?*

* Respondents selected up to three answers

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"Intelligent and transparent collaboration will be critical to the future of the construction industry. With that in mind, it's alarming that communication problems are not only holding up projects but creating conflict – which doesn't help anyone.

It's understandable that things can become tense: general contractors are highly dependent on the quality of subcontractors' work, while specialists can feel at the mercy of scope and schedule changes communicated by the general contractors.

Nonetheless, relationships and trust on jobsites are key to success. Working well together will improve every metric and benefit all partners. Smart collaboration tools can help, by enabling businesses to share information quickly and efficiently, reducing errors and outlining clear responsibilities for everyone involved."

— Rob Elvidge
Managing Director, EMEA Operations, PlanGrid

CUSTOMER CASE STUDY

Voyage Care

Voyage Care operates 400 properties nationwide to deliver essential healthcare support, including care homes, supported living and rehabilitation. The company works with a wide selection of partners and suppliers on a daily basis, requiring close collaboration across department teams and with external providers.

Voyage Care was using paper drawings, resulting in issues with version control, problems tracking the progress of projects and a lack of visibility over the roles and responsibilities of site teams. Difficulties with collaboration were impacting completions and resulted in costly overruns and rework issues with several projects.

Using a cloud-based platform ensures that all team members are working from the same sets of drawings and responsibilities are clear. Issue tracking provides visibility into outstanding problems and highlights the ownership of activities, enabling better communication and collaboration.

The Persistence of Paper

The construction industry's continued use of traditional methods rather than new technology is an essential underlying contributor to its productivity challenges. This is particularly visible when it comes to the use of paper.

The majority of construction firms still rely on paper to share drawings, plans and other key documentation with the project team.

Nearly a quarter (22%) say that their building projects are entirely paper-based, while another third (32%) run less than a quarter of projects without paper. Just 12% of respondents run three-quarters or more of their projects without paper.

Some construction firms have been reluctant to adopt paperless technology because of its perceived cost. This misconception may reflect a near-sighted view of upfront expenses rather than long-term business benefits. In fact, 42% of constructions firms prioritise immediate financial gains over organisational resilience, according to a report from Constructing Excellence.[6]

However, using paper presents clear disadvantages for firms, including its cost. Printing is expensive in itself, although this can be overlooked; 48% of industry professionals don't know how their firm tracks the cost of paper spend, while 14% estimate it as 0.5-1% of project costs as standard.
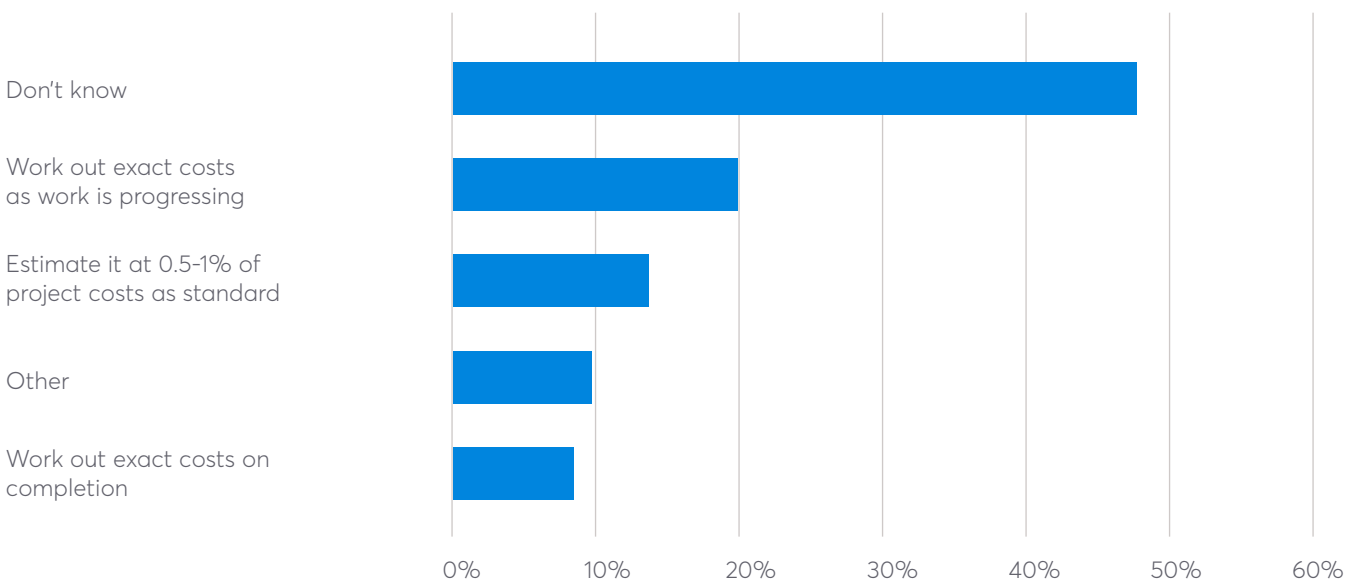
Relating to productivity, paper is also time-consuming for people on the jobsite to utilise. This is important when 37% say that spending too much time on administrative tasks is the biggest factor impacting their productivity.

Making changes to paper drawings is often a lengthy and even tedious process. Project teams have to wait for updates to their sheets while new sets are printed, delivered and distributed, if they are even notified of changes in time. Each additional step increases the risk of errors within jobs.

Importantly, there is also the risk of damage to plans, drawings and contracts during projects.

Reassessing this reliance on paper, in favour of digital technologies, could support greater accuracy, improved efficiency and easier collaboration within construction firms.

How do you track the costs of paper spend per project?

Category	Value
Don't know	~47%
Work out exact costs as work is progressing	~19%
Estimate it at 0.5-1% of project costs as standard	~13%
Other	~9%
Work out exact costs on completion	~8%

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"With its inherent drawbacks, using paper for building projects undoubtedly contributes to many other productivity issues that construction firms are facing. Historically, many businesses have been put off using paperless systems due to fears about costs and concerns about effectiveness on sites without internet access.

However, the rise of devices like tablets and smartphones – as well as the availability of offline drawings powered by cloud-based software – means that paperless tools are both affordable and accessible to use on jobsites. Digital platforms can have added benefits, such as collecting data about the firm's performance across various projects, which can then be used to drive improvements in productivity."

— Rob Elvidge
Managing Director, EMEA Operations, PlanGrid

AbraxysGlobal

AbraxysGlobal are health and safety consultants who have been servicing the exhibition industry for over 12 years. The team manages events on-site to ensure that all exhibitors comply to relevant safety regulations and record any incidents.

Conferences traditionally rely heavily on paper, with massive A1 plans mapping out stand locations, designs and the venue. This can represent up to 2,000 stands, resulting in the AbraxysGlobal team requiring a significant number of paper files on-site.

Moving to a cloud-based platform enabled the team to upload stand plans, technical floorplans and general event regulations to their devices, to ensure they have access to all key data for the duration of a show. Intermittent internet connectivity is not a problem, as the platform works effectively offline, syncing automatically when the device is back online.

Steps in the Right Direction

There is clearly an appetite at some construction firms to use more technology. Many are using one or more digital technologies to improve the efficiency of their teams across projects.

Using file sharing tools like Dropbox to share and access drawings is by far the most common technology to have been adopted by industry professionals, at 52% of respondents.

Building Information Modelling (BIM) technology followed next (13%), with small numbers also using scheduling software (5%), estimate software (5%) or web conferencing for meetings (5%).

A small proportion of firms are also utilising drone (2%) and collision detecting software (1%) to support workers on-site.

Proliferation of technology on jobsites is certainly a positive trend. However, digital file sharing does not provide all the answers for professionals looking to access accurate information on-site and make meaningful improvements to their productivity.

Without industry-specific technology and software, it can be difficult to clearly link files to their relevant projects or purposes so that everyone on a job can

access the right information, at the right time. Versioning can be an issue in construction, as updated digital drawings must still be shared with and highlighted to the team, to ensure that everyone is using the correct version.

Firms using paperless tools also have a tendency to use disparate software platforms. This can create its own problems, especially if varying kinds of software are used between the jobsite and the front office. Three-tenths of US construction firms have experienced issues because of difficulties integrating the many applications they use, according to the Construction and Technology Report.[7]

Although it's still concerning that 10% of industry professionals don't use any technologies to improve their efficiency, there are certainly signs of steps in the right direction.

Following in the footsteps of the manufacturing industry, there is an excellent opportunity for the construction sector to make productivity gains from implementing technology.

To make the most of technology, however, it has to be implemented into workflows in a way that is helpful to the firm and supports teams on the ground.

What technology has your company implemented to improve digital efficiency with teams across projects?

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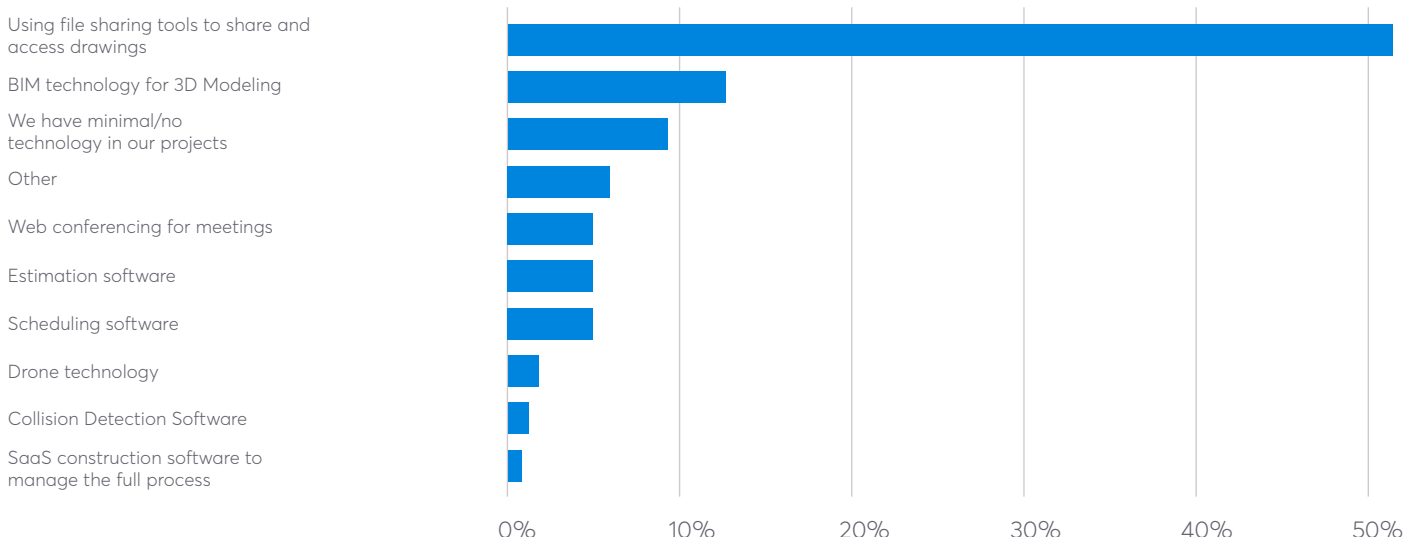
"It's promising to see a growing appetite for adopting technology in the construction industry. But to make paperless technology work for the team, it has to be connected and shared in a useful way.

Think back to the introduction of digital cameras. These were clearly useful tools for project teams to capture and share visual information on jobsites. However, if you're just looking at a random set of images, it's very tricky to link them to a project, let alone a specific issue, to work out what action needs to be taken.

By using a single platform to integrate drawings, annotations, reports, photos and issue reporting in one place, you can ensure that the data is linked and everyone can access what they need, when they need it."

— Rob Elvidge
Managing Director, EMEA Operations, PlanGrid

CUSTOMER CASE STUDY
Jerram Falkus

Family-owned construction business Jerram Falkus employed some technology to share drawings, but contracts and specifications were all shared in written form.

The only way to ensure teams were complying with requirements on a project was for the project manager to haul all the relevant paperwork on-site – a cumbersome and inefficient approach. It required time spent in the site office interpreting and transcribing handwritten notes from the jobsite and searching through digital site photos to provide relevant evidence to resolve issues.

Using cloud-based software designed specifically for the construction industry enables the team to connect all relevant files to one project, including drawings, specifications, contracts and time-stamped photographs to help resolve snag lists in a timely manner. As Project Leader Martin Hickey says, "A photo can tell a thousand words; with PlanGrid we get that priceless information at our fingertips in seconds."

Tech and Talent

Resourcing is one of the most pressing challenges in today's construction landscape. In fact, lack of resource is the biggest factor impacting the productivity of UK firms, selected by 46% of industry professionals.
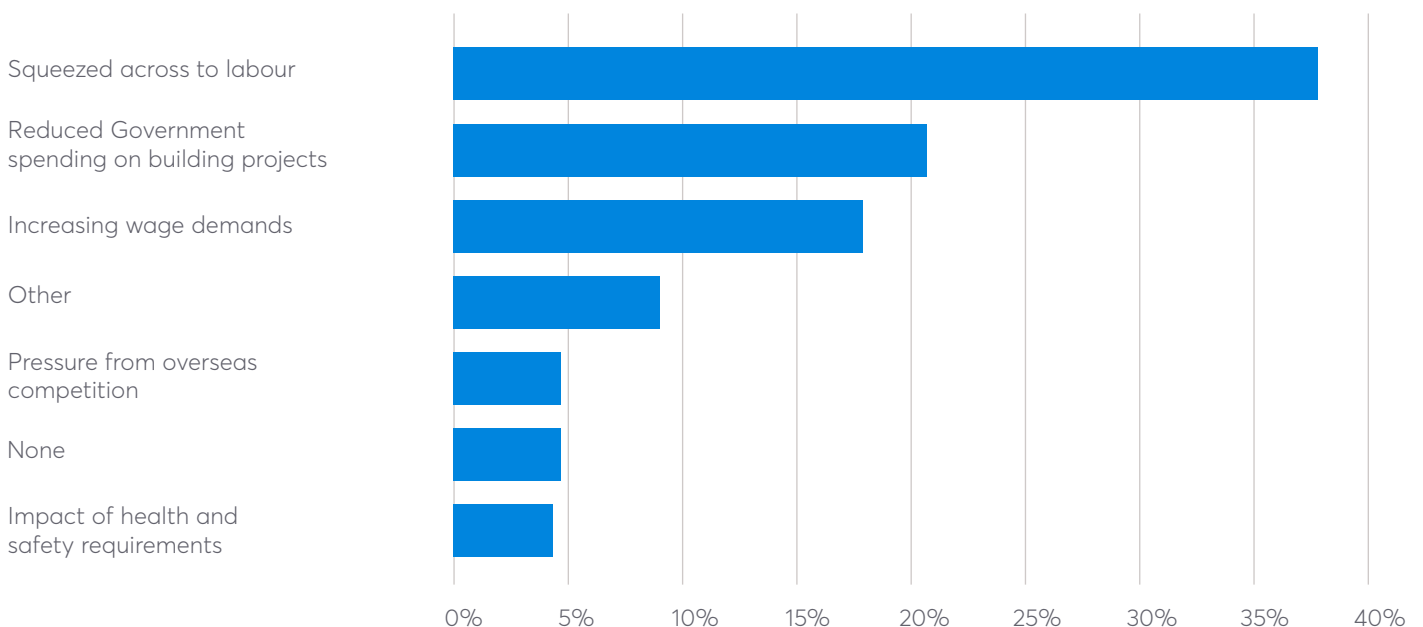
Migration is currently a key source of workers for construction businesses, especially in cities. As a result, labour shortages may intensify if the Brexit settlement leads to further restrictions on immigration.

Perhaps it's not surprising then that most respondents (38%) see squeezed access to labour as the top challenge for the UK construction industry in the next 12 months, while 18% similarly point to increasing wage demands.

With that in mind, it's critical for firms to retain and engage their current employees and consider how they might attract the next generation into the construction industry.

Staff engagement is fundamental to a business' productivity. Better engagement leads to better performance and improved rates of retention.

Worker engagement also helps to reduce absenteeism, something that 13% of construction professionals describe as an "ongoing management headache" and 26% experience sporadically.

Technology can help to improve engagement by cutting administrative burdens, supporting teamwork and reducing the need for rework to correct mistakes. It's equally important for firms to attract the next generation of talent.

Because of the age of the existing workforce and current numbers of new entrants to the construction profession, there's estimated to be a 20-25% decline in the available workforce[8] within a decade.

This means that an extra 700,000 workers will have to be recruited into the industry over the coming years. Digital natives, including millennials and Generation Z, have grown up with technology and expect to be able to use it in the workforce.

According to The Farmer Review of the UK construction labour model,[9] technology could be a pivotal way for the construction industry to overcome historical image problems and ensure that it is seen as a progressive and exciting sector to work in the future.

What challenges do you see for the UK construction industry in the next 12 months?

Challenge	
Squeezed across to labour	~37%
Reduced Government spending on building projects	~20%
Increasing wage demands	~17%
Other	~9%
Pressure from overseas competition	~4%
None	~4%
Impact of health and safety requirements	~4%

0%   5%   10%   15%   20%   25%   30%   35%   40%

"

"Staff engagement is a core part of productivity. Employees can easily be left frustrated by outdated processes that take up time and cause errors. I've seen colleagues working long hours to correct mistakes caused by outdated documents and missing family events as a result. At a time when competition for talent is fierce, this won't stand up.

Using digital technology is a brilliant way to not only improve the working lives of existing employees but attract digitally native workers into the construction industry. Digital natives want to use technology at work and will be attracted to the industries – and firms – that provide it. Technology is an important way for individual businesses and the sector as a whole to improve productivity, for today and for the future."

— Tracy Young
CEO and Co-founder, PlanGrid

CUSTOMER CASE STUDY

Sobha Hartland

Located in Dubai, Sobha Hartland is concentrated on developing an 8 million square feet freehold community. Sobha Hartland chose to use a cloud-based platform to reduce inefficiencies and allow the team to spend more time on-site, rather than on administration.

"Adoption was quick because PlanGrid can be handled like Facebook or other apps used daily," said Head of Quality and Assurance and Technology, Olaf Wagner. "We took already available technology and awareness and added PlanGrid to it, allowing us to take site collaboration and data sharing to the next level."

From a people management perspective, Olaf can effectively track the performance of his team. New recruits are also visibly energised to work with a mobile, cloud-based application, which improves their productivity and drastically increases the amount of time they spend on-site.

Conclusion

The UK's construction industry is facing some significant productivity challenges, which are set to become even more pressing with the economic uncertainty and talent shortages on the horizon.

Technology may be the most powerful way to address the industry's fundamental productivity concerns.

When client budgets are tight, technology eliminates mistakes and improves profitability.

In times of labour shortages, technology can enable teams to do more with less and improve employee engagement.

And as collaboration becomes essential to project success, technology supports clearer communications and better relationships with partners.

In the long-term, collecting data will ultimately enable firms to implement improvements and make better decisions for the future.

There are excellent signs in this report that firms are looking to adopt digital technology. With the right tools, designed specifically for the construction industry, there are significant gains to be made.

And there is government support. Construction is highlighted as a priority sector for productivity improvements in the Industrial Strategy. In July 2018, the government announced a £420 million investment in new construction technology to increase productivity in house-building.

Meanwhile, government schemes like the Road Investment Strategy[10] incentivise firms to demonstrate efficiency savings – an area where technology can play a key role.

Construction is currently one of the least digitised industries worldwide.[11] That means there is an incredible opportunity to use technology to improve productivity and the working lives of everyone in the industry.

It's time for construction firms to use digital tools to improve their performance and make the industry future-ready – to the benefit of both the construction sector and the UK economy as a whole.

Methodology

This research was carried out by *Construction Manager* through an online survey of 235 UK construction industry professionals in May 2018.

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