CONSTRUCTION COLLABORATIVE LEADERSHIP FRAMEWORK

“What if we don’t change at all ... and something magical just happens?”

Modernise or Die - Farmer

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PART 1

INTRODUCTION TO THE CONSTRUCTION
COLLABORATIVE LEADERSHIP FRAMEWORK

“You cannot solve a problem from the same consciousness that created it. You must learn to see the world anew.”
PART 1
SECTION 1 – EXECUTIVE SUMMARY

The Farmer Report published in 2016 stated clients and industry had “Modernise or Die”. The Construction Leadership Council in their second report on collaboration published in September 2017 stated, “Now or Never”. Robert Soames the CEO of Serco said, in relationship to the collapse of Carillion, the Government is presiding over an outsourcing market “where only the dumb and desperate want to compete for public sector contracts”.

Parts of the industry are world class, smart clients, and innovating companies are pioneering ahead with the new opportunities like digitisation and off-site manufacturing are bringing about. But this is unfortunately the few and not the many.

From Boswell 1934 to Farmer today, there has been many reports that led to the conclusion that clients and industry have failed to improve in how they work together. This is why we took the decision at Scottish Building Federation that we would build a leadership framework which looked in detail at the collaborative psychological factors that leaders need in this current disruptive market where opportunities and threats abound.

In this research it became quickly apparent that conclusions by themselves do not bring about transformation. Without emotion nothing happens as Donald Calne the Canadian Neurologist states below:

“*The essential difference between emotion and reason is that emotion leads to action while reason leads to conclusions.*

If this industry is to change then leaders at all levels from clients, companies large & small and key stakeholders need to understand the logic that leads to conclusion. Then they must have the motivation and desire to change. Produce all three then individual leaders will transform and in time so will this great industry. But without the motivation and desire nothing will happen.

The contract that SBF has with CITB is to build a Construction Collaboration Leadership Framework and to share this on a PDF on an information Portal. Three quarters of this work is now complete structured as follows:

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In Part 2 we have examined the strategic implementation framework as it is emerging around procurement, new ways of working, legislation and contract form, workforce development strategy and key stakeholders in Scotland leading on modernisation. This we are calling the “tactics manual”.

Leadership cannot be taught in isolation to context\(^1\). This is why we are integrating the tactics with the leadership requirements across the four perspectives we are using for CCL Framework (see next section

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\(^1\) See the McKinsey Company report available on line called: Why leadership development programmes fail
for more detail on this). The outline for this is at Part 3. We have gathered a great deal of industry focused research on this and we are developing the narrative for this now.

At Part 4 we look at motivation and desire and how this is influencing our thoughts on the next phase of CCL Framework once this existing contract is complete on 31 April 2018. We will consult widely with stakeholders and SBF members on how we take this forward.

We are positioning the CCL Framework as part of the wider Strategic Implementation Framework which is emerging in Scotland. The industry has failed for over 80 years on any scale to improve the relationships between clients and industry. Conclusions AND desire are needed if the industry is to transform on any scale. The CCL Framework is Scottish Building Federation’s contribution to this wider strategic implementation agenda at both conclusion and desire levels.

If you have the motivation and desire to transform this great industry, or closer to home your organisation, then please read on. We value your feedback and guidance on how we continue to develop the CCL Framework for this current CITB contract and how you feel CCL Framework needs to be developed on an ongoing basis post 31 April 2018.

Thank you in anticipation for reading this working Draft 1.1. Concurrently, we will continue to add new material and refine down the document as we tighten up the writing.

_The will to win, the desire to succeed, the urge to reach your full potential. These are the keys unlock the door to personal excellence._

Source: Confucius

Vaughan signature
Vaughan Hart
Managing Director
Scottish Building Federation (SBF)

_Since 1895 the Scottish Building Federation (SBF) has been supporting constructors and builders across Scotland by building trust to bring together ideals, collective needs and collaborative business practices of its members and through this collective voice influence the wider industry. CCL Framework is part of this service we provide to our members and the wider industry and clients._
PART 1
SECTION 2 – OVERVIEW OF THE CONSTRUCTION COLLABORATION LEADERSHIP (CCL) FRAMEWORK

CONTEXT

The construction industry in the UK has a world-wide reputation for excellence. Equally, there are deep rooted leadership and cultural issues at client and sector level that have dogged the industry for decades. Reports going back to the 1930s indicate the need for effective collaboration supported by appropriate procurement methods and related contract form. These same issues are being reported on today, as the extract from the Construction Leadership Council (CLC) web site below illustrates:

At its best, the UK construction sector is world class. We have a global reputation for our architectural and engineering skills and for our ability to deliver low carbon and sustainable solutions for the built environment. Our recent record of delivering mega-projects is the envy of the world. But the sector continues to face fundamental issues. The combination of our cyclical workload and low levels of client leadership, result in a fragmented supply chain which blocks opportunities to identify and benefit from all of the value which exists across an asset’s life-cycle.

THE ROLE OF SBF IN DEVELOPING THE CCL FRAMEWORK

Since 1895 the Scottish Building Federation (SBF) has been supporting constructors and builders across Scotland by building trust to bring together ideals, collective needs and collaborative business practices of its members and through this collective voice influence the wider industry.

In 2015, we felt we had to make a strategic contribution to our members, the wider industry, clients and stakeholders regarding the deep rooted issues around culture and entrenched mindsets that had dogged the industry for decades. We felt the best way to do this was to build a leadership framework for the industry which integrated the sector context with best practice regarding collaboration leadership. We wrote the case for this through the CITB Innovation Funding route and in August 2016 we were commissioned by CITB to build the Construction Collaboration Leadership (CCL) Framework for our members, the wider industry, clients and key stakeholders who were focused on the emerging modernisation agenda for the industry.

In developing the CCL Framework, SBF has taken the experience and feedback from its 400 members across the Built Environment into account as well as in-depth research on the historical context for the industry and best practice which is emerging. A common theme running through all this research is adversarial behaviour and culture which current procurement methods and contract form are encouraging.

---

2 Source: Construction Leadership Council (CLC) web site
3 We are using the term modernisation agenda throughout CCL Framework to reflect the changes that are now taking place such as emerging procurement standards, digitisation (including BIM), design for manufacturing & assembly, robotics, the circular economy etc.
4 We are using the term the Built Environment throughout this Framework to include all parties involved in the project life cycle
Digitisation is a key innovative disruptor\(^5\) across all sectors and within the Built Environment and this will create winners and losers. *Modernise or Die* as Farmer put it so starkly. We are conscious that digitisation will not just affect the Principal Contractors, it will impact across the whole industry. For example, Heriot Watt University are working in collaboration with Historic Scotland to develop a computer scanning tool that they can use on their buildings to analyse the state of the lime based mortar. This an example where digitisation will affect the small traditional builders positively, if they adapt or negatively if they do not. When disruption hits a sector, it affects all parts of that sector. This is shown using an appropriate image at Figure 1 below:

![Image](image.png)

"If size mattered, the elephant would be the king of the jungle."

**Figure 1**: Modernisation gives opportunities to all, if you are adaptive and agile

**CCL FRAMEWORK FOCUS**

In Scotland, we have a large number of Micro and SME companies. Modernisation is an opportunity for those that are agile and adaptive, whatever their size. The bigger you are the more resource you will have to adapt but equally your momentum for modernisation may well be slow given your size. Plus, you will need to engage and support your supply chain with the transformation that digitisation will bring about. If you are small you may not have much in the way of resource to help you through this but if you are agile and open minded then you will quickly be able to adapt to emerging opportunity.

The CCL Framework is being designed for leaders at client, industry and stakeholder levels who can see the opportunities emerging and are seeking tools to support them take advantage of this emerging opportunity. This dynamic set the early design philosophy for the CCL Framework. We needed to build a framework which captured emerging industry context and then integrate this with relevant world best standard approaches for collaboration leadership within this framework.

As we have learned more from research and consultation our approach has equally changed and adapted over the period. An example of this is the Construction Leadership Council second report on collaborative in the industry which was issued in September 2017 and we include an extract below.

*In many ways, the Industry is its own worst enemy. On the one hand, it appears to be convinced of the need for change if it is to survive and prosper in the future. On the other hand, there is an*

---

\(^5\) Disruptive Innovation is a term in the field of business which refers to an innovation that creates new market opportunities and associated value networks which eventually disrupts an existing market and value network, displacing established market leading firms, products, and alliances. Source: Wikipedia
inertia and deep-seated reluctance to change established methods of procurement, working practices and to embrace new technologies.6

This leads us to the conclusion that contextual framework for the leadership development programme had to take account of emerging best practice with:

- procurement & contract form,
- new ways of working that digitisation is driving
- and the new technologies both at site and with off-site manufacture.

TRANSFORMATIONAL CHANGE

![Figure 2 – Transformational change](image.png)

Farmer discussed the need for a Strategic Implementation Framework and the relevant extract from his Review is shown below

*There is no strategic incentive or implementation framework in place to overcome the issues the industry is facing to initiate largescale transformational change*.7

Farmer Review 20168

Through research with key stakeholders such as the Construction Scotland Innovation Centre (CS-IC), Zero Waste Scotland and the Supply Chain Sustainability School and research such as the Scottish Government Review of Construction Procurement9 we came to the conclusion that in Scotland a strategic implementation framework is emerging and we have captured this framework in a simple logic model 10 shown at Figure 3 on the next page:

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6 This quote is taken from CLC Report: Collaborative Construction 2 “Now or Never?” A further development of the key themes at the heart of the Construction Industry’s reluctance to embrace more collaborative working practices. Published September 2017 which is available free on line.

7 See Annex A at the end of this Part of the Document for the definition of transformational change that we are using throughout the CCL Framework

8 The Farmer Review of the UK Construction Labour Model – Modernise or Die. Published in 2016 by the Construction Leadership Council. Available free on line

9 This report was published in 2013 and is available on line. We are awaiting an update to the Construction Procurement Manual for Public works and we will include key aspects within ongoing updates to CCL Framework

10 A logic model is a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan to do, and the changes or results you hope to achieve. We examine business and logic modelling within the CCL Framework
Figure 3 – The emerging strategic implantation framework for Scotland

THE PROBLEM

Design led across project life cycle methods down through the supply chain using whole cost disciplines

WHERE THE INDUSTRY HAS BEEN FOR DECADES
Lack of collaboration brought about by siloed based competitive tendering and fragmentation
Poor internal and external image
Low margins – high waste culture
Focus on cost based outputs which are not integrated across whole life of the asset

THE SOLUTION

Digitisation including BIM
Design for Manufacture and Assembly
The Circular Economy
CS-IC
ZWS
SFT
Etc

FORM

Smart procurement
New ways of working
Support Organisations
Legislation

WHERE THE INDUSTRY IS GOING
2025 Targets as agreed by Government and Industry
33% Lower costs
50% Faster
50% less emissions
50% improvement in exports
Focus on collaborative based outcomes across the whole life of the asset.

Strategic Implementation Framework as envisaged by Farmer
Modernisation agenda led by “smart clients” and industry pioneers

Strategic Enabler - CCLF
Perspective 1 - What the client needs, at a fair return
Perspective 2 - How we will meet these needs
Perspective 3 - The strategy we will develop to make this happen
Perspective 4 – Behavioural Leadership Profile

ESSENCE
THE STRATEGIC IMPLEMENTATION FRAMEWORK WHICH IS EMERGING IN SCOTLAND

In the model of the Strategic Implementation Framework, we have captured the historical context for the industry, which we are using to define the problem:

Where the industry has been for decades – the problem

- Lack of collaboration brought about by siloed based competitive tendering and fragmentation
- Poor internal and external image
- Low margins – high waste culture

Focus on cost based outputs which are not integrated across whole life of the asset

Where the industry is going – future solutions

We have taken the UK Government’s 4 strategic targets from the 2025 Strategy for the industry as where the sector needs to go, we are using to define future solutions. These are ambitious targets. At Annex B, we have attached an article from B1M\textsuperscript{11} regarding the UK Government’s 2025 Strategy.

\textbf{2025 Targets as agreed by Government and Industry}

- 33% Lower costs
- 50% Faster
- 50% less emissions
- 50% improvement in exports

Focus on collaborative based outcomes across the whole life of the asset.

Outcome based working across the whole life of the asset from policy/strategy\textsuperscript{12} to deconstruct is an example of a best practice methodology which is emerging, driven by the gains that digitisation give.

The strategic enablers to make this happen

The enabler that will get us from the problem to the solution is shown at Figure 4, where we are integrating smart procurement, emerging contract and legislation requirements, new ways of working and key stakeholders promoting the modernisation agenda with the lead that smart clients and industry pioneers will give us on the modernisation journey.

\textsuperscript{11} The B1M is a video channel for the Construction Sector. It is an excellent source for best practice around the modernization agenda

\textsuperscript{12} Throughout CCL Framework we use policy in the context of the public sector and strategy within the context of the commercial sector
We identified that CCL Framework cannot “sit on its own”. It has to be part of the key enablers for modernisation as shown above. Equally, adversarial fragmentation has been a dominant factor in the industry for decades. This led us to the conclusion that we had to use whole system disciplines in designing CCL Framework if the situation shown graphically at Figure 5 were to be avoided!

Figure 5: The perils of fragmentation

CCL FRAMEWORK MODEL

Our initial thoughts on the CCL Framework model was that it had to link client value with the means of achieving this value through a strategic leadership approach. We designed and tested several models with our members and stakeholders, which resulted in the model we are now using for CCL Framework and this is shown at Figure 6.

We will explore in more detail the development of CCL Framework in the follow-on parts to this document.
We will populate the CCL Framework model with a great deal of information for leadership within the modernisation agenda for the Built Environment. But equally the model can be used as a simple checklist to test your capability aligned to how the industry is changing with the modernisation agenda now in place. We suggest you may wish to share the check list below with your peers. Give them a week or so to contemplate this checklist. Then use this as a strategy development exercise to identify were your organisations is against the separate points. We have written this from a constructor perspective but just adapt it if you are a client or stakeholder.

- How will we ensure maximum value to our clients in terms of meeting or exceeding their policy or strategy requirements in a way that lowers the whole life costs of the asset at a fair return to the consortium?\(^{13}\)
- How will we update our business model to reflect this? Are we going to be a traditional high volume low margin business OR will we build a new business model aligned to the opportunities emerging from the modernisation agenda?
- How will we build in value engineering and value analysis\(^{14}\) actions across our consortium to enable client value to be created whilst we maximise our shared short-term margin through

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\(^{13}\) Throughout the CCL Framework we are using the term consortium to cover all organisations from client representatives, to designers, consultants, constructors/builders, asset managers, suppliers and deconstruct specialists.

\(^{14}\) Value analysis is a discipline under used by clients and the industry. We will seek input from Scottish Futures Trust on the work they are doing in this area so we can include best practice with the CCL Framework.
gainshare and create long term wealth through enhanced reputation/brand and strategic capability to maximise opportunity stemming from the modernisation agenda now taking place across the Built Environment?

- How will we build the relationships across our clients, other contractors and the wider supply chain so we are clear about the strategic agenda/narrative which in turn will support the building of alignment, motivation and engagement across the workforce at all levels in the supply chain? (We have created a new term for this within CCL Framework which we are calling Relationship Engineering, which looks at this part of the checklist in detail).

- Strategy - Looking outwards into the future
  - How are we going to develop our capabilities as an organisation and consortium so we can maximise opportunities to build reputation and profitable repeat business through constantly meeting client value requirements within a dynamic market place?
  - How can we reduce the threats that the dynamic and in some places disruptive market is presenting?

- Organisational Development - Looking inwards as an organisation/consortium
  - What are our current strengths and how can we use these within the market conditions agreed above?
  - What are our weaknesses and what do we need to do to reduce these so we are not held back?

- Leadership development - Looking inward to me as the leader what do I need to do and behave in order to support innovation around our modernisation agenda
  - What are my strengths as a leader to carry out the actions above?
  - What areas do I need to build on so I continue to build my leadership capabilities in what is now a potentially disruptive market place?

- Workforce Development – what is our strategy for strategic workforce development so that we continue to manage the day to day AND make the future happen?
DEFINITIONS OF CHANGE

Disruptive Innovation
Disruptive Innovation is a term in the field of business which refers to an innovation that creates new market opportunities and associated value networks which eventually disrupts an existing market and value network, displacing established market leading firms, products, and alliances.

Developmental Change
Developmental change is the simplest type of change: it improves what you are currently doing rather than creates something new. Improving existing skills, processes, methods, performance standards, or conditions can all be developmental changes. Specific examples include increasing sales or quality, interpersonal communication training, simple work process improvements, team development, and problem-solving efforts.

Transitional Change
Transitional change replaces “what is” with something completely new. This requires designing and implementing a “new state.” The organization simultaneously must dismantle and emotionally let go of the old way of operating while the new state is being put into place. This “transitional” phase can be project managed and effectively supported with traditional change management tools. Examples include reorganizations, simple mergers or acquisitions, creation of new products or services that replace old ones, and IT implementations that do not radically impact people’s work or require a significant shift in culture or behaviour to be effective.

Two variables define transitional change: (1) you can determine your destination in detail before you begin, and can, therefore, “manage” your transition, and (2) people are largely impacted only at the levels of skills and actions, not the more personal levels of mindset, behaviour and culture.

Transformational Change

Transformation, however, is far more challenging for two distinct reasons. First, the future state is unknown when you begin, and is determined through trial and error as new information is gathered. This makes it impossible to “manage” transformation with pre-determined, time-bound and linear project plans. You can have an over-arching change strategy, but the actual change process literally must “emerge” as you go. This means that your executives, managers and frontline workers alike must operate in the unknown—that scary, unpredictable place where stress skyrockets and emotions run high.

Two variables define transitional change: (1) you can determine your destination in detail before you begin, and can, therefore, “manage” your transition, and (2) people are largely impacted only at the levels of skills and actions, not the more personal levels of mindset, behaviour and culture. that does not occur, i.e., the new systems require people to share information across strongly held boundaries or put the needs of the enterprise over their own turf agendas. Without these changes in attitude and behaviour, people do not use the technology as designed and the change fails to deliver its Return on Investment

15 Source: What is Transformation, and Why Is It So Hard to Manage? Dean Anderson &Linda Ackerman Anderson
This is particularly relevant for BIM within the industry and how BIM is used, not just at organisational levels but also shared within the supply chains.
B1M INTERPRETATION OF THE UK GOVERNMENT 2025 STRATEGY FOR CONSTRUCTION

THE UK’s Construction 2025 Report is important, but also quite dull. Here, we bring the document to life, explaining why construction matters, why it needs to change and how to approach the radical targets proposed.

The British Government have an Industrial Strategy that supports job creation and economic growth. As part of that Strategy, they are forming partnerships with key, influential sectors – including construction. “Construction 2025” is the strategy developed by industry and the UK Government to improve construction by 2025.

WHY DOES CONSTRUCTION MATTER?

Construction employs nearly 10% of the UK working population (equivalent to about 2.9M people) as well as contributing £90 billion to the economy – about 7% of its total. The sector is set to grow by up to 70% between 2013 and 2025, with the total global construction output reaching USD $12 trillion. “The total global construction output will reach USD $12 trillion by 2025” The industry creates and maintains the built environment that our society exists in. It’s extremely influential and what happens in it matters, to everyone.

WHY DOES CONSTRUCTION NEED TO CHANGE?

Construction is not working as well as it could be at the moment. And that’s a bit of an understatement. We’re driven by output – how quickly and cheaply we can deliver built assets – rather than the ultimate outcome they’re going to have on that business and our communities. We work in silos and don’t talk to each other. People are out for their own commercial gain. The margins are suicidal so everyone’s looking to price in risk or for contractual slip-ups that mean they can penalise someone else. Adversity is rife and the Forms of Contract we use only encourage it. There’s a low level of innovation, there’s not much knowledge sharing, there’s massive gender imbalance and many young people don’t see it as an appealing place to work.

Of course, we’re highlighting the challenges here, but it’s not all bad. In amongst those issues are some incredible people, phenomenal feats of engineering, true innovation, rising stars, and most importantly: enormous potential. So how do we realise it?

HOW DO WE CHANGE CONSTRUCTION?

In the context of the Construction 2025 report, several measures are proposed. Initially the UK Government and industry’s vision and aspirations are set out across 5 different areas:

1. **PEOPLE:** For construction to become an industry that is known for its talented and diverse workforce.
2. **SMART:** To have an industry that is efficient and technologically advanced.
3. **SUSTAINABLE:** To be an industry that leads the world in low-carbon and green construction exports.
4. **GROWTH:** For construction to drive growth across the entire economy.
5. **LEADERSHIP:** An industry with clear leadership from a Construction Leadership Council (formed
of Government and Industry representatives).

The report goes on to set out a number of short to medium term strategies for achieving the vision and targets.

It talks about adopting building information modelling (BIM) and exporting Britain’s expertise in that area, investing in low carbon technologies, driving up safety standards on smaller projects, focusing on occupational health, creating apprenticeships, clarifying the employment routes into the industry, changing procurement routes and promoting innovation – amongst a number of other areas. The strategy states that “By 2025, construction will be radically transformed”.

Stay with us. We know what face you’re pulling – because we pulled it too.

Yes, the targets are radical. But let’s be frank: reading them when you are flat-out busy and working in the current industry context makes them feel downright ridiculous. All those strategies sound great, but you may feel like they’ve been talked about a thousand times before. That’s not an unnatural reaction to have. Such feelings really highlight how far behind we are, how bad things have got and how significant the change required actually is. It’s not that the targets are wrong or unrealistic. The shock comes in how far away from them we currently are.

Unfortunately, there’s no secret sauce. This is going to come down to people. We created these problems and it’s not beyond our ability to fix them, especially in the technology rich world we now live in.

If you feel like you can’t take part in this because the contract you’re currently working under doesn’t enable you to: CHANGE IT. If you feel like the way you work has always inherently been a bit wasteful: CHANGE IT. If you’re fed-up with adversity: CHANGE IT. If you’re sick of the image that this industry has: LET’S CHANGE IT.

Please don’t think this is a PDF full of dreamy ideas that other people are going to deal with for us. We all need to play our part.

Let’s not be another generation that oversaw a period of status-quo in construction. Let’s be the generation that history remembers as the moment when everything CHANGED.
The B1M’s Fred Mills advocates change in the “Construction 2025 Explained” video. Available on YouTube

UK Government Construction Strategy 2016-2020 Explained | The B1M

https://youtu.be/nTizPwr-1Es

Before you read Part 2 we strongly recommend that you watch this YouTube clip.
PART 2

THE EMERGING STRATEGIC FRAMEWORK FOR INDUSTRY TRANSFORMATION IN SCOTLAND

The “tactics” manual
PART 2
SECTION 1 – WHERE THE INDUSTRY IS COMING FROM

Historical Perspective
Low productivity and poor image have been factors for decades in the industry. Bossom 1934, Simon 1944, Banwell 1964, Latham 1994 and Egan 1998 all highlighted the need for the clients and industry to come together to collaborate across the life cycle of projects. In terms of methods and products the industry has moved on significantly but the underlying behavioural factors of low productivity and poor image remain, as demonstrated by three recent report extracts below:

“The external image of the industry is important in recruitment and in relationships with clients and Government. The current image is poor, due to the lack of technology, poor quality, a poor health & safety records, and precarious employment terms. While flexibility and problem solving abound in the industry, its resistance to change, macho image, confrontational attitudes up and down the supply chain, sexism and prejudice are recognized as being deterrents to efficiency, recruitment and diversity.
Source SAMI report on the industry published in 2015

There is no strategic incentive or implementation framework in place to overcome the issues the industry is facing to initiate largescale transformational change. Critically, a plan for change needs to recognise, based on past evidence, that the industry will not change itself unilaterally at scale. It needs to be led by clients expressly changing their needs and commissioning behaviours or government acting in a regulatory or strategic initiation capacity to drive positive disruption. The construction industry’s ‘collaboration problem’ is at the root of its change inertia. It prevents itself scaling up, sharing risk more appropriately and creating more business plan certainty. The industry is currently conditioned to using adversarial margin protection and expansion tactics. This underlines the tensions that often exist between the industry and its clients that prevent more acceptance of collaboration within industry and between industry and its clients.
Source Farmer Report published 2016

Collaboration is a vital issue for the Industry to address if it is to embrace technology and evolve into the efficient, cost effective and profitable industry which the UK needs for the future”.
Source: Construction Leadership Council Report – Collaborative Leadership Construction 2, published September 2017

The Current Situation
The context for clients and the industry is at present dynamic and in some cases innovatively disruptive and effects of this will increase as the modernisation agenda\(^{16}\) unfolds. Those that can adapt will be able to maximise this emerging opportunity. It is for this group that CCL

\(^{16}\) We are using the term modernisation agenda throughout CCL FRAMEWORK to reflect the changes that are now taking place such as emerging procurement standards, digitisation (including BIM), design for manufacturing & assembly, robotics, the circular economy etc.
Framework is being designed.
PART 2
SECTION 2 – THE EMERGING STRATEGIC IMPLEMENTATION FRAMEWORK

THE SIX ELEMENTS OF THE FRAMEWORK

Farmer points out there is no strategic incentive or implementation framework in place. However, the situation in Scotland has perhaps moved on and we explore this in the remaining sections of Part 2, where we examine how elements of the implementation framework are emerging in Scotland. This also gives a “whole system” view which has shaped how we have developed CCL Framework. At SBF we feel that there are six key elements emerging which support the Strategic Implementation Framework for Scotland, these are:

1. Changes in procurement
2. New ways of working
   a. Digitisation
   b. Design for Manufacture and Assembly
   c. The Circular Economy
3. Opportunities arising from legislation and new forms of contract
4. Implementation Leadership - Strategic support organisations
5. Strategic Workforce Development
6. Modernisation agenda led by “smart clients” and industry pioneers

The overview of the Strategic Implementation Framework at Figure 7 shows the integration of these six elements into an integrated system. Standard management techniques are about breaking things down into manageable chunks - reductionism. Collaborative leadership requires that people first understand the whole picture and where they fit into this.

A metaphor here is that Jimmy and his dad take Jimmy's bike to bits, clean each of the bits, oil them and put them back together again. A good example of reductionism in action. But not all systems are like bikes. Next week wee Jimmy notices that his pet frog is not looking well and luckily just as wee Jimmy is getting his scalpel out to “fix the frog” his dad notices and stops the dismemberment before any damage is done.

Any system with people in it has to be looked at across what is - rational form and what is - emotional, essence. Looking at the history of the industry going back to Bossom in 1934, form is clear on how the industry has to change and these patterns have been repeated right up to Farmer’s report in 2016. But collaboration requires both form AND essence, What and how within an integrated system. The need to include form and essence within CCL Framework has been a key aspect of the design of the approach. Equally the CCL Framework in isolation will be unlikely to bring about the transformation the industry seeks. This is why we have designed CCL Framework within the broader strategic implementation context which is now emerging in Scotland.

17 There are two key parts to collaboration. One is essence. The other is form. Essence is heart to heart and values to values. And form is how you’re going to do it.” Source Ken Blanchard taken from a TED Talk available on YouTube: https://youtu.be/HKGk8RK1kSo
Figure 7 - Overview of Strategic Implementation Framework, which is emerging in Scotland
PART 2
SECTION 3 – DESIGN LED COLLABORATION ACROSS PROJECT LIFE CYCLE

THE NEED FOR CLIENT LEADERSHIP

“Implementation begins with clients. Clients are at the core of the process and their needs must be met by the industry”\textsuperscript{18}. Source: Latham 1994

“Too many clients are undiscriminating and still equate value with cost, selecting designers and constructors almost exclusively on the basis of tendered price. This tendency is widely seen as one of the greatest barriers to improvement. The public sector, because of its need to interpret accountability in a rather narrow sense, is often viewed as a major culprit in this respect. The industry needs to educate and help its clients to differentiate between best value and lowest price”\textsuperscript{19}. Source: Egan Report 1998

As a background to this element it will be worthwhile to read the Latham and Egan Reports. The issues identified by both reports remain largely unchanged today. Both reports identify the focus the public sector in particular and the majority of commercial clients have on lowest cost tendering which is encouraging silo based procurement around adversarial rather than collaborative commissioning behaviours. New procurement standards for public sector works are being developed from the Scottish Government Procurement Review of Construction published in 2013\textsuperscript{20} with an emphasis on a design led approach across project life cycle, a summary of this approach is documented below:

“We believe that there is a need for clearer leadership to ensure that construction is properly planned using a design-led, whole of life cost approach. From project conception to contract award, there should be a focus on the design quality and whole life cost of an asset. Throughout the procurement process – from project conception to contract award, the public-sector focus should always be on the whole life cost of an asset – that is to say, the costs of constructing, owning, operating, maintaining and disposing of the asset.

The requirement for procurement to take account of whole life cost of an asset has been a common recommendation of all the industry improvement recommendations going back beyond Latham and Egan. This was one of the key improvement requirements identified by Bossom\textsuperscript{21} in 1934. This has traditionally

\textsuperscript{18} Latham report: “Constructing the Team” published 1994. The same need is reported in the 2016 Farmer Report indicating the lack of progress in this area
\textsuperscript{19} Egan Report Constructing excellence
\textsuperscript{20} The Report on the “Review of Scottish Public-Sector Procurement in Construction” is available on line
\textsuperscript{21} Building to the skies - The Romance of the Skyscraper’ Alfred Bossom’s book ‘Building to the Skies: published in 1934, was one of the first major criticisms of the standard of performance of the UK construction industry. Bossom was an architect who went to the USA in the early 20th century, where he was involved in the design of skyscrapers. This impressed on him that construction was a process like any other, and that if all the parties worked together it could be planned in advance and then carried out to an agreed schedule. (This is what Egan was basically saying in 1998, 64 years later and still this is a capability that clients and industry still do not have an any noticeable scale today. The same sentiments are expressed in the Scottish Government’s Review of Construction Procurement published in 2013) Bossom found that contractors in the USA were able to build faster than their counterparts in the UK, but at the same cost, and as a result they were more profitable and were able to pay higher wages. When he returned home, the deficiencies in the UK construction industry were obvious to him, and he became an advocate for change. He saw an adversarial and wasteful industry in which construction took too long, was too expensive and was not satisfactory for its clients. Similar criticisms have followed Building to the Skies, most notably; the Latham Report, Constructing the Team in 1994; The Egan Report, Rethinking Construction in 1998; the Government Construction Strategy in 2011 and Construction 2025, published in 2013. Sir Michael Latham described the UK construction industry as ‘ineffective’, ‘adversarial’, ‘fragmented’ and
been a difficult criterion giving the amount of data involved with whole asset management which has been made even more difficult with the industry fragmentation which has gathered pace over the last 20 years. Digitisation is now giving this whole life asset management capability through data management from policy/value proposition\textsuperscript{22} to recycle. Shown at Figure 8 below is one example of a whole life asset cost system.

![Figure 8: Project Life Cycle](image)

The book, BIM Demystified by Steve Race is an excellent introduction to BIM which focuses more on the business and cultural aspects of BIM rather than the technical requirements. The circles in the diagram represent the consortium team as shown at Figure 8A below:

![Figure 8A – The Consortium Team](image)

BIM enables data to flow from the Core Team to the Extended Team and on to the Supply Chain for each of the stages in the asset life as follows:

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\textsuperscript{22} Throughout CCL Framework we use the term policy for the public sector and value proposition for the commercial sector. Same meaning, different language

\textsuperscript{23} Source: BIM Demystified by Steve Race. Published by RIBA. We have permission from RIBA Publishing to use Steve Race’s project life cycle graphic.
• The Business Case
  o Policy/Strategy: For public sector clients, this will be the policy context to why the asset is required. This needs to be expressed in output terms for each of the phases so that project deliverables are clear. Equally, their needs to be clear statements at policy stage on the difference the asset will make in service user (outcome) and community terms (impact). This is the same process for commercial clients, just different language will be used. Policy will normally be expressed as business strategy or value proposition. Outputs remains the same. Outcomes will be defined around the customer requirements and impact will be the market opportunities and revenues the project will deliver. Traditional contracting is siloed across the project life cycle focused on contract deliverables (outputs) and not the difference these deliverables make. This simple distinction is vitally important if clients and industry are going to shift the adversarial relationships which output contracting encourages to the collaborative requirements focused on outcome and impact measures. BIM is a key enabler for this and an approach we will examine in detail at Part 3 of the CCL Framework.
  o Feasibility: This is a key stage where the consortium across the project life cycle need to be involved. This is where the first tranche of value engineering takes place so that the client requirements expressed in output, outcome and impact statements can be examined against the life cost of providing these statements. This is a significantly different approach to cost based procurement not integrated across project life cycle. For example, how will the design & construct phases support asset management? This has to be thought through from one process to another looking at how client specification can be enhanced at the lowest life cycle cost for each stage. This is not new, it is just sound value engineering disciplines that have been around since World War 2. The difference is BIM which enables this whole process.

• Procurement
  o Design: Once the business case is defined then detailed design can commence. This is unlikely to be a linear process. As the BIM models are established this will allow the client and user groups to “see what the building will look like” this in turn will inform the design stage. It is better to take time in this stage rather than having to make changes once construction has commenced. The culture in the UK is to move quickly to build without taking time to get the basic concept stage agreed between the business case and design stage. It is a concept where most value can be created, if conducted properly and most value destroyed if the design has not been linked robustly with the business case.
  o Construct: During the construct phase the BIM 3-D models show the consortium team what is required at each stage of the build and data is generated and stored to guide the construct phase and use stages of the project whole lifecycle. BIM 4-D models show the schedule of the build in model form so that core, extended and supply chain teams can “see” and rehearse what is required in the low-cost environment of the office BIM Suit rather than the high cost of the site where any rehearsal is extremely difficult and costly. This process also allows changes to be made post design if these changes enhance client

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24 Cost structured contracting based on output at the lowest tender price versus value based contracting looking at output, outcome and impact measures across project life cycle has been a balance that clients and industry has failed to resolve for decades. The articles flooding the press as this was being written concerning the bankruptcy of Carillion are just another example of the failure of cheapest tender price based on soloed output measures. Clients and industry have to move from focusing on cost to value across asset life cycle.

25 This is the process engineering disciplines that Egan tried to introduce in 1998 from his experience with the transformation of the UK car industry but his recommendations were largely ignored by clients and industry.

26 Using models to engage and rehearse the combat and supply chains is something the UK military has been doing since Nelson’s time so again it is not something new.
specifications and lower life cycle cost. This is just basic effective relationship management across the consortium which is totally different to the claims culture grown up around siloed based contracting focussed on lowest cost and claim driven contract variation designed to enhance the low margin used at the bidding stage.

- **Operational Phase:**
  - **Use:** Currently there is very little integration between the construct and facilities management phases of the life cycle of the asset. Value analysis like value engineering is a science that has been around for decades but it is underused by both clients and industry. Value analysis should be taking place throughout the job to ensure that what is being delivered matches agreed output requirements in both quality and cost. Grenfell Towers and Edinburgh Schools are two examples of the lack of value analysis through the construct and on to use phase. As the build phase comes to its end it is here that the final value analysis needs to take place to ensure that what was agreed to be delivered in cost and quality terms has actually been delivered. But this cannot be a one off at contract completion, it has to be a continuous process through the construct phase. Again, this technique is common sense but unfortunately not common practice. As the building or infrastructure is being used it is here that BIM data can be used that was generated in the design stage. For example, if a building has a planned life of 60 years. Do you design the windows to last for 60 years or do you replace them at the 30-year point? This is just basic value management but a process which is greatly enabled with the data storage that BIM provides. Augmented Reality can also be used to assist with routine and emergency maintenance driven again by BIM. As the building starts to get occupied this is where data is again captured from employees, and service use/customers to start to build the data sets around outcome and impact measures.
  - **Recycle:** The recycle plan is established in the design phase and needs to take account of maintenance across asset use and deconstruct once the building or infrastructure has come to the end of its life. Support for this way of working is readily available and often with grant provision from Zero Waste Scotland.

Nothing in the description above is futuristic. In fact, many of the techniques have been established for decades. BIM will enable the whole process across the life cycle of the asset which will in turn support the need to think output, outcome and impact for all the phases of the life of the project. Smart clients and industry pioneers are already using these techniques. We now need a massive increase in application across the industry, maybe the tragic lessons of Grenfell and the bankruptcy of Carillion will be the joint shock that clients and industry need to transform27.

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27 The need for a shock to change the industry was highlighted in the 2015 SAMI Report on the industry
The diagram at Figure 9 shows the value management curves across project life cycle. Effective collaboration through concept and design adds value. Unplanned change post design destroys value.

![Figure 9: Value and Project Management Curves](image)

**CCIL SUMMARY**

Get the client & engineering meetings right at project front end... and it will save you having meetings with people like this at the back end.

![Figure 10: Collaboration culture versus Claim Culture](image)

The ability for commission behaviours to encourage collaboration at the front end of the project rather than through the siloed stages encouraged through sequential contracting is a challenge that clients and industry have failed to solve in any scale for decades. If the industry is to transform then this requirement, which is clearly stated from Bosom to Farmer has to be met in full. The Scottish Government 2013 Construction Procurement Review is clear in this respect. As mentioned earlier and discussed below, digitisation will be a key enabler in the way that data can now be managed to measure value through the life cycle of the asset.

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28 This diagram was published by the Institute of Civil Engineers in 1994 aligned to the recommendations of the Latham Report.
29 We are awaiting publication of the Scottish Government Manual of Construction Procurement for Public Works and when it is available we will cross refer here.
30 We are using the term consortium through this report to take account of all parties across project life cycle including clients,
MEASURING THE VALUE OF THE ASSET

Value is used widely in the industry and often mixed with cost. Throughout CCL Framework we are using one definition of value\(^{31}\), which is:

\[
\text{Client value} = \frac{\text{Client Requirements}}{\text{Life Cycle Cost of Meeting These Requirements}}
\]

Delivered in a way which gives a fair return for effort/materials across the project life cycle

**Figure 11: The definition of value**

The more the client requirements are met with related reductions in life cycle cost the more value will be added to the project. This to be at a fair return (gainshare)\(^{32}\) to industry and suppliers involved in providing this value.

Client requirements for public service delivery\(^{33}\) in Scotland are usually expressed in outcome terms (the difference the project makes to service users) and impact terms (the difference the project makes to communities, organisations and the overall system). For commercial contracts value proposition or strategy is more commonly used for specification and this looks at how the project will satisfy client/customer requirements.

Terms are important here. Project objectives or deliverables are measures around what has been agreed to be delivered, this is a process of **validation**. The difference the asset makes to service users, customers or communities is **evaluation**.

Measuring effectiveness of output based contracts is about ensuring that what was agreed to be delivered in contract terms has been delivered which is a validation measure.

Output/deliverable = validation

Measuring the difference, the asset makes to customers, service users, and communities is what **outcome/**impact working entails\(^{34}\) and this is a process of evaluation.

Outcome/Impact = evaluation

We are using these definitions throughout CCL Framework. Value requires that both validation and evaluation methods are used to ensure that the client’s needs are being met in relation to the whole life of the asset.

Business modelling is relevant here and we discuss this in more detail at Section 5 in this Part of the CCL

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\(^{31}\) We have taken this definition from the Institute of Value Management and HM Treasury in the Green Book which looks at investment appraisal for central and local government

\(^{32}\) This requirement is taken from the Scottish Government 2013 Review of Construction Procurement

\(^{33}\) These definitions have been taken from logic modelling techniques used in Scotland for central and local government. Logic models are similar to strategy maps used with balanced scorecard measurement systems. Both approaches link inputs with desired results.

\(^{34}\) The requirement for outcome based life cycle disciplines is taken from the Scottish Government 2013 Review of Construction Procurement
Framework. Balanced scorecard disciplines use strategy mapping to link inputs with desired results. In the public sector and voluntary sector logic models are often used to again link inputs with results. One example used by Scottish Government is the Kellogg’s Logic Model which we have shown at Fig 12 below:

Fig 12 - Kellogg’s Logic Model

We have used the graphic at Figure 13 below to integrate whole project life of assets to the logic model disciplines:

Fig 13 - Integrating logic models with validation and evaluation methods

Traditional Built Environment projects rarely integrate information between construct and asset manage. Evaluating client policy/strategy is even more difficult as this can only take place post-construct and requires both tangible and intangible methods. Digitisation and data flow across project lifecycle is

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35 Kellogg’s, the breakfast cereal corporation give large sums of money to support voluntary service work in the USA. They have developed this logic model to measure the output/deliverables and outcome/impact of their programs.
changing this perhaps not on any great scale at the moment. However, given the obvious benefits for clients using this approach the uptake of this way of managing the Built Environment will only grow.

There is nothing new or radical about the definitions we are using here such as validation or evaluation. These are standard value definitions used for whole system approaches which have been around for decades. In simple terms the client is not buying a building or an infrastructure, this is just the enabler for what they need to do in policy/strategy terms. An example here is Velox windows. Look at the Velox website, their brand is not built around product - the window, this is just the enabler. What Velox promote is the creation of family space, and this is the service they provide to their customers. Having great windows is essential to this brand message and this is the vital deliverable but it is the message of creating space on which they have built their brand around and service delivery around36.

We cover this approach to measuring value in more detail when we examine value analysis in the CCL Framework learning modules at Part 3.

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36 The book “the Discipline of Market Leaders co-authored by Michael Treacy and Fred Wiersema is relevant here. This book compliments balanced scorecard and strategy mapping disciplines. It proposes that there are only three types of company. Those that are operationally focused on lowest cost such as the supermarkets and budget airlines. Then there are companies who are product led and finally the third type is those organisation that are client solutions led. In extreme terms, commissioning behaviours in the Built Environment have been based on buying a commodity from the supermarket, what is the cheapest price we can get? Companies like Velox are clear about where they fit within the customer solutions brand. As digitisation assists clients with both validation of deliverables AND evaluation of outcomes/impact linked to policy/strategy then those organisations that can work across the project life cycle focused not just on output (operationally focused) but outcome (solutions focused) are the ones that are likely to expand market share.
PART 2
SECTION 4 – NEW WAYS OF WORKING
Section 4.1 - Digitisation

BENCHMARK EXAMPLE

We are using the UK military as a benchmark given the complexity of what they do, often in difficult working conditions, which gives similarity with the construction industry. Another reason to choose the military as a benchmark is that the UK Armed Forces have embraced digitisation of the battle space and logistic chain since way back in the late nineties. A perspective of this is given below:

“Digitised battlespace is not a matter of technology. It is not even a matter of people. It is an issue, on an astonishing scale, how people interact with the technology. In handling the digitised battlespace, we cannot simply take for granted that the right people will be there unless we have a clear focus on the recruiting, training and retention of our talented people.”

Expeditionary operations now involve a multitude of nations coming together, often in difficult environments where collaboration is essential. For the military, digitisation is not something new on the horizon but a facet which has been embedded in how they have operated for over two decades now. The term how people interact with the technology is relevant for construction. Why put scaffolding up to check a roof, for example when you can get a drone to do it. The military use Skills, Attitude, Knowledge (SAKs) when they develop strategic people capabilities. This ensures that attitude/behaviour/mindset are built into capability development. This is a feature we are using throughout CCL Framework.

DIGITISATION – WHERE THE INDUSTRY IS NOW

The take up of digitisation in UK construction is expressed below from a McKinsey Report on the industry

The construction industry is ripe for disruption. Large projects across asset classes typically take 20 percent longer to finish than scheduled and are up to 80 percent over budget. Construction productivity has actually declined in some markets since the 1990s; financial returns for contractors are often relatively low—and volatile. The construction sector is the second last sector behind agriculture and hunting with regards to embracing digitisation.

Research on the take up of digitisation within construction from a European perspective is summarised below.

Digitisation is about businesses encountering connected systems at every link in the value chain. It is about working with tools and practices based on information and communication technology. This understanding is changing the role of digital technologies. They are no longer

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37 From a conference in 1999 on “Digitisation in an Era of Expeditionary Operations” Presented by The Deputy Chief of the Defence Staff (Equipment Capability)
38 See NBS report available on line on how drones are being increasingly used in construction.
39 McKinsey report - Imagine construction's digital future
40 Source: Digitisation in the construction sector. Building Europe’s Road to construction 4.0, Author Roland Berger. The PDF version of the report is available on line
mere tools to help companies do the same things a bit better (management led efficiency). Instead, they fundamentally change the way business is done (leadership led effectiveness). Digitization will eventually permeate every part of every company from large multi nationals to small specialist contractors. 93% of construction industry players agree that digitization will affect every process. 100% of building material firms believe that they have not yet fully integrated digitisation in their business model. Less than 6% of construction companies make full use of their digital planning tools.

Building Information Modelling (BIM) is a critical aspect of digitisation. However, digitisation is much more than BIM and as stated above it is about connecting up ALL parts in the value chain. The past has been dominated by competitive tendering and this is the current default position for the majority of clients and contractors. But competitive tendering across siloed elements of the project life cycle destroys value.41

DIGITISATION – WHERE THE INDUSTRY IS GOING IN THE FUTURE

Scottish Government

Digitisation, aligned to project life cycle costing within the overview of capital and operating budgets will and is changing siloed mindset around output based projects not aligned to whole system thinking. The extract below from the Scottish Government Review of Construction Procurement illustrates the emerging policy environment for this:

“We recommend that the use of Building Information Modelling (BIM) should be introduced in central government with a view to encouraging its adoption across the entire public sector. The objective should be that, where appropriate, construction projects across the public sector in Scotland should adopt a BIM level 2 approach by April 2017”

We have shown at Figure 14 an example of a graphic explaining project life cycle integrated with digitisation.

41 Source: Constructing Excellence report – the Business Case for Lowest Price tendering? Extract: The preferred option of many organisations is the ‘traditional working’ process which they have always used involving sequential lowest price tendering. A sequential approach is where the Client engages consultant(s) to design the requirements followed by a separate procurement to appoint contractor(s) to undertake the construction without any integration of the teams. This destroys value through:

- The tender price on a construction project does not represent the final outturn price
- A low tender price which does not cover a contractor’s costs will normally lead to the contractor seeking other ways, such as claims and disputes, to recover additional costs
- A fixed price, lump sum contract can still be subject to risks and claims which can result in the price increasing; passing risk to a contractor will attract a risk premium which may or may not represent good value for money;
- High value contracts which carry a high-risk exposure are not generally attractive to the market and can result in a lack of competition
- The quality of the works provided or services delivered cannot be guaranteed if the monies reimbursed under the contract do not cover the costs of providing them.
Working draft number 1.0 for Consultation

3D modelling within BIM, plus augmented and virtual reality systems, allows asset users to contribute to the policy/strategy and feasibility stage with regards to the business case for the asset. Bringing together designers, contractors, suppliers, asset managers and deconstruct specialists at the design stage ensures that standard value engineering takes place across the full asset team. The enables focus on adding value to the client by meeting or exceeding their policy/strategy requirements at the lowest possible life cycle cost with rewards to the Built Environment teams linked with gainshare. Again, none of this is new. BIM just makes the whole process so much easier to capture, store and use the data over the life cycle of the asset.

Centre for Digital Built Britain

The UK Government is supporting the digitisation of the industry through the Centre for Digital Built Britain which was formally launch on 1 January 2018. Details regarding what the Centre does are copied below from the Centre web site:

“Mission
The Cambridge Centre for Digital Built Britain will support the digitally enabled transformation of the full lifecycle of the built environment to increase productivity and improve economic and social outcomes in the UK and, where appropriate, internationally.

42 This links in with best practice within the Circular Economy. It enables recycling strategies to be established and built into the design stages across the life cycle of the asset. This is similar to the Construction (Design and Management) Regulations 2007 radically improved health and safety on site and reduced costs by including the requirements in the design stage of any Built Environment project.
How the mission will be achieved
The Centre for Digital Built Britain is a partnership between the Department of Business, Energy & Industrial Strategy and the University of Cambridge to deliver a smart digital economy for infrastructure and construction for the future and transform the UK construction industry’s approach to the way we plan, build, maintain and use our social and economic infrastructure.
An integral part of the Industrial Strategy, Construction 2016 - 2020 is the HM Government’s Digital Built Britain (DBB) Strategy published in February 2015. The strategy brings together the Business and Professional Services Strategy, the Smart Cities Strategy and the Information Economy Strategy to provide a consistent vision regarding the creation of a high performing and transparent economy that efficiently delivers services to all its citizens.

Digital technology is changing the way we plan, build, maintain and use our social and economic infrastructure. Building Information Modelling (BIM) Level 2 is already transforming the UK construction industry.

Over the next decade this technology will combine with the internet of things (providing sensors and other information), advanced data analytics, data driven manufacturing and the digital economy to enable us to plan new infrastructure more effectively, build it at lower cost and operate and maintain it more efficiently.

Digital Built Britain seeks to digitise the entire life-cycle of our built assets finding innovative ways of delivering more capacity out of our existing social and economic infrastructure, dramatically improving the way these assets deliver social services to deliver improved capacity and better public services. Above all, it will enable citizens to make better use of the infrastructure we already have.

This will enable a thriving UK Digital Economy for the Built Environment to encourage growth and competitiveness – this is Digital Built Britain.”
PART 2
SECTION 4 – NEW WAYS OF WORKING
Section 4.2 - Design for manufacture and assembly

DESIGN FOR MANUFACTURE AND ASSEMBLY

Why build a civil engineering structure or a house outside in Scotland in the winter when you can build it inside a factory and transport it to site? Off-site manufacturing or Design for Manufacture and Assembly (DfMA) as it is often called is going to be to be an ever-increasing aspect of all forms of construction from civil engineering (Crossrail) to House Building (Legal and General Modular Homes).

Benchmark – Ship Building in Scotland

Through the offices of Construction Scotland Innovation Centre, house builders, off-site manufacturers and suppliers are collaborating so that they can share ideas in how our future houses in Scotland are designed, manufactured and are assembled both on and off site. Develop this further in Scotland aligned to recovery of materials under the Circular Economy legislations and you start to build capability for Scotland to export building/construction parts to such projects as the new Heathrow Terminal and the High-Speed Link and reduce the use of raw materials through recycling. Not realistic? Well we already have this capability in Scotland with ship building and the recent example of this was the DfMA of the Royal Queen Elizabeth Class aircraft carriers.

![Figure 15: DfMA applied to ship Building in Scotland](image)

Construction Scotland Innovation Centre Factory

Increasingly robotics, artificial intelligence and virtual & augmented reality will be used across life cycle stages to overcome skills shortages and to introduce quality assurance principles which are standard in manufacturing. The image at Figure 16 shows robotics in action at the Construction Scotland Innovation Centre Factory.

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43 Increasing exports whilst decreasing use of raw materials through recycling is one of the four strategic targets in the HM Government 2025 Construction Strategy
Fig 16: Demonstration Robots at CS-IC Factory

If you have not already done so visit the Construction Scotland Innovation Centre Factory to see examples of DfMA and speak with the staff about the collaborations with Scottish contractors, off-site manufacturers and suppliers, already in place to move forward DfMA in Scotland. You will be inspired to see how the industry is changing.
PART 2
SECTION 4 – NEW WAYS OF WORKING
Section 4.4 – The Circular Economy

THE CIRCULAR ECONOMY

Taking an Integrated Approach

Improved design processes involving all in the concept phase of asset build and management integrated with off-site manufacturing enabled by BIM, will radically improve value and related gainshare for those consortia who can develop the strategic capability to make the most of these emerging opportunities. This is in turn will increase value for the client in both meeting requirements at reduced life cycle cost AND increased margin and long-term wealth opportunities for industry across the life of the asset. Incorporating the Circular Economy within this improved way of working will give further benefits to both clients and industry. This is explained below from an extract provided by Zero Waste Scotland:

“CIRCULAR ECONOMY FOR CONSTRUCTION

What is the circular economy?
The circular economy is one that’s sustainable, and as much as possible eliminates waste. But it’s more than that. It’s an all-encompassing approach to life and business. It’s about developing new business models, designing products smartly with their whole life cycle in mind, remanufacturing and reprocessing to create new products from old, and re-using and repairing – all to keep products and materials within the economy for as long as possible. In the case of the construction sector, the same principles apply, but instead of thinking of products, think about it in the context of buildings i.e. “designing buildings with their whole life cycle in mind.”

Why is a circular economy needed in construction?
The construction sector is the largest consumer of natural resources and the largest contributor to waste in Scotland, accounting for at least 50% of our overall waste. (4,000,000 tonnes to landfill in 2014 alone). In our quest for a truly circular economy where waste is eliminated, the built environment is therefore key player when it comes to moving away from the linear model of “make, use dispose” to a sustainable and circular model. From 1 January 2018, the 500,000 tons of plastic waste which used to be shipped to China for processing will have to be dealt with in the UK as result of the waste strategy China is now following. By 2025 only 5% of current waste in Scotland will be able to be disposed of by landfill methods. These two factors put considerable pressure on the industry to adapt to it deals with its waste both now and in the future. Also with increased construction off-site, recycling gives the opportunity to be used as a valuable material for the off-site construction process. The saying, where there is muck there is brass, has probably never been truer than today, for those organisations that can maximise opportunity stemming from the need to recycle and reuse within the industry.

44 The terms short term profit and long-term wealth generation are taken from balanced scorecard and strategy mapping techniques so that both short term tangible measure and longer-term intangibles such as brand and strategic capability are taking into account when valuing the overall worth of an organisation
Existing building infrastructure wasn’t designed with the circular economy in mind, buildings are rarely constructed to be dismantled and re-used. A circular approach to construction is all about building with the future in mind, in the sense that the materials used (natural or technical) will have a future purpose beyond the life of the building.

Fundamental to the success of the circular economy in Scotland is how modern buildings and modern materials can be designed to be better used, last longer and be able to be used for other purposes at the end of their life cycle.

What kinds of activities make up the circular economy in a construction context?

Tools and techniques which can be used at the design stage are:

- Using Building Information Modelling (BIM) as a technique to design, plan and manage construction projects as it allows 3D models of the clients’ vision to be created.
- Whole life costing is an approach which can be helpful at the design stage as it allows the whole life cost of a new build or refurbishment project to be measured and the impact of different design choices can be tested.
- Sharing/Leasing/Hiring – allow flexibility within the design to acquire unconventional items if necessary and to allow for the potential for material exchange. There are also some businesses now leasing construction materials such as steel frames.
- Servicing and repair – extending the lifetime of buildings by maintaining and repairing them, so they remain in their original use for as long as possible.
- Remanufacture and re-use – extending the lifetime of buildings at the end of their ‘first life’ by repurposing them or enabling other, subsequent uses. E.g. transforming a commercial building into disparate domestic dwellings. This is also about prioritising the sourcing of re-used materials. The increasing use of materials passports to document all the components of a building helps in encouraging re-use and recycling.
- Recycling – separating products into component parts and materials, and enabling those to be reutilized in new products, displacing the use of virgin raw materials. At the design stage, it’s about design specifying the use of recycled materials wherever possible.

What does it mean for construction?

Construction in both a new-build and retrofit/refurbishment context is a competitive marketplace, and with rising energy and material costs being identified as the third most significant threat in the engineering and construction sector, moving from a simple diverting waste to landfill commitment to more circular approaches has never been more imperative.

Sustainability initiatives in construction have traditionally been focused on recycling materials into lower grade materials with less value. The industry must move further up the waste hierarchy and consider more circular approaches such as re-using materials and preventing waste in the first place by eliminating materials which cannot be re-used at the design stage (effectively, designing out waste).

Designing and constructing buildings which are adaptable allowing them to be dismantled and re-used also allows buildings to be used for short term requirements. There is often a need for buildings with a shorter life span and this can help the sector move the circular agenda forward, as buildings which can be dismantled and reconstructed elsewhere is a key circular economy
principle. This principle should also be adopted in buildings with longer life spans too, as far as possible.

Experts predict that with smart technology in the built environment, buildings use cycles may become shorter in future but with modular design, performance based use of components and embedded product inventories, they can affordably and easily be repurposed.

**Construction in the circular economy**

For the circular economy to function in a construction context, there is a need for a fundamental shift in the design, maintenance and ownership of buildings. In terms of design, buildings require to be easily modified; robust enough to last as long as possible; and eventually to be disassembled into components which could then be re-used or recycled.

Designers and architects should be encouraged to use concepts such as ‘design for deconstruction’ in order to apply these circular economy principles to their design.

New technology is changing prototyping. Building Information Modelling (BIM) allows 3D, digital models of buildings to be created and presents a full picture of the life cycle of a building from conception to deconstruction. By doing this, errors can be avoided, time can be saved and waste greatly reduced because it allows all project stakeholders to understand exactly how a building will look and operate before construction begins.

As for maintenance and ownership, rather than selling products, manufacturers could provide a guaranteed level of service, upgrading components as more efficient ones become available and taking back the old materials via advertised “take back schemes,” examples of which already exist in the sector e.g. in the case of British Gypsum.

Where there is unavoidable waste which cannot be re-used or recycled, there is the possibility of adopting energy recovery from waste techniques.

**The benefits of construction in a circular economy**

The benefits of a circular approach in construction can be summarised as follows:

- Buildings are designed to last longer, are of higher quality and with alternative uses for components at the end of their life. This increases the value and potential marketability of a building once it requires to be sold;
- Creation of secondary markets for used materials would result in the creation of new business opportunities, revenue value streams and jobs;
- Redefining waste as a resource can reduce costs protecting construction firms against price volatility and security of supply where needed;
- Offsite construction solutions mean that waste can be reduced, precision and quality improved, reducing assembly time and making working conditions safer.
- The carbon footprint of a building is vastly improved helping to tackle climate change.”

Since 1 January 2018 the 500,000 tons of plastic waste that the UK shipped each year now has to be dealt with by the UK. This makes waste management across the Built Environment even more important.
Figure 17 shows a generic model for the Circular Economy:

**Fig 17 - Generic model for the Circular Economy**
PART 2
SECTION 5 – OPPORTUNITIES ARISING FROM LEGISLATION AND NEW FORMS OF CONTRACT

LEGISLATION/REGULATIONS

Building Regulations – What is Not Working

An extreme example of failure regarding building regulations is provided with the Dame Hackitt interim report on the Grenfell Towers fire published in December 2017. Key extracts are reproduced below:

“The interim review of building regulations ordered after the Grenfell Tower fire has found the system is “not fit for purpose” and open to abuse by those trying to save money. Dame Judith Hackitt’s interim report into building safety called for an overhaul of the construction industry to put safety above cutting costs.

In the foreword, Dame Hackitt said she was shocked by some of the practices she had uncovered. “The mindset of doing things as cheaply as possible and passing on responsibility for problems and shortcomings to others must stop.” Her report highlights concern about increased privatisation of the building inspection regime leading to safety being compromised and a reduction in expertise within local authorities.

Dame Hackitt concluded that: In summary, this is a call to action for an entire industry and those parts of government that oversee it. True and lasting change will require a universal shift in culture. The industry has shown this is possible in the way the health and safety of construction workers has seen a positive transformation in culture and practice over the last decade. This change needs to start now”.

The Dame Hackitt Interim Report summaries the thread running through all industry reports since Bossm in 1934 where the forms of contract and the ability to effectively collaborate across the whole life of the asset is sadly a repeating feature which the industry has failed to overcome. Again, form and essence are relevant here. From Dame Hackitt’s Interim Report, as she put it:

“There was no shortage of words regarding the regulations but they were over complex and not fit for purpose”.

But form without essence seldom works. This is why Dame Hackitt has been direct in her statement regarding the need for essence with her call for a universal shift in culture for the entire industry and those parts of government which oversee it.

No doubt there will be further recommendations regarding building regulations stemming from the Grenfell Review. This will possibly disrupt industry practice given the scale of change required. But with all disruption it is those smart clients and industry pioneers who will not only show the way in regulatory terms but in turn they will add client value again with enhanced gainshare for those involved. This has

45 Building a Better Future: An Independent Review of Building Regulations and Fire Safety is available on line
been the outcome of good practice going back over 80 years. It is those that have the leadership ability to show that there are other ways of working and are able to align organisational culture to these emerging opportunities which are so badly needed across the industry that CCL Framework is being designed to support.

Building Regulations – What is Emerging?

Example 1 - The WELL Building Standard

New standards are emerging which are supporting the modernisation agenda. An example is the WELL Building Standard is revolutionising the way people think about buildings. The standard explores how design, operations and behaviours within the places where people live, work, learn and play can be optimised to advance human health and well-being. Covering seven core concepts of health and hundreds of features, WELL is a flexible building standard and represents the future of modern design.

![Figure 18 – The WELL Building Standard](image)

The WELL Standard reinforces the need for design led procurement across the project life cycle. To use the quote of Covey again. “Start with the end in mind”. The WELL Standard requirements from policy (public sector) or value proposition (commercial sector) takes into account how the building performs in terms of the agreed life cycle management and the feedback from staff and service users. It reinforces the need for whole system thinking which digitisation will enable focused on end use outcomes - evaluation. This is not new, smart clients have been using these techniques for years. Emerging procurement requirements focused on whole system working across the life cycle of the asset enabled by digitisation will increase the take up of this way of working as the benefits to both clients and industry become more universally appreciated. We have shown at Figure 19 a simple graphic to allow you to make a simple assessment on where you are with regards to the comparison with the practices taking place at Grenfell and the new ways of working which outcome based legislation such as WELL Building will encourage:

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46 This statement was copied from the WELL Building Standard Institute’s web site
Fig 19 - Where is your organisation?

The graphic above represents two extreme examples of regulation legislation, which with one extreme, Grenfell is not fit for purpose and leading to industry bad practice. The example on the right with WELL Building shows where the industry needs to go. On a scale of 0 is Grenfell and 100 is WELL Being, where is your aspiration on this scale for your organisation and where on a scale of 0 to 100 do you feel you are now? How are you going to close the gap?

Example 2 – UK Government Strategic Targets - Legislation Aligned to Modernisation

The for need for Strategic Leadership from Government

“Critically, a plan for change needs to recognise, based on past evidence, that the industry will not change itself unilaterally at scale. It needs to be led by clients expressly changing their needs and commissioning behaviours or government acting in a regulatory or strategic initiation capacity to drive positive disruption”

Farmer report

UK Government’s Response47

“Construction is a sector where Britain has a strong competitive edge. We have world-class expertise in architecture, design and engineering, and British companies are leading the way in sustainable construction solutions. It is also a sector with considerable growth opportunities, with the global construction market forecast to grow by over 70% by 2025.

The Government wants to work with industry to ensure British companies are well-placed to take advantage of emerging opportunities. As part of our Industrial Strategy policy, the Government is building long-term partnerships with sectors that can deliver significant growth.

47 The information on this section has been taken from the UK Government’s Industry Strategy: government and industry working in partnership – Construction 2025
Construction is one of those sectors. Government worked with people across the construction industry to develop a long-term vision. The result is ‘Construction 2025’ a joint strategy which sets out how industry and Government will work together to put Britain at the forefront of global construction over the coming years”.

The shared strategy between government and industry starts with a clear vision of where UK Construction needs to be by 2025. The vision for this joint government and industry strategy begins with where UK Construction will be by 2025 expressed across the following five aspirations:

- **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 exports
- **GROWTH** An industry that drives growth across the entire economy
- **LEADERSHIP** An industry with clear leadership from a Construction Leadership Council

This vision is backed up with the four following strategic targets:

- **Lower Costs**: 33% reduction in the cost of construction and the whole life cost of built assets
- **Lower Emissions**: 50% reduction in greenhouse gas emissions in the built environment
- **Faster Delivery**: 50% reduction in the overall time from inception to completion, for new build and refurbished assets
- **Improvement in Exports**: 50% reduction in the trade gap between total exports and total imports for construction products and materials

The Construction Sector contributes 6.1% of UK GDP and employs 9% of people employed in the UK. It is a vital sector for the UK economy in both GDP and people employed. Improve the productivity of the industry and this in turn will impact on the overall productivity of the UK. This legislation and the ambitious targets it sets out represent considerable opportunities for smart clients and industry pioneers that can take advantage of this positive disruption that this strategy will encourage. Sceptical about this statement? Then read the B1M article on the UK 2025 strategy at Annex B to this Value Proposition.

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48 These two percentages are taken from the Office for National Statistics
CONTRACT PROVISION

WHAT IS NOT WORKING

Historical Perspective

When looking at forms of contract the major reports on the industry going back over 80 years are relevant for this topic. Extracts from these reports are copied below:

- **Bossom – 1934**: In 1934, Alfred Bossom’s published his book “Building to the Skies”. In this book, he compared the efficient way the industry worked in New York on the skyscraper projects where collaborative planning and execution being at the heart of the build projects. He compared this with his experience in the UK of the adversarial and wasteful industry in which construction took too long, was too expensive and was not satisfactory for its clients.

- **Simon – 1944**: Simon looked at the issues open tendering presents, especially with the lack of collaboration this leads to at the concept phase of projects. He also looked at how the lowest tender was creating a culture of low quality and claims working to increase industry profit at the expense of the client.

- **Emmerson - 1962** commented on the need to improve costs, time, quality and fitness for end users. He identified the need to improve trust, foster a collaborative culture and eliminate adversarial relationships.

- **Banwell – 1964**: Banwell looked at the issues of the client not being able to effectively specify what they required from the project and how fragmentation across the industry makes this lack of client focus even worse. He recommended that the clients and industry adopt a “whole system” approach built around collaboration.

- **Latham – 1994**: Latham examined partnership working with clients and the industry and building the team using collaboration methods. He identified that lack of trust and adversarial working results in an average cost increase to the client of 30%. He advocated close collaboration with the client and across the build teams focused on partnership win/win situation or gainshare as it is more commonly known now.

- **Egan – 1998**: Egan stated that both the client and industry need an integrated project process, which will enable the client, designers, constructors and suppliers work together through a
series of projects, continuously developing the product and the supply chain, eliminating waste in the delivery process, innovating and learning from experience". He used the car industry as a benchmark the industry should learn from.

**Constructing Excellence** carried out a Review of the Latham initiatives published in 1994 to transform the industry through collaboration. This Review was published in March 2015. The conclusion of this review is summarised below:

*Constructing the Team* (1994), commonly known as the Latham report set the starting point for the most recent change agenda in the industry. The widespread growth of partnering and subsequently collaborative working can be traced to Latham. He stated that widespread adoption of collaborative working practices could achieve a 30% real cost saving within five years. Latham also recognised the significant role of the client in achieving successful construction projects. There was patchy take up of the recommendations in the Latham report, hindered in part by public sector procurement rules.

On the Construction Excellence web site, there is a valuable overview of key industry reports focused on transformation⁴⁹. One of these is the Constructing Excellence report on value in the industry called “Be Valuable” an extract is given from this web page below

*Concern over understanding of “value” led Constructing Excellence to publish “Be Valuable”⁵⁰. This defined the concept of value as being what you get over what you give⁵¹. It also suggests that the structure of the industry prevents it from engaging with the whole life cycle of a building. Clients are removed from occupiers, end users and facilities managers and therefore take little interest in the operational phase of a building. Built environments should be seen as working assets rather than as physical artefacts.*

**The Farmer Report - 2016** stated that:

*The industry and its clients usually have non-aligned interests reinforced by traditional procurement protocols and a deep-seated cultural resistance to change pervading across both parties. The use of competitive tendering is widespread throughout the industry and there appears to be very low usage of more collaborative and integrated design, procurement and construction delivery models. Clients tend to fixate on lowest initial tendered price and this is often perpetuated by their advisors, who, in a traditional procurement model, are implicitly employed (at least partly) to manage a fixed and adversarial transactional interface between clients and industry. The cost-based procurement model often hinders the ability to focus on value, outcomes or performance if appropriate weightings are not made. Critically, a plan for change needs to recognise, based on past evidence, that the industry will not change itself unilaterally at scale. It needs to be led by clients expressly changing their needs and commissioning behaviours.*

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⁴⁹ To reference type into the internet: Construction Excellence, Key Industry Publications
⁵⁰ The “Be Valuable” report is available on the Construction Excellence, Key Industry Publications web pages
⁵¹ What you get over what you give is just another form of the definition of value we are using for CCL Framework which is – Value = Client requirements over the life cycle costs of providing these requirements
Scottish Government review of construction procurement 2013 stated:

Throughout the procurement process – from project conception to contract award, the public-sector focus should always be on the whole life cost of an asset – that is to say, the costs of constructing, owning, operating, maintaining and disposing of the asset.

Through our many stakeholder engagement meetings it has become obvious that public sector clients are using a myriad of contract forms. In some cases, there has been a clear selection process applied to contract choice which addresses the nature of the work, the procurement method and the risks lying within a project. In others, it appears that there has been much less thought and planning and rather a continuation of “tried and tested” historic practice, regardless of whether the contract type is the best fit or approach for the project in question. It is noticeable in some sectors that newer contract forms such as NEC3 and PPC2000, which promote a partnership approach to project delivery, are less widely used. We do not seek to promote any particular contract form, but we find it self-evident that thought must be given to the pros and cons of whichever contract form is used for a given project. Recommendations around contract provision are as follows:

- Thorough consideration of options must be applied to contract selection as part of the pre-commercial stage.
- To help achieve this recommendation, an updated comparison matrix of the main standard contract types currently available should be compiled and regularly reviewed and maintained.
- On project completion and during post-occupancy evaluation\(^{52}\), contracting authorities should also consider how well their selected contract type has delivered for them. This should be done in terms of quality of the end-product, value for money of both the project and the resource required to contract manage it, the collaboration it allowed and whether it delivered any additional benefits such as innovation. This learning should then be applied to future projects.
- We also believe that by recording the contract types being used for contracts awarded through Public Contracts Scotland greater intelligence on the usage of contracts could be accumulated and the public sector could more readily share experiences of different contract types and how well they have delivered. This will in turn help to make future contract selection more informed and the public-sector client more confident in selecting the contract type most appropriate for the project.

Carillion Business Model

We have copied below a letter the Daily Telegraph Newspaper\(^{53}\) which gives one reader’s perspective on the collapse of Carillion:

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\(^{52}\) This aligns with the definition of value we are using throughout CCL Framework linking contract outputs/deliverables with validation and the outcomes/impact that is the difference which the project makes post occupancy to service users, clients and the wider community. Project completion being a validation on deliverables. Post occupancy being an evaluation of the difference the asset is making to service users/customers (outcomes) and the wider community (impact). This is basic value analysis, which for the Built Environment has been around for decades but it is an underused protocol in today’s adversarial relationships focused on linear and siloed output (deliverables) based contracting where claim is used to build margin (suicide bidding as described in the Scottish Government Construction Procurement Review)

\(^{53}\) Daily Telegraph 17 January 2018, Letters to the Editor.
Sir – With the collapse of Carillion it has become clear that Britain’s construction industry is engaged in a race to the bottom.

Many large contractors are struggling to achieve adequate returns because of poor organisational and management, along unsound business fundamentals.

Public sector procurement is poor. Many contracts are awarded without sufficient scrutiny or understanding of what the work should cost. Buying on price without considering value leads to conflict, cost overruns and losses, often because the contract sum is insufficient to achieve what is required. Risk is neither properly understood nor fairly shared.

Sadly, most of the industry that makes up about 7% of gross domestic product is broken. It needs a sea change if it is to turn around and deliver the services our country so desperately needs.

Michael Coombs, Beckenham, Kent

IMPLICATIONS

The overriding conclusion of historic and current evidence on contracting form is that it is the problem and not the solution. Bossom, Simon, Emerson, Bakewell, Latham, Egan, Farmer and Crawford (SG Construction Procurement Review) are all saying the same thing, yet in 84 years nothing has been done about this on any significant scale.

Form is leading essence. Lack of trust and “we have always done it this way” – “it’s aye been” to use the Hawick version of the phrase) is leading to a situation where competitive tendering, with its well documented faults is still the default position across most of the public and private sectors. We could design the best collaborative leadership programme in the world, but the historical evidence is clear that it will have no impact unless the contract form is radically amended to reflect the need for collaboration across the life of the project from policy/strategy to deconstruct using whole life disciplines. Amending contract form is outside of the scope of this project and this is why we are embedding CCL Framework within the Strategic Implementation Framework for Scotland.

The historical evidence is clear on the need to consider essence as well as form when looking at how new forms of contract can support the modernisation agenda. Get the balance right and modernisation will pick up pace and scale. Fail to align contract provision with the modernisation agenda will put a break on progress. At the moment, the contract is the dominant master. The contract needs to be shaped around the modernisation agenda so it becomes the enabler for good practice through design led collaboration across all stages of the project from policy/strategy to deconstruct. This way the contract moves from the “master” to the enabler supporting collaboration at levels focused on delivering client value and maximising return to industry in:

- Enhanced margin with more effective working leading to gain share opportunities and reducing operational costs with focused waste reduction
- Long term wealth generation through enhanced reputation/brand, strategic capability and

54 We are awaiting the update to the Scottish Government Construction Procurement manual which is being written to reflect the recommendations of the 2013 Construction Procurement Review. This is the authority for public works contracting in Scotland. We will also seek advice for commercial Built Environment contracting so we can signpost best practice with contract provision aligned to the modernisation agenda.
repeat business which through enhanced shared knowledge through effective collaboration and value analysis leads to constant improvements between client and industry.

A benchmark is the UK car industry was a mess 30 years ago. Then the industry went about fundamental change which Sir John Egan\textsuperscript{55} was at the centre off. Now we have leading standards for manufacture and R&D with Formulae 1.

![Image of a car with text: British It's the New German](image)

**Figure 21 – The transformation in the UK Car Industry**

Digitisation gives the enabler to the Built Environment to help this fundamental leap in productivity, enhance client value and return to industry in both short and long-term measures. To maximise this opportunity forms of contract, have to be designed which reflects the modernisation agenda (form) AND mindsets need to change to radically change the culture (essence) with contract working, again aligned to the modernisation agenda.

\textsuperscript{55} Author of the 1998 Report on the Industry – Constructing Excellence
PART 2
SECTION 6 – IMPLEMENTATION LEADERSHIP AND STRATEGIC DELIVERY AND SUPPORT ORGANISATIONS

IMPLEMENTATION LEADERSHIP - SEEING THE FUTURE BY MODELLING

EXAMPLE 1 - UK ARMED FORCES BENCHMARK

A key part of transformation leadership agenda is to be able to picture what the future looks like. Here we are not talking about creating vision statements as part of a branding exercise. Rather it is the ability to see into the future and then model what your organisation will look like in this emerging state. Modelling is a key here. Using the UK Armed Forces as a benchmark, when an operational mission comes from Government the nominated Command Centre brings a collaborative planning team into play. The military use software to build the picture of the battle space and are in constant communication with combat and logistic units so they can use their expertise to contribute collaboratively to the overall model. This model is then federated out to all units involved in the Mission. Field officers use model kits to show their people the federated model of where they will be operating in terms of the ground, objectives to be achieved and the overall plan of battle.

Figure 22 – Sharing the “federated model” down the supply chain

This allows the team to visualise and practice before conducting operations, normally with UK Forces carried out at night under the cover of darkness. This is known as battle prep and it ensures everybody in the mission has a picture of their overall area of responsibility and what they need to do to achieve the mission. 4-D Modelling from BIM allows this but in a much more advanced way where you can see

56 We are deliberately using the term “federated out” which is not a military term but one used in BIM to reflect how the master 3D model is shared with the Built Environment teams. Different context same process

57 Battle prep is a part of a wider discipline called Mission Command. Stephen Bungay in his book “The Art of Action” takes the military model and applies it to businesses which are operating in agile and dynamic environments. Mission command or intent based leadership as it has been called within a business context creates highly autonomous units were people take responsibility for their own actions. It creates both effective delegation and high levels of engagement across collaborative teams. This again is very relevant to the Built Environment. BIM provides the structure for this, CCL Framework is being designed to align culture to this way of operating which uses models to help people “see into the future”
each stage of the build within the model and practice and rehearse the different stages in the low-cost environment of the office before going on site. This process also opens add value potential with associated gainshare by standard value engineering techniques. None of this is futuristic, this capability is available now and Principal Contractors can share 3-D, 4-D and 5-D models down the supply chain so sub-contractors and suppliers in turn can brief and rehearse their teams using the federated models.

Sharing and collaborating around the federated models helps the different parts of the overall team to come together so that there is collective understanding of what is required plus it opens up the opportunity for value engineering at each stage of the build, use and reconstruct phases of the asset. Modelling helps people to see and understand the future so they are prepared and rehearsed for what is required.

**EXAMPLE 2 - BUSINESS MODELLING**

In a disruptive market place the ability to model your organisation’s future within this market place is essential. This business model has to be agile to keep pace with the disruption emerging market forces are bringing about. Those organisations that have this strategic capability are the ones that gain in disruption. Using the military benchmark, combat is an extremely disruptive science (form) and art (essence). The military through centuries of experience understand that it is easier to adapt if you have a plan/model to work from rather than going in unprepared.

There is an excellent book on business modelling called – “The Business Model Innovation Factory, how to stay relevant when the world is changing”59. The front flap summary of the book is as follows:

*Blockbuster’s executives saw Netflix coming. Yet they stuck with their bricks and mortar business model, losing billions in shareholder value. They were Netflixted.*

*Business models just do not last as long as they used to. Historically, CEOs have managed a single business model over their entire career. Today, all organisations must be capable of designing, prototyping and experimenting with new business models*

*Business model innovation is a team sport. It requires all of us to build stronger collaboration muscle and to becoming more comfortable with and much better at connecting across siloes, disciplines and sectors.*

**Business Model Canvas**

Developing business models is simply and pragmatically presented in a book called “Business Model Generation”60. A summary of this book is given below:

*Disruptive new business models are emblematic of our generation. Yet they remain poorly*

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58 A business model describes the rationale of how an organization creates, delivers, and captures value, in economic, social, cultural or other contexts. The process of business model construction is part of business strategy. Source: Wikipedia. Logic models and strategy maps are just sub sets of generic business models. The common thread is that they all join up inputs to results.
59 “The Business Model Innovation Factory, how to stay relevant when the world is changing” is available on Amazon books
60 Business Model Generation is available on amazon books. The book uses Generation the actual model is called the Business Model Canvas
understood, even as they transform competitive landscapes across industries. Business Model Generation practice what it preaches. It was co-authored by 470 Business Model Canvas practitioners from forty-five countries. The approach is business leaders ready to abandon outmoded thinking and embrace new, innovative models of value creation.

The Business Model Canvas is shown below:

Figure 23 – The Business Model Canvas

The logic model is an excellent approach for public and third sector. Business Model Canvas uses the language of the commercial sector but it is equally applicable to the public and third sectors. Linking customer segments with value proposition channels thinking outwards in terms of what the customer is seeking. This is an essential part of the policy/strategy decision for Built Environment projects, especially those focused on outcomes.

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61 If you would like to learn more about the Business Model Canvas, type the following into YouTube: The Business Model Canvas - 9 Steps to Creating a Successful Business Model - Start-up Tips. Every Built Environment project and new consortium is a start-up. This tool when used at the start point helps to create the overall strategic agenda and starts the process of alignment and engagement across the consortium.
Integrated Service Delivery Model – ISDM

Another example of a business model aligning people strategy with business strategy is shown at Figure 24. ISDM\(^{62}\) was developed initially as an integrator to align and streamline different quality systems such as Investors in People and EFQM with individual company strategy. It also links “managing the day to day” with “delivering the future” and links this with strategic workforce planning to build this dual capability. This is an essential requirement for organisations facing the challenge of modernisation. They need to keep the day to day running to maintain the cash flow AND they need to plan for the future. Using models allows the senior team to see into this future and use options analysis techniques around the prototype models coupled with scenario based planning. This encourages agile and fast decision making and in turn the models can be used to align, motivate and inspire the workforce in both the day to day AND future actions required to “make the future happen”.

ISDM enables strategy to be expressed using modelling techniques with the aim of capturing this strategy on one single page. The process of building your organisation ISDM helps people to come together to discuss the future and how you are going to shape your actions to maximise opportunities from this emerging future and also to counter any associated risks with for the Built Environment is now a very dynamic market place.

We will explore business modelling in more detail when we develop the learning modules for CCL FRAMEWORK. One of the leadership benchmarks we are using is the Kotter Model as it is simple and

\(^{62}\) This model was designed by the MD of Tern Business Systems Design as a way that leaders could see the overall requirements of their organisation in business and people strategy terms. It has been used across all three sectors to support whole system thinking leading to coherent action and execution of strategy (the future) and performance improvement (the current situation)
pragmatic. This model states that the key role of a leader is to set the future agenda and then align, motivate and inspire people to execute this agenda. Models or frameworks help to create a picture of the future and through neuroscience we now know the more you look into and discuss the future the more your brain rewires to build this capability.

Also models or frameworks help you to arrange your ideas in a logical pattern which helps with initial planning and then using this framework you can align your people to what is required using simple models. To see the power of how this works in practice ask a group of people to play noughts and crosses but without any visual aids or pencils/pens.

Figure 25 – Frameworks help you see the future in a structured and logical way

The four lines allow the different parts to be put together within a single system which is then easy to share with others.

The Graphic we have developed for the Strategic Implementation Framework reproduced below, is another example of a business model. We have copied this graphic below for ease of reference:

This simple graphic captures the key aspects of implementation and embeds CCL Framework within this Strategic Implementation Framework. Models support the saying that “one picture is indeed worth a thousand words”
The model we have developed for CCL Framework is shown below:

**Working draft number 1.0 for Consultation**

**Figure 26 – CCL Framework Model**

We have used the Framework to integrate the emerging agenda coming from modernisation with best practice with regards to collaborative leadership. We have shown this below:

**Figure 27 – Whole system approach**

**MAXIMISING OPPORTUNITY**

From a dynamic and potentially disruptive market place

**BEST PRACTICE**

For collaboration within a transformational market place

**CONTEXT**

Modernisation agenda
The "Tactics Manual"

**KEY ENABLER**

CCL Framework integrating "tactics" with leadership within the overall industry modernisation agenda
CCL Framework integrates best practice for collaboration with the modernisation agenda for the Built Environment and is a key enabler within the strategic implementation framework which is emerging in Scotland.

We are using the CCL Framework model to structure best practice for collaboration integrated with the modernisation agenda across the following four perspectives:

1. Client value at a fair return to industry
2. Delivering this value – value management
3. The strategy we need to make it happen
4. The collaborative practices and behavioural profile to develop leadership ability aligned to perspectives 1, 2 and 3

CCL Framework is the “filing” cabinet which allows us to store and retrieve best practice on collaboration within the context of the modernisation agenda for clients and the industry.

We will populate the CCL Framework model with a great deal of information for leadership within the modernisation agenda for the Built Environment. But equally the model can be used as a simple first step to creating consortium collaborations as follows:

- How will we ensure maximum value to our clients in terms of meeting their needs/specifications in a way that lowers the whole life costs of the asset?
- How will we build in value engineering and value analysis actions across our consortium to enable client value to be created whilst we maximise our shared short-term margin through gainshare and create long term wealth through enhanced reputation/brand and strategic capability to maximise opportunity stemming from the modernisation agenda now taking place across the Built Environment.
- How will we build the relationships across the consortium so we are clear about the strategic agenda/narrative which in turn will support the building of alignment, motivation and engagement across the workforce at all levels in the supply chain? (we have created a new term for this within CCL Framework which we are calling Relationship Engineering).
- Strategy - Looking outwards into the future
  - How are we going to develop our capabilities as an organisation and consortium so we can maximise opportunities to build reputation and profitable repeat business through constantly meeting client value requirements within a dynamic market place.
  - How can we reduce the threats that the dynamic and in some places disruptive market is presenting?
- Organisational Development - Looking inwards as an organisation/consortium
  - What are our current strengths and how can we use these within the market conditions agreed above
  - What are our weaknesses and what do we need to do to reduce these so we are not held back
- Leadership development - Looking inward to me as the leader to support innovation around our modernisation agenda
  - What are my strengths as a leader to carry out the actions above
  - What areas do I need to build on so I continue to build my leadership capabilities in what is now a potentially disruptive market place?
• Workforce Development – what is our strategy for strategic workforce development so that we continue to manage the day to day AND make the future happen

These are the basic 7 questions that CCL Framework asks. Building and populating the CCL Framework gives the information in a logical way which will assist you in answering these 7 basic questions.

SEEING THE FUTURE – THE SUPPORT THAT IS AVAILABLE

CONSTRUCTION SCOTLAND INNOVATION CENTRE (CS-IC)

We have conducted a great deal of research with the modernisation agenda, which we summaries in this Part of the Value Proposition. In Part 2 we will integrate collaborative leadership requirements within the overall modernisation agenda so we have a coherent whole system which looks at both client and industry needs within the one business model. Part 3 looks at how we can use this work post current project exit.

The research we have conducted is significant but research in isolation carries risk. The breakthrough with testing this research was provided at the CS-IC Factory launch in early September 2017. Here we were able to see off site techniques within the CS-IC factory and listen to a wide band of speakers discussing how they are positioning their organisations firmly within the modernisation agenda. It also introduced us to clients and industry leaders also working within this agenda. We are indebted to the CS-IC CEO Stephen Good and his team for letting us “see the future now” which is a key enabler for innovation. This experience was simply inspirational and it brought the research for CCL Framework to life.

Copied below is an article about CS-IC which the Stephen Good wrote for the Scotsman newspaper in June 2017 to set context in how CS-IC is contributing to the strategic implementation framework in Scotland.

The word innovation is common currency these days. It seems to feature in every organisation’s mission statement, business plan or client brief – an umbrella word for anything new, bright or shiny. If you’re a business leader, chances are you’ve engaged in the topic. You’ll have read a few articles, maybe attended a conference or two, and held some internal “how do we do more innovation” workshops with your team.

I would not be surprised, however, if the word - “innovation” leaves you wanting to throw your smartphone at your smart TV. We often have a tendency to overcomplicate or fear things which we feel we should be doing, but are not quite sure how to approach. Innovation is one of them.

As leader of one of Scotland’s eight innovation centres, I’m aware my sentiment might seem somewhat ironic. But after two years of connecting industry and academia to initiate innovation projects, it’s clear that businesses often “don’t do innovation” because they associate it with risk, uncertainty and cost. The irony of course, in the fast-paced, global world we live in, is that the real risk more likely lies in doing nothing. So how to define innovation? For me, it is change that

63Type [www.cs-ic.org/.../construction-scotland-innovation-centre-ceo-writes-in-the-scotsman/](http://www.cs-ic.org/.../construction-scotland-innovation-centre-ceo-writes-in-the-scotsman/) To gain a link to this article
unlocks new value. It can be simple improvements to existing processes or the development of entirely new products. It can be evolutionary or revolutionary. By its very nature, innovation should bring about improvements in cost, time or production complexity. In an economy that is reliant on increasing productivity for growth, it is also essential. So how do you innovate? Here are some simple approaches.

Firstly, look at your people and how you can support them better or give them authority to do their jobs in new ways. People innovate, so ask your team to come up with better solutions to daily challenges. Where opportunity allows, bring in diverse talent.

We recently recruited for six posts and purposely chose a mix of talent who didn’t all have a conventional construction background, individuals with creativity, passion, enthusiasm, intelligence and transferable skills who could bring fresh perspectives. Six weeks in, the team is coming together beautifully. Secondly, get involved. Collaboration is the bedrock of innovation. In Scotland, we are fortunate to have a rich support ecosystem, with organisations such as Scottish Funding Council, Scottish Enterprise, Highlands & Islands Enterprise, Interface and the eight innovation centres working together to support industry-led innovation. Costs to businesses for accessing support are affordable and flexible, sometimes even entirely free. From September 2017, the construction industry will have access to Cusic’s state-of-the-art prototyping and training facility – The Innovation Factory – at Hamilton International Technology Park. With 35,000 square feet of prototyping and training space, £1.5M of cutting edge equipment and a calendar of workshops, live projects, training and networking events to encourage cross-industry collaboration, this new hub builds on the growing demand for somewhere industry can “make innovation” as well as “talk innovation”.

Working with leading technology and ambitious construction companies, the outcomes of their work will be open to industry and academia to help drive the change that will unlock new value as the construction industry embraces a digital future. So, although we are indeed using the clichéd robot to innovate, it doesn’t need to be that technical. If in doubt, engage your team, and start.

If you are starting out on the modernisation journey or you are well on your way, and if you have not done so already, we would strongly recommend you visit CS-IC and discuss your needs with them. CS-IC are central to the strategic implementation framework which Farmer indicates is essential to help clients and the industry transform. Go and be inspired!!

ZERO WASTE SCOTLAND

It was through follow on workshops at CS-IC that we came across Zero Waste Scotland (ZWS) and how its agenda is another key cog in strategic implementation framework for Scotland. Construction generates 45% of all waste going to landfill in Scotland. On 1 January 2018, the 500 000 tons of plastic waste which used to be sent to China will now have to be processed in the UK. By 2025 only 5% of current levels can go to landfill.

In Element 3.3 of this Part of the Value Proposition we described how the Circular Economy will influence new ways of operating within the Built Environment. Below we have copied a bit more on the background to Zero Waste Scotland:
Zero Waste Scotland exists to create a society where resources are valued and nothing is wasted. The organisation is funded to support delivery of the Scottish Government’s circular economy strategy and the European Circular Economy Stakeholder Platform. Our goal is to help Scotland reap the environmental, economic and social benefits of making best use of the world’s limited natural resources.

The construction sector is one of the most important sectors in Scotland in terms of economic impact and employment. However, the scale of the sector means that over 4.4 million tonnes of construction waste was produced in Scotland in 2014 which equates to over a third of all waste generated.

A truly circular construction sector in Scotland would feature design for adaptation, re-use and deconstruction as mainstream. A typical house would be built using durable and re-useable materials logged as part of a sector wide inventory system able to be tracked and monitored throughout the assets’ lifecycle.

Scotland has the capacity to deliver change in the construction sector in collaboration with key stakeholders such as the Construction Scotland Innovation Centre and other partners.

We aim to enable the transformational change which is essential for a circular economy in practice. We can help companies access tailored products and services that can help them take a more circular economy approach. There are two key aspects to the ZWS offering: The Circular Economy Investment Fund and the Business Support Service, named the Circular Economy Service.

The Circular Economy Service is a free business development offering that will provide specific, tailored support to SMEs seeking to develop or adopt circular economy technologies, products/services or practices. The service will be open to all small businesses and organisations across Scotland but will have a targeted interest in: built environment, manufacturing, energy infrastructure, food and drink / bio economy and re-use and repair.

Visit www.zerowastescotland.org.uk/circulareconomy

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Attending workshops at CS-IC and listening to people discussing the Supply Chain Sustainability School in the context of sector modernisation, off-site manufacturing and the circular economy. Was another source of “helping us to see into the future” which has influenced Part 1 of this Value Proposition.

Details about the Supply Chain Sustainability School, from their web site are given below:

The School is an award-winning industry wide collaboration, led by our Partners and Members whose Vision for the School is to be “A world class collaboration to enable a sustainable built environment”.

The School is for everybody working in the Construction, FM, Homes and Infrastructure sectors who work in England, Scotland and Wales. We cover a wealth of topics from Waste & Carbon,
Fairness Inclusion and Respect and The Modern Slavery Act as well as many more sustainability issues.

The School is completely FREE and allows you to access training in 3 different areas Sustainability, Management and Offsite, and offers you the opportunity to attend our training and networking events, gain CPD points, complete a self-assessment and get a bespoke action plan, complete e-learning modules and various training resources.

The four values which shape essence are:

- Collaborative: We share knowledge and resources. Our direction is led by our partners and members
- Progressive: We deliver measurable impact through dynamic leadership
- Inspirational: We inspire our members and partners to drive positive change
- Inclusive: We exemplify respect for the planet, our colleagues and wider society

We wish to thank CS-IC, ZWS and the Supply School for helping us to “see into the future” for the Built Environment and the knowledge and inspiration to help us to develop this part of the overall value proposition

STRATEGIC IMPLEMENTATION FRAMEWORK – OTHER KEY STAKEHOLDERS

Strategic Delivery Partners focused on Built Environment Transformation

We will seek input and feedback with CS-IC, ZWS and The Supply Chain Sustainability School on this Value Proposition.

We have also consulted with the following key stakeholders operating within the modernisation agenda now taking place and again we will seek their input and feedback on this Value Proposition

Scottish Government Construction Procurement Policy Team

We shared with the Construction Procurement Policy Team the approach we are taking to CCL FRAMEWORK in April 2017. It is 4.5 years now since the Scottish Government Construction Procurement Review was published. The Construction Procurement Manual is now out of date and the Policy Unit are working on a new Manual which takes into account the 2013 Scottish Government Review Construction Procurement. Information on this from the Scottish Government web site is copied below:

**Note:** The Construction Procurement Manual requires review and update in light of new legislation. While it reflects the general process, references to specific legislation and templates may no longer be current.

**Purpose**

A single source of mandatory guidance which draws together the key policy principles and procedures to be followed by those who are responsible for managing or delivering construction projects, (either in one of the specific Client roles or in providing Clients with support and advice).

**Coverage**

The Manual is mandatory throughout the Scottish Government, its Associated Agencies and all other public bodies which are subject to the Scottish Public Finance Manual (further details are in the Scottish Public Finance Manual Introductory Note).
Objectives
The Construction Procurement Manual aims to:

- Disseminate good practice in public sector procurement, including guidance on roles and responsibilities, procurement strategies and the process for appointing consultants and contractors, health and safety, design quality, sustainability and fire protection
- Deliver value for money, good governance and sound financial management
- Achieve compliance with national and international obligations including EC Procurement Directives

Scottish Future Trust

We shared our approach with the Scottish Futures Trust in June 2017. We seek further guidance and case study examples around best practice in procurement, especially that which is aligned to project life cycle and whole cost based on outcomes/impact. We are also interested in the work that SFT is carrying out with regards to Value Analysis and how this is influencing emerging new contract provision focused on client value at validation and evaluation stages of measuring this value.

Constructing Excellence/BRE

We discussed the approach we are taking with Constructing Excellence/BRE in September 2017. This was very much a first level consultation but we have used the Constructing Excellence web site to inform the development of CCL Framework. As the leading body in the Built Environment for collaboration we will share this Value Proposition with Constructing Excellence

The Construction Leadership Council (CLC)

We have not consulted with the CLC directly and we will use this Value Proposition to start this process. We have used their web site to gain knowledge and inspiration with regards to how CLC is leading transformation across the Construction Industry. A flavour of this is given in their web site and we have copied this below:

The CLC’s objective is to drive industry improvement. It draws together business leaders from across the sector to identify how to promote solutions to meet the ambition of a 33% reduction in cost, a 50% reduction in project time, a 50% reduction in carbon emissions and a 50% reduction in the trade gap.

The construction sector is massive, representing 8% of GDP and 10% of employment. It is 6 times larger than the automotive industry. Every year £150 billion is invested through the public and private sectors – creating the foundations for UK growth and playing a key role in achieving our clients’ wider social and environmental objectives.

At its best, the UK construction sector is world class. We have a global reputation for our architectural and engineering skills and for our ability to deliver low carbon and sustainable solutions for the built environment. Our recent record of delivering mega-projects is the envy of the world.

But the sector continues to face fundamental issues. The combination of our cyclical workload and low levels of client leadership, result in a fragmented supply chain which blocks
opportunities to identify and benefit from all of the value which exists across an asset’s life-cycle. This drives competition on the basis of price alone which results in low profit margins across the industry. This means in turn that the construction industry is unable to sustain the investment in skills, technology and innovation needed to deliver the step change in productivity necessary to meet the CLC’s ambitions.

Leadership Councils representing other sectors have achieved great improvements in productivity and competitiveness by focusing on a few big things, bringing industry with them and doing them well. Based on this proven route to success, the big question is, where should the CLC focus? Our answer is:

- DIGITAL – delivering better, more certain outcomes by using BIM enabled ways of working
- MANUFACTURING – increasing the proportion of off-site manufacture to improve productivity, quality and safety
- WHOLE-LIFE PERFORMANCE – getting more out of new and existing assets through the use of smart technologies.

By focusing on these 3 themes, and working with other organisations to join forces, mobilise and accelerate change, we can move the ‘dials’ to benefit the whole industry.

The CLC works through six work streams (supply chain and business models, skills, smart technology, innovation in buildings, exports and trade, green construction board, and communication) to identify the levers, and incentives to deliver the outcomes we desire and the benefits to all who participate.

STRATEGIC SUPPORT STAKEHOLDERS

In the next section, we examine Strategic Workforce Development. CCL Framework is a sub set of this. We are also developing Pathways which is project to support people with convictions get work in the Built Environment. With Pathways workforce development strategies, especially around vocational education and training need to be taken into account when designing the Pathway.

With the Pathways Project, we are already consulting with CITB Scotland, Skills Development Scotland, Re:markable (IIP Quality Centre in Scotland). Both projects are interlinked and what we learn from CCL Framework we will share with Pathways and vice versa. We will widen the consultation to take account of emerging policy for vocational education and training with Scottish Government and Local Authorities.
PART 2
SECTION 7 – STRATEGIC WORKFORCE DEVELOPMENT

THE HISTORICAL PERSPECTIVE REGARDING STRATEGIC WORKFORCE DEVELOPMENT

Latham: Constructing the Team – 1994

One of the main problems facing the industry is how to attract a high calibre of young person into construction firms. With regard to the recruitment of able young persons it is essential that the image of the industry is improved.

Women are seriously underrepresented in the industry. There is no obvious reason why this should be so at a professional consultant level, while the traditional excuses offered in respect of site operatives are becoming less relevant as the building process becomes more mechanised, there is more off-site prefabrication and plant replaces labour.

There has been little progress on these two recommendations made by Latham in 1994. With deeper fragmentation since this period, if anything the image of the industry as a vocational employer for young people has probably become worse since the Latham report was published. Within the Principal Contractors there are probably more women now involved in the sector but this is perhaps not the case further down the supply chain in any great scale.

Hays Recruitment\(^64\) in a survey carried out in December 2017 that:

- 55% of women had suffered sexual discrimination in their time in the industry and 31% said they had experienced in the past year
- A majority of women, 56% said they had experienced harassment or victimization, compared with 36% of men

Egan: Constructing Excellence – 1998

UK construction at its best is excellent. We applaud the engineering ingenuity and design flair that are renowned both here and overseas. The industry is also eminently flexible. Its labour force is willing, adaptable and able to work in the harshest conditions. Its capability to deliver the most difficult and innovative projects matches that of any other construction industry in the world. The UK construction industry at its best is excellent. Its capability to deliver the most difficult and innovative projects matches that of any other construction industry in the world.

Nonetheless, there is deep concern that the industry as a whole is under-achieving. It has low profitability and invests too little in capital, research and development and training. Too many of the industry’s clients are dissatisfied with its overall performance. If the industry is to achieve its full potential, substantial changes in its culture and structure are also required to support improvement. The industry must improve management and supervisory skills at all levels. The industry must design projects

\(^{64}\) This survey was commissioned by Building Magazine
for ease of construction making maximum use of standard components and processes (this last sentence links in with off-site manufacturing which is now gaining in scale across the UK.

The balance that Egan, recognising with the excellence of the industry and its willing workforce is not universal and overall the industry is under-achieving is the same as all the key industry reports are saying now.

The industry has a deep routed culture around how it recognises, supports and motivates its people which it has been dogged with for decades.

WHERE THE INDUSTRY IS NOW WITH STRATEGIC WORKFORCE DEVELOPMENT

SAMI: – 2015

THE SAMI Report identified:

An industry with a poor external image which is hampering recruitment and relationships with clients. Additionally, internal attitudes such as confrontation up and down the supply chain, macho image, resistance to change are deterrents to efficiency, recruitment and diversity.

In the early 90s when Latham wrote his report the majority of Principal Contractors still had large direct labour forces and ran well managed apprenticeship schemes. But this changed rapidly where direct labour was contracted out to the smaller contractors, many of whom did not have the resource or the expertise to develop staff and operatives that the Principal Contractors had. The industry has fragmented even more since the 90s with some of the key employers of direct labour at operative, trade and managerial levels are now employment agencies.

Farmer: Construction Labour Market in the UK

The Farmer Report states:

The real ticking ‘time bomb’ is that of the industry’s workforce size and demographic. Based purely on existing workforce age and current levels of new entrant attraction, we could see a 20-25% decline in the available labour force within a decade. This scenario has never been faced by UK construction before and would be a capacity shrinkage that would render the industry incapable of delivering the levels of GDP historically seen. Just as importantly, it would undermine the UK’s ability to deliver critical social and physical infrastructure, homes and built assets required by other industries to perform their core functions.

The current pace and nature of technological change and innovation in wider society is such that unless the industry embraces this trend at scale, it will miss the greatest single opportunity to improve productivity and offset workforce shrinkage. Failing to embrace change will also further marginalise the industry by reducing its attractiveness to a new generation of workers who will have grown up in a digital world.

Recommendations applicable to Strategic Workforce Development from the report are copied below:
o Recommendation 5: A reformed CITB should look to reorganise its grant funding model for skills and training aligned to what a future modernised industry will need. Industry bodies and professional institutions should also take a more active role in ensuring that training courses are producing talent which is appropriate for a digitally enabled world, making sure that the right business models are evolved with appropriate contractual frameworks.

o Recommendation 6: A reformed CITB or stand-alone body should be challenged and empowered to deliver a more powerful public facing story and image for the holistic ‘built environment’ process, of which construction forms part. This responsibility should include an outreach programme to schools and should draw on existing industry exemplars and the vision for the industry’s future state rather than just ‘business as usual’.

o Recommendation 7: Government has recently reaffirmed its commitment to having a strong industrial strategy. The government should recognise the value of the construction sector and be willing to intervene by way of appropriate further education, planning and tax / employment policies to help establish and maintain appropriate skills capacity.

THE FUTURE FOR STRATEGIC WORKFORCE DEVELOPMENT

HM Government 2025 Construction Strategy

An extract of the 2025 strategy is shown below

An industry that is known for its talented and diverse workforce.

We have a great opportunity to convey excitement about career opportunities in the built environment. Low carbon technologies, digital construction, the internet – all of these developments are changing the world for the better. We want more people to realise the range and potential of working in construction. To drive our vision for Construction 2025 we must reinvigorate the image of the industry. Change is required in the construction industry itself and in how the construction industry is perceived by the public. Industry and Government must work together to inspire young people. Increase capability in the workforce. The industry faces a pressing need for a capable workforce that can deliver transformational change in the next decade. As the wider economy emerges from recession, construction firms must be able to recruit, retain and develop skilled, hard-working people in sufficient numbers to meet the increasing demand for construction.

Construction Leadership Council

The strap line of the Construction Leadership Council is:

“Leading transformation across the construction Industry”

It executes this strap line through 6 work streams one of which is skills. An extract from the skills work stream is copied below:
For the construction industry to thrive, grow and change it needs to be able to attract new and talented people to join it and to provide rewarding jobs to retain new and existing construction workers. This is critical to the work of CLC work streams with skills underpinning so much of the transition the industry is embarking on. The skills work stream has identified key areas of focus and action to be taken. The skills landscape is changing, with new apprenticeship standards, the Apprenticeship Levy and the need to identify how the existing skills structures such as the Construction Industry Training Board can best support the industry in meeting its skills challenges.

Skills have a very close inter-connection with innovation, smart construction, business models and many other elements of CLC work stream activity. Key areas of focus and strategy for the work stream are in the following areas:

Attract a wider and deeper pool of talent into the construction industry
To support those joining the industry to gain qualifications and continue to develop their careers
To develop strategies to retain people in the industry over the long-term
To agree with the industry the key areas of focus for skills for the short, medium and long-term
Educate public about range of opportunities in the industry in support of delivering a modern infrastructure.

CSL sponsored the Farmer Report which recommended that:

*The Construction Industry Training Board (CITB) should be comprehensively reviewed and a reform programme instituted*

**CITB: Vision 2020**

In response to the CSL recommendation, CITB is going through a period of change as a result of a major consultation process across industry and key stakeholders which is now being driven with a new CEO. CITB is now adopting a 6-stage approach to strategic change as a result of the consultation process. These six stages are detailed below:

**Be accountable**
Through national campaigns, transparent strategic planning and a new outcome focus you’ll help shape what we do, how we do it and see it happen. We will work with our industry to develop strategy, focusing on the outcomes construction needs. By being specific, we’ll be able to initiate campaigns on key issues from careers to apprenticeships that translate into clear results such as a more diverse, inclusive and highly-skilled workforce. We will target our influencing activity to ensure the UK, Scottish and Welsh policy framework reflects the needs of construction.

**Be representative**
Through strong partnerships, renewed governance and improved accountability we will be more representative of our industry. We will ensure that smaller firms have representation on the CITB Board. We’ll also make sure that all of Great Britain is fully represented and engaged in our governance in order to influence decision-making. Building on better representation we will make better decisions, reflect the breadth of the construction industry, and work smarter to deliver the skilled workforce needed in England, Scotland and Wales.

**Be relevant**
By modernising, changing the way we do business and providing the support that you need – building an insight base, creating a high-quality standards framework, advocating, engaging and influencing to ensure training provision. CITB’s reform programme includes a commitment to focusing on the core areas of activity industry needs – careers, training and development, standards and qualifications. In addition, we have been developing and sharing high-
quality insight through our new white paper series of research briefs, which are designed to lead change in key areas. We will continue to build our evidence base and, importantly, use it to engage with government to help create a positive policy environment for construction. We will also divest of activity where we feel others are better placed.

Be responsive
By reforming our Grants Scheme, making payments easier and more accessible, and using our resources to support a sustainable, responsive and high-quality training and development market. The Grants Scheme reforms are designed to maximise returns on the investment that companies make but, importantly, our new reforms will shift the focus from ‘cash out’ to ‘skills out’. Construction invests in CITB because it needs a talented and generous pool of workers to support our world-class construction industry. We have a duty to make that money work harder and smarter, to deliver a skills-based return on investment.

Be innovative
Ensure our resources are focused on getting the market working, creating an outcomes-orientated business that is agile, flexible and strategic, delivering on the outcomes that matter to our industry. We know CITB can do better. This means working smarter and investing Levy funds in a way that boosts skills but also means a leaner, more agile organisation. By shifting our focus away from direct delivery of training and concentrating on our core activities we know that we can make a better, more meaningful contribution to the sector. CITB has a key role to play in advancing the modernisation agenda, driving future skills and leveraging investment to ensure that the training and development market works. It will also see CITB helping to develop world-class standards and qualifications that respond to your changing skills needs, making construction a ‘go-to’ career.

Be influential
Build engaging, dynamic partnerships that offer creative and innovative responses to industry’s big challenges – from closing the skills gap to advocating for construction careers. Influence on behalf of the construction industry through an insight-led approach to engagement. Future CITB will ensure that government and providers together create a training and development environment that meets your needs. We’ll deliver a strong research base that industry can rely on when making critical investment decisions. It will enable construction to approach strategic challenges with confidence and insight and help deliver the skills it needs to raise productivity.

Scottish Government White Paper on Youth Employment\(^{65}\) - 2015

Relevant extracts are shown below:

We will build a vocational education system in Scotland to rival that of our Further Education system.

Fundamentally, this is about ensuring a work relevant educational experience for our young people. It is about all of us valuing and understanding what a rich blend of learning, including vocational education, can offer. It is about employers playing an active role, both shaping and benefiting from Scotland’s education system by helping to create the talent pool they need and recruiting young employees. Ultimately, it is about the future workforce, our young people, making informed and ambitious choices about jobs and careers, ready to take their place in the world as effective contributors.

This is a bold statement and is so needed as the vocational education and training system across the UK has been a distant cousin to the further education sector for decades and we explore this in the next paragraphs.

\(^{65}\) Source: Scottish Government Paper - Developing the Young Workforce; Scotland’s Youth Employment Strategy; Implementing the Recommendations of the Commission for Developing Scotland’s Young Workforce
MANAGING THE GAP IN STRATEGIC WORKFORCE DEVELOPMENT

There is currently a very large gap between where the industry wants to be in the future, especially at vocational level and where it is now in terms of systems and related people development, image, and underlying culture/mindset/behaviours. This is a deep routed challenge to both the Government and Industry and there is no quick fix. If you are involved a strategic level in developing programmes to build capability across the industry then a good position to understand the divide in Britain now between the professional classes and those relying on vocational education and development is contained within David Goodhart’s book – The Road to Somewhere and we give an extract of this below:

“It was in the early 90s. I was the employment editor of the Financial times, recently returned from Bonn and a front row seat reporting on German unification. I had returned full of enthusiasm for German labour practices, both in the voice given to workers in large companies and the vocational training system which gives pride and status to middle and even lower skilled jobs.

My editor was keen for me to write about the German labour market model. But what we both failed to grasp was that Britain was in the middle of dismantling a large part of its vocational and technical training systems in the rush to a mass academic higher education system.

Both the centre left and centre right critiques of modern capitalist economy take too little account of human psychology. Work is not just about receiving a decent income and realising one’s individual talents. There is intrinsic satisfaction from a job well done and from the teamwork that goes with it. It is also about feeling respected and valued.

With the decline of vocational training and the expansion of white collar and professional jobs the labour market in Britain now resembles an hour glass with a bulge at the top and bottom, which are as much about respect and esteem as they are about pay.

Goodhart’s message about the dismantling of the vocational and technical training systems over the last 30 years is so relevant here. Not only has this robbed the sector of key skills development at vocational level it has also aided the negative human psychology factors he describes so well throughout his book. This has been made worse by the fragmentation of the industry and the responsibility for vocational training and employee motivation for direct labour pushed down the supply chain. Future supply chain leadership will need to look at how values and vocational skills are developed across and down supply chains if the drain in vocational skills and employee morale is to be turned around.

Also, foreign labour has propped up the labour market and has driven the “why bother to train – we can just use overseas talent” mindset, especially at vocational level. This is not just construction as an article in the Daily Telegraph on 3 January66 illustrates:

“A potato crisp maker in East Anglia is having to invest in new machinery to chop the spuds. The job used to be done by workers from Eastern Europe. But they are less keen to come to the UK since Brexit, so the supply of cheap labour has been cut. The business has had to buy the machine in case parts where subject to import tariffs further down the line.

66 Article by Tom Miers at page 4 of Daily Telegraph published on 3 January 2018
This was used by a US paper to spread doom and gloom. But of course, there is another way of looking at this story. Instead of relying on cheap foreign workers to grow, the business is investing in new machinery and having to do more with the people it’s got. Becoming more productive in other words.

CONCLUSION

From the research, we have conducted for both CCL Framework and Pathways. There is no clear strategic implementation framework that Farmer states is necessary for the industry with workforce development.

This framework, we would suggest has to be examined at from a Scottish perspective looking at not just potential graduates but those who wish to take a vocational route into the industry. With Pathways, we are designing this for people with criminal convictions. What Pathway has shown us is that if you are a young keen person wishing to join the industry the Pathway to do this from school is at least vague and it is certainly not joined up through workforce succession planning with the majority of employers.

We will seek to look to the horizon regarding the strategic implementation framework that Farmer states is necessary with regards to the future of strategic workforce development for the sector across the UK and in Scotland. We will update this element of Part 2 accordingly. We will also revisit this Element in Part 4 when we examine the Exit Strategy for CCL Framework.

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67 This is required because both Further and Vocational Education are devolved services.
PART 2
SECTION 8 – MODERNISATION AGENDA LED BY “SMART CLIENTS” AND INDUSTRY PIONEERS

This is work in progress
PART 2
SECTION 9 – PART 2 SUMMARY

THE EMERGING STRATEGIC LEADERSHIP FRAMEWORK

The Construction Leadership Council commissioned Farmer Report (2016) states that there is no strategic implementation framework to transform the industry. From the research carried out for CCL Framework we see that there is a strategic implementation framework emerging in Scotland.

One of the key capabilities for transformational leadership is to be able to see into the emerging future and devise policies/strategies/agendas that maximises opportunity and negates threats. There is so much research on how the industry needs to change. And it is time consuming to be able to read this never mind turn it into a meaningful framework for the future. To this end we have summarised what we see as the key enablers within the Strategic Implementation Framework suggested by Farmer as follows:

1. Changes in procurement
2. New ways of working
   a. Digitisation
   b. Design for Manufacture and Assembly
   c. The Circular Economy
3. Opportunities arising from legislation and new forms of contract
4. Implementation Leadership - Strategic support organisations
5. Strategic Workforce Development
6. Modernisation agenda led by “smart clients” and industry pioneers

We have also examined business modelling so that readers can use appropriate models for their own organisations based on the key enablers above.

Of the 6 elements bulleted above Strategic Workforce Development at vocational level lacks any strategic structure in Scotland. We would imagine this is the same conclusion across the rest of the UK but this has not been verified.

KEY STRENGTHS – STRENGTHS - WEAKNESSES – OPPORTUNITIES – THREATS - SWOT

The key aspects that the research has shown are as follows:

Current Strengths

- The industry contributes 6% to GDP and 9% of the current workforce
- At its best, the industry is a world leader with a dedicated, highly motivated and flexible workforce.

Current Weaknesses

- Going back to 1934 the key improvements the industry requires to undertake in terms of how it
works together and its image have not improved and anything with the fragmentation over the last 30 years the situation has probably worsened.

- The range of capability across the UK Built Environment goes from world leading to the horror that is Grenfell Towers to the sadness of the Collapse of Carillion that swallowed up so many well-known UK construction firms
- Methods and materials have progressed significantly over the decades but inappropriate behaviours around collaboration, encouraged by contract form which supports adversarial working, have largely remained the same over decades
- Over the last 30 years coherent vocational education and training systems have been degraded by successive governments and the fragmentation within the industry has made this worse. This not only affects capability it influences how people feel about themselves and those that employee them\textsuperscript{68}.

Current Threats

In all sectors undergoing fundamental change there is the normal human reaction which is to say it “\textit{will not affect us}”. For example, with some traditional builders working mainly with house maintenance and improvement with the old stone built houses in Scotland the benefits of digitisation may not be obvious. But Heriot Watt University in partnership with Historic Scotland are working on a digital scanner that can identify where the lime based plaster needs to be replaced. This will radically change maintenance schedules and reduce costs across their housing estate with the benefits that digital driven innovation brings about. Every opportunity below which is ignored is a potential threat to your organisation. Just be aware that your organisation does not suffer with the frog in the boiling water syndrome\textsuperscript{69}:

![Image of frog in boiling water]

\textbf{Figure 30 – The frog in boiling water syndrome}

Future Opportunities\textsuperscript{70}

- The need for changes in behaviours for procurement have been identified by the Scottish

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\textsuperscript{68} Psychological factors with employment is an area we are exploring with Pathways and what we learn with this project we will transfer over to CCL Framework

\textsuperscript{69} The boiling frog is a parable describing a frog being slowly boiled alive. The premise is that if a frog is put suddenly into boiling water, it will jump out, but if the frog is put in tepid water which is then brought to a boil slowly, it will not perceive the danger and will be cooked to death. The story is often used as a metaphor for the inability or unwillingness of people to react to or be aware of threats that arise gradually.

\textsuperscript{70} Note we are looking at opportunities from a sector context. Some organisations will be a lot more advanced than others so for them opportunities are actually current strengths.
government Review of Construction Procurement carried out in 2013. We await the revised Public-Sector Construction Procurement Manual which captures the 2013 Review recommendations.

- Digitisation is like the tide, once it comes in you cannot stop it. Digitisation is already changing the industry by enabling data flow to be captured at all stages of the whole life of the asset.
- Digitisation is giving us best practice examples in procurement which can be shared so that modernisation grows across projects and clients.
- Digitisation will connect processes at site, within the logistic chains and supply including off site manufacturing to be joined up into coherent whole systems capable of being driven to excellence through data capture and continuous improvement.
- The history of digitisation in other sectors coupled with disruptive innovation shows that small agile organisations can capture market share from those larger organisations that do not have this agility and flair to innovate. Think Blockbuster and Netflix.
- BIM as part of the digitisation programme is enabling data capture and exchange but it is much more than this:
  - It is enabling service users/customers, clients, designers, constructors, suppliers, asset managers and recycling specialist to come together at the feasibility/design stage of the project so that design led collaboration is built into whole life asset management from the start. This in turn will influence procurement and collaboration behaviour.
  - BIM enables value engineering to take place at the feasibility stage so that client spec can be met or exceeded at overall reduction in the whole life cost of the asset.
  - Modelling at 3-D and 4-D levels with virtual and augmented reality enable the whole asset teams to see what is required at build, manage and recycle phases of the contract.
  - By capturing data throughout the whole life of the project this will harness value analysis so that processes can be captured and improved. This in turn will enhance contractor selection.\(^{71}\)
  - BIM will enable emerging legislation/standards such as the WELL Build standard through validation at the construct stage and evaluation at the use stage around the WELL indicators.
- Off-site manufacture enables manufacturing levels of quality assurance and continuous improvement to be leveraged across the Built Environment. This in turn will significant increase overall value through enhanced product specification at continually reducing costs of manufacture.
- Off-site manufacture enables opens up opportunities for UK industry to export parts ranging from house kits to large civil engineering infrastructure.
- Robotics at site and manufacturing levels will significantly improve productivity.
- The circular economy, especially at co located hubs with off-site manufacturing gives opportunities which for many at the moment are a cost, into a revenue stream.
- Building is waste management planning at the feasibility stage gives the ability to reduce life cycle costs through efficient waste and value engineering working. This will reduce whole asset costs for the benefit of clients and industry.
- For consortiums who have the capability with outcome working across whole life of the asset this will improve their market share with smart clients who wish to use emerging legislation such as the WELL Building Standard to improve the experience their employees and service users, customers have of the build or infrastructure.

\(^{71}\) This was one of the key themes in the 1998 Egan report. Digitization now allows data in in depth, to be captured, stored and used at all stages of the asset life.
• The ambitious targets for the industry set in the UK Government 2015 strategy for the industry will encourage organisations to innovate, especially around the grant/funding which is available at EU, UK and Scottish Levels to support this innovation

• Organisation like CS-IC, Zero Waste Scotland and the Supply Chain Sustainability School are contributing to the strategic implementation framework. They are helping companies to innovate so they can in turn increase market share with the opportunities opening up with modernisation

• As an industry working with Government we have the opportunity to rebuild vocational education and training to enhance strategic workforce capability and to return dignity and self-esteem for those who are carrying out vital vocational tasks at all levels in the industry

• Business models and frameworks help people to “construct the future now”. We are building a sector level business model with CCL Framework. The information and best practice we will capture in this sector business model will aid clients, consortiums and companies to develop and execute their own business models to take gain market share and increase short term profit and longer-term wealth generation. We would wish this to happen in such a way that the motivation and satisfaction of the working in the industry improves proportionately.

Annexe:

C. Support programmes available from Zero Waste Scotland
SUPPORT PROGRAMMES AVAILABLE FROM ZERO WASTE SCOTLAND

Government funding
The Circular Economy Investment Fund is a funding opportunity for businesses and organisations in Scotland working in all business and social economy sectors. We are investing £18 million as grant funding to small and medium sized enterprises who are helping to create a more circular economy. To advance the circular economy in Scotland Zero Waste Scotland is helping the construction sector to build resilience by rethinking the whole construction process right from the start. This means from the design stage. Design adaptability and planning for end of life solutions are strongly encouraged. The aim is to keep resources in high-value use for as long as possible. With the help of Scottish Government and European Regional Development Funds money is available to help the Scottish construction sector achieve sustainable business growth.

Zero Waste Scotland are interested in:
• Exploring markets for new circular economy products
• Development and adoption of innovative business models for new circular economy products and services
• Development and uptake of innovative technologies, products and services to support a circular economy
• Here are some example scenarios of projects that could be eligible for funding:
  • Building in layers – major components of a building should be separate allowing buildings to be reconfigured for different uses.
  • Designing for adaptability – allowing alternative uses for materials and the building to the considered e.g. modular structures allowing building layouts to be easily reconfigured.
  • Designing for disassembly – this considers the future need to disassemble the building for other uses of its component materials.
  • Selecting materials - Responsible sourcing and selecting recycled materials in construction
  • Sharing/hiring/leasing – for example, leasing of construction materials or equipment, or allowing for material exchange.

Zero Waste Scotland are inviting grant applications from £50,000 to £1,000,000, the fund is open to all construction sectors.
Visit http://www.zerowastescotland.org.uk/circular-economy/investment-fund

Resource Efficiency - preventing waste in construction
Fully funded Government support for Scottish construction businesses. Resource efficiency can make a big difference to the profitability of businesses in Scotland. But we know that cutting your waste, resources, energy and water might not be your top business priority. Resource Efficient Scotland, a programme of Zero Waste Scotland can help you with improving your resource efficiency. And help your business to unlock immediate savings. They have already identified over £42 million savings for Scottish organisations and 9/10 customers would recommend them to other businesses.

Government funding
There is an interest-free, unsecured SME Loan available to help organisations purchase capital equipment.
Grant funding is also available for projects with a focus on raw materials savings, carbon savings and the movement of waste material up the waste hierarchy.
Examples of projects include:

- Building information modelling (BIM) software (purchasing of licences);
- Development / operation of re-use hubs for wood and other construction materials;
- Offsite construction infrastructure / equipment;
- Material storage protection;
- Computer numerical control (CNC) cutting machines.

One call to Resource Efficient Scotland and they’ll help you to reduce the waste you produce and the raw materials you use in your projects, so you can save money and grow your business. Call 0808 808 2268 or visit www.resourceefficientscotland.com/construction
PART 3
CCL FRAMEWORK CONTENT

Integration of collaboration best practice with the emerging strategic implementation framework which is emerging in Scotland

NOTE: The research for Part 3 is virtually complete. Now we are developing the narrative around content, checklists and signposting best practice. At Part 3 we have shown an outline of the approach we are using.

We are using military metaphor for the development of Part 3 as follows:

- **Strategy**: The UK Government 2025 Strategy and strategic targets developed through government and the industry
- **The Tactics Manual**: This is Part 2 of the CCL Framework
- **The Leadership Manual**: This is Part 3 which we are developing integrating leadership approaches with the relevant tactics
- **Operational Checklists**: We will develop checklists for Parts 2 and 3 of the CCL Framework so that simple steps are established to create the bridge from conclusions to action
Working draft number 1.0 for Consultation
PART 3
SECTION 1 – COMMON THEMES

COMMON THEMES

At Figure 32 we have shown the CCL Framework Model using visual icons across the four perspectives. In the research for this Part of the CCL Framework common themes became apparent that run through the four perspectives and we have explained these below.

Consciousness

As Einstein so wisely said, “You cannot solve a problem with the same consciousness that created it. You must learn to see the world anew”

For the CCL Framework, we are defining consciousness as:

Awareness of self and my impact on others within an external environment which is emerging.

The four key parts here are:

**Self:** Before you can lead others, you have to understand yourself

**Others:** To lead, you need followers, you have to understand how your style of leadership impacts on them

**An external environment that is emerging:** This is the modernisation agenda for the industry and where you and your organisation "sit" within this agenda

**You must learn to see the world anew and act on it:** This is the crucial part of the modernisation agenda. It is not just enough to see you also have to act. You need to be clear of what your world looks like now. The easiest way to do this is to look at your current business model. Then you need to see the world you wish to go to by rebuilding the business model. This is the basis of transformation and why it is so hard because not only do you have to understand how your behaviours impact on others. You have to do this and evolve new ways of behaving aligned to the world as it is changing around you. It is a bit like trying to throw a dart on roller skates whilst standing on a 4-wheel buggy. Everything is in movement around you. The CCL Framework gives you the support to work through this uncertainty.
Figure 28 – As a leader it can feel quite shoogly\textsuperscript{72} in today’s ever-changing world!

The CCL Framework focuses leaders on running the day to day business AND making the future happen in what is a transformational environment for the industry. The shoogle syndrome!!

Deep Thinking

Figure 29 – Deep thinking

The world today is fast paced and frenetic. At operational demands can be overwhelming. Firefighting can get like a drug in that you get hooked on the short-term success.

When we are firefighting or problem solving we are using the active parts of our brain. Deep thinking however, is different, it works away slowly within the subconscious. It is the Eureka moment in when we suddenly think we have just got a great idea. But this idea has probably been brewing away for some time in your subconscious.

We will investigate this theme more as we develop Part 3. Just think of shoogly frogs in boiling water and you have cracked it!

What is Leadership – The Kotter Model

There is no one common standard or definition of leadership. We are using the Kotter Model\textsuperscript{73} to show the difference between leadership and management.

\textsuperscript{72} Definition: A Scots word meaning to shake. Just shoogle it about a bit and it’ll come loose. Source: MacMillan Dictionary

\textsuperscript{73} Source: Book by Professor John P Kotter called. A force for change – How leadership differs from management.
<table>
<thead>
<tr>
<th>Creating an Agenda</th>
<th>Management</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and budgeting</td>
<td>Establishing detailed steps and timescales for achieving needed results and then allocating the resources to make that happen</td>
<td>Establishing an agenda</td>
</tr>
<tr>
<td>Engaging with people to achieve the agenda</td>
<td>Organising and staffing</td>
<td>Aligning people</td>
</tr>
<tr>
<td>Establishing structure and staffing to achieve the plan, delegating responsibility, providing policies and procedures and review systems</td>
<td>Communication the direction, influence to ensure that people understand what they have to do to achieve the vision</td>
<td></td>
</tr>
<tr>
<td>Execution</td>
<td>Controlling and problem solving</td>
<td>Motivating and inspiring</td>
</tr>
<tr>
<td>Monitoring results against plan, identifying deviations and then planning and organising to solve these problems</td>
<td>Energising people to overcome major political, bureaucratic and resource barriers to change</td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td>Produce a degree of predictability and order, to consistently achieve key results expected by stakeholders</td>
<td>Produce change within the organisation to meet external influences or to bring about significant internal improvements or both</td>
</tr>
</tbody>
</table>

**Figure 31 – How leadership is different to management**

Professor Kotter in his years working in both public and private sectors came to the conclusion that most organisations in the developed world are over managed and under led. When we use the term leadership in CCL Framework it is using the definitions at Figure 31 as the structure for this. With collaboration, the requirements follow the same structure but now the leader has to use his/her influence across organisational borders to agree joint agendas then work with others to gain alignment and motivation across the combined workforces in a way which inspires people to overcome the barriers to change.

**Learning**

Neuroscience is showing us our brains are plastic and they continually change with time. This is relevant for leaders. The more leaders use options or scenarios often expressed in business models the more their brains develop around future thinking. This way the brain is a bit like a muscle. Keep using it a certain way and it will become stronger in that direction.

Looking back to learn, or reflective learning as it is often caused focuses on the past to improve current performance. Leadership learning is different, first you have to create a picture or business model of the future and continually visit this image. This uses different learning approaches aligned to setting future agendas which is the first key step for any leader.
We will develop these 4 themes within the overall narrative for Part 3 which we are working on now.
PART 3

SECTION 2- CCL FRAMEWORK MODEL USING VISUAL ICONS

CCL FRAMEWORK MODEL USING VISUAL ICONS

The CCL Framework Model is at Figure 26, Section at Part 2 of this document. At Figure 28 below we have shown the four perspectives of this model using visual icons:

Figure 32 – CCL Framework Model using Visual Icons

INTEGRATION OF LEADERSHIP WITH TACTICS

We will integrate the elements of the emerging strategic implementation framework for industry transformation detailed at Part 2 (the tactics manual) to this document with key aspects of collaboration leadership across the 4 Perspectives.

We have completed the majority of the research for Part 3. Now we are developing this a strategic narrative. In the remaining sections in Part 3 we will show each of the perspectives in outline so you can see the approach we are taking.
PART 3
Section 3 - CLIENT VALUE\textsuperscript{74} AT FAIR RETURN TO THE CONSORTIUM INVOLVED

VISUAL ICON

We have shown the visual icon for this perspective at Figure 7 on the next page. The diagram showing whole project life is taken from Steve Race’s book, BIM Demystified\textsuperscript{75}.

\begin{figure}[h]
\begin{center}
\includegraphics[width=\textwidth]{figure33.png}
\end{center}
\caption{Client value at a fair return to the consortium involved}
\end{figure}

**“TACTICS”\textsuperscript{76} RELEVANT TO PERSPECTIVE 1**

We will explore this in more detail at Part 3 to this document. At this stage, we are just giving an overview and for Perspective 1 we have bulleted this below:

\textsuperscript{74} We have used the definition of value as defined by the Institute of Value Management and Her Majesty’s Treasury “Green Book” for Investment appraisal.

\textsuperscript{75} We have their kind permission of RIBA as publisher to use this graphic to show whole project life stages of the asset.

\textsuperscript{76} The “tactics” are covered in detail at part 2 of this document.
• Design led collaboration across the whole life of the asset taking into account whole life costing disciplines integrated with client specifications
• Output versus outcome/impact procurement and related validation and evaluation measures
• Emerging legislation supporting whole asset life cycle working
• Emerging contract form to support whole asset life cycle working
• Digitisation as the enabler

RELATED LEADERSHIP APPROACHES

We will examine the following techniques aligned to the “tactics” for this Perspective:

• The difference between operational and strategic thinking
• Deep thinking techniques
• Being aware of our levels of consciousness
• How we learn and the difference between reflective learning (performance improvement) and learning leaning into the emerging future (strategy development and execution)
• Understanding behaviour and what we need to do us leaders to modify our mindsets and engrained habits
• Psychological levels of leadership maturity and their impact on consortium collaboration.
• Cognitive difference in thinking with left brain reductionist approaches geared on performance improvement and right brain whole system approaches geared on future solutions aligned to whole project life cycle working
• How we see “our world” at personal, organisation and consortium levels
• Mind management for innovation and creativity leading to design led collaboration across the asset life cycle
PART 3
Section 4 - Delivering Value to the Client– Value Management Techniques

VISUAL ICON

At Figure 34 below we have shown the three stages of value management we are using throughout the CCL Framework. Value engineering and analysis are traditional phases. We have developed a new phase which we are calling Relationship Engineering as part of the overall Value Management discipline

“TACTICS” RELEVANT TO PERSPECTIVE 2

- How BIM changes both value engineering and value analysis
- The importance of data
- Maximizing fair return with both short term profit (margin) and longer-term wealth creation (brand enhancement, strategic capability development, repeat business etc.)
- What we need to do to engineer the relationships across the consortium aligned to whole asset costing and outcome/impact engineering disciplines

RELATED LEADERSHIP APPROACHES

- The requirement to “see the future”
  - BIM as the enabler for the value engineering across the whole project life cycle
  - Business modelling as the enabler for consortium working
- Leading by example through dialogue to create the capability across the consortium for effective whole life asset focused value management disciplines
• The ability to share learning through value analysis\textsuperscript{77} techniques to adapt and learn
• Understanding both collaboration “form” (structures based) and collaboration “essence” (cultures/values based)
• Using existing standards such as BSI 11000 Collaboration and Investors in People to build relationships across the consortium
• Have the psychological leadership maturity to work within the consortium in a way which encourages, cohesion and whole system thinking enabled by BIM (form) and collaboration (essence)

\textsuperscript{77} We are aware that Scottish Futures Trust are looking at value analysis in detail and we will consult with them to identify best practice examples we can use for this perspective
PART 3
Section 5 - Organisational and Consortium Strategy

VISUAL ICON

The visual icon for perspective 3 is shown below at Figure 35. This is a simple simple strategy map showing the relationship between inputs, outputs and outcomes.

**Figure 35 – Organisational and Consortium Strategy**

**“TACTICS” RELEVANT TO PERSPECTIVE 3**

- What we seek in short term profit terms and longer term wealth generation for our organisation and consortium
- How we will manage the emerging threats coming from modernisation at organisation and consortium levels

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78 A strategy map is a diagram that is used to document the primary strategic goals being pursued by an organisation or management team. It is an element of the documentation associated with the Balanced Scorecard, and in particular is characteristic of the second generation of Balanced Scorecard designs that first appeared during the mid-1990s. Strategy maps help to envisage the picture of the strategy and the key connectors. Like logic models they are just another form of business modelling techniques that use visual linkage to link the results with the inputs to enable these results
• How we will maximise **opportunities** stemming from the modernisation agenda at organisation and consortium levels
• The key strategic capabilities we will develop across organisational and consortium levels building on current **strengths** and **weaknesses**
• The actions I need to take to develop my leadership capability to maximise opportunities stemming from Perspectives 1, 2 and 3 within the CCLF Framework Model
• The investment in resources that are required for the existing business and those additional resources required to maximise opportunity, for example:
  o Cash
  o Time
  o Organisational development support
  o Workforce development

**RELATED LEADERSHIP APPROACHES**

• Business modelling
• The awareness to make time to scan the future to maximise opportunities and minimise risk stemming from the modernisation agenda
• Foresight and business acumen using future based learning techniques and mind management disciplines
• The ability translate foresight into effective action
• Understanding of how people process thought from a brain perspective so all the personal strengths of the team are utilised and any blind spots are covered. This links in with balanced scorecard disciplines
• Developing resilience for self and the workforce to support transformation aligned to modernisation
• The ability to influence others that you have no operational control over
• The ability to manage the operational aspect of the job as well as “making the future happen”
PART 3
Section 4 - Leadership Behavioural Profile

VISUAL ICON

The visual icon for Perspective 4 is shown at Figure 36 below:

![Figure 36 - Leadership Behavioural Profile](image)

**TACTICS RELEVANT TO PERSPECTIVE 4**

- Supporting people to understand their part in the modernisation agenda that is being pursued at organisation and consortium levels
- Creating alignment
- Building Engagement
- Motivating and inspiring\(^79\) others to overcome barriers that will hinder the achievement of organisational/consortium modernisation agenda

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\(^79\) Definition: “Inspirational leadership can increase people’s motivation and commitment to the organisation. Inspiring leaders create an environment of mutual trust in which people can be creative and motivated to do their best. They tend to:
- Have a clear sense of purpose
- Inspire others to achieve their potential
- Are honest and trustworthy
- Have passion
- Encourage others to share their vision and follow their lead willingly.

Source: Investing People Glossary of Terms
• Agility to adapt the agenda as new opportunities or threats emerge
• Applying validation and evaluation techniques so any change projects remain aligned to deliverables or outcome/impact requirements

RELATED LEADERSHIP APPROACHES

• Whole system thinking to be able to join up the outputs and desired outcomes of Perspectives 1, 2 and 3 into a coherent approach to aid personal and workforce development
• Applying different forms of intelligence such as:
  o Awareness and development of self. (Emotional intelligence)
  o Awareness of impact on others and required development actions. (Social Intelligence)
  o Awareness of building relationships across team, organisation and consortium (Relationship Systems Intelligence)
• Using behavioural change approaches identified within the CCLF Framework to aid self and to support others to develop ways of aligning behaviour to support collaborative working both at symptom and root cause levels
• Coach and support others to align behaviour to support collaboration
I hear, and I forget. I see, and I remember. I do, and I understand.
Source: Confucius
PART 4
SECTION 1 – FROM CONCLUSIONS TO ACTION

Part 1 of the CCL Framework Draft 1.0 gives the background to why and how the CCL Framework was developed. Part 2 gives the emerging strategic implementation framework required to support modernisation of the industry (the tactics). Part 3 gives the leadership requirements across the 4 perspectives of the CCL Framework within the context of the modernisation strategy. Part 3 is still being developed. Parts 1, 2 and 3 gives the research evidence around industry modernisation and the aligned leadership requirements. This gives the rational logic underpinning the CCL Framework. However, as the quote below states we need much more than just the rational argument we also need emotions to bring about action.

“The essential difference between emotion and reason is that emotion leads to action while reason leads to conclusions.”80

As Boswell, Simon, Latham, Egan found is; just because you present a rational and well thought through logical case, unless the emotions are evoked nothing will actually happen. The same will be true of the Farmer Report and the Construction Leadership Council’s Report on Collaboration published in September 2017, if history is followed. It is emotion that leads to action. We could go deeply into the psychological aspects of this but in simple terms if you really want to do something you will. But if you nod your head at the rational case and carry on as before then you have no desire to change. This basically sums up the construction sector at client and industry relationship levels since the 1930s. Unless the CCL Framework touches on the emotions and the desire to change then it will just sit on a shelf and not be used.

Transformation is a word used a great deal these days. It is easy to say but extremely hard to deliver in practice because it requires behavioural change starting with the leaders and then spreading through the workforce. This is one of the hardest things to do in business. As leaders, you have to work with your current business model to keep the cash coming in and at the same time you have to migrate your operations on to the new business model and take your people with you. In most cases this requires a shift in behaviours of the top leaders themselves to move underpinning culture from the old business model to the new. All this is happening where the operational requirements are screaming action me now. You must have the desire to change as was stated by Pluto so long ago as his quote below illustrates:

“Human behaviour flows from three main sources: desire, emotion and knowledge”81

The desire to change is probably the most important collective emotion across clients and industry that has not been met at relationship level for over 80 years. Nothing will change unless leaders in Government, Construction Companies and Industry Stakeholders have the desire to change. The CCL Framework gives you the route map for transformation (knowledge) but only you can take the first steps, if you desire to.

80 Source: Canadian Neurologist, Donald Calne
81 Source: Plato
At leadership level it just does not just take desire to change it takes courage. Especially if your business model as procurers and contractors is based on the high volume low margin model which has been the default industry model for decades. Leadership starts with setting new agendas. This can be a lonely place where at the start most will be against you. This takes courage, and this is described in the context of warfare in the quote below:

The two key emotions in war are fear and courage. Fear is a basic response that all of us experience when faced with a dangerous situation and is designed to preserve our physical being. Courage however, is different on that it can override the natural feelings of anxiety when faced with danger, such as a cavalry charge. Incidentally this is something the Scots experienced at the battle of Bannockburn. They held the ground against the English cavalry charge but only after practising for weeks before hand to overcome the natural instinct to run like crazy.

We can bring this up to date with the modern science of neurology. We now know the more we think and discuss about the future the more our brains rewire to make sense of this future. The more we share and use dialogue the more we build the collective action to move from conclusion to action. In simple terms the more we can try and see the future and work towards it then our brains at the reptile level move from fear to the courage to act. Wallace did it at Bannockburn: see the future, set the agenda, align, motivate, inspire and model/rehearse so you have the courage to face the unknown. Same process today he just did not have BIM to help him!

“Now or never” as the CLC Report on collaboration stated or as Farmer put it “Modernise or Die”. This time it is different. The modernisation agenda gives incentives to those smart clients and industry pioneers who have the desire and the courage to maximise emerging opportunity. Equally the SAMI report discussed the need for “the many to follow the few and how a shock may be required for this”. Different things motivate different people differently. Some may love the challenge of the new and relish designing and implementing new business models to maximise opportunity or others may be driven by the motivation to survive as the chap on the bike below illustrates:

A fundamental question we suggest you may wish to ask yourself and your peers is:

Do I/we have the desire to maximise the opportunities stemming from modernisation and do I/we have the courage to act on this?

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82 Source: Carl von Clausewitz’s On War, A modern day interpretation of a strategic classic.
Irrespective if you are driven by motivation to build new business models or the emotion to survive, if you have a desire to change then the CCL Framework is designed to support you on this journey. This something we will examine in more detail at Part 3 of the CCL Framework in our ongoing development of this narrative.

**PART 4**

**SECTION 2 – CREATING THE DESIRE FOR MODERNISATION**

All change starts with desire. You have to want to do it. This is perhaps the main reason that the sound initiatives of Latham and Egan did not make any significant difference to the industry. The research at Part 2 is clear and unless procurement behaviours change, and related contract form is amended then why change? What is the incentive? Carillion is not the only Principal Contractor that focused on high volume, low margin and claims to the client and long payment terms to contractors and suppliers in order to break even. It has been and is the default way that the majority of clients and industry works today. Latham through his research showed that 30% of costs in just the contract phase are lost due to lack of trust and conflict. Working collaboratively works in terms of ensuring client value and enhancing margin and long-term wealth generation works but without desire none of this will happen.

If transformation is to take place in the industry, then it has to start with clients and industry getting together to agree how procurement and related contract form has to change. Together both parties have to look at emerging opportunity coming from modernisation and the tactics they are going to use they maximise this way of working as they move collective forward. This has to happen before any thoughts on the build stage. It has to be built into the front end of client policy/strategy discussions. The clients and their industry partners have to sit down and work out how they are going work together. Are they going to stay with the old procurement models or will they agree together new methods? This is scary for a lot of people in procurement at both client and contractor levels as it takes them right out of their comfort zone. If they are using tried and tested procurement methods and even if these encourage adversarial working, then the procurement specialist cannot be blamed as this is the way its “aye been”. This is why transformation is hard because transformational will only happen if people transform. And moving from a habit/behaviour they are comfortable to one that causes them anxiety and stress is not easy.

This is recognised in the Construction Leadership Council Collaboration Report 2 published in September 2017 and the relevant quote is copied below:

*Independent Coaching*

*Many teams can benefit from the use of an independent person to manage and to coach them through the challenging issues which they will inevitably face. Although a number of standard contractual structures already provide for the use of an independent adviser or manager, few clients appoint anyone to these roles or alternatively see the role as focusing on purely technical or operational issues. There should be greater willingness to use independent specialists.*

Experienced facilitators can support clients and industry partners to examine how they are going to work together. From this the process of procurement and related contract form can be agreed. If this first step does not take place, then the chance of any significant transformation around the emerging modernisation agenda is unlikely. There has to be a shared desire to work differently starting with
procurement and contract form. Both parties have to believe it will make a difference and have the self-awareness and courage to adapt behaviours aligned to the emerging procurement requirements.

Once this first step around procurement and contract form has been taken, the consortium need to bring together the leaders across all the organisations involved and agree how they will work together across the whole life of the asset. Latham set the precedent for this with his “Constructing the Team” approach. 28 years on this process is greatly enabled by the use of BIM which supports connectivity and collaboration. Tactics like digitisation, off site manufacturing, output/outcome/impact contracting, and waste management policies need to be agreed as part of the working relationships. This is where the Principal Contractors with the qualified resource need to ensure that they are supporting THEIR supply chain with the capability enhancements around the agreed tactics or if necessary bring in new sub-contractors/suppliers that have this capability already.

These are all big steps and most of them clients and industry has failed to correct for over 80 years. The CCL Framework, when complete will give you the research base, the integration of leadership techniques with the modernisation agenda and simple checklists for shared actions. However, one thing it cannot give you is the desire to modernise. Only you can do this.

We examine this in more detail at the next Section of Part 4 which examine ongoing collaboration to develop approaches for ongoing CCL Framework beyond this first contract phase.
PART 4

SECTION 3 – ONGOING ACTIONS FOR CCLF DEVELOPMENT

ONGOING DEVELOPMENT OF THE CCL FRAMEWORK TO COMPLETE THE EXISTING CONTRACT WITH CITB

Schedule

<table>
<thead>
<tr>
<th>TIMELINE</th>
<th>ACTIONS</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>24 January</td>
<td>Working draft 1.0 of CCL Framework sent to key stakeholders and SBF members who are focused on the modernisation agenda</td>
<td>Preparation: Lead Designer</td>
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<td></td>
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<td>Executive Authority: SBF MD</td>
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<tr>
<td>10 February</td>
<td>Deadline for feedback from stakeholders and members</td>
<td>Checking and collation: Lead Designer</td>
</tr>
<tr>
<td>28 February</td>
<td>Draft 2.0 of CCL Framework sent to SBF Members attending the Annual Conference on 18 March</td>
<td>Preparation: Lead Designer</td>
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<tr>
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<td>Executive Authority: SBF MD</td>
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<tr>
<td>18 March</td>
<td>Draft 2.0 presented to members at the SBF conference and their feedback is collated</td>
<td>Preparation: Lead Designer</td>
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<td>Executive Authority: SBF MD</td>
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<tr>
<td>9 April</td>
<td>Draft 3.0 completed and distributed as per the decision of SBF members at the Annual Conference</td>
<td>SBF Members</td>
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<td></td>
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<td>Ongoing development: Lead designer</td>
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<td>Executive Authority: SBF MD</td>
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Ongoing Development Tasks to complete CCL Framework to Draft 3.0

- Continue with the development of Part 3
- Integrate feedback from stakeholders and SBF members
- Prepare Draft 3.0 for distribution based on the feedback from SBF Members from the Annual Conference

ONGOING CCL FRAMEWORK IMPLEMENTATION POST INITIAL CONTRACT

On the 31 April 2018 when we distribute the CCL Framework, as per the original contract agreement with CITB, this initial contract will be complete: Between now and 31 April we will work with SBF members and key stakeholders to examine how best we can embed the CCLF Framework within the Strategic Implementation Framework which is emerging in Scotland. We will look at this in terms of what needs to happen collaboratively, and we will build the shared funding model.

“Now or never” as the Construction Leadership Council puts it or “Modernise or Die” to quote Farmer. But nothing will change unless clients and industry have the collective motivation and desire to change. The ongoing development of the CCL Framework will integrate the rational with the emotive, so we can move from conclusion to actions. We look forward to ongoing collaboration with SBF members and the wider stakeholder community in Scotland to achieve this.