DEI WG2 questionnaire on (national) programmes on platforms, piloting, and testbeds

Background

Digital innovations are changing the way we design, produce, commercialise and generate value from products and related services. Advances in technologies such as the Internet of Things (IoT), 5G, cloud computing, data analytics and robotics are transforming products, processes and business models and ultimately reshuffling global value chains in all sectors.

To maintain their competitive edge, companies have to fully embrace digitisation not only by making the best use of the latest digital technologies but also by integrating digital innovations as key elements of their development strategies. Next digital champions can emerge in any sector of the economy from construction and textile to health, agriculture or energy equipment. In Europe, many companies, especially in the high-tech sector, are already grasping the opportunities of this new industrial revolution, and studies show that digitisation of products and services could increase EU industry revenues by €110 billion a year.

However, many traditional sectors and small and medium-sized enterprises (SMEs) are lagging behind: less than 2% of them use advanced digital technologies to innovate in products and processes. In addition, a large disparity exists between Member States and regions creating a new 'digital divide', which can ultimately hurt all economies in Europe.

To tackle these challenges, the European Commission launched the Digitising European Industry[1] initiative in April 2016. Its overall objective is to put in place the necessary mechanisms to ensure that every industry in Europe, in whichever sector, wherever situated, and no matter of which size can fully benefit from digital innovations.

The initiative focuses on actions with a clear European value-added. It builds on, complements and ensures the scaling up of national initiatives. Of particular importance are four action lines: the European platform of national initiatives, Digital Innovation Hubs, Digital Industrial Platforms, and Digital Skills.

One of the follow up actions of the DEI initiative has been the setting up of a working group on Digital Industrial Platforms (WG2). Here, we only focus on digital platforms and working group WG2.

Objectives

WG2 focuses on the challenge of creating the next-generation digital platforms and using them to enable the digital ecosystems that will be vital for an increasing number of economic sectors.

Various platform development activities exist at EU or national level. Projects developing the next-generation digital platforms need to bring together various EU and/or national programmes and act as linking pins. These projects need to build on existing platforms, pilot sites, testbeds, and experimental environments that have been developed in these various (national)

---

[1] http://bit.ly/DigIndEU

programmes. This questionnaire aims to collect information about these (national) programmes, so that links can be established in a later phase.

The European Commission expects to launch a number of projects in the 2018-2020 time frame that will make a significant step forward in platform development, interoperability between existing platforms, integration of relevant digital technologies such as IoT, AI, photonics, robotics, cloud and Big Data, and validation via pilots and experimentation facilities. Starting from suitable reference architectures, platforms are defined, tested via piloting, and supported via ecosystem building for their roll-out, and evolved into standards.

These projects will be launched in the following sectors/topics:
- Connected Smart Factories
- Smart Agriculture
- Digital Transformation of Health and Care
- Industrial Data Platforms
- Internet of Things

Therefore, this questionnaire focuses on platforms, pilots, and testbeds in these sectors/topics.

Platforms

The term 'platforms' has several different meanings. One use for the world 'platform' is to describe a forum or a podium that brings different stakeholders together, as for example *Plattform Industrie 4.0* in Germany, *Industrie du Futur* in France, *Piano Nazionale Industria 4.0* in Italy, and *Produktion der Zukunft* in Austria. The Commission is also talking about the need of a European "platform of national initiatives" or a "platform of platforms" that brings together various national initiatives. This interpretation of 'platform' as a place or opportunity for public discussion is not the interpretation in this questionnaire.

The DEI Communication defines platforms as "multi-sided market gateways creating value by enabling interactions between several groups of economic actors".[2] In this questionnaire, digital platforms are like operating systems that bring together different technologies, applications and services. They open up data and make it accessible, allow third-party innovation to happen on top and connect different stakeholders, such as users and application developers. In general, three main aspects/roles can be distinguished in platforms[3]:

1. **In their community role,** platforms explicitly connect users with one another, as in social networks. Some act as marketplaces, supporting business exchanges. Their community role lies in third-party producers creating value, a key source of value for the platform. However, to facilitate value creation, the next role is needed.
2. **In their infrastructure role,** platforms provide the infrastructure and functionality needed to allow developers to build applications and create value on top of this infrastructure. This openness to and reliance on third-party complementary applications

---

[2] COM(2016) 180 final, 19 April 2016
[3] Adapted from http://platformed.info/platform-stack/

triggers platform value in a reinforcing manner: the more developers work on a platform creating attractive applications, the more valuable these render the platform's offer. The attractiveness of the platform increases with more customers, attracting more developers, etc. This infrastructure role of platforms also channels the data that the platforms unlock and integrates different technologies and systems.

3. **In their data-handling role**, platforms use and/or make data accessible. In many cases, this data serves to provide relevance, matching the most relevant content/goods/services with the right users. In other cases, value exclusively lies in the data that is made available from connected applications, sensors and devices.

Different platforms fill the above three roles in different ways and to varying degrees. Some focus more on connecting users and providers (e.g. Facebook), some on unlocking data (e.g. Nest), whilst others act as development platforms for third parties (e.g. Android). We see a combination of these three roles in many real-life examples.

It should be noted that we do not consider online platforms in the consumer world, but **industrial platforms** in the business wold. Both worlds differ. Online search and social-networking services are easy to scale, because the needs of human beings are similar across the world. Particular industries and companies, on the other hand, often have specific requirements that call for customised products[4].

An example of such a digital platform is the Smart, Safe & Secure Platform – S3P, of the French S3P Alliance[5]. This software development and execution platform for the Internet of Things aims at enabling the rapid development and exploitation of IoT-capable devices and applications, combining safety, security, agility and portability. It is developed in a 45 M€ project, which is financially supported by the French Government "Nouvelle France Industrielle" initiative with an 18.3 M€ government funding.

The two most well-known commercial platforms in manufacturing are Predix[6] by GE and MindSphere[7] by Siemens.

Some industrial platforms focus on community-led cross-sectoral (horizontal) virtual space, open to any data holder interested in sharing data and willing to respect the common rules. The Industrial Data Space association[8] in Germany is developing such a model open for participation of European actors from the industry, services and trade.

In the agriculture business, there are numerous examples: 365FarmNet[9] is an open platform linking together applications and services of different manufacturers and service providers; MyJohnDeere[10] is a Farm Management Information System with an open API allowing access of other systems such as those provided by SMAG and Agro-Office to agricultural machinery data.

---

4   http://www.economist.com/news/business/21711079-american-industrial-giant-sprinting-towards-its-goal-german-firm-taking-more
5   http://www.esterel-technologies.com/S3P-en.html
6   https://www.ge.com/digital/predix
7   http://www.siemens.com/global/en/home/company/topic-areas/digitalization/mindsphere.html
8   http://www.industrialdataspace.org/en/
9   https://www.365farmnet.com/en/
10   https://myjohndeere.deere.com/

Similarly PLM Connect[11] is a Farm Management Information and Decision System by New Holland, which also offers an open API.

Another example in the automotive sector is AUTOSAR[12]. In that sector, leading OEMs and Tier 1 suppliers work together to create a development base for industry collaboration on basic electrical/electronic functions while providing a platform which continues to encourage competition on innovative functions. To this end a development partnership called Automotive Open System Architecture (AUTOSAR) has been formed. It aims to create and establish an open and standardized software architecture for automotive electronic control units excluding infotainment[13]. The AUTOSAR standard will serve as a platform on which future vehicle applications will be implemented.

Pilots and testbeds

Digital platforms are validated in pilots and testbeds through the development and use of prototype applications on top of the platforms. Both controlled environments and real-life use cases can be used to validate the platforms and complementary applications. To foster take-up and large scale deployment, pilots may adapt platforms to specific application needs and validate their relevance for such needs. The pilots should cover innovative application scenarios with high socio-economic impact making use of the digital platforms.

Labs Network Industrie 4.0 is an example of a network of manufacturing testbeds in Germany[14]. Networking the numerous testbeds enables distributed production and application processes to be simulated across several test environments. Labs Network Industrie 4.0 was founded in Germany as a one-stop shop for the coordination of the different approaches. It supports companies in the initiation of Industrie 4.0 projects, pools results from the testbeds, and forwards them to relevant standardisation and international cooperation bodies.

An example of a testbed is ARENA2036 – Active Research Environment for the Next Generation of Automobiles. The ARENA2036 research campus is a bridge between research and development in the field of lightweight construction and innovative production technologies. All activities of the ARENA2036 research campus are systematically combined in a "research factory". In this "research factory", the results of development and construction research as well as those of simulations can be tested immediately.[15] Digital manufacturing platforms could be implemented and validated in the research factory.

---

[11] https://www.plmconnect.com/
[12] http://www.autosar.org/
[13] https://en.wikipedia.org/wiki/AUTOSAR
[14] http://www.plattform-i40.de/I40/Navigation/EN/InPractice/Testbeds/testbeds.html
[15] http://www.arena2036.de/de/arena2036/inhalte-und-ziele