# Innovation and the Vocabulary of Governance

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Innovation has become a crucial part of the vocabulary of contemporary political governance and its conceptual equipment. As innovation has emerged as an ever-more significant political issue, the discourse on innovation has become intertwined with the notion of network. This paper argues that certain ontological elements inherent in this discourse tend to lose their openness when they are defined as policy-oriented concepts, and uses the innovation system concept as a case study to illuminate this. Insofar as innovation, the production of something novel, is the basis of contemporary economy, then political language has to strive both to attain what is new and, at the same time, to make it governable. It seems, however, that when a concept receives its political formulation, that is, when it becomes a means for governance, then the unifying process attendant to the production of a field of governance will replace the perspective of change. This essential tension is investigated in what follows through innovation policy as articulated mainly in the Finnish policy discourse.

*Keywords*: Innovation System, Governance, Ontology

## Introduction

With the introduction of novel vocabularies around which new governance strategies are organized, the concept of innovation has come, since the 1970s, to constitute the key concern in areas such as technological innovation studies and evolutionary economic theory. As part of this process, the innovation system has in the early 1990s become a crucial part of the vocabulary of contemporary political governance (OECD, 1992; 1994). Yet many political concepts and ideas, while allowing representations of a complex, changeable and heterogeneous operational environment, tend however to become solidified, and, therefore, insensitive to their original purpose.

There is an interesting theme in Alexis de Tocqueville's De la democratie en Amérique, which deals with the relationship between democracy and language (de Tocqueville, 1966). According to de Tocqueville, the language of democracy has to be flexible enough to allow the movement of ideas along with the movement of democracy (de Tocqueville 1966, 450). Without elaborating this theme further, it is widely agreed that politics is intimately linked with language and that it is possible to identify relationships between political and conceptual qualities. The aforementioned solidification tendency is clearly visible in the concept of the innovation system. It seems that when this concept receives its political formulation, that is, when it becomes a means for

governance, then the unifying process attendant to the production of a field of governance will replace the perspective of change.

In this paper I will consider the innovation system concept from the point of view inspired by Pierre Rosanvallon's (e.g. 2006: 43) conceptions concerning the tension between the 'sociological principle' and the 'political principle'. The political principle – the idea of a unified whole – strives to bring together the collective subject that the sociological principle – the plurality of individuals – tends to make less coherent. What is of particular interest here and what makes the concept of an innovation system an important object for social thought is the tension, inherent in the notion, between an essentially open, network-based political framework that does not form a closure, on the one hand, and the boundary-drawing elements necessary for any governmental concept, on the other. It is this tension or duality between the 'political' and 'governmental' aspects of the notion of the innovation system, resembling Rosanvallon's differentiation but going in the other direction – that is, moving not from a unity to disintegration but rather from an open whole to a closed one – that constitutes the main topic of this paper. In particular, the purpose in this paper is to address the question of how innovation policy in terms of network, information society and liberal governance has come to been articulated within the concept of the 'innovation system' or 'national innovation system', above all in Finland. More precisely, the paper claims that this has taken place in response both to the changing perception of the nature of and the inherent tensions between an ontologically open structure and the administrative need for demarcations and boundaries. While analysing the nature and changes of the innovation concept, the existing research on the innovation policy of Finland (e.g. Schienstock & Hämäläinen, 2001; Miettinen, 2002; Hämäläinen & Heiskala, 2004; Lemola & Honkanen, 2004; Ali-Yrkkö et al., 2006; Miettinen et al., 2008) often tends to imply a common national interest, understood as natural and unproblematic. In contrast, this paper seeks to open an ontological perspective to the theme in question. Thus, it argues that certain ontological elements inherent in political concepts tend to lose their openness when they become defined according to policy-oriented goals, using the innovation system concept as a case study to illuminate this.

This is basically a theoretical paper which aims at creating conceptual distinctions and an analysis. While the Finnish policy environment provides a context for this, it is not a case which will be examined systematically. Therefore the documents analyzed here serve to illustrate the theoretical argument and not to constitute proper empirical data. This kind of analysis can help us pay more attention to the duality between opening and enclosing tendencies in a politically used innovation concept (in addition to the innovation system, similar concepts include triple helix, mode I/mode II knowledge production, etc.), to the original questions to which it was formulated as a response, to the way it opens a new perspective and novel set of practices in an area of political problematization, and the pressures relating to the need to represent the domain to be governed as a well-defined field with its own limits and the process of naturalization that often follows. In the following pages, I will trace the contours of the aforementioned tension by elaborating on the social and conceptual preconditions of the innovation system approach, the formation of the network as both the object and the means of politics, and the spread of the innovation concept

in Finnish policy language. Let me begin, however, by elucidating the origin and definition of the notion.

## Defining the National System of Innovation

The concept of national innovation system was first introduced in the 1980s (Freeman, 1987; Lundvall, 1988) and it began to organize the discourses around technology policy in many countries in the 1990s. The national innovation system has usually been conceived of as a set of country-specific organizations, operations models and connections for the generation, dissemination and application of scientific and technological knowledge. This system is regarded as the totality of all the actors who participate in scientific research, in the processing and distribution of information, education, the development of technology and the creation and diffusion of innovative products and services. It is seen as referring to structures from standards to laws and provisions, as well as government actions for promoting different industries and services and for improving competitiveness as well as strengthening the infrastructure of the economy, all of which aim at producing, shaping and regulating new scientific, technical and social innovations (e.g. Kuhlmann & Edler, 2003: 623).

Yet the concept does not exclusively denote regulation mechanisms, structures and policies, but also a large number of economic theories, innovation models, different forms of knowledge and the attendant positions of expertise and authority. In fact, the concept has given birth to a new vocabulary, used by many economists, civil servants and politicians as well as by labour market organizations, industrial enterprises and universities and other research institutes. In this way they can, at least in principle, meet and

recognize each other as part of an often comparatively consistent discourse when it comes to its objectives and terminology. Moreover, one must not forget the impressive set of measuring techniques, assessment methods and very physical technologies from business accountancy to the methods used by national Statistics Centres for the systematic and routine gathering and comparing of information in order to constantly measure national competitiveness. Thus the concept refers to the institutions related to the production and diffusion of knowledge. It also refers to the interrelations of these institutions from schools to universities and further to research organizations, industrial enterprises and government institutions. The concept thereby connects technical patents, industrial standards, the methods for evaluation and comparison as well as juridical steering mechanisms and views these all from the perspective of generation and the utilization of knowledge and innovations. Through this new language, these elements together define a relatively coherent system of practices, objectives and policies.

The genesis of the concept of the national innovation system is, however, connected particularly to the work done with evolutionary economic theory and innovation research. First, it is linked to the endeavour, having emerged within economics, to try to understand the technological and institutional elements related to economic development. The well-known study by Christopher Freeman (1987), in which he investigated the post-war economic development of Japan in the light of the nation's institutional characteristics, is crucial in this respect. Second, it is connected to critiques of the model of linear innovation and to the attendant idea of interactive learning as the basis of the economy. The central formulation here is

Bengt-Åke Lundvall's (1988; 1992) ideas on interactive learning and the innovation process that takes place within the limits of a nation-state. Rather than viewing them as isolated incidents, the origin of innovation started to be seen as a multilevel, long-term network of development processes, involving concurrently a number of different social institutions and actors.

Seen against this background, the introduction of the concept was connected to the needs of policy makers and students of innovation (Lundvall et al., 2002: 215). J. Stanley Metcalfe has characterized it both as a social phenomenon and as a framework for policymaking (see Miettinen, 2002: 28-9). The main purpose of the concept was to help formulate policies in a time when the significance of innovation for a nation's economic potential became widely recognized (for the controversy concerning the academic or policymaking origins of the concept, see Sharif, 2006). Thus it was not solely a theoretical but also a political concept, being linked to questions of governance.

The concept of an innovation system makes it possible to view the interrelationships between the economy, technology, politics and governance as sets of interdependent processes within the same conceptual framework. It tries to transcend administrative boundaries while forming a uniting, systemic perspective in which different processes and effective relationships can be assessed as a historical-political whole: the interrelationships between the increase in the role of knowledge, the development of technology and the generation of innovations are considered from the point of view of the society as a whole. In this undertaking, it is closely linked to the work done within evolutionary economics, a school of economic thought dealing with the processes that transform the economy from within (e.g. Freeman & Soete, 1997; Nelson

& Winter, 1982). In this way, it is believed, the concept sets a horizon through which national strategies can be formulated in a more comprehensive way (Lundvall et al., 2002: 227). According to a report by the Organisation for Economic Co-operation and Development (OECD, 1997: 11), the concept has promoted the mushrooming of systemic reviews, the recognition of the economic significance of knowledge, and the more versatile and multifaceted view of institutions involved with the production of knowledge. This has arguably enabled the evaluation of economic growth and technological development within a relatively consistent perspective in the light of governance, coordination and diverse controlling measures. Its viewpoint is based on a certain simplification[1], but this is simplification for a reason. Any political concept, in other words, a concept articulating political governance, simplifies out of necessity: administration is about fixing responsibilities and drawing boundaries (e.g. Kettl, 2002: 74, 153). In the end, however, this preempts capturing what is new, transient and boundary-transgressing, which was its original goal. I will discuss this issue in more detail in the following pages.

## Network, Knowledge and Governance

The concept of an innovation system can be seen as reflecting the convergence of two pivotal social forces. Although the term has a more specific origin, especially within economic theory and innovation research, as was shown above, these forces have shaped the intellectual field which constituted the precondition for the concept's possibility and its inherent tensions. The first consists of the social order based on knowledge, and the second of the so-called advanced liberal governance. Both of them are structured around the notion of network.

First, the transition to what is referred to as the information society and to the corresponding workings of the economy has been a key topic of political discussion since the latter part of the 1970s (Bell, 1976; Porat, 1977; Lyotard, 1984; Castells, 1996). It has been widely agreed that the logic of the economy is increasingly based on knowledge and learning, which is why these themes have become highly politicized. The OECD has emphasized in its reports the move to a knowledge-based economy in which the constant generation of innovations is crucial (OECD, 1981; 1986; see Godin, 2006; 2008; Felt, 2007). In the 1990s, the OECD (1998) defined the knowledge economy as a form of economy which is based immediately on the production, distribution and usage of knowledge and information. The central idea here is the constitutive role of the innovations related to the circulation and utilization of knowledge as the precondition for the growth of commerce and industry. The concept of an innovation system is precisely connected to knowledge creation, distribution, and utilization (Chang & Chen, 2004: 17-8).

The idea of a knowledge or information society has emphasized the technological dimension of the economy's functioning and has brought together questions related to the development of society from the viewpoint of knowledge and technology. In its simplest form, the advancement of the information society concept meant promoting an infrastructure based on information and communication technologies and the related tele-informatic expertise (e.g. OECD, 1981). Once the information society became the object of political thinking, it was intimately connected to the network approach: networks, in particular information and communication networks, have become a crucial feature of the new societal order. The networks associated with the information

society reflect the functioning of this society in some non-trivial way, not only its technical preconditions.

Second, the concept of an innovation system can be seen as operating as a part of a broader social ethos in administrative politics that has been called advanced liberal governance (see Rose, 1999), based on the decentralized, networked nature of power. If political governance was previously seen as having been articulated largely in terms of central political institutions and the decisions they made, now it is based on relationships and processes which can no longer be reduced to the idea of a dominating centre. As a consequence, governance is no longer viewed in light of state-centric political thought (Pierre, 2000: 4-5). Liberal governance thereby breaks away from an administration taking place through a centre or boundaries–which have been characteristic of modern, hierarchical political governance. Questions and phenomena determining politics today can no longer be dealt with through unambiguous sectoral or geographic boundaries. What is inside and what is outside has therefore become ever more difficult to distinguish.[2]

The new forms of governance have moved from centralist governance towards arrangements which are multi-centred, interactive, and process-based and which are directed at reconciling the interests of both diverse public and private actor groups in the name of some collective strategy (e.g., Rose, 1999; Dean, 1999). The responsibility for the results is divided among the government institutions, legislative bodies, local communities and different experts and consultants which form into chains as a kind of network. In this respect the innovation systems approach is an excellent example of the techniques used by contemporary government. This system engages institutions and processes with a set

of collective aims, advances their abilities for cooperation, and measures routinely their performance and results with an eye to making the functioning more effective. All this takes place by withdrawing central administration, utilizing cooperation networks and developing the potentialities of networks in governance.

As an overarching metaphor, network has come to be established as the salient notion when describing society and its central processes. It has opened such a fundamental horizon, as it were, in and through which society appears to us today and in which this experience of society assumes a conceptual form, amenable to governance (Rhodes, 1997; 2000; Stoker, 1999; Marsh, 1998). Thus the idea of a network is not only an analytical tool for thinking about complex interdependencies, but also and above all, a common framework for our experience of society and a pivotal form of social self-representation. What is characteristic of this representation is that it does not operate on exclusion like many previous models and metaphors (e.g. society as a machine). As a concept, network is ontologically open: it integrates without totalizing (Eriksson, 2005). Due to its quality that allows people to speak about a given whole without the burden of closures and static structures, the notion of network has emerged as one of the key political concepts today.

In technology policy, the idea of the national innovation system has, in recent years, functioned particularly as an integrating concept which articulates its object as being network-like. The growing use of the concept is intimately related to the introduction of the network perspective (e.g., Hughes, 1983; Castells, 1996; 1997; 1998). Freeman (1987: 1) defined the term originally as the "network of institutions in the public and private sectors whose activities and interactions initiate, import, modify, and diffuse new

technologies". Similarly, Niosi et al. (1993: 219) have defined an innovation system explicitly in terms of a network, and so has the OECD (1999: 24). This concept emphasizes the decentralized nature of innovation creation; new innovations depend more and more clearly on mutual cooperative networks between business organizations and different knowledge producers. This concept therefore stresses the relationship between innovation and technical development, simultaneous interactive communication, the distributed, multilateral system of operation and the functioning of coordination between organizations (Freeman, 1987; Schienstock & Hämäläinen, 2001: 73). It is from this same experience of boundaries disappearing that innovation politics also emerges.

## Network-policy

The general acceptance of the notion of a network as a major form of society's self-representation, the emergence of a social and economic order termed as an information society, and the engineering of new techniques for governance are by no means independent phenomena. Although they have their own histories, it is precisely the practices in terms of which they are mutually articulated that are of particular interest for our purposes. In fact, it is exactly this mutual articulation which constitutes the connection through which the idea of a network, the concept of information society, and the new political governance, largely appear to us.

This is seen especially in the way 'networks' have become both the object and the means of politics. For the new innovation policy, the network-form constitutes the precondition or foundation for governability, since the structures of business and industry, as well as the central social processes, have converted

mainly into network-like formations in the globalizing world (e.g. Castells, 1996; 2000). Political governance not only takes into account the increasing network-formation as the precondition of its own pursuit, but also actively endorses this process by promoting the mutual networking of actors involved in the production and utilization of knowledge. In Finland, as in many industrial countries, governance moves "from traditional operations models to strategic development and influencing based on cooperation networks" (The Science and Technology Policy Council of Finland, 2003: 26). Government through networks thus does not only denote cooperation with interest groups – although this is one of its most important forms of operation – but above all, it involves political steering through network-cooperation. More broadly understood, it means promoting the self-governing potentials inherent in a political community. Self-activating communities and civic networks are nurtured as an antidote to the negative effects of market forces and remote central government. Therefore, networks are not simply the realm within which projects are to be implemented – they are themselves *a means* of government (Rose, 2000: 329).

On the other hand, new concepts and forms of government have at the same time assumed a network-like shape. In public administration, the growing stature of 'network cooperation' both between different departments of government and between these departments and their interest groups illustrates the point well (The Science and Technology Policy Council of Finland, 2003: 25, 26; the Council directs and defines science and technology policies for the Council of State). Besides the administrative practices of government, the operations models of municipal administrations are also defined today by their intense and pronounced work with interest groups. Yet the streamlining of the central administration and the introduction of network cooperation not only characterize politics by giving it a new attribute, as it were, but the idea of a network has itself become a constitutive horizon for the thought and implementation of politics.

Innovation policy is not, therefore, merely a vehicle leading towards increased competitiveness, usually against international benchmarks. It is also an organized texture of scientific theories, institutional practices and political techniques which shape the decisions and behaviour of social actors, whether they are individuals, groups or organizations. Innovation policy creates subjects and actors by means of the language used. Thus the political language is never neutral but rather an integral part of the articulation of politics itself. The language of innovation policy seems to articulate a new way of thinking about the governance and practice of power in the age of economy, being based upon knowledge, network-form and the blurring of boundaries.[3] The new forms, concepts and practices of network guidance have, in fact, been conceived as a novel style of governance (Hirst, 2000: 19). The discourse of innovation systems weaves the governance of and by networks in a way that is itself both a precondition and a result of the transformation which has taken place in politics and in society.

Thus, networks operate as the means of government through methods and concepts which themselves are grounded in the idea of a network as indicated for instance by the importance of 'network cooperation'. Hence these methods and concepts organize the field of governance as if they were network-like. The forging of networks are supported, developed and assessed; networks are utilized, steered and co-ordinated. Nonetheless, networks are not just the object of politics but also the very form of

its execution: politics is realized expressly as the creation, promotion and development of networks. Network-facilitating policy has, in recent years, become an integral part of the innovation policy of industrial countries, which has also been taken into account in reports dealing with the Finnish innovation system (e.g. Schienstock & Hämäläinen, 2001: 12, 178-199).

An innovation policy is thus based on the immanent networking of socially consequential phenomena. This policy then attempts to exploit and steer the development: "the widening and deepening of network-cooperation has become one of the central issues for the developing of an innovation system" (The Science and Technology Policy Council of Finland, 1996: 42). On the other hand, this developing and steering illustrate precisely what innovation policy *is*: network-formation is the realization of this policy. Thus, it simultaneously both presumes and actively forges network-like reality itself.

## Innovation Metaphysics

In the concept of an innovation system, two things meet: the necessity of government and the entailing unifying perspective, on the one hand, and the idea of a network, based on an ontologically open structure, on the other. This encounter, which constitutes the precondition for the concept, however, is also the reason for its principal problems. This encounter also unveils a common problem inevitably involved in all policymaking. Once the idea of a network assumes a technical formulation so as to make it a useful political concept, it closes and erects a boundary demarcating the inside and outside. While fastening all key components into place and closing the field of operations, this concept tends to become naturalized, in other words it becomes a given, uncritical part of the conceptual

system. Besides, this concept often reduces its objects to a group of necessary functional preconditions. This sort of approach, which leads to a kind of innovation metaphysics, tends to become incapable of conceiving innovation processes in the course of their own unfolding. Thus David Hart (2009), for instance, has argued that the National Innovation System approach has a difficulty in accounting for major changes in the US innovation system context, reviewing three such changes which are related to the Internet boom, counterterrorism, and productivity growth.

Nevertheless, this concept does not have any real and pre-existing object to which it denotes. There is no natural social entity called an innovation system. Therefore, it is legitimate to criticize the use of the concept in the research literature (e.g. Miettinen, 2002: 67, 77). But when pointing out the weaknesses of this approach the criticism does not say anything about the notion's truth-effects. Representations also create the object they represent; they give rise to new ways of thinking and acting. The concept of an innovation system has a reality of its own as an initiator of new ways of speaking and seeing – e.g. a new connection between organizations, institutions, and innovation actors that was not there prior to the concept. Thus the notion engenders its own object in the course of its articulation process: it constitutes new domains of reality and makes novel fields of existence possible (see Miller & Rose, 2000: 31). Although many key economic doctrines, from self-balancing markets to the theory of rational choice, have turned out to be fairly problematic and one-sided, they have had a seminal influence on the thought of society and thus on the functioning of society. Their import has broadened out from being a mere tool of analysis aimed at explanation to a whole horizon of social self-representation. These doctrines have intertwined closer

with social practices more than ever, and a greater number of people and institutions have begun to assess their own behaviour and that of others by using these conceptual models.[4] This could be characterized as the ontological dimension of the innovation system concept.

Thus, although an innovation system is an analytical concept, this is not the whole story. The notion should also be regarded as a productive concept which is part of a certain politico-historical condition. As the concept becomes more widespread, it includes in its sphere previously remote and relatively independent social actors who, for their part, by using the concept for the evaluation and anticipation of the outcomes of the different types of action, consolidate and expand the constitutive, ontological position of the concept. This is why one has to investigate how the innovation system concept has become a part of the political domain's problematization and the self-representation of the new technology policy.

Although the concept of an innovation system is metaphysical in the above-mentioned sense, it has its own truth effects and histories as part of the institutional practices it has become involved with. To be able to cut loose from the kind of 'innovation metaphysics' which takes the concept as a given, and secondly to take its ontological dimension seriously, one has to be able to see the concept as not an unchanging and universal frame but instead to draw attention to those historical, theoretical and social conditions through which the notion is given meaning in a given context. This also means that one has to move from the study of an innovation system to investigate how the object of the concept has been problematized as part of the question of governance. That is, how it has been set as the object of political thought through different, yet interlinked discourses.

Here, however, it is possible to present only a preliminary account concerning these questions, as an exhaustive historical analysis would require an investigation of its own. In the rest of the paper, I will examine how the different historical interpretations of the concept of an innovation system have influenced the way in which the concept has gathered institutions, relationships, and processes in Finnish science and technology policy. This also helps us to perceive the new form of governance which, in the name of innovation policy, has organized the thinking of the interrelations between technology, economy, and politics in Finnish society. This last section of the article is based on documentary analysis using surveys published by the Science and Technology Policy Council, although these documents do not constitute here comprehensive empirical data but serve only to illustrate the theoretical arguments of the paper.

## The Finnish Innovation System

Finland has been reported to be the first country to adopt the concept of a national innovation system as a basic framework for its science and technology policy (Miettinen, 2002: 12; Sharif, 2006: 745). This notion has guided the implementation and the thinking of this policy not only through the surveys of the Science and Technology Policy Council and the related discourse, but also through different projects and undertakings. Such have been, for instance, the numerous technology programmes, technology centres and cluster projects often organized through these centres. Yet, as noted above, this concept has brought about a fairly coherent discourse which often has a shared terminology and common aims.

The notion of an innovation system has not been an unchangeable constant in the

Finnish technology policy, but it has been articulated mainly through three different interpretations. These are, basically, the notion's systemicity, its knowledge-based nature, and its openness. Each of these interpretations has organized the notion's content in a new way by bringing out dimensions and emphases that have articulated its meaning anew and, in this way, have connected the notion to new politico-historical horizons of action. These can be seen as being historically successive, but they are not entirely mutually excluding; rather they are interlaced with and articulated through each other.

The first interpretation assumed as its starting point the definition, included in the national innovation system, of the systemic, interactive character of the innovation processes. A shift in the technology policy occurred in the 1990s when the emphasis on national competitiveness emerged concurrently as a concern of social welfare. Traditional technology policy has become a science, technology and innovation policy aiming at harnessing competitiveness with the advancement of employment, innovations, and social well-being. At the same time, the linear interpretation of this innovation process was replaced by systemic readings. Whereas according to linear understanding, an innovation process is a succession of distinct, yet consecutive, stages from basic research to research and development, the systemic interpretation views innovations as the result of the interrelations of various actor groups at each stage of the process, as has been mentioned above (Lundvall, 1992: 12-3; see also Kline & Rosenberg, 1986).

The Science and Technology Policy Council (1990) adopted the concept of a national innovation system as a key framework to formulate the aims and scope of science and technology policy. Since then, this concept has been an integral part of the Finnish technology policy discourse. The most important influences, according to Tarmo Lemola (2002: 1485), came from the OECD's Technology and Economy Programme (OECD, 1992) and from the writings by Freeman (1987), Lundvall (1992), and Nelson (1993). In the Finnish technology policy, the concept has been understood to denote a whole set of public and private factors influencing the development and utilization of new knowledge and know-how (Lemola, 2002: 1485). The Finnish policy stresses the "central significance of an extensive *systemic* regeneration of innovation activity and society" from the economic viewpoint (Schienstock & Hämäläinen, 2001: 9-10; emphasis original).

In Finland, the notion of a national innovation system is based on the idea that the components and relationships relating to the developing of 'knowledge and know-how' – the basic elements of the system – can be conceived as a single entity (see e.g. The Science and Technology Policy Council of Finland, 1990: 17). The central value of the term was to enable one to think about these elements, their interrelationships, and the questions concerning the steering and governing of the thus composed, constantly changing structure in a systemic way that transcended the traditional branches of politics. This notion represented a way to recombine the fragmented field of politics from the viewpoint of generating innovations. If the earlier technology policy concentrated on promoting basic scientific research and key technologies because they were seen as starting points for the innovation chain, the concept of an innovation system contains a conception of an ensemble, formed of interlinked components, in which activities are formed into chains as a complex interactive series of events.

Another line of interpretation started to progressively centre on the idea of a 'knowledge-based society'. When Finland was recovering from a recession in the mid-1990s, the Science and Technology Policy Council (1996) introduced the concept of a knowledge-based society as a key vision to direct social development and as a concept to steer the science and technology policy strategy. The view of a knowledge-based society as the model for directing development strongly guided the Finnish science and technology policy in the 1990s (Innovaatiojärjestelmän uudistumishaasteet, 2002: 16). According to Lemola (2002: 1485), the concept and the thinking behind it came from the OECD Jobs Study, an extensive programme that was launched in the early 1990s (OECD, 1994; 1996; 1998). Once the creation of knowledge-intensive jobs was taken as a pronounced objective, it was recognized that a macroeconomic policy and labour policy measures alone could not ensure knowledge-intensive growth and that wide cooperation was needed which would transcend policy sectors (Lemola, 2002: 1485). Like the previous interpretation, the conception emphasizing the knowledge-based character of innovations also organized the fragmented field of traditional policymaking into a single entity, but did so from a somewhat different perspective. The concept of a knowledge-based society stressed the technical dimension of an innovation system and gathered questions relating to society and its development from the point of view of knowledge and technology. In its simplest form, the improvement of a 'knowledge society' – which was, for instance, the aim of the technology policy's definition of the government platform in 1999 – meant the development of the infrastructure founded on information and communication technology. Thus these technologies give

the framework to speak of the characteristics of an information society and a way to legitimize this discourse. Attention is then directed especially to the promotion of "the infrastructure of a knowledge-based society" and the accompanying teleinformatic expertise (The Science and Technology Policy Council of Finland, 1996: 9).

In light of the surveys published by the Science and Technology Policy Council, the interpretation of the innovation system changed from a set of factors influencing innovation generation (The Science and Technology Policy Council of Finland, 1990: 17; 1993: 7) to a system which was enacted between the creators and users of knowledge (The Science and Technology Policy Council of Finland, 1996: 23, 39). The utilization of 'knowledge and know-how' came to the fore and what was foregrounded was the forging of efficient mechanisms for this purpose by means of using information technology, promoting the facilities of individuals and businesses, and developing the interplay between distinct political sectors (The Science and Technology Policy Council of Finland, 1996: 9, 39). The development of the Finnish information society, or at least its knowledge economy variant, thus constituted the framework against which the evaluation of the innovation system took place.

Finally the concept of an 'innovation environment' has started to gain ground as a conceptual perspective of the Finnish innovation policy – emphasizing the idea of openness as opposed to a closed innovation system (The Science and Technology Policy Council of Finland, 2003; Ministry of Trade and Industry, 2004; Sitra, 2005). This concept also provides a means to break away from excessively technology-driven approaches. The technology policy in Finland has been largely technology-centred, expert-intensive, and top down directed, which

are all manifested in the interpretations of the innovation system. In Finland, which retains many bureaucratic characteristics in its polity, generation of innovation has mainly been the domain of engineers. When moving from a technology policy, as it has been traditionally understood, to an innovation policy, the area of politics has been widened to include new points of view such as, for example, viewing the video game industry, although small in Finland, as part of technological production. Innovation policy discourse has also begun to stress so-called social innovations instead of those defined narrowly in terms of technology (The Science and Technology Policy Council of Finland, 2003: 4, 25). Secondly, in contrast to the expert-orientated system, formulations emphasizing activity emanating from citizens have emerged (e.g. Häyrinen-Alestalo & Pelkonen, 2004). Thirdly, a new emphasis has been placed on the significance of strategies stemming 'from below', based on individual actors and firms, for the whole innovation system (see for instance, the Science and Technology Policy Council of Finland, 2003: 32). The concept of an innovation environment constitutes an attempt to open up political discourse in all these directions.

The Finnish interpretation of the innovation system has been emphasized as a wide agreement about the existence, nature, and aims (Rask, 2001: 52) of the system. As Pauli Kettunen (1997), for instance, has noted, there is a long tradition in Finnish social thought to see matters as national necessities, and the notion of an innovation system closely follow this tradition. In this way, the discourse concerning the existence, character and aims of the innovation system is transferred outside politics proper and is apt to become a rather technical question. Thus, although the concept apparently allows multiple ingredients and interpretations, it tends, in the Finnish discourse, to emphasize unity at the expense of pluralism: instead of being a tool of bringing different interests and groups together to negotiate policy options, it rather tends to be presented as if it is an already accomplished totality.

Yet pluralism, that is, disagreement and differences of opinion, is an integral part of a political community. According to a long tradition of political philosophy, a political community is often defined above all by the possibility of disagreement. Conversely, each action that restricts this possibility to disagree is by definition antipolitical. The juxtaposition between contention and unanimity has profoundly shaped modern political history. Insofar as governance, functionality, and efficiency have been emphasized, diversity and disagreement have typically been displaced by a unified form as the foundation of mutual understanding. But diversity is, however, a fundamental part of politics itself, because it serves as an empirical basis of politics, as it were, the ground in and through which politics is articulated. Although today there is an attempt to consider diversity and unanimity as being together, as mutually constitutive rather than mutually exclusive dimensions (e.g. Eriksson, 2008), an innovation system concept cannot, in its political use, set itself completely free from the logic of demarcation and exclusion, which necessarily constitutes an integral part of its political identity.

This tension is reflected in the way the national innovation system has been conceived of as part of broader policy questions and is visible in each of the dimensions listed at the beginning of this essay (i.e. information society, advanced liberal governance and network). Thus, while it is important to improve the intellectual capabilities needed in an information society and promote knowledge-intensive growth, it has been said that development

measures should be "accurately assigned" mainly to higher education and research as well as to the utilization of research knowledge (The Science and Technology Policy Council of Finland, 2003: 57, 67). These measures are necessarily based on boundaries because research financing is about making allocation decisions. Earlier, molecular biology, biotechnology, tele-technology and data transmission, as well as industrial design were specifically named as keys for innovation systems (The Science and Technology Policy Council of Finland, 1993: 37), thus excluding many other innovative fields of study. Furthermore, while it has been significant to point out that the public administration is only one, albeit the most important actor in the innovation system, the Science and Technology Policy Council of Finland (1996: 23) has reported having witnessed in the 1990s, "the development of the whole innovation system in the condition of increasing management by performance". Basically, this means that only top-ranked fields and organizations are promoted, with the ranking scheme and the priorities involved being politically pre-set. Finally, while it has been acknowledged, for instance, that different governmental offices have to be able to work as a single network, reaching this goal presumes that policymaking concerning knowledge and information systems is "adequately centralized" to ensure compatibility (The Science and Technology Policy Council of Finland, 2003: 25). In this way, many fundamentally political issues are continuously organized and problematized in a complex relationship between 'governmental' and 'political' interpretations, that is, between the practical need to set boundaries and priorities on the one hand, and the effort to seek the common good without depending on a principle of exclusion on the other.

Thus, given what has been said above, an 'innovation system' can be understood to refer to an ontological area in which phenomena related to innovation creation come to be seen as constituting an intelligible and yet an open whole. This area is not immutable or static but is instead in constant movement, oscillating between opening and closing tendencies. In his writings Rosanvallon does not view the political as a constitutive area but rather as both a general form of collective action and as a formation process of an actual political community. Thus, there is an apparent tension or discrepancy in the political itself: on the one hand, it is the *field* of collective life, a social framework that brings all the different activities together, yet on the other hand it is a *project*, the process of unification of the social forms of self-description. Self-description is an essential part of society; without it no society would be possible (Rosanvallon, 2006: 34–36, 74). This view becomes more complicated as he further distinguishes between the political principle of democracy (the consistency of the collective subject) and sociological principle (multiplicity as a society of individuals) (Rosanvallon, 2006: 43). The political principle thus unifies and consecrates what the social principle tends to make less coherent. There is always a difference between these principles that cannot be undone: society will never truly be united.

However, it is not necessary to start from empirical multiplicity or tendencies to render it a consistent whole. Instead, one can start from the innermost area of meaningfulness that constitutes the precondition for political programmes and strategies, as I have done in this paper. This area is characterized by ontological openness – it forms a code through which different messages can become intelligible and yet it cannot be a message itself. This

is not the 'idea' of a community but rather a field of meanings in which the idea of a community can come into being. This field tends to change when it is appropriated and utilized in governmental discourse: administration is basically about fixing responsibilities and drawing boundaries to accomplish complex tasks (Kettl, 2002: 74, 153). In this interpretation, the tension in the political is not necessarily characterized by a discrepancy between a fragmented sociological multitude and a coherent body politic. It can also lie between an opening and enabling ontological structure (which does not need to be consistent) on the one hand, and demarcating and closing governance practices on the other.

## Conclusion

This article has, I hope, clarified the often incompatible tendencies inbuilt in the concept of an innovation system and has shed light on the concept's historical change and articulation with respect to these tendencies. The concept aggregates diverse administrative routines, political institutions, industrial and commercial organizations, scientific theories, technology programmes, ways of representation, and forms of knowledge, which are all intertwined in the light of the perspective of knowledge and innovations. Within its framework, it has become possible, especially in the public administration, to conceptualize the questions of national government under the conditions of an information society and global competition. In this way, it relates to the quite practical, circumstantial needs of government. This necessity of government creates an integrated perspective through which it becomes politically possible to think and act on the implications of complicated social processes. This concept brings uniformity and coherence to a given phenomenon so that it can be taken as an object of thought

and action in some consistent way. This is because government always requires conceptual models to organize the area to be governed as an intelligible and consistent field with boundaries and characters of its own (Miller & Rose, 2000: 31). Nevertheless, this uniformity often causes the closure of the field of phenomena to be investigated. For example, the innovation system concept, according to Nelson (1993) in his retrospective conclusion, presupposes a much more fixed national unity than is actually the case. Moreover, it also tends to simplify the institutional and cultural context of innovation activity by having it wholly defined in terms of the commercialization of technological invention (Godin, 2009: 494). Because of its administrative nature, this concept tends to become a closing term: it gathers the field to be governed, localizes its most important players, and defines its boundaries.

On the one hand, the network-like nature of an innovation system leads one to an obvious recommendation: "cooperation and interaction between different parts of the innovation system has to be promoted and encouraged" (Lemola, 1995: 43). Commentators are invariably in agreement on this particular point (see for instance Bessant & Dodgson, 1996; Edquist & Hommen, 1999; Schienstock & Hämäläinen, 2001). On the other hand, the administrative element included in the concept tends to simplify an innovation system into an unambiguous whole as required by political performance. Although the Finnish interpretation has varied and has assumed different emphases, the uniting and unifying drive of the notion has not changed. This is because in order to be a useful tool for governance, the innovation system has to delimit the sphere of action and determine key players in a commonly recognizable way. Political usefulness requires the closure of the concept, which inevitably results in innovation metaphysics.

We need a conception of some common aims and objectives that enable us to identify what is significant and meaningful for us and distinguish this from what is insignificant and irrelevant. Something that is common and shared is therefore indispensable for the *sense* of an action. However, collective goals and common orientations are always based on the mechanism of exclusion: they exclude all that is dissimilar, that which does not accept the common end or does not go with it. An understanding of the innovation system as a coordination tool of a network-economy constitutes this kind of common space through which what is important can be distinguished from what is inconsequential so as to ensure a consistent orientation. Yet an innovation system is an idea of a set of processes and institutions which unavoidably excludes something. It has to be exclusive in order to be a usable political concept. Yet at the same time, it tends to be naturalized, in which case it is not exposed to radical contention and debate. Thus, what it excludes, then, is essentially the contention that characterizes political community. Society, however, is a pluralistic and constantly reorganizing field of practices and relationships that cannot be predefined, certainly not in a way which would result in some kind of completed whole.

The concept of an innovation system is an academic term, but it is also a political and administrative notion. This notion encapsulates a tension in-built in all policymaking. On the one hand, politics strives towards arrangements which could be capable of taking into account the change and transformation involved in any development, the dynamics of phenomena, and the emergence of what is new. In this sense, the concept of an innovation system is also an open one (e.g. Kaiser & Prange, 2004). On the other hand, politics requires concepts that, in order to be useful in operative terms, of necessity exclude all

that is divergent. By enclosing the idea of an open network into a more or less consistent conceptual system, and by acknowledging that the excluded difference is nonetheless constitutive of the identity of this system, the notion of an innovation system brings out the limits within which innovation policy can be articulated today. Insofar as the possibility for disagreement can be seen as being characteristic of political community, then opening the innovation system to radical contention would render it a genuine political concept. Thus, it would also mean the attempt to outline the kind of thought of an innovation policy that is no longer based on the exclusion of difference.

In conclusion, I hope this paper has contributed to research on innovation policies by showing the risks caused by the coming together of an empirically-oriented field of science, technology and innovation policy research with little emphasis on theorizing (e.g. Morlacchi, 2009: 572), and the tendency of new concepts to become naturalized components of the discourse addressing social problems. This can often result in the implicit belief that the political concepts we use do have a pre-political character, as it were, as if representing neutrally what is empirically evident to all. However, while language is an integral part of politics, concepts do have a political dimension. New concepts open up novel ways of understanding and phrasing social problems which, when becoming widely used, have broader ontological implications. Moreover, what often get unnoticed are the tensions and dynamics inbuilt in a given discourse: concepts are not static elements but they have vicissitudes of their own, as exemplified by the transformation of the concept of an innovation system in the context of Finnish technology policy. What is more, concepts have a tendency to become closed by losing both their openness and a living relation to the questions which formed their context

of origin. Yet maintaining conceptual openness is important not only because it keeps alive the links between language and its politico-historical contexts of use, but also because openness has a close relationship to democracy, at least if we embrace de Tocqueville's (1966: 449) view that language must be loose enough to leave the thoughts of democratic citizens play. This analysis of early American democracy implies that any activity which makes abstractions more precise would be undemocratic as they curb the free movement of democracy. If the purpose of policy scholarship is to understand and shape the ways in which key policy actors address society's problems (Morlacchi, 2009: 573), then paying attention to language and the way it is used is an integral part of this scholarship. These points would suggest focusing more closely on the historical vicissitudes of political concepts and their use, with a view to the social forms that these thwart and enable.

## Notes

1 In innovations systems literature, the concept is not normally conceived of as being narrow but, on the contrary, often too broad and all-encompassing (e.g. Edquist 1997; Reppy 2000, 3). However, by simplification I refer not to narrowness but rather to the fact that in order to be a useful concept in policymaking, an innovation system also has to determine what is important and relevant and to demarcate this from what is not, and thus be capable of simplifying and systematizing the domain in question in order to represent it as an intelligible whole in the context it is used (Miller & Rose 2008, 31).

2 This, in fact, is also an important critique of the innovation systems approach, questioning the appropriateness of speaking of a 'national' innovation system as compared to many other,

possible more suitable categorizations, such as regional, technological, or sectoral systems (Nelson 1993; Lundvall 1998).

3 Recent empirical studies on the application of the innovation systems approach to a specific economy include Mathieu & Laberge (2007) and Sharif (2009).

4 See, e.g., Callon (1998, 50) for an interesting analysis of how economics actually creates and not just records the economy by providing the calculating tools for different economic agencies, which then become able to calculate their decision and also to include in their calculations the calculations of other agencies.

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