

# Regional ‘innovation systems’ vis-à-vis ‘innovation support systems’ – Is clarification needed?

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## Abstract

How language is used has political implications as well as communicational consequences. Regional development, using means of systematic support for innovation, is a widespread phenomenon globally that also includes numerous political ambitions and implications. This article argues that ambiguities regarding the use of terms such as ‘innovation system’ and ‘innovation support system’ need to be clarified to improve communication in this field, as well as to reveal underlying political ideas on how systematic support for innovation should be carried out, by drawing on examples from studies of regional systems. Such ambiguities contribute significantly to the often-mentioned lack of involvement and engagement in regional development on the part of higher education institutions and academics. Examining key terms and concepts of this discourse, in the interests of promoting a common and stringent use of terminology, helps to illuminate whether the desired academic involvement in innovation processes relates to ideation, implementation and commercialization, or to support for processes through the contribution of knowledge and expertise.

## Keywords

Higher education institutions, innovation agency, innovation engagement, innovation involvement, innovation process, innovation system functions

## The ambiguities: An introduction

In researching a number of regional innovation systems in Sweden (Swenberg et al., 2019), we have identified some peculiarities in how the concepts of innovation systems and innovation support systems are used and understood. We have found that government employees, academics and intermediary representatives hold different views and mean different things in their use of the two concepts. An example is provided by this quotation from a university representative:

When we discuss the role of this student incubator, it is part of an innovation support function, so to speak. Of course, an innovation system would be something larger, in a bigger context than the things you perhaps think of operatively.

The view of this university representative differs from the following perspective, expressed by a representative from an intermediary organization:

[...] the innovation system not only supports innovation, it also supports growth and competition, start-ups, [...] financing, risk capital, and all those other things as well.

In addition, there are apparent differences in position regarding what innovation support and innovation involvement, respectively, are. Another intermediary representative expressed a strong opinion:

For me an innovation system is really a collection of several systems, aimed at being intermediates, that means to be facilitators for business development, research and innovation.

This is contrary to a regional government representative’s view:

I think one must separate an innovation support system from an innovation system. Often, one confuses “innovation system” with “innovation support system”. And I hold them as two different things, since in the support system the focus is on

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actors and nodes. In the innovation system one should shift the focus more towards the relations and meetings, and what happens between the nodes, really.

As a result of such diverse use of terminology regarding support in innovation systems, communication between the actors is blurred and sometimes becomes negatively affected. When comparing our findings to those of other studies of regional systems for innovation, similar discrepancies prevail. Previous research on how the conceptualization of what an ‘innovation system’ is has developed into a discourse of its own and confirms the fragmented picture (Liu et al., 2015; Martin, 2012; Souzanchi Kashani and Roshani, 2019; Uriona-Maldonado et al., 2012). This is not surprising since these systems have emerged in different ways in different contexts (Njøs and Fosse, 2019).

In the empirical material gathered by the authors of this article, three different perspectives emerge: (a) there are only ‘innovation systems’; (b) there are two parallel systems – an ‘innovation system’ and an ‘innovation support system’; and (c) ‘innovation systems’ and ‘innovation support systems’ are only different names for the same kind of phenomenon, while their definitions are the same. The first perspective, (a), tends to be rather political in the sense that it seems important to defend the one existing system and its all-inclusiveness. Moreover, it is also stressed that the innovation processes – set up, driven, and nourished by the system – should not exclude any party from participation. The second perspective, (b), recognizes that innovation takes place in many different contexts where people meet, share ideas and develop these into improvements or novelties, regardless of how such meeting, sharing and development are encouraged or organized. This is perceived as the actual ‘innovation system’, where innovation processes take place. Once an innovation process has started, it might need help from the outside at particular phases of its development or in the reach for a particular market. All units, set up and organized for any kind of innovation process support, together form an external ‘innovation support system’. The third perspective, (c), seems to mirror (a), but with the exception that there is no political ambition to avoid any party being a ‘support unit’ in regard to the (actual) innovation process. This perspective embraces one system, which includes the two main categories of participants: innovators (including entrepreneurs) and supporters.

The objective of this article is to clarify the ambiguities of the two different terms – ‘innovation systems’ and ‘innovation support systems’ – and to analyse the consequences of their use and political implications, as well as to provide insights for improving the governance of innovation. Taking the Swedish context as the point of departure, the article focuses on the involvement and engagement of the university in innovation processes. For that purpose, the article will consider ideas and attitudes encompassed in the use of the terms ‘innovations system’ and ‘innovation support

system’ and whether those ideas and attitudes are compatible or in conflict. Therefore, we set out to relate university activities, mainly research-related activities, to either innovation or innovation support.

## Emergence of innovation systems and innovation support systems

To our knowledge, the term ‘innovation system’ first occurs in the literature in the 1930s (Coase, 1937), but it is sparsely used until the 1960s, when it occurs approximately a dozen times, and then is increasingly in evidence during the following decade. During the 1970s, it renders an approximate 100 hits in Web of Science, Scopus, World Cat and Google Scholar all together, which increases to roughly 180 for the 1980s, and escalates to more than 1700 during the 1990s. It is then defined by Cooke et al. (1996) as ‘systemic linkages between sources of knowledge production (universities, research organizations), intermediaries (government and private innovation services) and firms, both large and small’, which is a definition clear and wide enough for us to use as a point of departure. From the year 2000, when it is used almost 700 times, the yearly occurrence in the literature increases continually, with the exception of 2012 and 2014, to more than 8000 times in publications since 2018. At this point in time, the term ‘innovation system’ is used also to include the need of public organizations to innovate their activities and services (Bason, 2018; De Vries et al., 2016; Hjelmar, 2019), as well as phenomena framed as ‘social innovation’ (Herrero de Egaña Muñoz-Cobo, 2018; Pue et al., 2016; Raupeliene et al., 2015).

In our research, we have found that the term ‘innovation support system’ occurs for the first time in its own right in the literature in 1979, when McGeown (1979a, 1979b) addresses the prerequisites for innovation in the British public school system. The term is used a couple of times during the 1980s (Grønhaug and Fredriksen, 1986; McGeown, 1980) and occurs less than a dozen times in publications from 1990 to 1994. In the latter half of the 1990s, it occurs almost 20 times, whereas in 2000 alone it is used in 20 publications. The figures are similar for 2001 and 2002, but from 2003 to 2005, the yearly occurrence is approximately 35. In 2006, use of the term ‘innovation support system’ is found in over 50 publications, while in 2008 it occurs in over 60, and from 2011 its use varies between 85 and 130 publications yearly.

Clearly, the term ‘innovation system’ is used more frequently than ‘innovation support system’. However, it is of interest to consider why the latter usage has occurred at all, since it might seem that the former is an all-inclusive term that incorporates all that is distinguished by the latter. Therefore, we undertake a qualitative analysis of how the term ‘innovation support system’ is used, conceptually, in relation to Cooke’s (1996) definition of an ‘innovation

system'. We limit the analysis to the regional innovation context, since that is the context of our study, and also where the relationship to higher education institutions (HEIs) prevails.

### Use of 'innovation support system'

In examining some 101 academic papers and public reports, all of which address regional innovation support systems, the term 'innovation support system' (ISS) is used for purposes ranging from denoting some kind of general innovation support to software applications for specific uses in innovation processes. Our qualitative analysis of those different usages (and meaning implications) has rendered eight main categories:

1. A vague indication of the existence of systematic external support for innovations for those involved in innovation processes.
2. Government support, such as public organizations, and a variety of programs, networks of supporting agencies and institutions, or specific systems of HEIs and intermediaries, R&D support, advisory services, technology innovation and transfer, or financial support, at either regional, national or EU level.
3. Systems of intermediary organizations and agencies as an infrastructure for support services, functions and mechanisms, combining public and private actors, as an external system or network for, primarily, innovating small and medium-sized enterprises (SMEs); also operative at several levels.
4. Systems internal to or dedicated to the spin-off of outcomes from HEIs; either for collaboration with external parties or for commercialization of new knowledge.
5. Intra-organizational (local) general systems for managing and supporting innovation activities and collaboration, excluding HEIs.
6. Specialized intra-organizational systems to support activities such as R&D, knowledge management, synergy of talent or for financial support (these usages occur most often in texts from East Asia).
7. Software to control and manage innovation processes, either for general usage or with specific focuses, such as HEIs, technology-intensive SMEs, or decision-making.
8. The innovation support exists within an innovation system, as either an integral part of it (where ISS = 'innovation system'), or as a sub-system of it, possibly dedicated per sector.

Most of these different usage summaries are derived from the ways in which the term 'innovation support system' occurs in the text. Some authors describe what they mean

by an ISS or explain how it is composed or functions, whereas a few give definitions – for example: Nath (2013) settles for the definition of an ISS as a 'support system for promotion of innovation' (Nath, 2013: 85); Fichter et al. (2016) define an ISS as '[a] support system comprises all actors, institutional settings and resources that help entrepreneurs in innovating successfully' (Fichter et al., 2016: 5); while Hassink (2002, 2004) uses 'a group of actively co-operating organizations that support the innovativeness of small and medium-sized enterprises' (Hassink, 2004: 157) as his definition.

Clearly, the varied usages of the term 'innovation support system' are incompatible, even if some are closely related. The dedication of the term to software (No. 7 in the list above) stands out, since these are just technical systems intended as aids to manage innovation processes. The general use of the term (No. 1) for any kind of external support to innovation is compatible with all the others as a meta term, except in the last example, but is unique in its vagueness, and therefore none of the more specific usages could be replaced by it with their respective meaning maintained. Equating 'innovation support system' with 'innovation system' (No. 8) does not recognize any of the other usages. The main differences between using 'innovation support system' for governmental support (No. 2) or systems of intermediaries (No. 3) are that the former use covers tax-funded support at different levels and a wider range of supported stakeholders and activities, whereas the latter denotes mixed public–private funding via dedicated intermediating parties, and a focus on SME activities. The three other usages, HEI-focused (No. 4), intra-organizational (No. 5) and specialized intra-organizational (No. 6), carry even more focused and limited meanings that point to increasingly narrowed contexts for the application of the term. The narrower the application of the term, the more it excludes other usages.

This variety of ways in which the term 'innovation support system' is applied indicates that support activities which address innovation processes need a vocabulary that expresses in what sense these activities form a systematic approach to innovation support.

### Distinctive differences in involvement

It is thus assumed that innovation, in general, does not take place in isolation but through cooperation and collaboration among people and organizations (e.g. firms), and thus that innovation systems are social systems (Cooke et al., 1996; Fuglsang and Sundbo, 2005; Lyasnikov et al., 2014; Suerdem et al., 2015). Yet, innovation might take place in such diverse settings as within a department of a firm, between two firms or public organizations or between several private or public parties. How such cooperation and collaboration are initiated and accomplished also differs considerably (Cooke et al., 1996; Grobbelaar et al., 2016;

Poti and Basile, 2000; Thomas, 2010). Therefore, the systems in which innovation takes place may differ by societal sector and geographical conditions, while still being systematic with regard to the operational aspects of cooperation and collaboration. Further, the parties involved in each innovation process might be wholly self-sufficient or might need support in a variety of ways, depending on the individual parties, their competences and resources, or even the structure of the particular societal sector.

From the papers analysed regarding regional systems for innovation, it is clear that all usages of the term ‘innovation support system’, except No. 8, consider the support of innovation as something specific and of categorical difference from innovation itself. Therefore, we argue for an analysis that distinguishes between different processes, agencies, involvements, functions and contributions regarding innovation. To do so, it is useful to recognize two kinds of systems that operate in relation to each other: innovation systems and innovation support systems. The two different systems are in themselves neither homogenous nor distinct in their scope. An innovation system can take many forms. It can be entirely regional and contain few actors, but it can also be a global network spanning many different business sectors and academic disciplines. In addition, two innovation systems within the same geographical region can operate wholly separately from one another, depending on the type of business, industry or societal sector. Moreover, the support system itself can provide support for a large number of innovation systems or for solitary innovators.

Hence, the significance of innovation support systems, in the regional setting, is to provide agents, services, functions and mechanisms that support innovation, regardless of how the innovation system is set up or operates. The support system must then be adaptable to a wide range of needs, depending on the involved parties and the functionality of the specific sector.

The implications of the different perspectives encountered in our research relate to the agencies of those participating in the regional innovation system and/or innovation support system: companies, public administrations, intermediaries and universities. Regarding universities, the two-systems perspective, (b), allows academics to make a clear distinction between their involvement in what are knowledge- (or research-) related activities, and what are business-related activities, whereas the other two perspectives, (a) and (c), do not, but might instead be seen as a threat, with the risk of steering research questions away from the academic researcher’s interests, and thus becoming incompatible with the core values of academic freedom. For companies, government administrations and intermediary organizations, there are arguments that a one-system perspective, (a) or (c), is important in that it does not diminish the contribution of any party to the innovation process, even if roles differ, which might be the case with the second two-systems perspective.

Nevertheless, we argue that there are quite a few ambiguities involved in the use of a single term for all – innovation system – a term that does not recognize the difference in perspective and involvement following from participation in innovation, or supporting innovation by providing a service. These ambiguities blur the understanding of what kind of involvement and engagement is expected from those who participate. Particularly, this confuses understanding of what is expected from academics at the university: involvement in innovation by exploitation of knowledge as ideation, targeted for commercialization; or expert support for ongoing innovation. An innovation system that includes all does not discriminate between what kind of involvement or engagement is required from whom.

At the other end of equating the term ‘innovation system’ with ‘innovation support system’, there is another set of ambiguities: when support of innovation is the main phenomenon, much of the innovation taking place in regions, as well as at HEIs, is excluded. Incubators, science parks and other intermediaries are important as innovation facilitators, but there are several other actors to be recognized, such as clusters, test centres, Triple Helix entities, and many kinds of business networks.

Officially recognized initiatives at HEIs, such as collaboration centres, or knowledge transfer efforts are also highlighted, but many other innovative activities taking place during daily operation at departments and research centres become excluded – for example, researchers who do not think of their research in terms of traditional ‘innovation’, which is especially common in the humanities and social sciences.

## Conclusion

The main conclusion of these observations is that different parties of a regional innovation system or innovation support system may have different needs with regard to how they discriminate between activities and involvement in such systems, according to their respective agency. For some, involvement itself is at the core; for others the supporting functions are of prime importance; whereas for yet others the divide between ideation and business is the most important one. We conclude that, by clarifying these different points of interest, as well as the range of functions in a system, involvement, engagement and collaboration between a university and its collaborators in a regional system might be better facilitated.

There is, as we have just shown, a need for deeper understanding regarding the ideological as well as cultural preferences included in any language or specific terminology being used. Particularly, how core concepts are used may help, or disrupt, the clarification needed to enhance communication between parties, and thereby make expectations overt or diffuse.

There is also a need for a vocabulary that clarifies, on the one hand, the distinction between innovation activities, processes and involvement and, on the other hand, support services, functions and mechanisms. For the fulfilment of systematic innovation, as well as its support, there is a need for a variety of different agencies and roles, each with inherent expectations. A distinct vocabulary makes expectations clear, and thus improves communication and collaboration, and provides a better prerequisite for the involvement and engagement of the HEI, perhaps not only in the regional context, but also locally, nationally and internationally. With unveiled expectations, the social relationships of which systematic innovation is composed may develop in a more untangled way.

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