FABSPACE 2.0: THE OPEN-INNOVATION NETWORK FOR GEODATA-DRIVEN INNOVATION

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ABSTRACT

The FabSpace 2.0 project (the open-innovation network for geodata-based innovation – by leveraging Space data in particular, in universities 2.0), funded by European Union under the Horizon Programme, aims at making universities open innovation centres for their region and improving their contribution to the socio-economic and environmental performance of societies. In order to achieve these general objectives, the FabSpace 2.0 project focuses on Earth observation data, an area with high expected socio-economic impact. In this context the universities involved in the project must endorse a new role beyond knowledge providers: co-creators of innovations. This does not mean that they will replace businesses and give up basic research, but that they collaborate with businesses to tackle market challenges and capitalize on opportunities.

Index Terms— Technology Transfer, Open-data, Fablab, Geoinformation

1. INTRODUCTION

The major challenge universities are facing is their full realisation as innovation generators. Universities are funded as an investment in the production of knowledge on behalf of society, so that there is a need to increase the usefulness of academic research. University resources (knowledge, advanced technologies in particular) are a key asset to foster innovation and growth, however they are underexploited. This analysis is developed in the 2014 Independent Expert European Group Report on Open Innovation and Knowledge Transfer [1]. In spite of the recent revolution that has widespread technology transfer offices in universities in the last decades (technology push model); the rise of open innovation has changed the paradigm on the innovation process, from linear to a complex system with a range of contributors. That is why co-creation must become the new approach to innovation at university.

Now that the Galileo and Copernicus satellite programmes are entering their operational phase, innovation possibilities in the field of satellite data applications are getting huge. Thanks to these two massive investments in technology, European and worldwide companies are starting to benefit from increasing, regular and cheaper (not to say free of charge) data flows, which could lead to the development of new and innovative applications and services in an incredibly vast range of markets, including non-space markets [2]. The exploitation of satellite data, as well as open data (from public authorities in particular) has the potential to generate a lot of innovations. In this context the FabSpace 2.0 project aims at putting the Universities at the front line for the take-off of Earth Observation based applications worldwide. This can be pursued by hosting and animating open places dedicated to geodata-driven innovation where young developers from the civil society, experienced developers from industry or academic research, public administrations as well as civil organisations can meet, work together and co-create new tools and business models. They can create an ecosystem fitting (and developed according to) the particularities of geodata-driven innovation, in particular for the emergence of Space data downstream services. In this innovative environment, innovation is driven by the needs of users through the involvement of civil society in the innovation process. Innovation challenges will be provided by civil society organisations. Moreover the actors making innovation will be anonymous civilians (students and researchers in particular) and will thus be at the same time developers and end-users of the applications they develop. That is why the FabSpace 2.0 project is expected to improve the capacity of Universities to generate more innovations and generate positive socio-economic impact (Fig. 1). All partner universities are centres of excellence in research in

geomatics and space based information. They can not only offer a high-qualified human capital likely to generate innovation, but they also provide open access to data generated within previous research works. Thus the FabSpace 2.0 project can be a particularly relevant opportunity for research teams to make a step forward towards Science 2.0.

2. THE FABLAB CONCEPT

FabSpace 2.0 is fully committed in disseminating among students and researchers in particular the Science 2.0 approach: Open access to research data, Open research collaboration based on the Open source software collaboration, data-intensive innovation, involvement of citizens and civil society organisations. The greatest achievement of this new approach to innovation is the Fablab phenomenon. It has been developed in late 1990s in Massachusetts Institute of Technology [3]. A charter defines what Fablabs are:

• They enable invention by providing access to tools for digital fabrication, that is to say an evolving inventory of core capabilities to make (almost) anything, allowing people and projects to be shared
• They provide operational, educational, technical, financial, and logistical assistance
• They are available as a community resource, offering open access for individuals as well as schedules access for programs
• They form a global network
• They prompt users not to hurt people or machines (safety), assist with cleaning, maintaining and improving the lab (operations), and contribute to documentation and instruction (knowledge)
• They allow inventors to protect and sell designs and processes developed in the labs, but inventions are expected to remain available for individuals to use and learn from
• They can prototype and incubate commercial activities expected to grow beyond rather than within the lab and benefit the inventors as well as labs and networks that contribute to their success.

The Fablab concept relies on two major models coming from software development:

• Open source: an open-source software has a source code made available to people for free distribution, access and creation of derivative softwares
• Open collaboration: it can be seen as a collaboration based on three principles of egalitarianism, meritocracy and self-organisation. In other words, it is defined as any system of innovation or production that interacts to create a product or service of economic value, which they make available to contributors and non-contributors alike [4].

Built around the "Do It Yourself" concept, these new generation initiatives are open to entrepreneurs, designers, artists, handypersons, students, etc… and provide all kinds of tools to the public, including computer-monitored machine tools to design and build unique objects, such as decorative or replacement pieces. By bringing together all kinds of populations, age groups and trades, Fablabs represent a unique meeting environment dedicated to creativity and open collaborations. The Fablab model fits totally the challenges universities are facing. Universities could therefore widely benefit from the Fablab experience, adapting it to their own specific ecosystem.

The last point now is how to get from the Fablab to the FabSpace model (Fig. 2).

A Fablab is a one-stop shop access to any materials, machines and tools to digitally manufacture new products. A FabSpace is a one-stop shop-access to Space data and a wide range of other data as well as free software and data processing tools to develop new digital applications.
Apart from the non-manufacturing nature of machines made available and the software nature of innovations resulting from a FabSpace, every characteristic of Fablabs are found in FabSpaces.

3. THE PROJECT

FabSpace 2.0 project (www.fabspace.eu) received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement no. 693210. It brings together universities and business and innovation support organisations in six European regions: France, Italy, Belgium, Germany, Poland, and Greece. The 6 partner universities collaborate with 6 co-located business-oriented organisations (ESA BICs and/or triple-helix clusters) to strengthen the link with business and foster co-creation. Civil Society Organisations have been also involved in the project. In each partner university facilities a data management infrastructure able to ingest, process, store and disseminate data/metadata to allow the development of new services, algorithms, software and applications using spatial data has been deployed. The objective is not to develop new infrastructure but to provide universities with an existing infrastructure able to foster innovation. Within FabSpace services, users will have access to such a facility, moreover they will be provided a technical support by people trained to the huge possibilities that the platform offers. This is a sine qua non condition for the full realization of FabSpace services as innovation generators. In the following other main activities considered in the project are quickly presented.

One identified obstacle to the enhancement of the innovation potential of students is the lack of promotion of

entrepreneurship at university. That is why through an exchange of best practices each university is implementing an entrepreneurship-oriented program. As for researchers, they have often not been delivered training on innovation leadership. This is an obstacle for the realisation of their creativity and innovation potential. That is why within the FabSpace project local partner business & innovation support organisations, working closely together with universities to create new training contents for researchers, consisting in new training seminars among the offer of professional trainings that researchers are invited to attend.

The capacity of students and researchers to innovate depends not only on the attractiveness of entrepreneurship but also on their access to a knowledge base dealing with technical issues in particular. That is why a MOOC (Massive Open Online Courses) aggregator will enable an access to any MOOC in relation with FabSpace matters: geomatics, space science, computing science, software use, etc.

Each FabSpace will offer a "Space Science Shop" service, that collects the needs and the societal challenges of these external stakeholders, linked to application domains of Earth Observation (EO) and satellite navigation uses (i.e., Agriculture and Forestry; Energy; Environment and resource efficiency; Intelligent Transport Systems; Smart cities; Health and well-being). The scope is to provide independent participatory research support in response to concerns experienced by external stakeholders, offering a demand-driven and bottom-up approach to the FabSpace facility and screening questions provided by these stakeholders. The Space Science Shop staff will translate these questions into challenges for the contests.

Three runs of local workshops will be organised during the project. They will take the form of business plan competitions and local hackathons/appathons which will be organized by the Business partners in collaboration with the universities and will take place at the same time in all FabSpaces or in the incubation facilities. Each local contest will be based for instance on the challenges identified in Space Science Shops and cover different domains such as the ones previously identified. Participation is expected to build cross-sectoral and multi-disciplinary collaborative teams as the diversity of applicants is a prerequisite for the emergence of innovative ideas. Among the 6 local winners of each FabSpace, 1 team will be selected as "local overall winner". The local overall winners will be invited to participate to a European contest at the end of each run of local contests.

2017 will be the crucial year for this project so it will possible to show its preliminary results under various perspectives: changes in the involvement of universities and research organisations in innovation activities regarding EO, creation of new start-ups, increase of the use of EO data in public administrations, increased innovation leaderships of researchers.

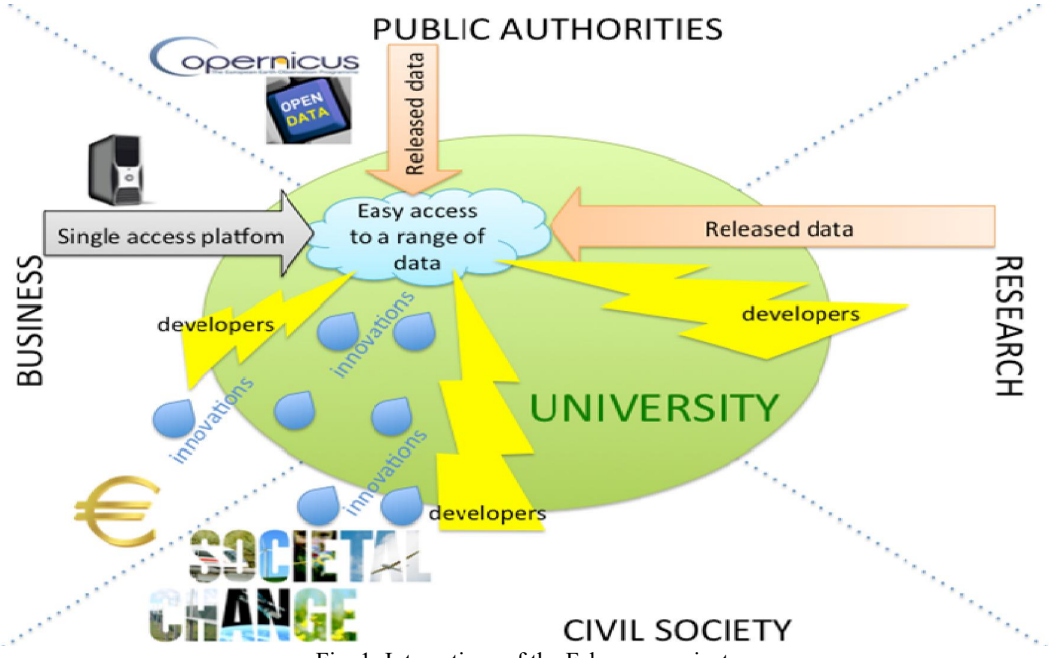

Fig. 1: Interactions of the Fabspace project

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Fig. 2: The Fabspace model