Construction Leadership Forum Scotland

Digital Strategy for

Construction SME's

Outline Strategy

June 2022

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1.0 Introduction

As part of the industry response to the Covid-19 pandemic the Scottish Construction Leadership Forum published the [Construction Industry Recovery Plan](#) to help the industry recover and rebuild better. The plan identified five areas of focus, one of which is Transformation. This area looks at the requirement for the transformation of working practises including a strong focus on embracing digital ways of working. One of the actions identified was to "review / develop an outline digital strategy for industry - notably SMEs".

A working group was established to take forward the action. Membership of the group is noted in Appendix A.

In the initial phase of developing this action, the Construction Scotland Innovation Centre, on behalf of the working group, and supported by funding from Scottish Government, commissioned a series of reports, and workshops. These included:

- Digital Technologies in Construction (delivered by Optimat)
- Data Technologies in Construction (delivered by Optimat)
- Digital and Data Policy in Scotland (delivered by ScotlandIS)
- Digital technologies for SMEs workshops and report (delivered by Glasgow School of Art)

A summary of the findings of each report has been included in Appendix B. This work has informed a set of recommended actions set out later in the report.

The working group also took account of work already being done in the arena by other groups such as the University of Cambridge's Digital Construction on a Shoestring project (DCoS), which had identified 10 digital priorities for construction SMEs (detailed in Appendix C) and work being done by to enhance the SFT Digital Technology Navigator for use by construction companies.

The group were also able to call on the experience of the Digital Construction Skills programme, under the leadership of Saffron Grant, who provide digital training services to construction companies, particularly SMEs. This work continues to expand, and its use should be encouraged across the sector.

Aims

The aims of the exercise were identified as follows:

1. To support SME construction businesses to enhance resilience, performance, and capability through the adoption of digital tools, systems, and processes.

2. To improve visibility and adoption of the digital support and enablement infrastructure in Scotland.

3. To identify and address gaps in digital maturity, capability, and support, and provide a coordinated and coherent response tailored for SME businesses in the industry.

Purpose of this report

The purpose of this report is to:

- Bring together the findings of the exploratory research, consultations, and development work to inform a digital strategy.
- Inform subsequent discussions with the goal of establishing a delivery strategy.

2.0 Drivers for Change

Drivers for change were identified as follows:

- Support for small businesses
- Potential for improvement in:
    - Productivity
    - Construction Quality
    - Cost efficiency
    - Health & Safety
- Impact on climate change
- External pressures e.g. COVID-19
- Policy and legislative drivers
- Staff expectations
- Threat of disruption from external providers (i.e. being overtaken by new entrants to the sector)
- Peer pressure - being left behind if digital adoption is not undertaken
- Support a more efficient and carbon neutral industry in how services are delivered.
- Informed and proportionate Client requirements (directly and passing through the supply chain)

3.0 Strategy Details

Overarching details

The following high-level points have been discussed and agreed with the working group:

- *What should be the duration of the delivery strategy?*

It is envisioned that the strategy will run for three years.

- *Who is responsible for the implementation and governance?*

Implementation will sit under the Construction Accord, with the support of the working group.

The working group membership will be reviewed and active agents to oversee initial implementation will need to be identified.

- *How will it be funded?*

Funding sources will need to be identified. Depending on the specific aspect under review. Funding could be sourced from Scottish Government, Enterprise agencies, Industry and industry representative agencies such as CITB.

- *Who is the target audience?*

Direct focus is on SME constructors and design teams. However, it is acknowledged that the wider industry needs to be considered (i.e. policy makers, implementors, Tier 1 contractors, and educators) as they will have a direct impact on the success of any strategy.

Identifying a numerical target (i.e. something that affects 10 - 20% of the 50,000 companies in Scotland) should be considered.

Areas of focus

Three priority themes were identified from the Glasgow School of Art (GSOA) Workshops as being essential to any digital strategy development for SME's.
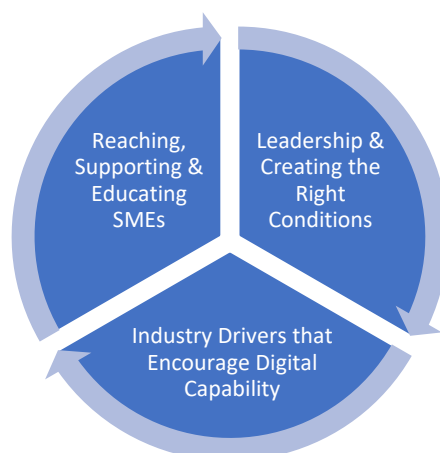
The findings from the GSoA, Optimat and ScotlandIS reports, along with input from the steering group, were collated and the recommendations grouped against these three areas:

Priority Theme	Proposed Actions
Leadership & creating the right conditions	• Expand the current working group to ensure wider representation and reach. • Identify key sub-sectors / trades for initial implementation. • Appoint a range of digital champions from businesses across the sector (SMEs, Tier 1s, clients, etc). • Work with relevant academic bodies to ensure that apprenticeships / college / universities are including digital techniques as standard. • Re-engage with CDBB to develop relevance of the DCOS work.
Industry drivers that encourage digital capability	• Undertake engagement with industry to refine and develop outline strategy. • Supply chain could be influential by rewarding and incentivising companies who clearly demonstrate investment towards staff training in digital and data adoption • Quantify and publicise the impact on climate change and achieving Net Zero - demonstrate that digital adoption is key to addressing such wider issues. • Work with clients to help them specify digital processes whilst ensuring that sufficient support is available to support contractors adopting them.
Reaching, supporting & educating SMEs	• Development of a campaign to promote benefits of digital adoption and promote the assistance and funding that is already available. • Identify what the most useful areas of technology adoption would be and support those initially through training, advice, and financial support. • Arrange for trial approaches to demonstrate differences and potential advantages of digital transformation.

Multiple sub actions were then identified during the workshops and from the commissioned reports. These have been grouped into short, medium, and long term and expanded upon over the following pages.

Note - timescales for short, medium, and long term to be further developed at next stage.

4.0 Short term actions

Action	Resources Required	Potential Supporters	Notes
Expand the current working group to ensure wider representation and reach. The working group should contain wider representation from trade and industry bodies to ensure that support for any engagement is maximised to help gain additional resources and support.	• Time commitment from existing and potential steering group members • Facilitation of group	• CSIC and SFT (facilitation & knowledge of contacts) • Existing working group contacts • CLF - chairing of group & direction setting	Tech suppliers should be considered to allow them to gain a greater knowledge of the industry so they can design, build, and deliver industry-specific solutions that can drive a real shift in digital construction. SELECT are running a business improvement strategy - potential tie in.
Identify key sub-sectors / trades for initial implementation. Due to highly fragmented nature of the industry not one size will fit all. While the strategy should cover the whole SME industry, implementation should identify key areas / trades and build support round them first to maximise the return on investment.	• Support from relevant stakeholders	• Industry bodies • CICV forum	Initial efforts should be focused on identifying quick wins
Appoint a range of digital champions from businesses across the sector (SMEs, Tier 1s, clients). These champions should be well-versed in the benefits of digital adoption and can act as figureheads and promoters. This could be backed up using case studies and webinars / events.	• Time commitment from champions • Development of case studies to promote benefits	• Working group members	Should tie in with key sub-sectors to maximise return
Development of a campaign to promote benefits of digital adoption and promote the	• Identification of funding streams and support (build	• DCS • CITB	DCS have already started to build a database of resources

Action	Resources Required	Potential Supporters	Notes
assistance / funding that is already available. This will address the situation that there is no one point of access for funding and support for digitisation.	on Digital Construction Scotland work) • Resource to monitor and maintain any database of support • Consider establishment of co-working opportunities across local government, colleges, and trade bodies, etc to identify local SME's and to both gather information on needs / status and disseminate knowledge on support available, etc. • Marketing resource		
Undertake engagement with industry to refine and develop strategy. • Tier 1 contractors - workshops to gain support and integrate their views • Integrate work being undertaken by SFT tech navigator working group.	• Organisation and facilitation of workshops • Time from industry participants	• SFT Tech navigator working group	
Identify what the most useful areas of technology adoption would be and support those initially through training, advice, and financial support.	• Potential to build on DCoS work (if appropriate) • Continue to develop SFT Technology Navigator • Build on relationship with other Construction Accord	• DcoS • Other Accord workstreams	Working group already connected into DCoS team

Action	Resources Required	Potential Supporters	Notes
	transformation work streams, such as improving construction quality. • Investigation into barriers to adoption of identified technologies		

5.0 Medium term actions

Action	Resources Required	Potential Supporters	Notes
Arrange for trial approaches to demonstrate differences and potential advantages of digital transformation.	• Funding to carry out trials • Firms willing to donate time and potentially funding to pilots	• Industry suppliers (potential source of investment?)	Build upon and link into the case study and trial sub-sector work undertaken in short term actions.
Supply chain could be influential by rewarding and incentivising companies who clearly demonstrate investment towards staff training in digital and data adoption	• Research into what rewards could be	• Procurement bodies	Need to consider carrot / stick approach – cost of not adopting could be factored in.
Quantify and publicise the impact on climate change and achieving Net Zero - demonstrate that digital adoption is key to addressing such wider issues.	• Build upon work already being undertaken • Build into marketing campaign as part of benefits	• Industry • Research bodies	Research already being undertaken for Net Zero, for example - Key FM, SFT, CSIC

6.0 Long term actions

Action	Resources Required	Potential Supporters	Notes
Work with relevant academic bodies to ensure that apprenticeships / college / universities are including digital techniques as standard.	• Engagement resources • Input from industry into what is missing in current courses	• Industry bodies • Skills providers	SQA and SFC to be involved
Work with clients and less digitally advanced Tier 1's to help them specify digital processes whilst ensuring that sufficient report is available to support contractors adopting them.	• Identification of most relevant targets	• Scottish Government • Industry bodies	Link into identification of support to help delivery and implementation.

7.0 Next Steps

This initial report will support the work of the working group going forward under the auspices of the Construction Accord.

Appendix A - Working Group Membership

Ron Fraser, Construction Scotland

Colin Proctor, Scottish Futures Trust

Sharon Miller, Scottish Government

Lynsey Brydson, Construction Scotland Innovation Centre

Douglas Morrison, Construction Scotland Innovation Centre

Paul Dodd, Scottish Futures Trust

Alastair Burt, George Leslie Ltd

Andrew Richards, Construction Scotland

Saffron Grant, Digital Construction Skills

Appendix B - Findings from Phase 1

1.0 Overview

This paper provides a high-level overview of the commissioned research into the development of a digital and data strategy for the construction sector in response to the [Construction Recovery Plan](). There were 4 research papers delivered between Feb to May 2021 and funded by Scottish Government.

1. *CLF Digital & Data Strategy Workshops - Glasgow School of Arts May 21*
2. *Digital Technologies in the Construction Sector - Optimat May 21*
3. *Data in the Construction Sector - Optimat May 21*
4. *Analysis of Digital & Data Transformation for Construction - Scotland IS*

Fundamentally the cumulative research papers were to inform the wider digital strategy for the construction sector to address the issue of how better use of data and application of digital capabilities can help enable, accelerate, and enhance recovery and renewal in the construction sector, and what needs to be in place to support implementation, with a particular focus on SMEs within the sector.

The papers have explored key areas that will inform any future strategy including themes, funding opportunities, policy considerations, areas for further review. The 4 research papers have engaged with circa 35 Industry stakeholders through a combination of surveys, interviews, and workshops. A summary of each research paper and findings are listed below. Links are provided to the papers.

These research papers provide a useful platform to build from.

2.0 Digital & Data Strategy - Glasgow School of Art & CSIC

This research commission encompassed initial exploration, via a series of three workshops, aimed to inform the digital and data strategies for construction by identifying challenges and key areas of opportunity. It developed a consensus on key themes and priority areas listed below. The research report can be found ([here]()).

The seven themes were:
1. Leadership and Drive
2. Data exchange and quality
3. Technological innovation
4. Education and information
5. Understanding value and impact
6. Skills and people
7. Collaboration

Priority focus areas
1. Reaching, supporting, and educating SMEs.
2. Leadership & creating the right conditions - the visibility and connectivity of support for IT and digital.
3. Industry drivers that encourage digital capability.

3.0 Digital Technologies in the Construction Sector - Optimat May 21

The research provides an overview of existing themes, reports, and trends within the construction sector in relation to the value, opportunity, and current adoption of digital within the construction sector. The research report can be found ([here](#)) made the following conclusions: -

- Growing appetite, mixed spectrum in adopt across supply chains relation to organisational and project size.
- Evidence of the value of digital and its support to drive a more productive efficient and improve quality of service.
- Need for further research and engagement across

  - Exploring levels of adoption for specific technologies (e.g., AR/VR, drones, IoT).
  - Exploring how companies use data currently.
  - Identify specific skills shortages and current and future skills requirements; and
  - Understanding what support services/organisations are currently being utilised and where more support is required (e.g., skills, strategy, innovation).

4.0 Data in the Construction Sector - Optimat May 21

This report, Data in the Construction Sector, naturally overlaps with Optimat's Digital Technologies in the Construction Sector report. "Data" and "Digital" are inextricably linked but often the terminologies are used interchangeably; our position across both reports is to differentiate the two.

- *Data* relates to the intangible assets which can be collected, processed, contextualised, analysed and interpreted to generate actionable data-driven insights that create an effect.
- *Digital* relates to the technologies and systems that are adopted and deployed to collect, process, and analyse data; they harness the data so the user can exploit its value.

The research report can be found ([here](#)) made the following conclusions: -

Cross-referencing desk research with primary research - we would recommend that the desk research reports are cross-referenced with the workshop outcomes. This will not only enable the secondary research to be validated from a Scottish industry perspective, but it will also potentially reveal any gaps that require further research/industry consultation.

Complete further industry engagement - we would recommend that based on the analysis of both the desk research and the workshop outcomes that further engagement with industry is considered. This will allow greater detail and insight into specific areas that have not been identifiable through desk research and have also not been covered in the parallel workshops including, for example:

- Exploring levels of adoption for specific technologies (e.g., AR/VR, drones, IoT)
- Exploring how companies use data currently.
- Identify specific skills shortages and current and future skills requirements; and
- Understanding what support services/organisations are currently being utilised and where more support is required (e.g., skills, strategy, innovation).

5.0 Analysis of Digital & Data Transformation for Construction - Scotland IS

ScotlandIS was commissioned to analyse the relationship between the digital, data and construction sectors. In doing so we aimed to highlight the areas that digital, and data can improve performance, productivity, and sustainability in the construction sector. We have also looked at the landscape of policy across construction, digital and technology. The research report can be found ([here](#)) made the following conclusions: -

- The strategy should seek to promote a "digital champion" from a range of construction businesses across Scotland to embrace digitisation in the sector.
- The Scottish Government should focus on a series of "targeted policy interventions" towards the construction sector to facilitate digital transformation. This could take place in the form of specific digital/data training programmes and funding initiatives focused towards the construction sector.
- Establish a digital cross sector steering group for both the construction sector and partners in the digital sector to foster greater collaboration and partnership working. This would better enable technology companies to understand and be able to design, build and deliver industry-specific solutions that can drive a real shift in digital construction.
- The Construction sector should look towards diversity and inclusion training initiatives to ensure they are representative of everyone in society. In doing so, the sector will be better placed to attract a diverse range of talent who will want to work in the sector.
- Embark on a marketing campaign centred on all the funding and grants available to the sector from a digital perspective.

- The Scottish Government should endeavour to reward and incentivise construction companies in the procurement process who clearly demonstrate investment towards staff training in digital and data adoption.
- The construction sector in partnership with the public sector should aim for a common reporting and standards digital framework. This would allow for accurate baselines projections and the sector as a whole working on similar platforms.
- An umbrella trade association/membership body is required to support the needs and requirements for the construction sector. This body would be the "go to" organisation for their needs on policy matters ranging from procurement, digital, data, economic to transport policy.
- SME's and Sole traders in partnership with larger construction firms should trial new approaches on real sites, side by side with traditional methods to analyse differences and potential advantages of digital transformation.
- Construction Scotland Innovation Centre should coordinate a strategic presence at COP26 to showcase the innovation and digital transformation taking place in the sector here in Scotland.
- Work closely with the industry and other stakeholders to create apprenticeships which have specific focus on digital and green skills. Michelin Scotland Innovation Parc in Dundee are creating a green skills academy, and this presents an opportunity for the construction sector to be part of the curriculum.

Appendix C - DcoS Top 10 Priorities

- Construction scheduling
- Process monitoring
- Unified change management and issue reporting between design and construction
- Digitised employee training
- Display of construction schedule/work plan
- 4D virtual project planning (3D rendering)
- Digitised work instructions and assembly procedures
- Automated quality inspection
- Automated completeness checking
- Project management system (to track status of schedule time, cost, etc)