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Online platforms for smart specialisation strategies and smart growth

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Abstract

This paper reports on the findings of the Online-S3 project, funded under the Horizon 2020 Programme (ISSI-4-2015), which tries to address the challenge of strengthening regional smart growth policies by developing an online platform for policy advice. The Online-S3 Platform offers a web-based environment for supporting the design, implementation and assessment of Research and Innovation Strategies for Smart Specialisation (RIS3) aiming to enrich the methodological framework that is being used towards enhancing smart growth policy design processes in EU regions. The paper first provides an overview of the Online-S3 platform, and then, focuses on the applications that could be used to help regional and national authorities during the priority setting phase of a RIS3 strategic planning process. Given that this phase relates to the identification and selection of specific sectors that can be used as flagships to support regional growth, the Online-S3 Platform offers a great tool towards enhancing the effectiveness of the smart growth paradigm.

Keywords: Online platforms, Regional innovation, Regional economy, Smart specialisation, RIS3, European Union, Entrepreneurial discovery process.

1. Introduction

Policy design is an inherently complex activity that ordinarily involves multiple stakeholders and a plethora of insufficient information. Two features that have been identified as essential for improving strategy formulation processes are extended quantitative analytical exercises and enhanced stakeholders' participation (Rowe and Frewer, 2004; Charalabidis *et al*, 2010; Komninos *et al*, 2014a; Panori *et al*, 2016). During the last decade, data collection and analysis have emerged as two of the most valuable assets, not only for entrepreneurs concerned with leveraging new market opportunities, but also for regions, which are required to design innovative strategies for strengthening their economic growth models. At the same time, the emergence of digital platforms as an intrinsic feature of the continuously evolving economic structure, has opened new opportunities that relate to issues concerning stakeholder participation and the exploitation of sophisticated data. Platforms offer cyber-spaces which enable the formation of new ecosystems, where users can effectively collaborate across a broad range of activities (Oskam and Boswijk, 2016; Kenney and Zysman, 2016 Biber *et al*, 2017). In addition, platform environment can also be exploited in terms of lessening transaction costs, preempting market failures and reducing instances of incomplete data (Parker *et al*, 2016).

The emergence of the platform economy was initially characterized as a "disruptive innovation" phenomenon, as a result of the re-interpretation of traditional socio-technical and business practices. However, the rise of the platform capitalism has created important challenges, mainly due to the creation of new forms of digital economic circulation. An example of this, could be idle assets exchange by geographically dispersed areas, which are connected through online communities, despite the absence of any geographic proximity (Langley and Leyshon, 2017). In this changing scenario, platforms have become a new type of "mediator" for socio-technical and business arrangements, affecting a broad extend of already existing capitalization processes. Thus, the platform economy has resulted in a re-organization of economic activity, specifically by resetting entry barriers and changing the logic of value creation (Kenney and Zysman, 2016).

Whilst various characteristics can be used for platform typology, some of the most prevailing platform types include: i) platforms for platforms; ii) platforms that provide online digital tools and support the creation of other platforms and market places; iii) platforms mediating work; iv) retail platforms; and v) service-providing platforms (Kenney and Zysman, 2016). In most of the above-mentioned categories, platforms act as knowledge operators (Langlois and Elmer, 2013; van Dijck, 2013; Schwarz, 2016; Angelidou and Psaltoglou, 2017), offering a smart environment for business processes to be undertaken and promote evidence-based decision-making. Intelligence generated through data generation and analysis, can lead to entirely new opportunities for those who have access to the data (Schwarz, 2016; Angelidou, 2017; Panori *et al*, 2017).

This fast-paced transformation of the digital platform economy, from a "disruptive innovation" to, what is today, an essential feature of regional economic structures, has had a significant impact upon policy design in EU member states. Literature on emerging technologies for strategic planning reveals that the use of platforms as decision-supporting tools has altered existing forms of governance, strengthened public participation and enabling sophisticated data analysis. The use of platforms for developing policy design frameworks, specifically intended to foster innovation and smart growth policies, have not yet been adopted by policy-makers to any great extent (Angelidou *et al*, 2011; Komninos, 2014; EC, 2015; Angelidou *et al*, 2017; Panori *et al*, 2017). In the case of European Union, Research and Innovation Strategies for Smart Specialisation (RIS3) have been identified as the primary policy framework to cultivate smart growth (EC, 2014). In accordance with the official guidance, these strategies should be formulated by adopting an entrepreneurial discovery process; a practice of '*choosing races and placing bets*' rather than '*picking the winners*'. Consequently, strategic interventions should be precise, continuously updated and guided by evidence which is appropriate to the regional context. At the same time, outcomes should be closely monitored and evaluated, using both quantitative and qualitative metrics and data.

Situated within these terms of reference, this paper attempts to shed light on the capability of platforms to reveal opportunities for regional growth. The Online-S3 project, funded under the Horizon 2020 (ISSI-4-2015) programme, directly addresses this challenge by developing an online platform for policy design. The following sections provide a brief description of the Online-S3 Platform, focusing mainly on the applications that have been developed to foster regional growth opportunities.

2. The Online-S3 Platform: Applications for regional growth

Given the sharp shift towards an evidence-based policy design framework, EU regions are required to design and implement RIS3 as an *ex ante* conditionality in order to receive funding for research and innovation from the European Regional Development Fund (ERDF). To facilitate and streamline this process, the European Commission has published a Guide to RIS3 (Foray *et al*, 2012) and a handbook for implementing Smart Specialisation Strategies (Gianelle *et al*, 2016), which taken together provide a set of methodological steps advising national and regional governments on RIS3 development. Whilst these publications provide valuable resources to facilitate RIS3 design and enable the subsequent implementation process, the inputs considered are mostly concerned with developing the methodological framework, and as a result, somewhat neglect the operational directions that could support the delivery of the methodological tasks in a streamlined and user-friendly way (Reid *et al*,

2012; Iacobucci, 2014; Komninos *et al*, 2014b; Kroll, 2015; Capello and Kroll, 2016; Griniece *et al*, 2017). Having identified this discrepancy, it would appear that the development of tools for quantitative analysis during the strategy formation process could be crucial in transforming available data into intelligence and thus, leverage hidden opportunities for economic growth at a regional level.

The Online S3 Platform which the authors refer to in this paper, is designed to address the current challenges and shortcomings of RIS3 design, implementation and assessment. The platform itself is a web-based environment that enables a community of stakeholders to navigate through the six phases of RIS3 strategic planning. At the same time, the idea of developing an open platform for policy design, as the Online-S3 Platform, lies on the context of promoting a sharing economy model[1] for smart growth. Under this context, it offers a peer exchange and learning space that triggers potential innovative interactions between sectors and regions, which may lead to disruptive synergies, acting as boosters for smart growth policies. In addition to this, the Online-S3 Platform aims to provide the necessary means to monitor and assess implementation of RIS3 policies.

By adopting a connected intelligence approach, the Online-S3 Platform uses smart assistance and roadmaps to: (1) standardize and automate the tasks of strategy elaboration; (2) provide access to databases guiding strategy formulation; and (3) enable participatory co-design that facilitates the potential for collaboration amongst various stakeholders. Within the platform ecosystem, co-creation emerges as a product of effective interaction between users. Data analysis techniques can then be combined with knowledge co-creation, further illustrating the capability of platforms in policy design (Angelidou *et al*, 2012). These features enable the community of stakeholders to interact with each other, reinforcing a collective intelligence model, that is both creative and effective.

This section presents a group of applications included in the Online-S3 Platform, which have been developed to support RIS3 development, with the specific intention to exploit underlying growth opportunities at a regional level. As previously stated, the design of the Platform is based on the premise of connected intelligence, where the key objective is to provide the user with a helpful guide for designing a RIS3 strategy, by offering a comprehensive framework of information to guide them through the process. In acknowledging the existing literature on platform development (Choudary, 2015; Langley and Leyshon, 2017), the typical structure is based on three overlapping layers: (1) cloud hosting of applications; (2) online databases; and (3) online collaboration and consultation (Fig.1). These structural elements are presented to the end user as three main functions (The Guidance, the 29 Applications, and an online Forum for discussion) that co-exist and co-operate within the Online-S3 Platform.

The Guidance section includes a content management system, offering an introduction to the RIS3 policy design concept, where some brief descriptions are provided, including *What is RIS3?* and *How to form a RIS3?* A set of external links are also provided, redirecting the user to relevant sites and supplementary material, such as the JRC's S3-Platform (http://s3platform.jrc.ec.europa.eu/) and a set of working papers. Detailed descriptions for each of the 6 phases of the RIS3 development process are also provided within the Guidance section, which highlight the main linkages and interactions between them. Furthermore, the forum provides a discussion place for users to interact, including participants from all components of the quadruple helix, aiming to facilitate and promote collective intelligence processes throughout the RIS3 strategy design framework (Carayannis and Rakhmatullin, 2014).

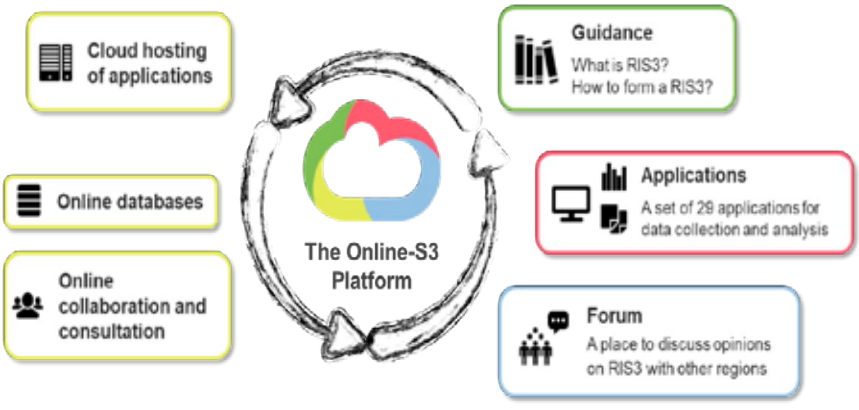
Whilst stakeholder participation and guidance are essential components of the Online-S3 Platform, the development of the applications lies at the core of the institutional empowerment that the platform aims to achieve. Given that each of the 29 applications have been developed as stand-alone tools, it is not necessary to use the applications in a complete and/or sequential manner. Thus, it is possible to combine or group them in multiple ways, based on the specific nature of each issue under consideration; in this way fostering the innovation capacity of the platform (Hargadon, 2003; Williamson, 2016).

In this paper, the authors have focused on applications that specifically relate to the priority setting of the RIS3 policy design, a phase that considers emerging growth opportunities aiming to

[1] On platform for growth typology, see: http://emeraldinsight.com/doi/full/10.1108/JTF-11-2015-0048.

foster regional smart growth in EU regions. Below, a set of four core applications are presented targeting on revealing emerging sectors of production and helping to identify novel growth opportunities across the EU regions.

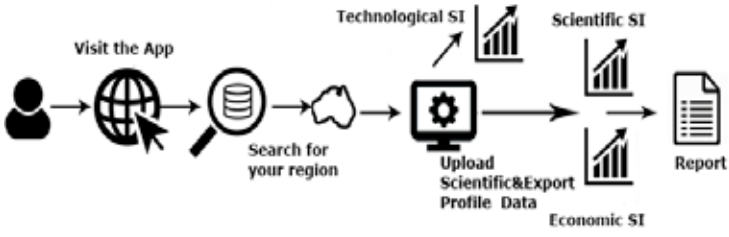
Figure 1: The Online-S3 Platform layers and main functionalities



Application 1: Specialisation Indexes

In analysing existing regional assets, regions should further investigate their key strengths and advantages, in terms of technological and economic specialisation. This application offers an opportunity for platform users to explore the three most important categories of regional specialisation; technological, scientific and economic. In doing so, the user is presented with the following options: i) to search an existing database to determine the revealed technological advantage (RTA) across various technological sectors within a region; ii) to establish the scientific profile of a region, based on publication data obtained from Scopus; and iii) to calculate the regional comparative advantage (RCA), based on trade flow data that users can upload. Fig.2 illustrates the schematic structure of the application, including the information flows between the different stages of the application.

Figure 2: Structure of Specialisation Indexes application. Online-S3 Platform (www.s3platform.eu)



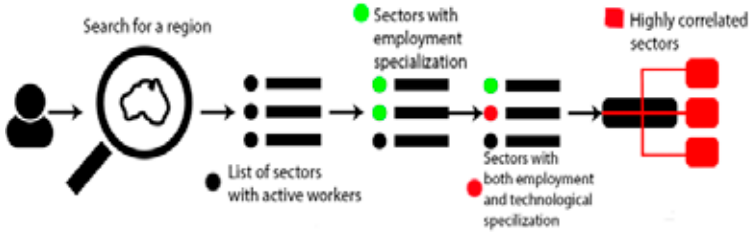
Application 2: Related Variety Analysis

Related Variety Analysis is an application that is designed to identify highly correlated sectors which can represent underlying regional growth opportunities (**Fig.3**). Related variety refers to the variety of industries within a region that are cognitively related (Frenken *et al*, 2007) and maximise the potential for learning opportunities and growth of existing industries, as well as the local sources of growth for new industries (Boschma, 2014). As a method for policy making, related variety can be used to define the level of industrial diversification or the degree to which different industries of an area share common knowledge bases which allow interaction and knowledge spill-overs to occur.

Combined with other methodologies, related variety facilitates decision making through the selection of investment priorities for future specialisation. The identification of such sectors is found by means of combining data from two discrete sources: i) sectoral employment data from EUROSTAT; and ii) patent data from PATSTAT. The application adopts the following logic: First, the application reveals the most specialised sectors, in terms of employment and technological specialisation, based on

the available data, and; secondly, linkages between the NACE[2] sectoral codes and the International Patent Classification (IPC)[3] categories are constructed, leading to the identification of a set of highly correlated sectors within a region. The merging of these two datasets is enabled by the compatibility of the IPC V8 and NACE REV.2 codes (van Looy *et al*, 2014).

Figure 3: Structure of Related Variety Analysis application. Online-S3 Platform (www.s3platform.eu)



Application 3: EDP Focus Groups

Information obtained through the use of *Specialisation Indexes* and *Related Variety Analysis* provide a baseline upon which policy-makers can prioritise wider sectors of the regional economy, focussing on those sectors that have the greatest potential for growth. However, it is beyond the scope of these applications to specify precise interventions required to progress.

To meet this requirement, the Entrepreneurial Discovery Process (EDP) Focus Groups application provides a content management tool that facilitates the organisation of an EDP group meeting. An additional feature of the application is the provision of publicly-available documents relating to the process. Such documents might include agendas designed for EDP meetings, as well as thematic reports related to specific economic sectors which illustrate the main outcomes obtained from previous EDP activities. This repository of information is a feature of the connected intelligence approach which underpins the Online-S3 Platform, offering an accumulative expansion of the knowledge-base, upon which new EDP processes are designed. Sectoral categorisation of the EDP outcomes is another helpful feature of this application, not only in reducing the search time but in categorising the results obtained.

Application 4: Intervention Logic

The Intervention Logic application displays the intelligence gathered in the form of a schematic dashboard that enables users to review and elaborate their selected interventions. The design of an intervention logic starts with understanding both the problem to be addressed and the desired outcomes to be achieved, specifying the program logic, and building stakeholder consensus related to this theory of change. The systematic recording of information, emerging from different phases of the RIS3 design process, provides an effective way for maximising the impact of the selected strategies. To this end, this application provides a synthesis of outputs coming from analytics tools, as well as tools for policy design. The connection between these two different types of information constitutes the main added value of this application, as it aims to determine the causes of possible implementation failures, as well as identifying potential solutions based on the evidence-based analysis. A set of questions included in this application requires the user to rationalise their selections, with regard to the selection of specific indicators and action plans.

3. Discussion

At present, the platform economy is growing exponentially, affecting transformation processes of regional economic structures, as well as the emergence of knowledge driven growth models and new forms of policy design. Sophisticated methods focusing on regional specialisation and related variety analysis are two core elements of the smart growth paradigm, which itself is grounded in an evidence-

[2] NACE codes: Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008). http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NACE_REV2

[3] International Patent Classification (IPC): http://www.wipo.int/classifications/ipc/en/.

based approach to policy formation. Within this context platforms can act as facilitators for regional growth, as they can easily reinforce peer exchange and mutual learning experiences, through their sharing information character, as well as enable regional authorities to adopt sophisticated techniques throughout their decision-making processes. Innovation emerges as an outcome of this connected intelligence approach, that aims to link interdisciplinary actions, from data generation to public participation.

The Online-S3 Platform has introduced an online space for facilitating the design and implementation of RIS3 strategies. In doing so, the platform intends to foster innovation and smart growth policies through data exploitation, systematic guidance and sharing economy aspects, such as public deliberation and peer experience exchange. Applications presented in this paper focus on facilitating effective prioritisation of emerging regional sectors, where synergies between regions or thematic areas could arise, reinforcing smart growth. Thus, it becomes evident that online platforms facilitate knowledge production, by using a central domain to share and disseminate policy outcomes, leading to proliferation of novel ideas and knowledge spill-overs between the regions, a process that lies in the heart of smart growth paradigm.

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