

Chapter 2

Innovation and Systemic Innovation in Public Services

This chapter reviews previous work from the OECD on private sector innovation as well as more recent work on innovation in the public sector. The growing body of knowledge on innovation in the public sector, including social innovation, makes it clear that there is a need to develop a better understanding of the drivers, enablers, barriers, and processes specific to innovation in the public services. Specific barriers to innovation in the public sector, for example, include: risk aversion of bureaucracies; political and auditing constraints imposed by performance and accountability frameworks; and inappropriate structures and organisational cultures for innovation. A key yet often missing element to public innovation is rigorous evaluation, which allows both designers and users to identify the precise strengths and weaknesses of a given innovation or reform. As the public sector offers distinct challenges to measuring impacts of innovation and there is as yet no agreed framework for doing so, important public innovations can thus be neglected (or conversely overly supported), with expensive implications for the public purse.

Introduction

The aim of this chapter is both to provide a theoretical framework for understanding innovation as a multi-faceted process and to look at the process of innovation as it occurs in the public sector. The first section will give an overview of how innovation has been traditionally conceived, particularly as a research-based mode of scientific and technological advancement. It will also attempt to distinguish between innovation and systemic innovation, which, along with previous OECD work, is the main focus. The second section will explore the differences between the traditional approach mentioned and one better suited to understanding innovation in the public sector. In addition, it will detail the elements – institutional incentives, barriers, and the policy environment – that are most conducive to innovation. Finally, it will highlight certain lessons and principles useful for guiding public sector innovation.

Innovation and systemic innovation: a literature review

What is innovation?

Innovation is an “elusive concept” (Lloyd-Reason *et al.*, 2002) that is more often used than clearly defined. The literature review undertaken for this project has revealed several uses of the word. Thus, innovation is often used synonymously with “reform” or “change”. This lack of conceptual clarity makes research on innovation extremely wide and undetermined. Below, we differentiate “innovation” from related terms.

The word innovation is derived from the Latin “*innovatio*” (renewal or renovation), based on *novus* (new) as in novelty (Williams, 1999; Clapham, 2003). Whereas “invention” is related to absolute creativity and discovery, innovation is positional. Thus, the definition of an action as innovative depends on the social setting to which it refers; an innovation does not necessarily need to be “new” to the individuals that apply it or to other social contexts (Rogers, 1995). Such a positional definition of innovation has been adopted, amongst others, by Bailey and Ford (2003, p. 248), who argue that “innovation occurs when individuals produce novel solutions and members of the relevant domain adopt it as valuable variations of current practice”.

A definition of innovation explicitly or implicitly contains – among other things – assumptions about: gradual change versus radical breakthrough, objective judgment of innovativeness versus social construction, and the alleged link between innovation and success or improvement. Some authors (Moore, 2005; Bessant, 2005) explicitly reserve the term “innovation” for radical, permanent change and real breakthroughs. They prefer to use the term “continuous improvement” for smaller steps, while not judging one of the types to be

superior to another. The simplest definition of innovation is *taking a new idea into implementation*. This definition makes a distinction between innovation and invention (having a bright idea) in that an idea must be put into action to be called an innovation. Since it leaves room for failed innovations, it is a definition that protects against a pro-innovation bias, which is one of the pitfalls of the literature on private sector innovation (e.g. Warford, 2005; Kelman, 2005; Hartley, 2006).

Yet to identify the mechanisms that lead to successful innovation, a more nuanced understanding is needed. One frequently cited definition of innovation is the one proposed by the Oslo Manual (OECD and Eurostat, 2005), which defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations” (p. 46). This definition highlights the following aspects:

Innovation contains novelty. The Oslo Manual suggests the following three concepts of novelty: new to the firm, new to the market, and new to the world. The minimum requirement for an innovation is that it is new to the firm. As suggested by the Nuclear Energy Agency, “the item should be new to the enterprise, not necessarily new to the market. For instance, pressurised water reactor (PWR) is not an innovative product for a country already building it by itself, but is an innovative one for a country where it is introduced for the first time” (NEA, 2007, p. 21). In other words, innovation includes products, processes, and methods that firms are the first to develop, as well as those that have been adopted from other firms or organizations.

Innovation brings benefits. Another key characteristic of innovation is that it “should bring economic and/or social benefits by being introduced to the market (or by being used within an enterprise)”. This implies that:

1. Innovation is distinct from invention. Often we succeed in invention but fail in innovation. A document on innovation in the business sector (OECD, 2005) defines innovation as the “successful development and application of new knowledge” and stresses the difference between invention and innovation, which is a multistage process. “Fixed capital investments are often necessary to be able to produce and utilise new products and processes, as are workforce training and organisational restructuring. In practice, it is convenient to view innovation as a process ranging from initial research (R&D) through to the development of prototypes and the registration of inventions (patents) and eventual commercial applications” (p. 7).
2. Innovation is different from research. OECD (2004) argues that innovation has economic and commercial imperatives. Basic research, however, is defined by the Frascati Manual (OECD, 2002, p. 77) as “experimental or theoretical work undertaken primarily to acquire

new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view”.

Institutional complexity. In addition to economic aspects, another key feature of the innovation process is its institutional complexity. This aspect is clearly explained in the following definition by the EU: “the commercially successful exploitation of new technologies, ideas or methods through the introduction of new products or processes, or through the improvement of existing ones. Innovation is a result of an interactive learning process that involves often several actors from inside and outside the companies” (quoted in Simmie and Sennett, 1999).

In the private sector, governments use a variety of definitions in practice. For instance, the OECD Health Innovation Survey (2007) asked respondents (governments and ministries) in various countries to define health innovation. It found that in most cases there was no common definition across the entire government. Health innovation was viewed as including not only new and improved products but also health care system reform. Another finding was that similar ministries, across countries, tended to conceive of innovation in a similar way. For example, Ministries of Industry tended to refer to innovation in terms of the delivery of new or improved products; Ministries of Health tended to conceive of innovation as reforms in health care services, including reforms in the financing or delivery system that improve upon their objectives of equitable access to good quality health services and cost containment. Finally, Ministries of Research often viewed health innovation policies as a subset of more general innovation policy, supported through research, education, and training grants.

Types of innovation: what is the “object” of innovation?

The Oslo Manual distinguishes between four types of innovation: product, process, marketing, and organisational innovation.

- *Product innovation:* “A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics” (OECD and Eurostat, 2005, p. 48). The term “product” refers to both goods and services. “New products differ significantly in their characteristics or intended uses from products previously produced by the firm.” *Significant improvements* can be made through changes in materials, components, and other characteristics to boost performance. Product innovations in services can include improvements in how they are provided (e.g. efficiency, speed), the addition of new functions or features to existing services, and the introduction of new services.

- *Process innovation*: A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment, and software. Process innovations can aim to reduce unit costs of production or delivery, to improve quality, or to produce or deliver new or significantly improved products.
- *Marketing innovation*: A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion, or pricing. These are intended to better meet customer needs, open up new markets, or newly position a firm's product on the market.
- *Organisational innovation*: “An organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations. Organisational innovations can be intended to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labour productivity), gaining access to non tradable assets (such as non-codified external knowledge) or reducing costs of supplies” (OECD and Eurostat, 2005, p. 51).

Taking a systemic approach to innovation

Because innovation takes place within complex networks of people and (sometimes) across multiple organisations, a holistic approach must be taken in conceptualising the process. Below, we focus on conceptualising innovation as it occurs within and across systems rather than as isolated events.

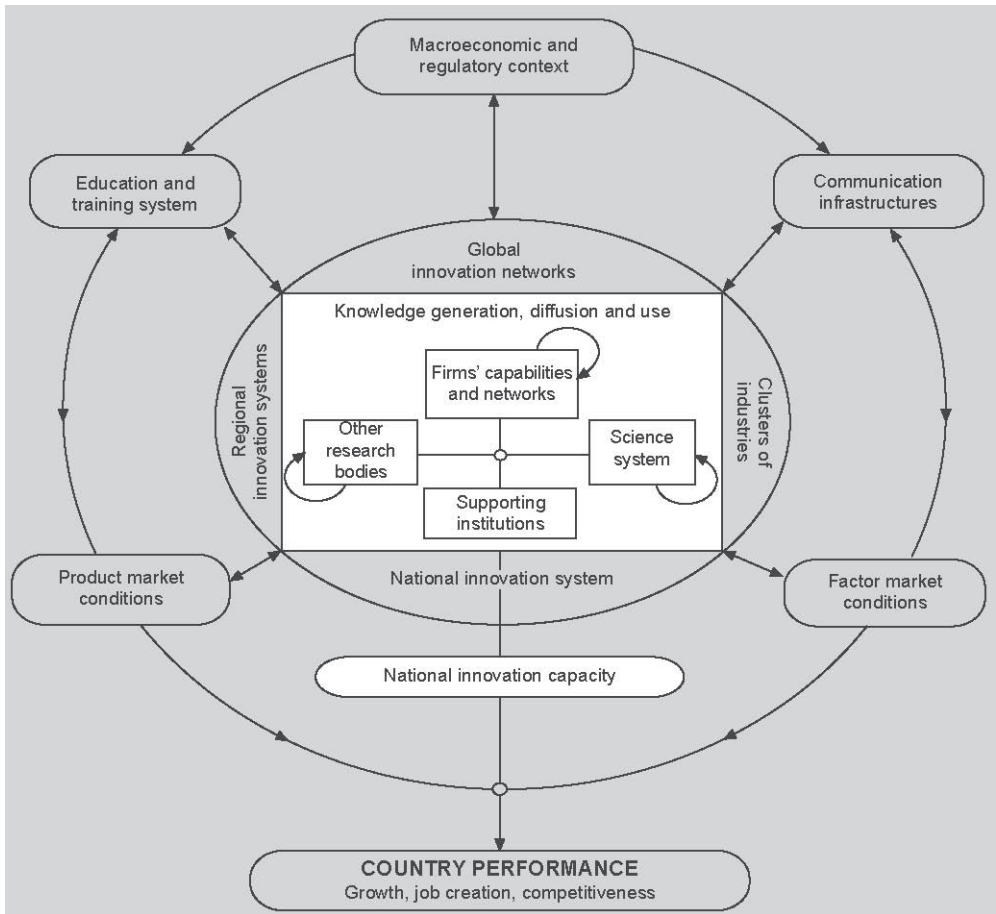
The role of interplay of institutions and actors

Traditionally, technology-related analysis of innovation focused on R&D inputs and outputs. However, innovative performance depends not only on R&D investments but also on successful interactions among actors (OECD, 2004). The innovative performance of a country is determined not only by the performance of individual actors (*e.g.* firms, research institutes, universities), but also by “how they interact with each other as elements of a collective system of knowledge creation and use, and on their interplay with social institutions (such as values, norms, legal frameworks)” (Smith, 1996). Figure 2.1. illustrates the different actors in an innovation system and their interactions.

The “systems of innovation” approach examines how external institutions affect the innovative activities of different actors. According to this approach, innovation is not a linear process performed within a single firm but a process involving a network of institutions in both the public and the

private sector (OECD, 2004). Successful innovation requires, in addition to bright ideas, a system of innovation that involves a combination of activities and many inter-related actors who generate and use knowledge and information (NEA, 2007).

Figure 2.1. Actors and linkages in the innovation system



Source: OECD (1999).

Levels in the analysis of national innovation systems

According to OECD (1999), the analysis of national innovation systems embraces the following approaches:

- *Micro level* analysis “focuses on the internal capabilities of the firm and on the links surrounding one or a few firms, and examines their knowledge relationships with other firms and with non-market institutions in the innovation system”.
- *Meso level* analysis “examines knowledge links among interacting firms with common characteristics, using three main clustering approaches: sectoral, spatial and functional. A **sectoral (or industrial) cluster** includes suppliers, research and training institutes, markets, transportation, and specialised government agencies, finance or insurance that are organised around a common knowledge base. Analysis of **regional clusters** emphasises local factors behind highly competitive geographic agglomerations of knowledge-intensive activities. **Functional cluster** analysis uses statistical techniques to identify groups of firms that share certain characteristics (e.g. a common innovation style or specific type of external linkages)”*Macro level* analysis “uses two approaches: macro-clustering and functional analysis of knowledge flows. **Macro-clustering** sees the economy as a network of interlinked sectoral clusters. **Functional analysis** sees the economy as networks of institutions and maps knowledge interactions among and between them” (p. 24).

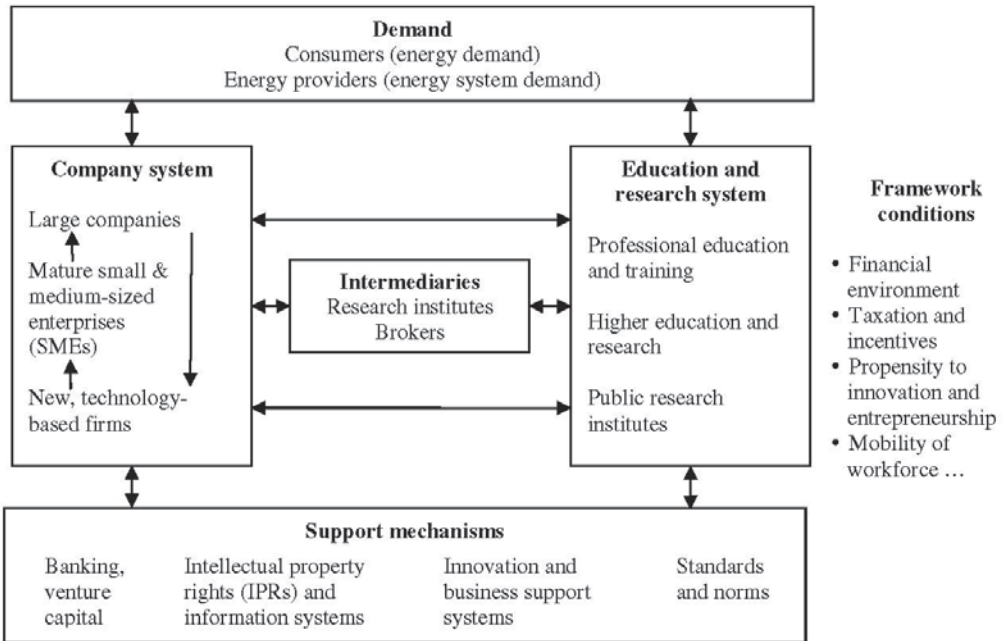
Characteristics of the innovation system

The innovation system (see Figure 2.2.) can be described through the identification of key drivers and analysis of knowledge management, in their relevant contexts (e.g. government incentives and framework conditions) (OECD, 2002).

Elements to be characterised include (OECD, 2002, p. 4-5):

- Drivers of innovation
- Production of knowledge (main actors, kinds of networks, and types of knowledge)
- Diffusion of knowledge (formal and informal channels and main actors)
- Absorption of knowledge
- Government incentives and framework conditions

Figure 2.2. Components and linkages in the innovation system



Source: OECD (2002).

The innovation process: models of innovation

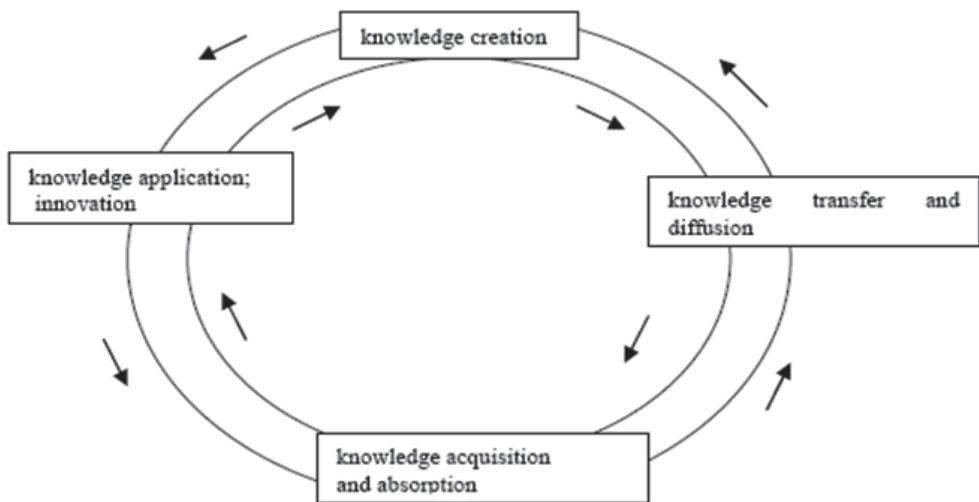
Many conventional accounts of innovation present the process in terms of a “funnel model”, starting with lots of ideas, many of which are eliminated until only a few remain. There are, however, very real flaws with this model. It has been argued, for example, that the linear model of innovation does not work well for applied science, let alone other fields. Often the end use of an innovation will be very different from the one that was originally envisaged; sometimes action precedes understanding and can act as a catalyst for ideas. There are also feedback loops between every stage, making real innovations more like multiple spirals than straight lines. Moreover, the linear approach fails to take account of the social factors that shape innovation, including market factors and social demands.

This section provides an overview of some alternative models that conceptualise innovation. The first focuses on the role of knowledge in the innovation process, the following two include commercial aspects of the innovation process, while the last one provides a more complex picture of innovation and includes policy-related aspects.

Knowledge inputs and innovation outputs

The first model focuses on the role of knowledge at different stages of the innovation process. It is argued that science and technology are necessary, but not sufficient, sources of knowledge for innovation. To result in innovation, technological knowledge must be combined with knowledge of businesses and market opportunities. OECD (2004) uses Dankbaar’s “circular flow” model, which describes how knowledge flows in both directions and attempts to depict this dynamic relationship.

Figure 2.3. **The four knowledge processes in the learning spiral**



Source: Dankbaar (2004) in OECD (2004).

The four stages of innovation

The next model depicts the successive stages of the innovation process, starting with research and finishing with dissemination. It proposes four stages of innovation (Figure 2.4), further suggesting that “the transition between the stages is difficult since the main actors in the stages and their interest are different from one another” (NEA, 2007, p. 24).

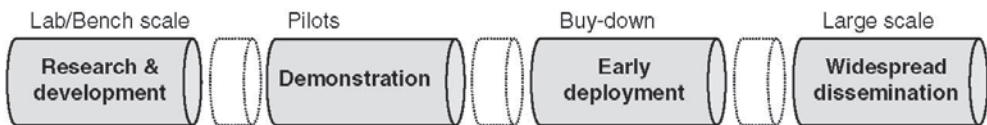
This model uses a view of innovation similar to that of the Oslo Manual, which defines innovation activities as “all scientific, technological, organisational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Some innovation activities are themselves innovative others are not novel activities but are necessary for the

implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation”.

NEA’s (2007) four stages of innovation are:

- *Research and development*: Basic research and conceptual development, the stage at which innovative ideas and concepts are born.
- *Demonstration*: This stage “consists of building one or more target systems of increasing scale to prove the technical and potential commercial viability of the technology. This is the point of *invention*, which then leads to the transition to *innovation*”.
- *Early deployment*: This stage involves scaling up manufacturing capacities and learning to reduce costs (manufacturing, system installation, and operations and maintenance) to be competitive with conventional technologies. The term “early deployment buy-down” refers to the process of paying for the difference between the cost of an innovative technology and the cost of its competitors. “This is the point at which a business case can be validated and might begin to attract levels of capital sufficient to permit initial production and marketing”.
- *Widespread dissemination*: The large-scale deployment of the innovative product; investors can expect to see the beginning of returns on their investments.

Figure 2.4. **Simplified stages of innovation**



Source: NEA (2007).

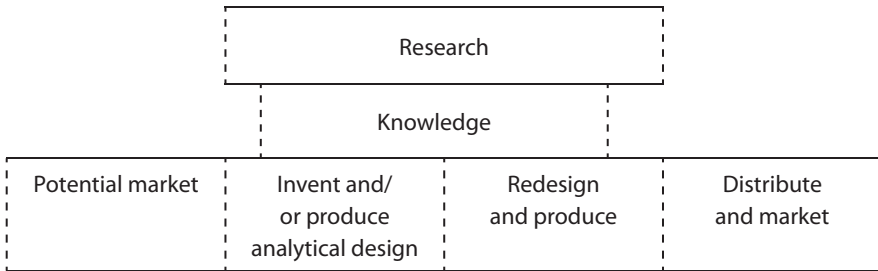
The chain-link model of innovation

One of the useful models that conceptualise innovation is the “chain-link model” of Kline and Rosenberg (1986). This model consists of elements similar to those of the one described in the previous section, including R&D and the stages related to commercialisation. However, an important difference is that in the chain-link model research is viewed not as the work of discovery that precedes innovation but as a form of problem solving that relates to any stage of innovation.

This model emphasises the interaction between market opportunities and firms’ knowledge base and capabilities. The outcomes of each broad function

are uncertain, and throughout the innovation process it may be necessary to go back to earlier stages. Maintaining effective links between these stages is crucial to the success of an innovation project.

Figure 2.5. **The chain-link model of innovation**



Source: OECD (1997).

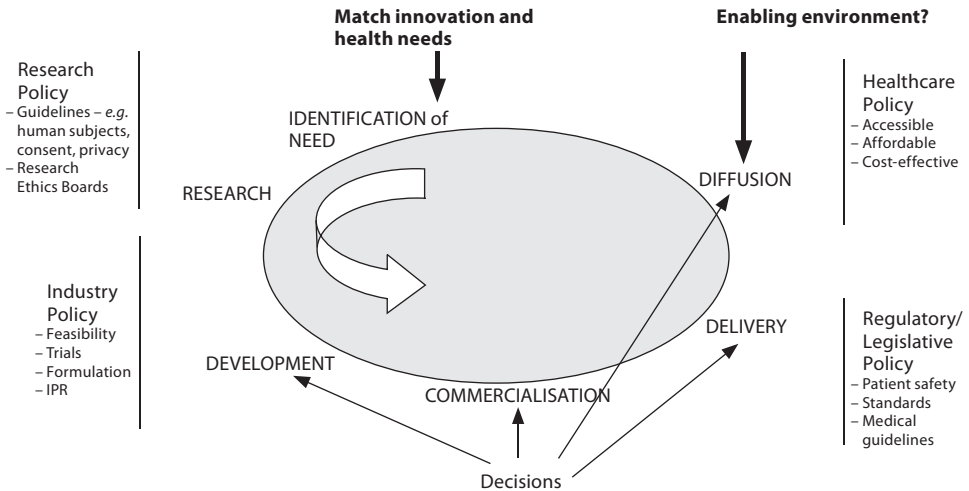
The health innovation cycle

This model, described in the OECD Health Innovation Survey (OECD, 2007), conceptualises innovation, acknowledging both its complexity and the interaction among different aspects. In addition to the stages included in the models described above, this conceptualisation also highlights the importance of identifying needs. The resulting innovation cycle includes the following stages: the identification of needs and opportunities, research, development, regulatory testing, commercialisation, diffusion, and uptake (see Figure 2.6). Here, innovation is viewed as a non-linear, dynamic, and interactive process. This process “includes inherent uncertainties and risks, and is continuously reinforced and reinvented by feedback loops” (p. 4).

While this overview is certainly incomplete, a number of elements emerge. First, novelty and benefits are central to the concept of innovation. In addition, innovation is typically conceptualised as being part of a system that involves numerous actors and institutions involved at several stages of the process. In particular, the systemic approach to innovation emphasises the crucial role of co-operation among multiple actors and institutions throughout the innovation process. Different models conceptualising this process provide a more or less complex picture of innovation. While the key elements of the innovation process (R&D, design, and commercialization) tend to be included in all of the models, there is more variation in how these elements relate to one another, and some models include additional elements.

However, these traditional approaches to understanding innovation rely heavily on the explanatory power of economic incentives and assume the existence of management and organisational structures that are not

Figure 2.6. The health innovation cycle



Source: OECD (2007).

necessarily present, or present to the same degree, in public sectors such as public health, education, justice, and transportation. Furthermore, organisations within the public sector are embedded in a vast web of organisations, many with differing aims. Because of the complex interconnections among sectors and the institutional constraints of government, substantial obstacles can impede systemic innovation in the public sector in particular. Thus, in Part B, we will look directly at the public sector to try to understand the distinct challenges it faces in fostering innovation and systemic innovation, as well as identify the elements that can help actors overcome these difficulties.

Innovation in public services and social innovation

Public sector innovation as a distinct challenge

In contrast to the private sector, the public sector faces a very complex incentive structure that is not always conducive to innovation. First, while the private sector responds to the pressures of market competition, the public sector has a host of differing interests, some of which act as incentives and others as disincentives. Second, the public sector generally provides services (in contrast to products, which can be more easily improved through

technological advancement). As Hartley (2006, p. 61) noted “service and organizational innovations require greater tacit knowledge; have less well defined system borders; are less tractable to cost-benefit analysis; rarely have a dedicated development unit; are more difficult to trial; concern behaviours, attitudes, relations and work tasks; often affect more people and are constructed by the subjective interpretations of the adopter”. Thus, the kind of innovation that each sector aims to achieve differs in its nature. In addition, measuring the relative success of innovation in the public sector also poses problems for researchers because whereas individual corporations are often used as the unit of analysis in the private sector, the public sector is more frequently divided into entire institutional fields (*e.g.* transportation services and health care).

Although lessons from the private sector cannot always provide direct solutions, it is important to identify what *can* be imported from the private sector. Transferring knowledge from the private sector to public sector innovation is suggested in many studies; however, the peer-reviewed literature suggests that it is rarely done in practice (Vigoda-Gadot *et al.*, 2008). Still, Bessant (2005, p. 41) argues that, “[...] there is a strong case for learning across the two sectors, not just in terms of transferring well-proven lessons (adaptive learning) but also for ‘generative learning’, building on shared experimentation and comparison of experiences around discontinuous innovation”.

Why do governments innovate?

It is true that while the incentives for private sector innovation seem crystal clear – ensuring competitiveness, increasing the market share, and making a profit – the incentives for public sector innovation are less clear-cut. Various motives for public sector innovation are mentioned in the literature. Many authors suggest that to face the challenges of modern society, government/governance must be innovative (Singlaub, 2008; Moore and Hartley, 2008). Those challenges include growing demand for responsive government (Vigoda-Gadot *et al.*, 2008), more client-led and individualised public service delivery (Bowden, 2005; Carter and Belanger, 2005), the need for policy instruments to stimulate sustainable development (Foxon, Gross, Chase *et al.*, 2005), and narrowing the gap of citizen’s discontent with performance of public sector organizations (Wesseling, 2005). Those challenges – to which coping with the increasing costs of the welfare state must be added – evoke extrinsic motives for governments to innovate.

In contrast to extrinsic motives for innovation, a more intrinsic motive for innovation is the motive of learning (from failure) or “learning-by-doing”. The idea is that even a failed innovation is good in itself because it initiates a learning loop, which requires room for experimenting, taking risks, and

experiencing failure. A common complaint is that experimenting and “double-loop-learning” are exactly what the public sector lacks (Bessant, 2005; Termeer *et al.*, 2005).

In an analysis of the motives and rationale for public sector innovation, the broad concept of *social innovation* is useful in understanding the aims that are common to nearly all innovation in the public sector. The term “social innovation” is used to describe the development and implementation of new ideas (products, services and models) to meet social needs. As in other fields, social innovation is distinct from “improvement” or “change”, which suggest only incremental change, and from “creativity” and “invention”, which are both vital to innovation but omit the steps of implementation and diffusion that make new ideas useful. Innovation is also distinct from entrepreneurship, since it is possible to be entrepreneurial without being innovative. Nevertheless, there is a substantial overlap between innovation and improvement, change, entrepreneurship, and creativity.¹

Social innovations have arisen from many sources. Individual social entrepreneurs have sometimes played a significant role; some innovations have been the result of broader societal or technological changes, while others have been driven by market dynamics. Social innovations can come through the public sector, the non-profit sector, and the private sector. The precise boundaries are fuzzy, and some models or services can move between sectors or become more straightforwardly economic or technological innovations. There is growing interest amongst governments, foundations, and other institutions around the world in better understanding the dynamics of social innovation, what institutions and finance can support it, and how social innovations can be more effectively developed, grown, and diffused.

In particular, there is growing interest in innovation within public services. Like other fields, public sector innovation can take a variety of forms. Various typologies of innovation distinguish between (i) policy innovations (new missions, objectives, strategies); (ii) service innovations (new features and design of services); (iii) delivery innovations (new ways of delivering services and interacting with service users); (iv) process innovations (new internal procedures and organisational forms); and (v) system innovations (including governance structures) (IDeA Knowledge, 2005). Some innovations can be described as “incremental” because they are close to existing practice, while other innovations are so radical that they warrant being seen as systemic (like the creation of a national health insurance system and the move to a low carbon economy) (Hargreaves, 2003).

Typology of public sector innovation

Just as numerous definitions of innovation and rationales for innovation exist, public sector innovations can be fit into conceptual typologies in many different ways. At present, coherence and consistency throughout the academic discourse are lacking. Presenting one possible typology, Hartley (2006, p. 31) suggests the following:

- *Product innovation*: New products (e.g. new instrumentation in hospitals);
- *Service innovation*: New ways in which services are provided to users (e.g. online tax forms).
- *Process innovation*: New ways in which organizational processes are designed (e.g. administrative reorganization into front and back-office processes and process mapping leading to new approaches);
- *Position innovation*: New contexts or “customers” (e.g. the Connexions service for young people [www.connexions-direct.com/]);
- *Strategic innovation*: New goals or purposes of the organization (e.g. community policing and foundation hospitals);
- *Governance innovation*: New forms of citizen engagement and democratic institutions (e.g. area forums and devolved government);
- *Rhetorical innovation*: New language and new concepts (e.g. that used for the introduction of congestion charging for London and for a carbon tax).

Barriers to innovation

Possibly more relevant than the question of why the public sector is not in itself very innovative (which is a statement many authors would contest) is why its innovative capacity lags behind the private sector so much. Why does it seem that so many government agencies are not innovative, innovating by themselves, investing in their own R&D, or copying successful innovations from other organizations? Is the sense of urgency not present; is there a lack of political pressure to innovate? Is the interplay of interests at stake responsible for failed attempts to innovate? Or is it simply a myth that the private sector is more innovative than the public sector? In this section we look at barriers to innovation.

General barriers

One of the general barriers for innovation suggested in the literature is that “people don’t like change”. Another general explanation for the lack of innovation is the inherent tension between organizing and innovating. Change requires much energy from the organization and individual employees, who are trained in standard practices. This change refers not only to the routines but also to the mental models that organizations develop. Such models are extremely effective in enabling collective action, but they also create a blind spot for signals from the surroundings that do not match the thought process of the new model. Thus, the desire or necessity to change does not penetrate (Kelman, 2005, pp. 21-31; Koch *et al.*, 2006, p. 38).

Another inhibitor for innovation is the way a bureaucracy is organised. The hierarchy in the organization reduces the chances that management will adopt new ideas, inhibiting employees from offering suggestions. Rules also form a shield for employees such that even if things go wrong, as long as the rules were followed, no one can be penalised. This protection explains the difficulty of reducing red tape, for doing so makes employees more susceptible to criticism. Consequently, employees generally oppose such measures (Kelman, 2005).

Barriers specific to the public sector

A specific explanation for the lagging productivity of the public sector compared to that of the private sector is Baumol’s Law. The law states that it is easier to raise the productivity of producing goods than of producing services. For example, today’s new computer will cost less in three years and will be four times as fast. That does not apply to the work of a hairdresser or a doctor in a hospital. Because the public sector mainly consists of providing services, its productivity will lag behind that of the private sector.

Another explanation for why the public sector lags behind the private sector in innovation is that government has a monopoly in most of its services. The argument is that there is no incentive created by competing organizations, which might put better products on the market. Innovation in the public sector is also hindered because within the political arena the punishment for mistakes is severer than the reward for excellence. This is partly due to the transparency of politics and the role of the media. Mistakes are more newsworthy and therefore receive more attention. It is possible to have a successful career in the public sector by avoiding risks, whereas one mistake can kill a career (Stuiveling, 2007).

Then there is the rule of law, which states that the government must treat citizens equally. Government organizations tend to be structured as bureaucracies because they excel at following standard operating procedures. From

the state's classic point of view, civil servants comprise a politically neutral instrument. Attention has to be drawn onto the political meaning of innovation when they write about innovation in policing, "...the diffusion and adoption of innovations is a rather complex phenomenon of which understanding cannot be reduced to a simple set of functional or instrumental considerations, especially if we want to understand why an innovation has been adopted. It is not only the relative advantage of an innovation in comparison to older practices that makes the difference" (Korteland and Bekkers, 2008, p. 16). The political dimension of innovation could provide a very good explanation for why organizations that should "innovate or perish" are nevertheless reluctant to copy innovations that have evidence-based relative advantage. Schumpeter originally understood innovation to be "creative destruction" – for something new to emerge, something older has to be destroyed. Perceived in this way, innovation suddenly becomes a more political than self-evident phenomenon. This could explain why innovations – even evidence-based innovations – do not occur naturally but instead are often contested, especially by people who have an interest in maintaining the *status quo*.

Finally, professional expertise has a role in hindering innovation: "(1) social boundaries and (2) cognitive or epistemological boundaries between and within the professions retarded the spread of innovations. These barriers are especially problematic when different professions are co-located within multiprofessional organisations. This argument contests prior work presenting professional networks as positive facilitators of innovation (Coleman *et al.*, 1966; Robertson *et al.*, 1996)." (Ferlie *et al.*, 2005).

Barriers to social innovation

Much of the literature on social innovation emphasises the barriers and blockages standing in its way. Some of these apply throughout the public sector and include:

- Risk aversion of bureaucracies;
- Political and auditing constraints imposed by performance and accountability frameworks;
- Lack of institutional support for innovation;
- Inappropriate structures and organisational cultures for innovation;
- Silo structures of public agencies, making value across organisational boundaries harder to operationalise;
- Uncertain results, increasing the difficulty of winning support for innovation.

In addition, academics such as Clayton Christensen have demonstrated that performance during the early stages of innovation is often poorer than that in more mature stages of existing models. The management of these periods has always proved challenging for the innovators and their supporters, especially in the public sector. The literature on the barriers to social innovation raises a number of salient points and highlights the importance of constraining risk where lives and careers are at stake. Ideas that may work well in theory may not work so well in practice; therefore, new models should be tested on a small scale and genuinely proven before they are scaled up. This has driven the greater emphasis on pilots, pathfinders, and experiments to test out different models of innovation.

The policy environment

It is difficult to single out specific policies that have helped to foster innovation in the public sector because of the complex networks in which public sector organisations operate. Frequently, the most salient factors, such as leadership and openness to new ideas, are intangible or involve the convergence of many factors. However, certain policies can be considered innovation *enablers*.

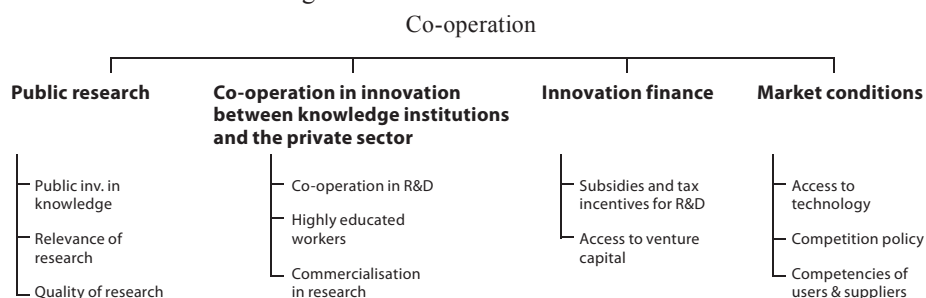
In the IDeA literature review of Innovation in Public Services, Borins (2001) describes certain factors in the policy realm that can help to stimulate innovation. First, he suggests that any innovation must be accepted and supported from above. This support can be achieved through “organisational priorities to guide innovation, recognition for innovators, granting the latitude for experimentation to take place, and protection for innovators from central agency constraints”. Recognition can often extend to reward (*e.g.* financial incentives). Second, innovation can only occur when resources are available. When specific funds are earmarked for innovation by the central government, the possibility and incentive for conscious innovation is enhanced. A third element of fostering an innovative environment ensures (through policy) that participants come from diverse backgrounds, thus bringing with them distinct perspectives and experiences, and that staff and stakeholders at all levels are included. Finally, policies can encourage organisations to research and rigorously evaluate the experiments of others. Learning from others and being able to identify which innovations have been truly successful are key steps to fostering an on-going culture of innovation.

It is also possible to identify certain policy arenas that have an impact on the ability to innovate. The 1997 Oslo Manual (OECD, 1997) suggests that four main “policy terrains” (*i.e.* policy and institutional factors) shape innovation activities:

- The broader *framework conditions* of national institutional and structural factors (e.g. legal, economic, financial, and educational) that set the rules and range of opportunities for innovation;
- The *science and engineering base* – the accumulated knowledge and the science and technology institutions that underpin business innovation by providing technological training and scientific knowledge;
- *Transfer factors* are those which strongly influence the effectiveness of the linkages, flows of information and skills, and absorption of learning essential to business innovation – these are factors or human agents whose nature is significantly determined by the social and cultural characteristics of the population; and
- The *innovation dynamo* is the domain most central to business innovation – it covers dynamic factors within or immediately external to the firm that directly impinge on its innovativeness.

Another view on the policy areas that shape innovation is presented in Figure 2.7. This model provides a more clearly defined and measurable list of factors that influence innovation activities. For the measurement of performance in each policy area, see the section on innovation indicators.

Figure 2.7. **Framework conditions**



Source: OECD (2004).

In addition to the factors listed above, two other factors are claimed to be essential:

- *The role of policy co-ordination*: A publication on the management of national innovation systems suggests that institutional arrangements play a key role in enhancing efficiency. Improved policy co-ordination among ministries and the involvement of various stakeholders in policy formulation can help increase transparency, facilitate information flows, and reduce systemic mismatches (OECD, 1999).

- *The role of proximity*: Researchers have argued that firms are embedded in national and regional innovation systems, in which physical interaction facilitates access to tacit knowledge. However, relational proximity cannot be simply reduced to spatial proximity because other forms of proximity (e.g. professional or organisational) also play a key role (Amin, 2003, as cited in OECD, 2004).

Factors that lead to successful innovation

A number of countries are leading the way in terms of creating national innovation systems. Denmark, Finland and Iceland have already put in place a number of measures, organisations, and financial packages to support and promote innovation. From these and other examples, a number of elements of an innovation system can be identified. The key is to have a well-functioning knowledge system that is able to learn quickly, aware of its changing environment, and is able to test out new models.

The first of these is **leadership and organisational culture**. Leaders can send strong messages about the importance of innovation and help to create a culture in which innovators are valued, recognised, and rewarded, and where innovation is seen as an integral part of everyone's job. Such leadership may come from ministers, senior officials, business leaders, and others, but it is also critical in establishing an innovative culture in which people in lower levels of hierarchy are supported to take risks.

However, this is easier said than done. In a review of ten years of articles written for the *Creativity and Innovation Management Journal*, Rickards and Moger (2006, p. 14) concluded that “[the concepts of] creativity and leadership remain highly ambiguous in definitional and operational terms”. Leadership is mainly investigated through quantitative data analysis (e.g. Aragon-Correa, Garcia-Morales and Cordon-Pozo, 2005; Considine and Lewis, 2007; Mack, Green and Vedlitz, 2008). Through analysis of large numbers of leaders and public entrepreneurs, it is believed that both personal characteristics of leadership and contextual/environmental factors can be discovered.

One insight widely shared among authors is that a senior position in the hierarchy of an organization does not automatically make someone a leader in innovation. Leadership and public entrepreneurship arises at all levels of organizations.

Second, there needs to be **effective supply** or direct “pushes” for innovation. Such supply depends on various enabling factors: sources of finance for early stage ideas to be developed and experimented with; free space, either within or outside larger institutions, where creative ideas can be developed; more formal support structures, sometimes with intermediary organisations playing a critical role in linking promising ideas to potential uses; and

research capacity to develop evidence. Finance may come in the form of funding and support, equivalent to the research and development support in science. Alternatively, it may come from the overt allocation of small percentages of turnover to new models, the use of experiments or zones, competitive bidding sources, or large foundations that play a prominent role in countries like the Germany, Italy and the United States.

Third, there needs to be **effective demand** or “pull” factors for innovation. This demand can come either directly from the public (*e.g.* service users, patients, and learners) or from purchasing and commissioning bodies seeking better performing and better value models.

Networks to share spread and diffuse innovations comprise another crucial element in the innovation system. Crudely, such intermediaries can link innovators with people who may have the skills, support, and means to turn their idea into a product or service. Such networks also play an important role in linking the micro level (*e.g.* school and further education) with the macro level (*e.g.* the Department for Education and Labour).

Finally, innovation is much more likely to occur if there exists either a **widely held view that current models are underperforming** or failing or a widely held view that such models have ceased to adequately respond to the likely pressures of the environment or of competitors. The evidence that smaller countries have proven more innovative – in their view, because of a greater awareness of the threats of a rapidly shifting external environment – is striking. Social innovation is a field that is developing in terms of research and understanding, and it is doing so in tandem with parallel fields: social enterprise and entrepreneurship; public sector improvement and change; design, including user-led; and, in its growing role in enabling innovation, technology.

These factors must be aligned if this idea is to grow into a successful model, product, or service. Thus, below we synthesise the necessary conditions for putting innovative products, services and models into practice sustainably and on a large scale.

- “Pull” in the form of effective demand, which comes from the acknowledgement of a need within society by organisations, consumers, or commissioners with the financial capacity to address it. These might include employers seeking new types of skills (*e.g.* an ability to work in teams and software programming knowledge).
- “Push” in the form of effective supply, which comes from: first, the generation of innovative ideas (by creative individuals and teams, potential beneficiaries, and users often inspired by anger, suffering, or compassion); second, the development of those ideas into demonstrably workable forms; and third, their communication and dissemination.

- Effective strategies that connect “pull” to “push” and find the right organisational forms to put the innovation into practice.
- Learning and adaptation to ensure that the innovation achieves social impact and continues to do so as the environment changes.

Many promising innovations have floundered because critical elements were missing. For example, a need might be widely recognised but not by organisations with power and money. Moreover, these factors all work in more distinct ways when compared with innovation in the private sector. This is especially the case with both “push” and “pull” factors, which will be shaped – within the public sector – by political priorities, budgetary demands, and public opinion.

Evaluating innovation in the public sector

One of the most important elements in any kind of innovation (or reform) is rigorous evaluation. A framework, in which new projects and ideas can be measured, allows both the designers and the users to identify the precise strengths and weaknesses of any given endeavour. As we have seen, the public sector offers distinct challenges to any innovator through its complex network and myriad institutional constraints. Although the role of the service sector is increasing in OECD economies, measuring innovation in this sector is problematic, and thus important innovations are often neglected. Developing, and using, a framework for evaluation specifically tailored to the public sphere is essential.

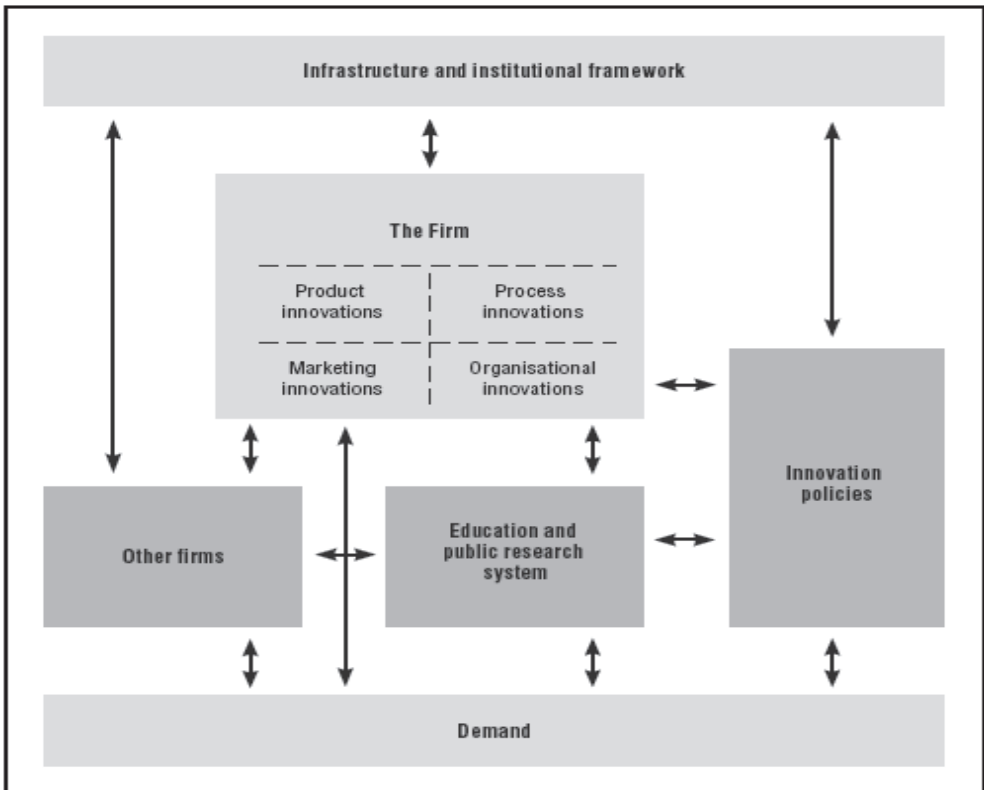
Numerous studies have aimed to develop indicators that provide a better picture of innovation in the private sector than do simple indicators such as the share of innovation or R&D performing firms. OECD (2007) suggests that R&D indicators are the most widely used indicators of innovative activity and that the usefulness or impact of innovation indicators is rather minor. Possible reasons include an assumption among policy makers that R&D data are of better quality, a lack of innovation indicators as widely accepted and used as R&D, and an unawareness of the availability of innovation data or its potential uses.

The limitations of quantitative indicators

The same document argues that the proliferation of composite indicators will raise questions regarding their accuracy and reliability. Due to the sensitivity of the results to different weighting and aggregation techniques as well as the problems of missing data, composite indicators can result in distorted findings on country performance.

The “Strategic view of innovation policy” (OECD, 2003) highlights three points regarding the weaknesses of quantitative measures of innovation. First, quantitative indicators provide an incomplete picture of innovation. Many factors that shape innovation are difficult to measure quantitatively. It is particularly problematic to measure the relationships between these factors and assess the structural relationships that determine correlation between variables. Second, “it is a fundamental problem of innovation policy that it lacks anything even vaguely resembling the fully specified dynamic general equilibrium model of innovation, which would be required to allow the numerical computation of an optimal innovation policy” (p. 7). It is therefore often necessary to rely on qualitative measures, “plausible but incompletely tested hypotheses and a significant measure of informed judgment”. Finally, qualitative measures are necessary due to the impact of country-specific features, such as institutional system and culture, on innovation performance.

Figure 2.8. **The innovation measurement framework (from the perspective of the firm)**



Source: OECD and Eurostat (2005).

Figure 2.8 illustrates the innovation measurement framework proposed by the Oslo Manual. This framework integrates perspectives from firm-based theories of innovation, as well as the approach that views innovation as a system.

There are a number of other indicators used by the OECD, including the EU indicators of science, technology, and innovation. However, all of these fail to cover some important areas. First, they do not indicate the links between industry and science. Second, while the business environment is an important determinant of successful innovation, the indicators do not cover economic incentives and institutional regimes. Finally, the indicators focus at the national level, whereas many innovative actors, particularly large firms, have important international activities (OECD, 2007). Follow-up work (Innovation Indicators: Some Proposals and Preliminary Results Based on the NIND Project, 2007) develops several composite indicators for use in policy. It is argued that these may also be useful in developing a single robust indicator of innovative performance. However, as they have been developed for the private sector, they cannot be easily or readily transferred to the public sphere.

Indicators of non-technological innovation

Especially in the public sector, innovation does not always include technological changes, as illustrated by the 2005 Oslo Manual, which extended the definition of innovation to include organisational and marketing changes as well as non-technological characteristics of product and process innovations. In light of the importance of non-technological innovative activities, it seemed necessary to develop indicators of non-technological innovation. An OECD Directorate for Science, Technology and Industry document on “Indicators of Non-technological Innovation” (OECD, 2007) suggests the following method to develop indicators of modes of innovation, including not only technological but also non-technological aspects. This consists of three steps:

First, five multivariate factors were constructed from the innovation survey:

- Factor 1: Index of technological activity (high factor loadings in relation to internal and external expenditures on R&D, capital, and IT, and knowledge acquisition, with training for innovation).
- Factor 2: Index of innovation outputs (high scores in product and process innovation outputs)
- Factor 3: Index of organisational innovation (high scores regarding changes to organisational structure and strategies).
- Factor 4: High values for protection methods related to design.

- Factor 5: High scores for expenditure on design and on marketing innovations.

The second step involved extracting clusters of firms specialising in modes of innovation, based on their combinations of factor scores. The resulting clusters were:

- Cluster 1: High in product and process innovation output; close to average on all other factors.
- Cluster 2: Low intensity in all factors; lower levels of innovation activity.
- Cluster 3: High engagement in all activities.
- Cluster 4: High in design related activities.
- Cluster 5: High levels of organisation change.

This review of innovation indicators suggests that numerous quantitative indicators have been and are being developed that cover both technological and non-technological innovation; these aim to evaluate not only innovative performance but also the characteristics of the entire innovation system. However, comprehensive frameworks for the public sector as a whole and for individual sectors within it (*e.g.* education, health, and transportation) are essential and need to be further developed.

Lessons from the comparative analysis of innovation in the public sector

Innovation systems will look different in different countries – with different actors, agencies, and cultural environments. Innovation is often contingent on the structures, institutions, and networks already in place, and it will therefore take different paths and forms in different countries. However, there are common identifiable principles or factors. These factors may include, for example, the nature of practitioner networks, the specific needs of the local community, the availability of resources for innovation, and whether there is a sense of crisis or underperformance.

Some useful lessons have emerged from specific projects. For example, the success of the Sure Start program in the United Kingdom showed that an important sense of ownership results from the inclusion of service users in the process of program development. Flexibility and leeway given to the service providers, in the context of administrative support from the top, allowed the various providers to design a network and system of joined-up services that reflected that actual needs of local users (IDeA, 2005, p. 44). A conceptual innovation in the London transportation system elucidated two key lessons: first, that innovation in the public sphere requires strong political

leadership and support; second, that there exists a clear legislative framework that can serve both to guide designers and to support the project's eventual implementation (IDeA, 2005, p. 45).

The IDeA (2005) literature review sums up the lessons from its case studies of successful public sector innovation by identifying seven key elements:

3. The identification of gaps and problems
4. The capacity for action
5. The commitment to innovation by political leaders
6. Administrative and institutional support
7. Collaboration between different departments and providers
8. The incorporation of service users' ideas and sensitivity to their needs
9. The use of new technologies

These general lessons could apply to all public sector innovation.

An effective innovation system will comprise the following principles:

- *Knowledge creation – the evidence base:* New ideas are the life-blood of innovation, so space for idea generation and design of new approaches that draw the insights of front line workers, such as teachers, trainers, learners, and business leaders, are essential to the innovation process. Here, there is a role for open discussions, prizes, small funds, competition, and contestability.
- *A commitment to implementation:* The evidence base can also be improved by committing resources to a series of more formal tools for testing innovative ideas in practice. Inevitably, innovation involves costs to generate ideas, test them, and then to adapt them according to experience. In *business*, a significant proportion of funding for innovation comes from governments – through grants, tax credits for R&D, and subsidies – and from private investment within companies and through dedicated investment vehicles, ranging from technology oriented venture capital to banks. In the *public sector*, the balance of funding will depend on the role and involvement of the different stakeholders. Although government is generally the major source, the public sector could draw on the experience of other sectors and organisations to diversify sources for social investment. Although commercial funds are likely less suitable for higher risk ventures, which cannot demonstrate a prospective income stream, they fill an important niche alongside the growing field of venture philanthropy of providing some debt and quasi-equity finance alongside grants. Foundations may also be an

important source of finance for the incubation of innovations because they often have greater freedom to experiment and target unfashionable or politically controversial fields or high risk, high impact innovations.

- *Transferring Knowledge – networks, federations, etc.:* An innovation system implies connectivity, which can be achieved through links such as networks, federations, and partnerships. Collaboration among schools, government, and business is critical in generating and spreading innovation as it allows greater access to knowledge, capabilities, and resources, space for creative thinking, and opportunities for testing and trialling. Such networks do, however, carry a number of risks. The benefits of such collaboration are greatest when there is a degree of “cognitive distance”, *i.e.* some level of difference in approach among the organisations, as this can provide novel insights (Dutch Ministry of Economic Affairs, 2005). However, if this distance is too great, there can be a complete lack of understanding.
- *A culture of innovation:* An organisational culture that is supportive of innovation is necessary to embed and mainstream innovation. Such a culture has to be underpinned by individuals with the requisite skills and mindsets for innovation, strong leadership at all levels, and innovation champions to help foster and support the development of new ideas. A culture of innovation would entail space for experimentation and risk, an acceptance that sometimes things will fail, and an awareness that rapid learning can stem from failures as well as from successes.
- *Replicating and scaling up:* As well as organisational cultures, there are also crucial processes to scale up, replicate, and spread successful innovations. This is where strategic budget setting and performance management can be vital.
- *Analysis and learning:* Finally, there needs to be constant assessment, analysis, and learning since unexpected results are likely. Currently, many organisations are developing the evidence base through the use of case studies. Usually, these case studies will highlight successful practice. It is, however, equally important to learn from failures to make sure that lessons are learnt and not repeated.

These principles need to be applied to innovation systems – but they also need to be matched by actions to remove some of the barriers to innovation. Barriers include bureaucratic inertia and the power of precedent; delivery pressures; short-term budgets and planning horizons; silos and organisational boundaries; inadequate funding or resources; lack of incentives and rewards to innovate; vested interests (among teaching unions, students and other institutions); risk-averse cultures; reluctance to stop failing programmes; and legislative or regulatory constraints.

Conclusions and policy implications

It is clear that the innovation and systemic innovation in the public sector is shaped by a unique configuration of incentive structures, resource availability, and goals, and that this configuration needs to be conceptualised in a way that captures its internal dynamics and complexity. Although the principles and lessons discussed above provide a starting point from which to understand innovation in the public sector as a whole, they do not always reflect the specific difficulties faced by particular arenas within the public sector. The following chapter will explore the role of innovation and systemic innovation specifically within the education sector to identify the particular challenges faced by schools and VET programmes. It will also propose a model of innovation in the education system that can be used to better conceptualise the processes and dynamics taking place.

Key messages

Research on innovation has traditionally focused on science and technological advancement in industry. Models of innovation have traditionally focused on the direct link between research and innovation in industry and measurements of impact have been based on patents or sales figures and the pressures of market systems. These are arguably not transferable to modeling or measuring innovation in the public sector.

The growing body of knowledge on innovation in the public sector, including social innovation, makes it clear that while there are lessons that can be transferred from traditional industry models of innovation to the public sector, there is also a need to develop a better understanding of the drivers, enablers, barriers, and processes specific to innovation in the public services.

Specific barriers to innovation in the public sector include: risk aversion of bureaucracies; political and auditing constraints imposed by performance and accountability frameworks; lack of institutional support for innovation; and inappropriate structures and organisational cultures for innovation.

Enablers of public sector innovation include a commitment to innovation by political leaders with the capacity for action; administrative and institutional support; collaboration between different departments and providers; and the incorporation of service users' ideas and sensitivity to their needs to increase sense of ownership.

A key element to public innovation is rigorous evaluation, which allows both designers and users to identify the precise strengths and weaknesses of a given innovation. The public sector offers distinct challenges to measuring impacts of innovation and there is as yet no agreed framework for doing so. Important public innovations can thus be neglected (or conversely overly supported), with expensive implications for the public purse.

Note

1. The section of this paper on social innovation draws heavily on the ongoing work of the Young Foundation and in particular, Mulgan, G. (2006), “Social Innovation: what it is, why it matters, how it can be accelerated”, Basingstoke Press, London; Mulgan, G. (2007), “Ready or Not? Taking Innovation in the Public Sector Seriously”, NESTA Provocation 03, NESTA, London; Mulgan, G., R. Ali, R. Halkett and B. Sanders (2007), “In and Out of Sync: The challenge of growing social innovations”, NESTA Research report, NESTA, London; Bacon, N., N. Faizullah, G. Mulgan and S. Woodcraft (2008), “Transformers: How local areas innovate to address changing social needs”, NESTA Research report, NESTA, London.

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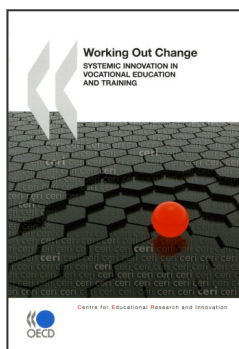
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