Chapter 6 The evolution of innovation narratives in the built environment

6.1 Introduction

Innovation is everywhere. The word innovation frequently appears on social media, company websites and industry workshops. As has been demonstrated in the first chapter, innovation has been investigated in a number of ways, reflecting different theoretical orientations and interests. Policy makers and practitioners organise events to talk about innovation; innovation strategies are being published in firms and projects; the new job roles with innovation in their titles are being created. Innovation is argued to be essential for economic growth, industry improvement, organisational survival and career progression. This chapter provides an overview of the evolution of narratives of innovation over the last decade. It addresses the duality of structure and agency in the way narratives of innovation interact at national, firm and project levels.

6.2 Grand narrative: The need for innovation

Historically, the UK built environment is tended to be led by the Government. The Government has set up the industry targets that drive an innovation in the sector: lower costs, faster delivery, lower emissions and improvement in export (*Construction 2025 Industrial Strategy*, 2013). There is a commonly accepted dominant narrative about a need for innovation in the UK infrastructure sector. For the last decade, the Government has been advocating innovation in the built environment to reduce costs of investment in physical assets such as public buildings, roads, bridges, airports, power stations, their operation and value creation for a society. At a policy level there is a need for innovations which are aligned with the Government Manifesto which is cheaper, faster, lower carbon and better export. It is through innovations that these targets can be achieved. The ability of the UK built environment to deliver the policy targets of the Government depends to an important extent upon the innovation narratives adopted (Green, 2011).

Infrastructure assets are delivered by project-based firms which are recognised to be intrinsically innovative on the basis that they continuously (re)create new practices on a project-by-project basis in accordance with specific needs of each project. It is the key industry players, owners and suppliers, who practice innovation. They formalise innovation strategies, create new job roles with innovation in their titles, create an environment and culture of innovation where everyone is committed to it. Yet, managers within project-based firms face the challenge of not only creating an innovation narrative that provides a sense of direction for the firm, but also aligning it with the Government-driven innovation narrative of the sector as a whole. The UK has high ambitious targets to lower costs, faster delivery, lower emissions and improvement in export through innovations. Politically, UK is now in a state of change through the BREXIT negotiation and while it is not clear how and if this will impact the agenda, the alignment between the policy and industry innovation narratives will have implications on the transforming the UK economy and consequently solving a “productivity puzzle” – a long-term slowdown in UK productivity growth.

6.3 Owners and operators driving innovation

It is commonly understood that innovations are driven by owner and operator organisations who have a direct relationship with customers and a strong interest in improving performance for those customers (see Figure 6.1 below).

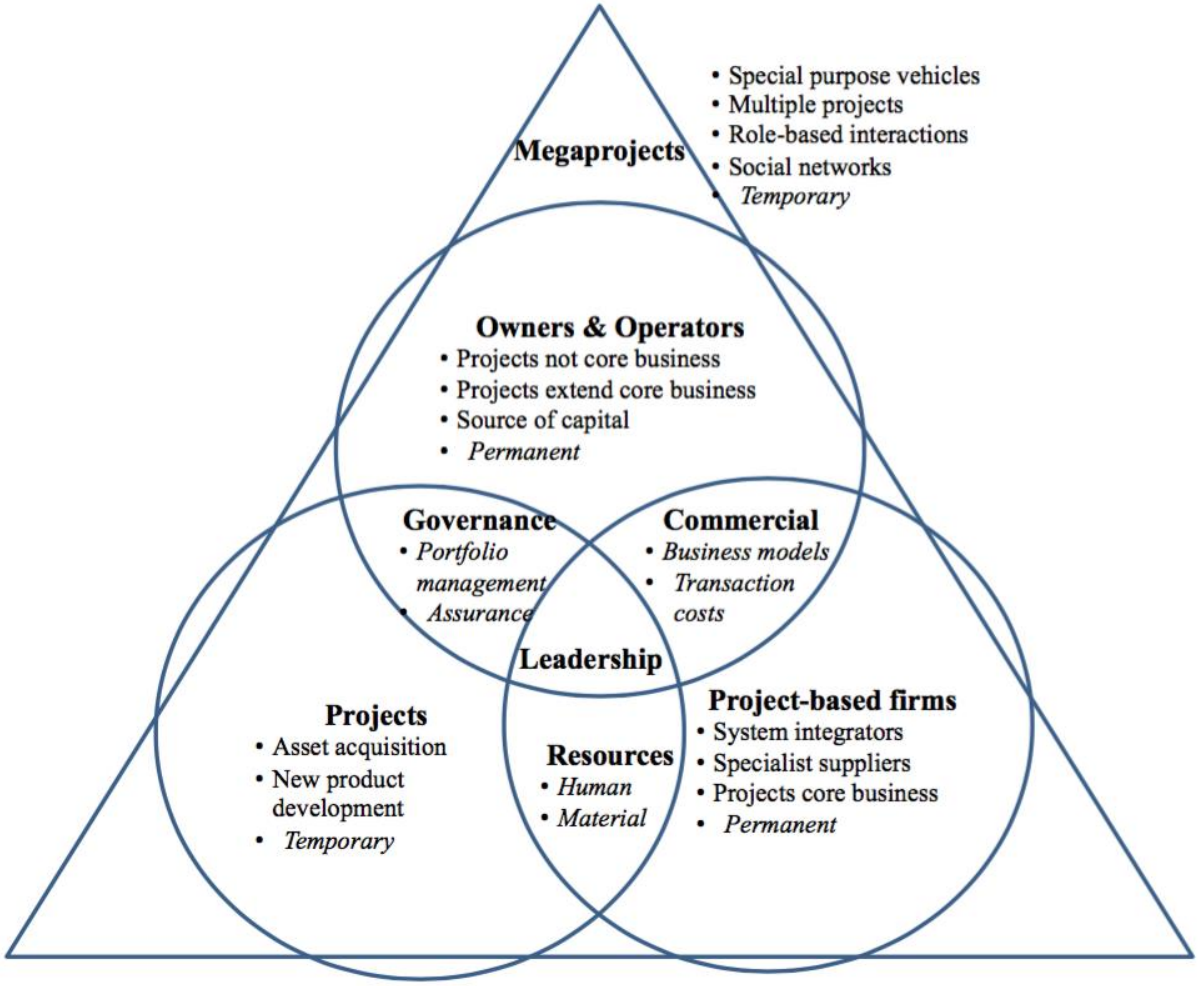

Figure 6.1. Temporary multi-organizations (adapted from Winch, 2014)

By definition capable owners should have innovative capabilities to drive and sustain innovations (Haugbølle *et al.*, 2009; Winch & Leiringer, 2016). Yet, the national narrative does not address the role of the owner in innovation, it is the supply chain that is seen responsible for innovation. Suppliers are forced or/and encouraged to promote innovative project narratives to owner organisations when bidding for the projects. In order to develop the project mission into a compelling narrative for innovative projects that will motivate staff and suppliers and commit stakeholders, it needs to be complemented with other materials that communicate the principles underpinning how the project will be delivered such as ethical principles, expectations of suppliers, benefits for stakeholders and the like. This narrative then needs to be communicated through various media including digital. It also needs to be (re)iterated to many different audiences and restated in many different ways throughout the project life-cycle. For the project narrative to be successful, the project team need to be "on message" in their conversations with suppliers and stakeholders, corporate communications need to be consistent with this message and carefully designed to reach their diverse intended audiences.

The innovative capability of infrastructure owners to improve performance depends to an important extent upon the innovation narratives adopted. Innovation is widely argued as being essential for the transformation of the infrastructure sector with a view to delivering value for customers. innovation as an essential part of capable owner business strategies or even a key organisational value. Narratives of innovation help to achieve a shared vision and play an important role in innovation strategies. These are consistently promoted by policy makers at the industry level to meet the targets set by the Government. Narratives of innovation at owner firm level are in a continuous interaction with the macro-level narratives set by the Government and policy levels. For the last two decades, the UK government has been advocating innovation in the sector to reduce costs of investment in infrastructure assets and value creation for a society. Narratives of innovation are often textual, but there are other forms of narratives such as spoken and symbolic/visual (Vaara *et al.*, 2016). Textual and symbolic are often reproduced on policies and reports, corporate websites, or in other externally-facing marketing material (e.g. videos). Narratives carry important messages at a sectoral level and at the level of the firm. Capable owners need a coherent narrative of innovation represented in textual, symbolic and spoken forms because they form a vision of where they want to be. Senior managers play an active role in the construction of narratives, as they are responsible for formulating and disseminating an organisational vision and strategies. Narratives of innovation play a prominent role in constructing industrial, firm, project and individual identities, as will be discussed in Chapter 3 in greater detail. Figure 6.2 presents a model of the interactions of narratives of innovation at different levels.

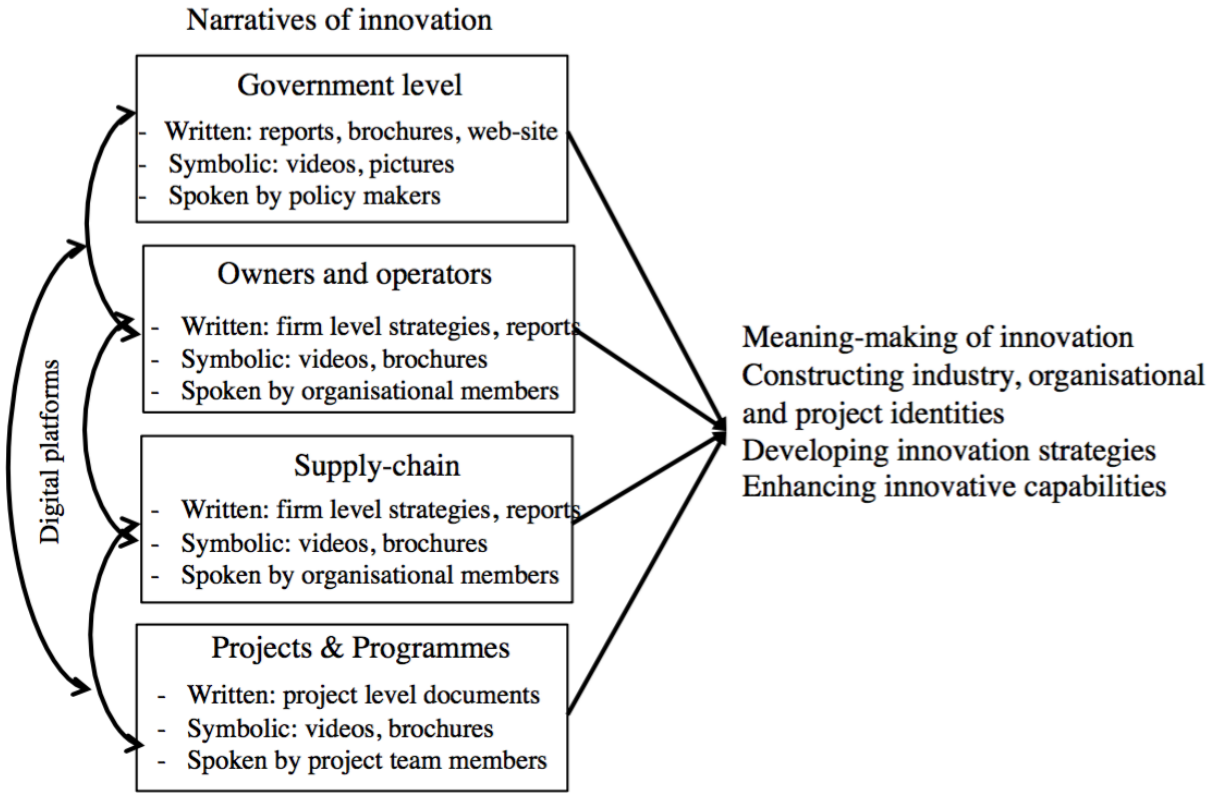

Figure 6.2 Narratives of innovation at multi-levels and their implications for practice.

Narratives at multiple levels continuously interact shaping the innovation agenda, strategies and enhancing innovative capabilities. The digital platforms such as intranet, forums, portals,

enable the interaction between innovation narratives at multiple levels. It is through the continuous interaction of innovation narratives at multiple levels that the meaning of innovation is constructed, shared vision is achieved. This has important implications for constructing individual and collective identities (Sergeeva, 2016).

6.4 Suppliers are innovating through projects

Owner and operator organisations set the challenges for suppliers to innovate to meet their needs and requirements. For example, suppliers are stimulated to innovate by the owner organisations in the area of sustainability, climate change and digital technologies. Owners and operators often set the requirements for innovation in the contractual relationships with suppliers. Suppliers innovate to meet the owners' needs and satisfy customers. Owner and operator organisations stimulate innovation in the supply chain by bringing them earlier in the process, providing necessary capabilities and sharing risks associated with innovative products, processes or services. Suppliers innovate through organisational and project level innovations.

Gann and Salter (2000) acknowledge that governance structure provides the context for the analysis of forms of organising innovation in supplier project-based firms. They emphasise the role of regulatory, governance authorities in shaping the direction of technological change:

> "Governments need to be involved in setting governance and regulatory structures to enable firm to develop better practices and services. Governments also need to become more sophisticated clients in procurement of their own complex products and systems." (Gann and Salter 2000, p. 971)

The project-based nature of work in the built environment implies that firms have to manage network of highly complex innovation interfaces (Miozzo and Dewick, 2002). As such, the construction sector can be viewed as a complex system in which there are many inter-connected elements. In this context, large contractors play a mediating role in the interface between the institutions that develop many of the new products, processes and services (suppliers), and those which adopt these innovations (owners and operators). Contractors are important sources and adopters of innovation that improve construction technologies and services, and integrate the different activities and innovations introduced by different parties in the construction process. The governance is related to the interplay between clients and supply system: clients govern the supply system but are governed at the same time by the supply system, through different processes and mechanisms.

6.5 Leading innovation in temporary organisations

Innovation is increasingly recognised as an integral part of project organising (Brady and Hobday, 2011; Davies *et al.*, 2009; Davies and Mackenzie, 2014). The specific characteristics of temporary project organisations that shape *innovative capabilities* are: (i) being bespoke or created for a specific purpose; (ii) one-off - specific end date, but usually long life-span throughout which managers keep changing; at the end megaproject members separate and may or may not work together on subsequent megaprojects; (iii) alliance contracting - collaborative framework, co-creative process which promotes innovation, openness, trust, etc.; (iv) substantial risks, e.g. financial, operational, reputational, innovation and uncertainties; and (v) with different organisational cultures merging together, e.g. owners, system integrators and

suppliers, which shape learning practices (Gann *et al.*, 2017). The majority of projects operate in a context of collaborative work meaning that they move away from coordinating via formal, more rigid organisational structures (e.g. rules, schedules, division of labour) towards an emphasis on collaborative, inter-personal coordination and informal communication mechanisms. This shift requires stronger leadership and team-working. For example, large-scale infrastructure assets such as water facilities, airports, roads, railways are complex systems that require a large investment commitment, take many years to develop and build, involve multiple public and private stakeholders, and have long-lasting impact on the economy, the environment, and society (Flyvbjerg *et al.*, 2003; Söderlund, 2004). Whilst megaprojects may possess some repetitive features and some degree of permanency (Brookes et al., 2017), they are essentially unique, temporary special purpose organisations, where stakeholders involved tend to change their positions across megaprojects.

6.6 The paradoxes of innovation in the built environment

The meaning of innovation in the built environment is emerging through a number of paradoxes.

Project-based organising

On the one hand, for all kind of reasons in project-based business it is difficult to innovate and transfer learning from project to project. The likelihood of capturing an innovation on one project and carrying into the next project is low, unless you have the same owner and the same requirements. On the other hand, project organising provides a positive environment for innovation. Projects are unique, there are many unique problems to solve that goes on quite regularly. The infrastructure sector provides a positive environment for innovations because it is project-based and there are always customers' problems to solve on a regular basis.

Innovation is associated with risks

Historically, owner infrastructure firms were criticised for not taking enough risks or viewing risks as threats rather than opportunities. If the firm takes risks on a new type of technology, and it goes wrong, the consequences are large. There is always a chance that an innovation may fail. If an organisation has a culture that does not allow failure, then people become risk-averse. If people become risk-averse they do what they have always done before. There is a whole behavioural aspect in this. One of the big problems in the infrastructure is that people do not share failures. But there are a lot to learn from failures. Sharing stories about failed innovations is powerful for future successful innovations.

Too tight specifications can stifle innovation

Infrastructure owners or future operators tend to specify what they want - how the asset will be designed and built. The problem with doing this is that innovation is stifled at the front-end because specifications are too tight. For example, when the criteria are specified for something to be build, or specifications about what people can do and cannot do without asking for a permission. A tight governance framework stifles innovation. There is a recognition of the need of a mature procurement model where people are encouraged to put certain percentages of cost to be spend on an innovation that will enable to out-deliver the contract in terms of quality, time and cost.

Diversity drives an innovation

There is a fairly non-diverse group of people involved in the infrastructure sector: primarily male, white, middle age or more. It is well understood in the literature that diversity fosters

innovation (Tidd *et al.*, 2005). Examples of organisational innovations include initiatives for more women in leadership positions, recruiting, developing and training next generation of leaders. By increasing diversity, a variety of new, innovative ideas will be generated beneficial for capable owner organisations. Professional project institutions are actively promoting narratives of diversity. According to APM "a diverse, empowered workforce gives us different ways of thinking, a more successful business, and better place for us all to work.

A lot of innovations in the UK infrastructure sector are adopted from other sectors, e.g. aerospace, manufacturing. There is a lot to learn from other industries about organisational innovations.

Incentives for suppliers to innovate

Owner organisations often do not use the supply chain in a way to stimulate innovation. The reasons behind it include suppliers not being involved early enough in the process. Another reason is suppliers tend to repeat routinely the work if they get paid on the time-basis. There is a need for incentives. Small companies are capable to generate innovative ideas, but may not have enough time and resources to implement innovation. It is a capable owner responsibility to incentivise and stimulate suppliers to innovate.

Owners and future operator tend to put all the risks on the contractors. Contractors are therefore incentivised to build in safest, proven way, rather than to think expansively about how to build an asset for the next generation, or the next century. And there is always a budget focus and time focus. There is a recognition of the shift from cost-driven to value-driven agenda, yet in reality not all organisations follow the value proposition to work together, share, and collaborate (*From transaction to enterprises*, 2017).

Case vignette: Capable innovative owner stimulating innovation from suppliers

The aim of this case vignette is to show how the capable owner innovates for relating to the supply chain. In particular, it demonstrates the ways in which the capable owner creates the environment that stimulates innovative proposals from its supply chain, and then uses those proposals as a selection criterion without undermining the commercial principles of competitive tendering. Using an integrated approach, capable owner facilitates innovations to create value for users. It also illustrates how the voice of the customer and a value-driven mind-set with a focus on the end product and not just on the construction process re-shapes thinking.

London Underground (LU), the major owner and operator of public infrastructure, has pioneered the development of a procurement process known as Innovative Contractor Engagement (ICE). ICE has been pioneered on a major upgrade project at Bank Station and the results demonstrate the increase in value that the industry can achieve. The successful execution of ICE on the Bank project reinforces LU's aspirations to be "an intelligent, innovative and efficient client" that can build strong relationships with the supply chain. ICE is designed to incentivise early innovation from the supply chain prior to selection. The core principles of ICE are:

- Pre-qualification based on suppliers' ability to deliver and specifically their ability to innovate;
- A post qualification period of 'Ideas Development' against a Requirements Schedule;
- The protection of suppliers' intellectual capital (IP) for innovation;
- Establishment of a non-disclosure agreement between the parties;
- Establishment of fees to be paid to the supplier for this development;
- Redrafting of the Requirements Statement to allow for constraint removal where conflicts are identified;

- Issue of the ITT against this modified Requirements Statement;
- Commercial evaluation against Requirements Statement; and
- Contract against Requirements Statement using NEC Option C.

ICE was an innovation in the procurement process within LU which originated with an idea from the experienced Programme Director which was presented on two-sides of A4 paper. The programme and project management team worked closely internally with departments in LU and Transport for London's (TfL) external insurance team. They decided to issue all the tender documents as a draft in the first instance. The formal contract document at the start of the process was a confidentiality agreement with each bidder. Workshops were held throughout the pre-contract process to focus on particular areas that LU was concerned about and on what they did not want to have. There were about five months of dialogue where bidders would come forward with ideas to improve the scheme and create better value. Meetings were held to evaluate the proposals with specialists from LU.

The suppliers knew the evaluation criteria which were presented to them as a guideline. This was an opportunity during the dialogue for the bidders to negotiate a contract. The evaluation criteria were focused on the final product (70%) and the method of building (30%) – effectiveness and efficiency respectively. The price that the bidders tendered was on the whole life cost in the business case (contract, maintenance, renewal costs, all the risks). An independent observer was present on the meetings to give advice to the bidders about confidentiality. The contracts were re-written based on the negotiations with the bidders. This process allowed competition that led to innovations. Four pre-qualified bidders were selected for the Bank ICE and they provided four different schemes with significantly different approaches. Two bidders in particular demonstrated innovative thinking. The tender winning bid by Dragados SA provides a more "effective product", increasing the benefits within the business case, and provides a more "efficient method", delivering it faster and cheaper compared to original LU Base Case. One example, which embodies both a customer focus and a value-driven mindset was the decision to invest in a moving walkway in a 90m tunnel. Under traditional procurement this would have appeared as a construction cost of £3m, while using the product orientated value perspective it provided a benefit of £10.5m.

Innovations pre-contract and pre-planning created greater value and at the end of the process LU decided to buy the IP in all the innovations. An amount of money was stated in the risk register. It is quite a good incentive for the bidders to get their costs back. The project manager has received the Award. He reflected: "I generally found people to be supportive. People wanted to make it work. That made a huge difference". It was a culture of collaboration within the LU and TfL, and with their supply chain. After the Bank project completion, the codification of ICE has led to the development of new project management processes of managing the development of supplier innovation and the promotion of a more collaborative, open and transparent relationship with the market.

Acknowledgment: This vignette was written for Project 13 in collaboration with Alliance Manchester Business School sponsored by Heathrow Airport.

Summary

Innovation is driven by the Government targets and owner organisations who have direct relationship with customers and strong interest in long-term organisational improvement through innovation. Particular features of firm ownership and organisational structures to diffuse knowledge within the firm may result in different types of innovation activities. The project-based nature of owner firms implies that firms have to manage network of highly

complex innovation interfaces. The infrastructure sector can be viewed as a complex system in which there are many interconnected elements. In this context, capable owners play a critical role in the interfaces between customers and projects. Capable owners possess the necessary innovative capabilities and can enhance them further by updating innovation strategies, achieving an innovation-driven mind-set within the organisation, articulating innovation narratives and motivating organisational members to innovate and take risks. Owners play an important role in setting a vision and direction for innovation across the supply chain. Suppliers innovate to provide solutions to challenges and problems set by the owners.

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