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Digital Playbook Strengthening Valorisation of Research and Innovation Infrastructures

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Abstract: The current green and digital transitions as well as demands arising from the global competitiveness targets set European industry in a challenging position. Simultaneously, the pandemic has limited our possibilities for traditional face-to-face collaboration, and many new ways of working are here to stay. The services and platforms offered by university-based research and innovation infrastructures are often lacking the point of view of other stakeholders' interests. Nor do they emphasise new initiatives towards more effective and collaborative innovation management actions targeting for example business opportunities and commercialization. In this paper we present a Digital Playbook approach facilitating the process to plan and pre-segment the standard service pathways for the benefit of more effective valorisation of research and innovation infrastructures. Embedding the digital tools into the process enables a larger number of innovators to be engaged and thus cultivates a prospective and creative innovation environment.

Keywords: Digitalisation; valorisation; research and innovation infrastructures; innovation ecosystem; triple helix; knowledge transfer.

1 Introduction

Problem to be addressed

European Commission's recent policy priorities such as green transition, digitalisation and resilience are challenging all types of organisations to re-think and re-design their services and collaboration methods (COM(2021) 118 Final; COM(2021) 350 final). This is true also as concerns innovation management tools connected with more effective valorisation of research and innovation infrastructures, mostly requiring extensive and long-term investments in both newest technology and high-level expertise.

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Currently, research, demonstration and innovation infrastructures along with their related co-operation services offered by universities to enterprises and other triple helix (Leydesdorff 2012) stakeholders are designed mainly based on specific research topics. Therefore, the services offered are often lacking the point of view of industrial interest or new initiatives towards new business opportunities and commercialization.

For enterprises, university infrastructures often appear only as showrooms of university's research expertise. Demonstrations, pilots and the co-creative expertise leading to genuine changes in companies' products and services, processes and business models are often not available, or at least not easily visible and accessible.

Goal and objective

In our approach towards increased and more effective valorisation of research and innovation infrastructures, we want to turn the picture upside down. Development of infrastructure services must be customer-based, understanding and highlighting the needs and expectations of industry and other stakeholders. In this process, enterprises can be identified and segmented into wider categories with specific features and expectations such as technology and innovation awareness and assessment.

In this paper we present the Digital Playbook for research and innovation infrastructures prepared for different situations and stakeholder groups. The Digital Playbook facilitates the process to plan and pre-segment the standard service pathways. Embedding the digital tools into the process enables a larger number of innovators to be engaged and thus cultivates a prospective and creative innovation environment.

2 Setting the scene

World of today is facing several major challenges such as climate change and aging of societies, which must be urgently addressed. For many of those challenges, research and science are expected to be the driving forces for positive change. As a response, European Commission has established remarkable policy level strategies and recommendations such as Green and Digital Transformation and European Research Area (European Commission, Directorate-General for Research and Innovation 2021). Nevertheless, despite the ambitious goals set by the high-level polices, the gap between research and innovation is often profound and difficult to be bridged at practical level.

To accelerate the uptake of research and innovation results by society, the EU valorisation policy has been introduced (European Commission, Directorate-General for Research and Innovation, 2020). It aims to involve all the players in the process to transform these results into sustainable products, processes and services that bring added value and sustainable impact for the society at all dimensions, namely economically, environmentally, and socially.

One practical element which can significantly contribute to the improved valorisation level is presented by the existing and new research and innovation infrastructures (RIIs), especially hosted by educational and research-driven institutions. These infrastructures often require extensive and long-term investments both in new and emerging

technologies and in high levels of expertise. However, the utilisation degree of RIIs is frequently relatively low due to missing or inappropriate service models.

To increase the efficiency and consequently also the valorisation of the RIIs to the society at large, close collaboration and co-creation with all quadruple helix stakeholders, i.e., universities, industry and SMEs, public authorities, and citizens should be guaranteed. Embedded features of capability offering, service and collaboration model of RIIs presented in the context of the Digital Playbook approach include, e.g., digitalization, improved agility and dialogue, accessibility and sustainability, and co-creative continuous capacity building of talents.

3 Digital Playbook Approach

A Digital Playbook as developed by Tampere University of Applied Sciences (TAMK) and its key partners and stakeholders in Tampere Region refers to a light guide or agreement on how to operate within university-based research and innovation infrastructures. In addition to tutorial guidance and agreements of collaboration, the Digital Playbook is a set of pre-prepared, situational and customer-oriented service offerings. This offering includes e.g. virtualised infrastructure capability presentations, access to technology demonstrations via online channels, and digital self-assessment tools for organisations' capacity, innovation and awareness levels.

Digital Playbook supports various types of organizations making use of the research and innovation infrastructures to learn faster, to build and transfer knowledge and competences within themselves, and to develop their operations whilst embedding the benefits from the use of new technologies and knowledge. It offers an easy step-by-step guidance for infrastructure owners how to promote their testbeds, platforms and related services for external usage. In addition, the Digital Playbook guides external users on how to operate in these infrastructures specifically as regards contact persons and access to the services, actual services available and pricing options. In addition, the digitalisation of the Playbook enables embedding virtual tours with demonstration videos to improve understanding of opportunities of new technologies and equipment available in the infrastructure. Traditionally, often only lists of devices and nominal operational accuracies are presented online.

Demonstrations, pilots and the co-creative expertise presented via Digital Playbook is expected to lead to genuine changes in external customers'/stakeholders' products and services, processes and business models. Specifically, there is a need to address and enhance the competitiveness of small and medium-sized (SME) companies. In TAMK's Digital Playbook, a particular focus is on the manufacturing SMEs, which often have scarce technological resources to keep pace with larger companies. Introducing the Digital Playbook will help them to exploit opportunities, increase their level of digitalisation while simultaneously supporting them to grasp the business opportunities based on the twin transition and sustainability requirements.

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TAMK Digital Playbook

TAMK Digital Playbook aims to support the innovation management capabilities and processes of various stakeholder groups, especially SMEs, who use university-based research and innovation infrastructures. Features which need strengthening include availability and easy access as well as attractive and straightforward service paths guiding customers and partners along the journey. Challenges related to timing, urgency and resources available can be helped through implementation of the Digital Playbook.

Starting point is the promotion of the infrastructure service offering. In TAMK Digital Playbook, this is described by visually introducing the capabilities and technology base of the RII as presented in Figure 1. This information is be supplemented by additional and/or specific information which can be gained by participating in virtual tours in the infrastructure premises. In this way, the customer can be more acquainted with machine, process or technology capabilities via demonstrations and videos.

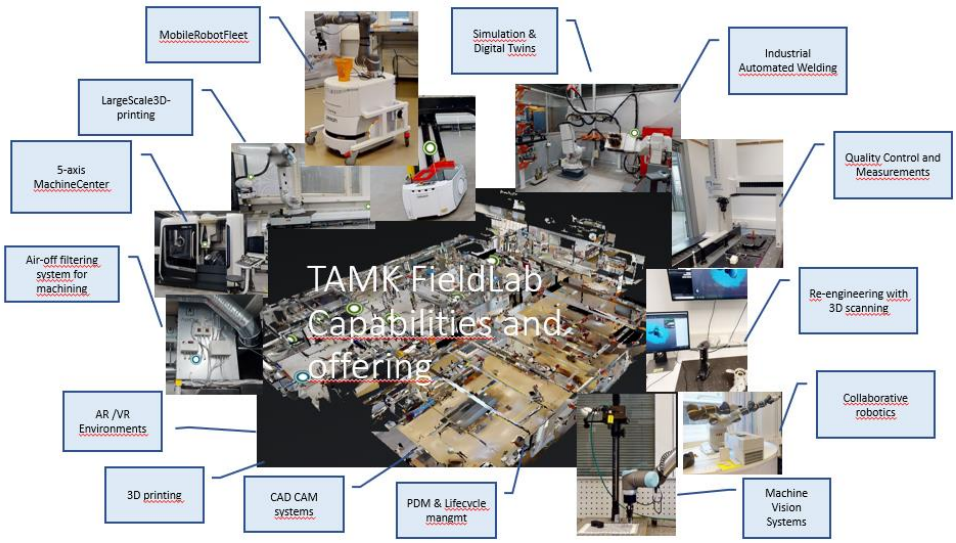

Figure 1 TAMK FieldLab visualised offering.

This visualised infrastructure with accompanied with service capabilities and offering is available online. If an organisation, such as a university, has multiple research and innovation infrastructures available for external usage, choosing the same standard information layout makes it easier to prepare web pages for the infra owners. And more importantly, it makes it easier for the external users to understand the service offering and capabilities of the specific infrastructure, how gain access, and how to benefit from it

According to the feedback from TAMK's external customers, at least following data should be provided: Official name and short description of the infrastructure with contact person and contact details. In addition, the customers are interested in information

concerning the infrastructure's focus areas, e.g., Industry 4.0 and Smart Manufacturing, as well as pricing options related to usage, depending on needed services and resources linked to the infrastructure's main hardware and software.

A more detailed description of capabilities offered by infrastructure and services from which external user can benefit should be promoted as well. In case of the TAMK FieldLab, we have created a description of themes and offerings areas with additional details presented in SIX Smart Manufacturing website (https://www.six.fi/fieldlab). As mentioned earlier, this offering needs to be supplemented with virtual infrastructure and machine or solution-level detailed descriptions provided via videos, process charts and demonstrations.

Figure 2. Description of the service offering of an infrastructure

While creating capability descriptions and demonstrations, the following should be considered: Customer-oriented objectives and their prioritization for requirement definition as well as typical pains and gains which external users are experiencing when looking for the potential of the services provided by a RII. Scheduling and infrastructure booking should be made visible online. In addition, indication of what tools, materials, equipment, facilities are of importance, as well as guidance how to create joint test plan with the infrastructure owner. In terms of IPR, an agreed way of review of business or technological benefits and their ownership after the project is a requirement. Infrastructure owners need to identify a pool of experts per offered theme within their institution who are able to provide the expert-level competences and create dedicated demonstrations or prototype environments for external users. Additionally, and effective process needs to be established, making sure the needed knowledge transfer and capacity building takes place, thus helping the customer to develop new skills and competences.

Knowledge Transfer Tool supporting the innovation management process

The Knowledge Transfer Charter (KTC) developed in TAMK provides a unique toolbox to support this aim. KTC process builds on offering the stakeholders TAMK's research

and innovation infrastructures as demonstration, piloting and testing environments for hand-on experimentation of new innovative technologies and services. Digital, virtual environment supplementing physical infrastructures jointly with our business expertise significantly speeds up the innovation and commercialization cycle. The same process can also be implemented in real-life environments, Living Labs, e.g., for smart city innovation solutions. (Puurtinen et al. 2020; Siivonen et al. 2021)

There is a need, for all stakeholders in the innovation community to make better use of existing research and innovation infrastructures and tie their added value to the processes of the whole innovation ecosystem in a more effective and cost-effective way. Digital Playbook is an approach supported with described methodology, knowledge transfer process and set of tools providing solution for that need. Close collaboration within external users and joint target setting has significantly improved the dialogue and common understanding on the benefits and requirements.

Relevant stakeholders such as industry support organisations, companies and SMEs, and representatives of the education innovation ecosystem have been actively included in the strategic planning, guidance and creation of Digital Playbook. In this way, co-creative processes focusing on strengthening the missing links in the usage of research and innovation infrastructures have been established. Our approach with Digital Playbook promotes valorisation for feasible business innovations and sustainable industry-driven collaboration.

4 Conclusions

The current green and digital transition as well as global competitiveness targets set European industry in a challenging position. Simultaneously, the pandemic has limited our possibilities for traditional face-to-face collaboration, and many new ways of working are here to stay. New product and process innovations must be communicated and co-developed at an ever-accelerating pace and within physically spread multidisciplinary teams. Time from idea to innovation must be squeezed to minimum, and tools and processes need to foster co-creative work that makes visible also the initiatives not foreseen at the early stages of the development. Research and innovation infrastructures conceptualised as joint assets for bridging the gap between research and practical industry value chains have great potential to serve as platforms for co-creating and sharing knowledge.

To conclude, the Digital Playbook refers to a light guide or agreement on how to operate within university-based research and innovation infrastructures for the infrastructure owners and external users. Digital Playbook aims to support organizations to learn faster, build and transfer competences within the user organisations and develop their operations embedding the benefits from the use of new technologies and knowledge. It offers easy step-by-step guidance for infrastructure owners how to promote their testbeds for increased external usage.

References and Notes

Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions (2021). *2030 Digital Compass: the European way for the Digital Decade*. (COM(2021) 118 Final).

Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions (2020). *Updating the New Industrial Strategy: Building a stronger Single Market for Europe's recovery*. (COM(2021) 350 final).

European Commission, Directorate-General for Research and Innovation (2020). *Research & innovation valorisation channels and tools : boosting the transformation of knowledge into new sustainable solutions*. Publications Office, 2020. https://data.europa.eu/doi/10.2777/480584

European Commission, Directorate-General for Research and Innovation (2021). *The new European Research Area*. Publications Office, 2021. https://data.europa.eu/doi/10.2777/2736

Leydesdorff L (2012). *The Triple Helix of University-Industry-Government Relations*. SSRN Working Paper Series. doi:10.2139/ssrn.1996760. ISSN 1556-5068.

Puurtinen HG, Pohjola P, Siivonen J (2020). *Co-creative Value Enrichment – Demonstration Environments leveraging Ideas to Market*. The ISPIM Innovation Conference – Innovating in Times of Crisis, 7-10 June 2020. Event Proceedings: LUT Scientific and Expertise Publications: ISBN 978-952-335-466-1

Siivonen J, Pohjola P, Puurtinen HG (2021). *Boosting the Unexpected – Industrial Cases revealing Knowledge Transfer Impact*. The ISPIM Innovation Conference – Innovating Our Common Future, Berlin, Germany on 20–23 June 2021. Event Proceedings: LUT Scientific and Expertise Publications: ISBN 978-952-335-467-8