

Designing an Accelerator for the Construction Sector

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About the Construction Innovation Hub

Funded by Government in 2018 with £72 million from UK Research and Innovation's Industrial Strategy Challenge Fund, the Construction Innovation Hub brings together world-class expertise from BRE, the Centre for Digital Built Britain (CDBB) at the University of Cambridge and the Manufacturing Technology Centre (MTC). We believe that collective innovation can catalyse the change needed for our built environment to deliver better outcomes for current and future generations.

We are enabling better decisions. Our Value Toolkit is a suite of tools to empower clients and policymakers to make value-based procurement decisions that will result in the environmental, social, and economic outcomes they want. Developed with Government, the Toolkit supports clients to comply with the policies in the Construction Playbook and to align with the United Nation's Sustainable Development Goals.

We are driving digital transformation by strengthening the business case for change and developing user-friendly guidance, training and tools to encourage more organisations to benefit from data-driven decision making and secure, resilient data sharing. Our resources support the adoption of the UK BIM Framework, Government Soft Landings, Digital Twins, Digital Estates and Security-Mindedness.

We are transforming construction delivery. Our Platform Design Programme is adapting proven manufacturing processes from other sectors for construction, to develop new rules and standards to improve the safety, assurance and interoperability of platform construction systems. We are developing proof of concepts with Government departments, including the Department for Education's Gen Zero schools programme, to develop a platform construction system that offers clients the flexibility to create beautiful spaces and grow a strong pipeline of demand for standardised components.

Together, we are making a change. The Hub has partnered with over 100 organisations to build client and supply chain capability and capacity, to ensure our work delivers value to the sector and the UK long beyond the life of the programme. We are openly sharing programme outputs and the lessons we learn along the way, so that businesses of all size stand ready to deliver the UK's future construction and infrastructure needs.

By working together, we will get there faster.

Partner with the Construction Innovation Hub and be part of the transformation.

Further information

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Executive summary

This report sets out to highlight some of the key elements to consider when designing an accelerator. It highlights learnings from the creation of the [Deeptech Labs](#) accelerator and venture fund in Cambridge.

During its creation Deeptech Labs worked with the Centre for Digital Built Britain (CDBB) as a partner in the Construction Innovation Hub on a project investigating how best to accelerate innovation in the construction sector with a focus on start-ups in the areas related to Platform Design for Manufacture and Assembly (PDfMA).

The initial hypothesis that we explored through this project was that there was not enough investment in start-ups related to the construction sector and companies were not being created. Therefore, we expected that to stimulate the creation of new start-ups in the construction space a new support and investment mechanism was required. However, a comparative analysis of US and UK investment activity in construction technology companies from 2011-2019 (Table 1) demonstrated that this was not the issue.

Capital invested per company							
		United States	United Kingdom	Canada	China	France	Germany
Deal Type							
Pre-Accelerator/Incubator		0.07	0.16	0.03	0.78	0.04	0.01
Angel		1.06	0.23	1.04		0.59	0.43
Seed		1.76	0.77	0.72	0.45	0.39	23.95
Early-stage VC		8.68	4.03	2.50	2.20	1.57	0.46
All		4.66	1.84	1.90	2.30	0.93	12.70

Table 1 Average capital invested in millions per Construction Technology company by stage and HQ country, Source: Data run on Pitchbook by Deeptech Labs

The analysis showed that at the foundational stages of company creation the UK invested substantially more than other markets but comparatively less at the later stages. While this analysis covered a relatively small number of companies (300 over eight years) the data was strongly suggestive that support targeted after the start of the company but before a Series A VC round (a company's first significant round of venture capital financing) was needed.

Deeptech Labs was created to fill this gap in the start-up investment ecosystem with a focus on deep tech start-ups at the seed to series A stage. This report sets out some of the considerations that have gone into designing the Deeptech Labs acceleration programme with focus on three areas of consideration:

1. Design values: What are the foundational decisions or beliefs that have informed the design of the Deeptech Labs accelerator programme?
2. Stakeholders: Who are the main actors to be considered when designing an accelerator activity and what are their roles?
3. Activities: What are the main phases of activity that need to be considered when designing an accelerator programme?

While we do not set out to provide a comprehensive guide to understanding or designing accelerators, we hope that by highlighting our learnings we can inform others exploring how to support start-ups, understand accelerator activities, evaluate and participate in them or set up their own activities.

1. Design Values

1.1. Focus on deep tech, post seed – pre series A start-ups

Understanding the stage and type of start-up that you will aim to support is the foundational decision of any investment or start-up programme. The broader the scope the greater range of expertise and experience you will need to draw on. Given that all programmes have limited resources this becomes a depth versus breadth decision. The answer will determine the type of stakeholders you will attract and need to engage.

As start-ups evolve they go through different stages of development. Each stage introduces its own challenges to focus on and address. Foundation stage companies are focused on discovery and have the most uncertainty. This stage focuses on discovering opportunities for new value creation and capture and revolves around developing customer understanding and developing a value hypothesis.

As these hypotheses are developed and become less uncertain start-ups focus on developing ways to deliver this value through a service delivery mechanism. They tend to focus on working with innovation focused customer segments who are able and willing to engage in what might be possible and discovering opportunities for differentiated value discovery. As companies enter the seed stage then they need to formulate and define product offerings that are attractive to early adopter customers, so that once they have created a product with an identifiable and repeatable sales process they are ready for series A funding.

Due to their nature deep tech companies at this stage face additional challenges - not only market and product discovery and development issues but also a substantial amount of technical risk. To be able to support companies that are not just developing technology but also discovering it is an additional burden that takes additional expertise to weave into a new company's development journey.

1.2. Optimise for learning

All new companies face high levels of uncertainty. There are many different areas of risk that need to be managed including market, product, customer, technology, team and financial. For companies that are exploring new areas they also need to develop hypotheses, design tests and implement and learn from them. The rate of learning and the amount learnt per cycle will determine the development velocity of the company.

This velocity, the amount of development needed and the resources available will be a major determinant in the success or failure of the venture. What some ventures don't appreciate is that they are not just racing to avoid failure, but if they are pursuing a valuable market opportunity they are also racing against other ventures to win. By developing well-informed hypotheses, designing and carrying out well-designed, high value, informative market experiments and maximising the learning from each, a start-up venture can maximise the development from each iteration.

To help them do this they need a network of peers and advisors to help them design their development strategy,

avoid rediscovering what others already know and recognise and prioritise the key risks and development milestones needed to gain traction in the market. To create this network a programme will need to identify, recruit and work with a broad range of stakeholders who offer experience, contacts and expertise to the ventures being developed.

1.3. Design for trust

When people or companies meet for the first time it can sometimes take a while to achieve the level of trust that enables ventures to be vulnerable enough to expose what they don't know and what they need to achieve, without fear of being taken advantage of. It also takes them a while to develop trust that the person or company they are talking about has the required experience or expertise to be able to offer useful advice or guidance.

When designing a programme of learning and development activities creating the environment and norms of behaviour necessary to enable this level of trust and openness in relatively short periods of time is essential. Part of this process is ensuring that incentives of the parties involved are well understood and aligned for the purposes of the activities. For the Deeptech Lab accelerator this alignment is created by a focus on the success of the entrepreneurs and their start-ups.

2. Stakeholders

Below we highlight some of the key stakeholders that need to be kept in mind when designing an accelerator programme.

2.1. Entrepreneurs

These are the primary stakeholders of a start-up accelerator focused on creating valuable start-ups. Through their efforts entrepreneurs create companies that deliver products and services that create value and make things better. However, a start-up programme should not try to do an entrepreneur's job for them or interfere with the running of their business.

There are as many different types of entrepreneurs as there are different types of companies. Trying to create a programme that supports all types of entrepreneurs is like trying to create a programme that supports all types of companies. The effort and impact of the programme becomes diluted and tends to have little impact.

An accelerator programme is defined by working with cohorts of companies. As such the best programmes focus on creating value, not only for the individual entrepreneurs and companies participating but creating value from the fact that there are multiple teams participating and creating synergies between them.

2.2. Advisers

Start-up advisers are even more varied than entrepreneurs and bring a wealth of different backgrounds and experiences. Much like creating a programme that focuses on particular types of entrepreneurs and companies, programmes also need to recruit and work with particular types of advisers.

Advisers should be recruited not only for their backgrounds and experiences but also their motivations, the expectations they have of entrepreneurs and their preferred engagement styles. As different entrepreneurs go through the programme, different advisers will be needed. Some programmes choose to recruit and pay for advisers whereas some programmes are more community orientated. There are pros and cons to both approaches and the number and range of advisers recruited needs to reflect this.

It has been our experience that the best advisers are not only experts in what they know, but are also experts in distinguishing and communicating the difference between what they know, what they don't know and what they believe. They are skilled in not telling the entrepreneur what they know or even teaching the entrepreneur what they know but helping the entrepreneur to discover what they need to learn and learning it.

2.3. Investors

In designing an acceleration programme there are three broad categories of investors that need to be designed for. There are the investors that have invested in companies before they reach the stage the accelerator focuses on. These investors need to believe that the accelerator programme will deliver enough value to the company that they have invested in to be worth the time that the entrepreneur and their team will invest in the programme. One of a start-up's most limited resource is time so this needs to be allocated very carefully. Alongside these early-stage investors the accelerator needs to develop relationships with the investors that will invest in companies following the programme. While the market will ultimately decide whether a start-up is successful these investors will be critical in enabling the start-up to have enough resources to reach the market and compete.

Finally, the accelerator itself needs investors. These investors contribute the resources that the accelerator needs for its activities. They need to believe that the investments the accelerator makes will create an above market return and the additional resource needs of delivering a support programme alongside investment capital are resources well spent.

2.4. Programme Partners

Companies that partner with the programme, or have a transactional commercial relationship with the activities of an accelerator programme, are both crucial and sometimes unappreciated dangers. Often these programmes offer short-term revenue opportunities for an accelerator programme that, like the start-ups it invests in, is resource limited. This is not a bad thing if these short-term business opportunities do not work counter to, or even undermine, the long-term determinants of success.

3. Activities

Alongside the usual business activities of finding partners and resources to build and operate a high performing organisation an accelerator's main activities fall into four categories.

3.1. Find

At the start of an accelerator process the companies that the accelerator supports need to be identified and qualified.

An accelerator will need to, in essence, create a marketing and sales pipeline that identifies and attracts high potential start-ups that are a good match for their programme design and investment hypothesis. This will entail both inbound and outbound processes. New programmes will need to focus on outbound process, proactively identifying and recruiting new start-ups until they have established market proof that the programme delivers value to the start-ups it works with.

To give an example of a 'find' pipeline for the first cohort of five companies that the Deeptech Labs accelerator invested in and worked with:

- 913 companies were identified through market databases, news and other public information sources that matched the stage and sectors.
- 257 companies were qualified for further progression using desk-based research.
- 108 companies responded to either direct outreach or introductions.
- 58 companies were progressed to meetings with the accelerator's investment team.
- 11 companies were selected to go forward for screening by the accelerator's Community Advisory Council.

Throughout the operation of this find pipeline it is very important to ensure that the entrepreneurs are treated well. As mentioned above one of the most scarce resources a start-up CEO has is time. It is important where possible to endeavour to deliver value back to the entrepreneur for the time they invest interacting with a process. This can take the form of feedback, suggestions or further connections.

Like all sales processes each stage of this process is an opportunity for the accelerator programme to sell and demonstrate the benefits and values of the programme itself as the very best entrepreneurs will have more offers of investment and support than they can take up.

3.2. Fund

Once the accelerator is sold on an entrepreneur and the entrepreneur is sold on the potential value of the accelerator programme an investment deal needs to be negotiated. This deal needs to meet both the needs of the entrepreneur and the needs of the accelerator. It is beyond the scope of this report to go into the details of investment but it should be noted that the development of this investment deal should be qualified and progressed in line with the sales pipeline above and commensurate with the time and effort each party is putting into the process.

3.3. Accelerate

Alongside the cohort-based nature of the recruitment and investment a defining feature of an accelerator is the programme of activities that are designed to accelerate the development of the companies. While it might seem obvious this focus on acceleration is important. The very best entrepreneurs are likely to have the capabilities to be successful without participating in an accelerator. Therefore, the defining characteristic for an accelerator is to help the entrepreneur save time and get there faster. This can be done in two main ways - network development or knowledge exposure.

A key element that distinguishes the design of later stage accelerator programmes from early stage programmes is that at the later stages an entrepreneur is already leading an organisation and any time spent on the programme is time not spent developing that organisation.

There is a balance to be struck between organised activities and the time that these activities take. This is also important when considering the time that the accelerator asks its community and advisers to spend with the start-ups. Therefore, any activity has to be designed to deliver value to those involved while respecting the time investments given by all.

3.4. Support

Finally at the end of the acceleration programme the accelerator falls back to the role of any other start-up investor and needs to decide what level and type of support is going to be offered to the companies in their portfolio. Accelerators need to keep in mind that while a typical venture fund will make two to three investments a year over a five-year period an accelerator will make 10-15 a year and therefore will end up with a portfolio of 50-75 companies to support.

4. Conclusion

In highlighting the considerations above, we hope to evolve the conversation about supporting start-ups to broaden the focus from the foundational stages to encompass how we help them to discover their initial markets and prepare for growth.

By focusing more on how early-stage companies translate their ideas and technologies into scalable products and services we can support the emergence of a more effective and mature innovation system for the construction sector. Doing so can help entrepreneurs, and the broader market, realise the value of the cutting-edge research that is being produced in our sector.

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