

Nevistić, Krešimir; Vlačić, Ernest

Conference Paper

Strategic Positioning Using Mission Oriented Innovation Model

Provided in Cooperation with:

Governance Research and Development Centre (CIRU), Zagreb

Suggested Citation: Nevistić, Krešimir; Vlačić, Ernest (2019) : Strategic Positioning Using Mission Oriented Innovation Model, In: Tipurić, Darko Hruška, Domagoj (Ed.): 7th International OFEL Conference on Governance, Management and Entrepreneurship: Embracing Diversity in Organisations. April 5th - 6th, 2019, Dubrovnik, Croatia, Governance Research and Development Centre (CIRU), Zagreb, pp. 356-369

This Version is available at:

<https://hdl.handle.net/10419/196094>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Strategic Positioning Using Mission Oriented Innovation Model

Krešimir Nevistić¹ and Ernest Vlačić²

¹Siemens, University Libertas, Zagreb, Croatia

²University of Applied Science Algebra, Zagreb Croatia

kresimir.nevistic@siemens.com

ernest.vlacic@algebra.hr

Abstract

Back in early 1990's developed countries have started to use systematic stimulations of their economies technological development, which resulted in issuance of variety of national, regional and sectorial tailor made methodologies and approaches. Nevertheless, none of these are yet suitable for universal application on countries different national innovation ecosystems. This appears particularly evident and vague when the larger agglomeration of countries, such as the European Union, is in question. The uncertainty and inappropriateness get even more accentuated in case of supporting the articulated European strategy towards the digital economy, which is the creation of the Digital Single Market. To tackle this ambitious challenge a number scholars and practitioners are attempting to address this challenge through designing and implementations of various theories of national innovation models. One of them is the Mission-oriented Innovation model which is designed to generate, produce and catalyse positive impacts on nations' economies development and growth. Thus, the aim of this paper is to explore a suitability of mission-oriented innovation model, as well as to evaluate whether it is appropriate to be efficiently applied in the case of Digital Single Market strategy. The results are showing that, although the mission-oriented innovation model use is effective in various cases, its practical implementation on Digital Single Market case may not represent the best choice.

Keywords: national innovation systems, mission-oriented innovation, technological development, strategic positioning

Track: Governance

Word count: 6.793

1. Introduction

Nowadays, innovations have an unavoidable role in aspirations for achieving economic growth and competitiveness. Only during the early 1990s, economists Freeman (1988) and Nelson (1993) have realized, through the example of the so-called Asian tigers (Japan, Taiwan and South Korea), that systematic stimulation of technological development and innovation brings in the products of economic growth and development (Vlacic, Dabic and Aralica, 2018).

Since then, the developed countries have started implementing systemic measures to foster innovation, which resulted in development of a few basic methodologies (national, regional, sectorial). However, none of these methodologies can be copied from one country and pasted to another. This appears particularly evident and vague when the larger agglomeration of countries, such as the European Union, is in question. The uncertainty and inappropriateness get even more accentuated in case of supporting the articulated European strategy towards the digital economy, which is the creation of the Digital Single Market. To tackle this ambitious challenge a number scholars and practitioners are attempting to address this challenge through designing and implementations of various theories of national innovation models. In a quest

to respond to this challenge a mission-oriented Innovation system is promoted by Mazzucato (2014, 2017, 2018).

Thus the aim of this paper is to explore a suitability of a Mission-oriented innovation model (MOIS), as well as to evaluate whether it is appropriate to be efficiently applied in the case of Digital Single Market strategy.

Besides this introduction, this paper is formatted in three sections. Firstly, the theoretical concepts related to the project management maturity levels are briefly discussed. It presents the role of innovation in a global economy and the basic types of innovative systems. Furthermore it explains the principles of mission-oriented innovation system and the strategy of European Digital Single Market (DSM). Finally, the second part is describing the research methodology and activities which are divided in two parts. The first one, case oriented where the mission oriented innovation system is successfully implemented and the second one where the MOIS methodology is evaluated by applying it on the strategy of Digital Single Market. The paper ends with resulting discussion on results and brief conclusions.

2. Theoretical background

In the globalized world, countries aspire to accomplish development and economic success with a goal of improving the life standard of the nation. Nations compete in achieving progress, and while it is still important, it is not enough to accept foreign technologies and knowledge, but to generate new technologies, innovations.

Here, innovation refers to the developments and wide adaptation of new types of products, manufacturing processes, services, as well as business and organizational models. In other words, innovation bring in production of products new to the market and society, along with new processes, services and functionalities which consumers and organisations find useful and valuable. This, precisely, is the type of innovation that is in the centre of the national and global economic improvement (Atkinson i Ezell, 2014, 10).

2.1. Innovation in the global economy, the role of public sector

Today, we live in the time of the Fourth Industrial Revolution (4IR), which changes the economic environment of the world by changing the drivers of growth and competitiveness. Achieving economic success is not possible through relying on the effectiveness and cost cutting only, as now, innovation, flexibility and adaptation to rapid changes have become the key parameters to consider. If change is constant, economies with an advantage are the ones, which are the fastest in accepting new ideas, methods, or products (Schwab, 2018, 9).

An example of such innovation is the digitalization of production, not referring to the implementation of automation and robots in the manufacturing process, since robots are nothing new, especially in the automotive industry for around 30 years. Digitalization of production refers to the introduction of artificial intelligence, communicational interconnection, digitalization, robotization and automation of the overall business cycle, from planning and development of a new product, simulation of the new manufacturing process using the Digital Twin (virtual stimulation of the future manufacturing process), supply chain and material storage, to delivery and post-sale customer service. Combining digital technologies with the manufacturing process will redesign the global product environment (Ezell, 2018, 1).

In today's global economy, nations have to compete to keep and attract investments in the economy. However, opposite to competition between countries in the "chase for the chimneys" 40 years ago, today most nations of the world have to compete in the "chase for innovations". Meaning they have to strive in achieving growth and attract economic activities with highest possible rate of added value: attempting to offer high wage, manufacturing

processes with intensive use of knowledge, research, program support, Information and Communications Technology (ICT) and service job positions which drive today's global, innovation based, economy (Atkinson i Ezell, 2014, 6).

Thus, this is an intense race for global innovation advantage, clearly distinguishing today's global economy from the group of regional and national economies, which competed in attracting "chimneys" just one generation ago. Nations throughout the world bring national strategies for encouraging innovations, through reconstructing taxation and regulatory systems to become competitive, broadening support towards science and technology, improving educational systems, stimulating investments in the broadband internet and other areas of IT, as well as undertaking a wide range of steps which seek innovations (Atkinson i Ezell, 2014, 7).

Economists, who are willing to admit the state has a crucial role, often argument this by correcting mistakes of the market (Mazzucato, 2014, 27). From this perspective, the fact that the market is not perfect should be treated as an exception, meaning the state has a role it plays, but the role is not interesting. Imperfection can appear due to multiple reasons: unwillingness of private companies to invest in the fields, such as basic research, out of which they cannot secure high enough profits, since the results of the research are considered "public goods" available to everyone (results of basic research and development as a positive externality). In addition, imperfection is that private companies often do not take into consideration factors, such as the expense of pollution (negative externality) when deciding on prices of goods and services. Additionally, an imperfection is the fact that the risk of a certain investment in research and development is too high to bear individually as a company. Due to these various formats of mistakes within markets, examples of expected roles of countries involve; public financing of basic research, increased tax burden of polluters, and public financing of infrastructural projects.

Successful innovation system entails that both private and public sectors take risk at their disposal to become the part of the overall ecosystem, which supports capabilities of businesses to create innovations. Once the governments decide to intervene in the market and encourage innovations, for a process to show results, innovations require stable conditions: strong institutions, comprehensive adaptation of ICT technologies, domestic free market competition and encouraging educational system (Schwab, 2018, 9).

Countries, who want to take the lead in the race for the global innovation advantage, have to design and implement a wide range of constructive policies purposely to support innovation capacity of their economies. Thereby, Atkinson and Ezell (2014, 166) claim that with such purpose, around thirty-five countries have created formal national innovative strategies, and at least twenty-four manages to establish national agencies for innovation. These steps have further intensified global competition for innovation lead. Countries with a leading position in the development of innovation policies have gone through a process with three steps:

- They recognized the need for systemic approach to innovation
- Have devoted the attention to the need for innovation operationally, through a political system, imposing inspiring vision and strategy of influence filled with clearly articulated goals and ambitions
- Made difficult decisions necessary, not only for implementation of institutionalised reforms at the top of encouraging innovation strategies, but also for their adequate financing (including giving tax incentives), as well as on the account of other items on public spending and fiscal policy towards individuals

Except the generic approach to innovations, many countries especially encourage certain industries with extremely expressed additional value, as those “real” innovative industries have some shared characteristics (Cory, 2018, 3):

- Regular and rapid development of new processes, products or services (many of them are disruptive), crucial to their competitive advantage;
- The marginal cost of selling the next product or service is significantly lower than the primary cost of producing. The most extreme example of such industry is the digital content industry (software, film, music, video games);
- Such innovative industries depend more on intellectual property (IP) than other industries. For instance, software depends on protection of source code, pharmaceutical industry on protection of molecular compounds, aerospace on materials etc.

2.2. Typology of Innovation Systems

Several concepts of innovative systems have been developed, and the first one to define the National innovation system was suggested by Freeman (1988). His definition was improved by Lundvall (1992) and Nelson (1993). Freeman (1988) determined the national boundaries of innovative systems, as there was a large gap between nations: in social structure, technological development, legal system, educational process, industrial policies, absorptive capacity (Vlačić et al 2019), and others.

National Innovation System (NIS)

Analysing National Innovation system contributed to the knowledge that research and development within institutions of science is not the only source of innovation, and that the main role of the government is not just providing money for individual projects, but also for the creation of conditions for companies promoting innovative projects and their interaction with institutions of science.

Nelson (1993) was the first to compare multiple National innovation systems and has concluded they are based on a strong belief that the technological capabilities of national companies are the main source of national competitiveness and can be generated with nation-wide activity. He has also discovered that the take-off of Asian tigers (Japan, South Korean and Taiwan) was initiated by national systems for encouraging technological innovations.

The concept of NIS is popular among politicians because it grants a framework for strategic influence on the societal level. However, the role of public policy is complex and intertwined, such that ministry of the economy is not enough for successful implementation of innovation systems, but the importance lies in the contribution and interaction between, for instance, ministry of science, education, energy, health and transport.

Regional Innovation system (RIS)

Regional innovation system emerged as the consequence of focus of NIS on regional aspect and is not imagined as a closed system, but as a system that interacts with other regional and national systems. Authors, such as Etzkowitz and Leydesdorff (2000), emphasized the importance of collaboration between the government, companies and educational system, while Foray et. al. (2009) elaborated this importance towards the Smart Specialization System – S3. S3 defines the capacity of economic system to generate new specialties through discovery of new opportunities in new fields that are of local concentration and coarsening resources and competencies in these areas.

Wintjes (2016, 20) claims that in some countries, politics operates through regulation, infrastructure, strategy and instruments, at the national level, while other (bigger) countries

have large differences between regions. For instance, in the case of Estonia and Luxemburg, there is no point in developing RIS, while in the case of Spain there is such need.

Sectorial Innovation system (SIS)

Sectorial innovation system was first introduced by Malerba (2002) who established innovation systems are operational at many levels within and above the boundaries of both, national and regional economies and technologies, wherein the definition of SIS considered only products and not services. Wintjes (2016, 20) claims the main objection to the first innovation systems was the focus on technological innovation in manufacturing sectors. However, if services are considered as well, it is difficult to determine boundaries of such permanent change, which constantly creates new sectors and sub-sectors. The problem of the definition of sectors is especially amplified in the case of digital technologies, which are also the technologies for general purpose.

The concept of Sectorial innovation system is rarely used, especially when compared to geographical concepts such as NIS and RIS. One of the reasons is the popularity of the “competitive” concept, clusters (Wintjes, 2016, 20). Besides clusters, in the United States the term “ecosystem” is used and is a sectorial system by nature. In Europe, the system of smart specialisation (S3) is used. S3 is a hybrid of regional and sectorial approach.

Concept of clusters, ecosystems, or S3 smart specialization is especially used for the purposes of the digital industry. Thus, Wintjes (2016, 21) claims the digital (ICT) cluster is placed in a “fruitful” region, where fruitfulness is defined as a combination of highly concentrated ICT business activities and high quality of enterprise surroundings.

2.3. Mission-oriented innovation system (MOIS)

As earlier mentioned, new, especially digital, technologies with societal trends arise from technological improvements and intensified globalization. Due to the constant race for economic growth and national competitive advantage, the governments are permanently searching for smart, inclusive and sustainable development (Mazzucato, 2017, 3). Continuously occurring challenges, such as demographic changes, longer life cycle, population ageing and climate change, create the need for new solutions and new approaches to economic and innovation policies.

One of the possible answers to stated challenges is the innovation system that creates markets, precisely Mission-oriented innovation system – MOIS. According to Mazzucato (2017, 5), the ambition to reach a certain type of economic growth (smart, inclusive, sustainable) is directly acknowledging the fact that the economic growth does not just have a numerical value, but it also has a direction. In that sense, recognizing the problem and defining a mission, will give rise to essential innovation and industrial strategies needed for achieving systemic changes, which are necessary for accomplishing the goal of the mission.

2.4. Strategy of Digital Single Market for Europe

Inspired by the accelerated changes in improvements of internet and digital technologies that affect the lives of individuals and businesses, the European commission in 2015 presented the strategy of Digital Single Market – DSM. The main objective of the strategy is elimination of barriers and fragmentation in the Digital Single Market and to use the opportunities created by the new technology for development, growth and employment. In his Political guidelines for the new European Commission – A New Start for Europe (EC, 2015), Jean-Claude Juncker stated: *“I believe that we must make much better use of the great opportunities offered by digital technologies, which know no borders. To do so, we will need to have the courage to*

break down national silos in telecoms regulation, in copyright and data protection legislation, in the management of radio waves and in the application of competition law.

Junker continues: *'By creating a connected digital single market, we can generate up to EUR 250 billion of additional growth in Europe in the course of the mandate of the next Commission, thereby creating hundreds of thousands of new jobs, notably for younger job-seekers, and a vibrant knowledge-based society.'*

Finally he visionary projects a roadmap: *'To achieve this, I intend to take, within the first six months of my mandate, ambitious legislative steps towards a connected digital single market, notably by swiftly concluding negotiations on common European data protection rules; by adding more ambition to the ongoing reform of our telecoms rules; by modernising copyright rules in the light of the digital revolution and changed consumer behaviour; and by modernising and simplifying consumer rules for online and digital purchases. This should go hand-in-hand with efforts to boost digital skills and learning across society and to facilitate the creation of innovative start-ups. Enhancing the use of digital technologies and online services should become a horizontal policy, covering all sectors of the economy and of the public sector.'*

Indeed, during 2015. The Strategy of Digital Single Market for Europe has been accepted. In its introduction, part the importance of creating and implementation of the strategy is once again stated. Precisely, because Europe does not take advantage of the possibility to have a leading role in the digital economy, fragmentation, and barriers, which do not exist on the physical single market, slow down the progress of the European Union (EC, 2015).

The strategy is based on three pillars:

- Better access for consumers and businesses to online goods and services across Europe
- Creating the right conditions for digital networks and services to thrive
- Maximising the growth potential of the European Digital Economy

Each pillar stated has a few components, for which the motivation to introduce the strategy is shortly explained.

2.5. Better access for consumers and businesses to online goods and services across Europe

The objective of this pillar is defining a framework for e-commerce and preventing discrimination of consumers and businesses in accessing content or buying products and devices online within the Single European market (European Union).

Cross-border e-commerce rules that consumers and businesses can trust

Europe has 28 different national consumer protection and contract laws, such as the right to withdraw from the deal and possibilities to return the order. This makes consumers and businesses back down in participating in e-commerce outside of national borders (EC, 2015). The consequence of such discrepancy is that the sellers online are trusted by 61% consumers within their country, while just 38% feels confident enough to purchase from a seller from another EU Member state. Lastly, only 7% small and medium businesses in the EU sell their products and services cross-border.

Affordable high-quality cross-border parcel delivery

Besides the problem of high prices and interoperability of various operators, the problem also lies in differing prices for different directions of delivery between the same two cities. Thus, EC (2015) states there are 62% business which currently do not sell their products or services online, but are trying to do so, and claims the problem lies in high delivery costs.

Preventing unjustified geo-blocking

Denial of website access based on location is one of the tools companies used to segment the market along the national border by limiting shipments or redirecting to local webpage of the same company, which displays higher prices as compared to the home state of the company. Around 74% of complaints received by the European Consumer Centres Network are regarding price differences or other cases of discrimination, such as geographical discrimination when shopping online (EC, 2015).

Better access to digital content – a modern, more European copyright framework

Barriers to cross-border access to media services, especially copyright protected audio-visual content, are very common. Due to copyrights, when consumers cross inner-border of EU they often cannot access the content acquired in their home country. Additionally, using detailed text analysis, citations, using data etc., in research and science projects are often limited because of unclear and different regulations on national levels (EC, 2015).

Reducing VAT related burdens and obstacles when selling across borders

This commitment aims to reduce burdens attached to cross-border e-commerce arising from different VAT regimes, provide equal conditions for businesses in the EU and ensure the VAT revenues are accrued to the Member state of the consumer (EC, 2015). The commission will explore the possibility for solving the tax treatment of certain e-services, for instance online publications and digital books, through the general VAT reform.

2.6. Creating the right conditions for advanced digital networks and services

The Digital Single Market has to be based on reliable, trustworthy, fast and affordable networks and services which protect consumers' fundamental privacy and personal data protection rights, while also encouraging innovation.

Making the telecoms rules fit for purpose

Telecoms rules and market rules of the European Union have to secure that the market operates more competitively, as well as that the consumers and companies have lower prices and better quality of services. Still, national markets lack connectivity (EK, 2015) and sufficient investments, especially in rural areas. Radio spectrum is vital for operating on a national level and for the deployment of broadband services.

A Media framework for the 21st century

Rapid technological changes and development of new business models for distribution of content, affect the audio-visual landscape. Viewers access content via internet through various ways, while smart phones change the viewing patterns.

A fit for purpose regulatory environment for platforms and intermediaries

Online platforms allow consumers and companies to search for information, purchase through e-commerce, virtual communication and similar. However, due to the fragmentation of the market, for European businesses, scaling-up is limited (EC, 2015). Platforms accumulate and monitor large amount of data about their consumers and use algorithms to turn this data into usable, saleable information. Platforms are innovators of the digital economy as they generated new business models, sharing economy, which lead to creation of new regulatory and taxation surroundings. Additionally, they lead to a rapid increase in illegal online content that has to be regulated too.

Reinforcing trust and security in digital services and in handling personal data

Cyber threats are a borderless problem resulting in security offences and significant economic losses. The increasing number of personal details, identity thefts and online payment fraud are

not only subject to financial losses, but they also result in fundamental rights violations, disruption of services and decrease citizens' trust in using internet.

2.7. Maximising the growth potential of the Digital Economy

In less than 10 years most of economic activity will depend on digital ecosystem, integration of digital infrastructure, hardware and software, applications and data (EC, 2015). To maintain competitiveness, keep a strong industrial base and to achieve the switch to smart industrial and services economy, the European Union should implement digitalization in all sectors. Only 1.7% of companies in the EU fully use the possibilities of advanced digital technologies, while 41% of them do not use them at all. Digital technologies, as the technology of general use, offers limitless possibilities to all branches of the economy – such as industry, transport energy, trade, tourism, but also the citizens – from e-government to e-health.

Building a data economy

Internet of things, big data and cloud services are the main drivers of the future digital, data economy. The data for the digital economy will have a role of raw materials, as they are considered as catalysts of innovation, economic growth and digitalization across all economic sectors.

Boosting competitiveness through interoperability and standardisation

In the digital economy, interoperability means effective communication between digital components. It means better connection throughout the supply chain and between industry and services sectors, as well as connection that is more efficient and automation of exchange across borders, between public services and authorities, as well as communities. Standardisation is essential in increasing interoperability of new technologies in the Digital Single Market, unavoidable in developing new technology of all types, as well as digital technologies.

An inclusive e-society

Demand for IT experts is increasing by around 4% every year (EK, 2015) and the constant shortage is expected in the future. Essential is the improvement of the educational system quality to adapt the course of digital revolution. Inclusive society involves the digitalization of the government, with a goal to increase transparency and reduce bureaucracy.

3. Research problem and methodology

Aiming to answer the leading research question of this paper, which is whether the MOIS can be used in supporting the DSM market, a particular methodology is presented. Firstly, an adequate project based layout of the DSM is presented, secondly a set of the MOIS related criteria is extracted, and thirdly this set is hypothetically applied on the DSM case. At the same time through a German government national strategic project called Energiewende a successful validation of similar projects, although on lower scale, is made.

Figure 1, represents the MOIS model of strategy of reaching in the greater challenge environment conditions (such as climate changes for example) guided by missions contexts.

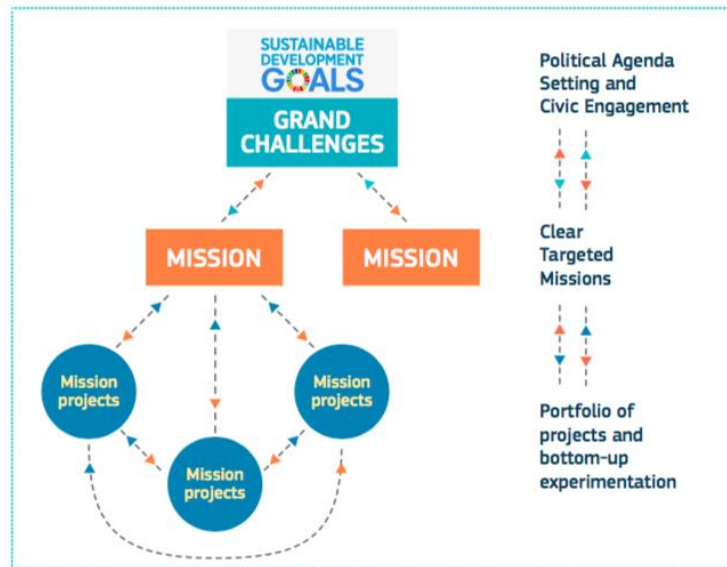


Figure 1: Illustration of the structure of a mission (Mazzucato, 2018, 11)

DSM Topology

In the previous section, the pillars of the strategy for Digital Single market are stated and briefly described upon acceptance by the European commission (2015). Figure 2, illustrates how the strategy for Digital Single market is envisioned as a major challenge, while each pillar is presented as a mission used to achieve this ambitious challenge. The pillars are composed of multiple projects (components of pillars as stated in the fifth section). For the simplicity, a representation is partial, respectively only two missions (out of three) are displayed and only three projects within the first mission (from possible five projects within the first, four within the second, etc.).

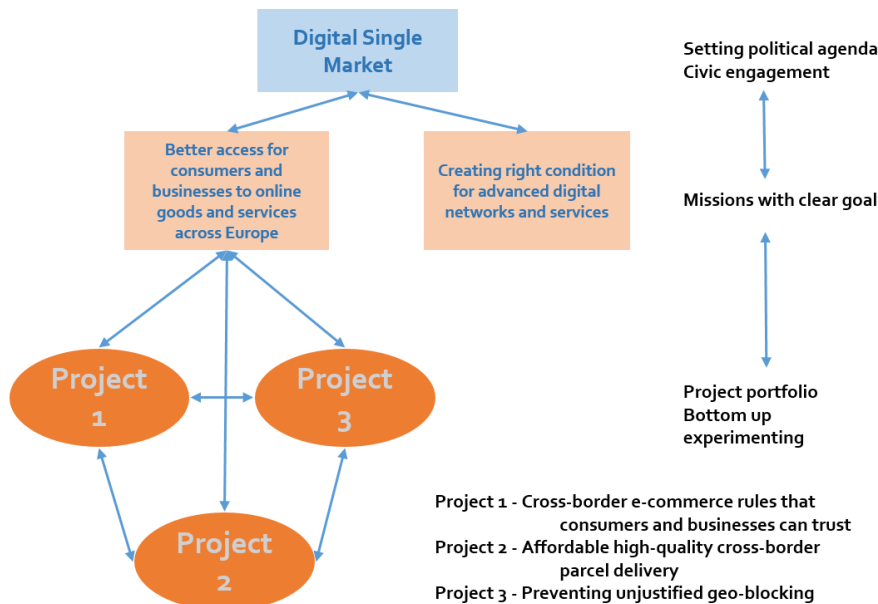


Figure 2: The structure of the strategy for Digital Single market

Here the main research question arises, could we therefore state the Strategy for Digital Single market for Europe is actually a mission formulated based on the criteria that are following?

3.1.Criteria for selecting a mission

While choosing a mission, wider societal contribution should be considered, as well as that the goal of the mission undoubtedly stimulates innovative activities within various scientific fields and industry sectors. Through her strategic recommendations for the Innovative system, directed towards missions, written for the new Framework for Research and Innovation of the European Union, Mariana Mazzucato (2018, 14) claims there are 5 key criteria European research and innovation missions should fulfil. Thus a mission should be:

Bold inspirational with wide societal relevance

Missions should engage the public, precisely to convince them the innovative solutions, developed through the mission, would have a positive impact on their daily lives. In order to do this, missions should have an exciting goal, with clearly defined societal challenges, which are to be solved. These challenges have to be relevant for a wider population of the European countries.

A clear direction: targeted, measurable and time-bound

Since they enable long-term investments, missions require specific, clearly defined and measurable goals. Absence of clearly defined targets and timing makes it impossible to determine success (failure), or even evaluate the progress, of the mission, towards success.

Ambitious, but realistic research & innovation actions

The goals of the mission should be ambitious, risky, while focused on activities of research and innovation across the whole innovation chain, including feedback between basic and applied research. Ambitious mission objectives should ensure challenge for the researchers and innovators, as well as to be realistically feasible, at least in theory, within the chosen time. Additionally, objectives of technological development should attract scientists to start research, otherwise unlikely to be undertaken within private sectors. Not in the sense of a narrow market failure, but more for market co-creation.

Cross-disciplinary, cross-sectorial and cross-actor innovation

Missions should be set up in a way to spark activity and cooperation across various scientific fields (including social sciences and humanities), industrial sectors (e.g. transport, nutrition, health, services), and different types of actors (public, private, third sector, civil society organisations). Missions should address clear challenges that shall stimulate the private sector to invest where it otherwise would not have. They connect all relevant actors through new types of partnerships and collaborations by focusing on objectives that require cross-disciplinary and cross-sectorial solutions. Mission-oriented innovation has the possibility to lead towards transformation of society.

Multiple, bottom-up solutions

Missions should not be achievable by a single development path, precisely by a single technology or scientific field. They must be open to being addressed by different types of technological solutions and developmental path, of which some will be adjusted and some will fail as they will not fit as a solution to reach the missions' objectives.

3.2. Implementation of missions and public engagement

Besides the previously proposed criteria, Mazzucato (2018, 16), claims the future missions will require new approaches to implementation. Thus, we have to learn from current, successful mission-oriented organizations around the globe and adapt them to the EU context. The main lessons can be categorized under the following aspects:

Engagement of diverse national and regional stakeholders

Mission should not exist in a vacuum, as it should provide relevance on the European and the national level, as their goals have to prioritize realizing of policies. Mission has to coincide with the national strategies, including the industrial strategy as much as possible. Precisely, industrial strategy has to be complementary to the accepted missions, this way it will not determine targeted sectors or technologies, but will determine targeted societal issues, and the solutions to guide innovation processes towards networking of participants within various sectors. Furthermore, for realization of missions it is especially important to construct the capacity of public organisations and institutions, as well as the knowledge and skills at the European, national, regional and local level.

Measurement and impact by goals and milestones

It is essential that a mission has clear and concrete goals, as well as the indicators and the framework for the activity audit of the overall process to be able to monitor it. One way to do so is to define the passing points, as on the athletic field. The passing points should secure clearly successive monitoring of realization and progress towards accomplishing goals of the mission. Additionally, detailed and precisely processed publicly accessible data allows clear public communication, as well as the clear base for potential decision making on additional measures, changes in the direction or even the need for redefining the direction of the mission.

Even if the main objective of the mission is not reached, it can be partially successful if the innovation process produced positive, economy-wide spillovers. Cross-sectorial spillovers as positive effects may in such case represent a success on its own.

Portfolio of instruments to foster bottom up solutions

A mission is not just a single project; it is a portfolio of actions which promote multiple cross-disciplinary and cross-sectorial projects and solutions. Thereby, in the process of defining and developing necessary innovation projects and solutions of the mission, participants should be given flexibility to generate and propose variety of solutions they find necessary to achieve the mission's goals.

Flexibility, pro-active management and building in-house capabilities

Upon realization of the mission, focus is on reaching the final objective, and to fulfil it, the high level of flexibility of adaptations in guiding the mission is essential. Thus, for an example, if it is discovered that the first individual project does not contribute to the mission, the possibility of diversion of funds and equipment from one project to another should exist. The increase for the second project leads towards realization of an individual project that will contribute to the realization of the mission's final goal. Therefore, organization of leading the mission should encourage risk takeover, even if failure seems possible. Precisely by giving up on a certain project within the mission without negative consequences for the participants engaged in the project.

Public engagement

Potential influence and the chance for success of missions is much higher when they inspire and engage in widespread public support. There should be a wide consensus that the mission is of high societal importance. Precisely, to ensure longevity and survival of it over multiple political cycles and possible policy changes. Citizens, or the public, are a part of the missions, as they should be inspired by innovations once they understand their purpose in use and possible feedback, because of which most innovation will have a greater purpose. Using media and open communication, the citizens should feel enthusiasm and trust in the process of change brought by the implementation of missions.

3.3. Case study

An example of a successful mission found in literature, is the project conducted by the German government called Energiewende (Mazzucato 2014, 2017, 2018). Energiewende was started in 1970s, but has only been recognized as an ambitious and brave mission at the beginning of the 21st century. Precisely, when the German government decided to exit nuclear power production by 2022 (Morris and Pehnt, 2016) aiming to replace it with energy produced using renewable sources of energy (wind, sun, biomass, etc.). Therefore, Energiewende represented a case of one of numerous possible in solving the issues of climate change to be managed by missions oriented model.

Immediate motive for such decision was the concern for the environment, respectively the negative influence of nuclear power production (potentially) has, as well as fossil fuel (carbon) thermal power plants. Thus, along with fighting the climate change, the goal of this mission was reducing the import of electrical energy, energetic security and stimulation of technological innovations in the field of renewable energy sources and reinforcement of local economy to achieve social justice.

Implementation of the Energiewende mission required a whole range of measures, along with proactive collaboration between public and private sectors at a national level, but also cooperation with the European Union's executive authority. The measures involved passing on concrete laws and regulations, financial incentives and credits, while the main consequence of the mission was the unexpected development of technologies for renewable sources of energy and the supporting industry.

3.4. Does DSM strategy fit into mission structure?

Considering structural organisation based on criteria for the next Framework for Research and Innovation of the European Union (Mazzucato, 2018), the ultimate challenge of setting up the strategy for Digital Single market should have a wider societal and economic contribution. However, can it initiate innovative activities within multiple scientific fields and industrial sectors? Application of MOIS in that sense is analysed through five criteria/missions as follows.

Criterion A – The mission can engage the public and convince it the innovative solutions will have a positive impact on the citizens' life. It has a higher goals and clearly defined societal challenge (inequality of the EU citizens in e-commerce access), relevant for the people of most of the countries.

Criterion B – In general, the mission has a direction (better access), the main objective would be that all the EU citizens have access to the market under equal conditions. However, a concrete deadline is not defined, as well as the stages used to measure progress.

Criterion C - The goal of the mission is ambitious and realistic, but potential research activities have to be visible. The mission consists of five projects, most of which presents exclusively political projects, meaning the projects are realized through reform of legal and taxation regulations on the national and EU level. The only potential for innovation and new technology is the project for *Affordable high-quality cross-border parcel delivery* which provides the possibility in innovation in tracking parcels, determining location, accelerating speed of delivery, etc., using technology such as Internet of Things, Blockchain, Robotized warehouse, drone or robot package deliveries, etc.

Criterion D – To achieve the main goal, the cooperation between legal, taxation and IT experts is unavoidable, thus making it cross-disciplinary, but not cross-sectorial since transport, economic and IT experts cooperate at the scientific level. In case of this project,

accomplishing goals shall encourage private sectors to invest where it usually would not, since other projects within the mission assure new legal and taxation framework, which creates a new niche in the market and enables entrepreneurs' innovation realization and potential return on investment, the mission enables transformation of society.

Criterion E – Besides the carried out changes in legal and taxation framework, the goals of the mission are achievable using IT technology, meaning the criterion on different types of technological solutions and developmental paths is not fulfilled.

4. Discussion and conclusions

Overall, the strategy of Digital Single Market for Europe is not a mission, but a higher goal driving structural changes. It shall adjust legislation of the European Union and its Member States by enabling functionality of the Digital Single Market, where citizens and companies within any EU country have the same rights and possibilities in the framework of the digital ecosystem of any Member state.

Individual pillars of the strategy stated can have a role of a mission. However, such missions are more of political than of technological nature. Within such missions, single project enables development of the complete innovation potential, as well as opens up investment opportunities for the private sector. However, this research and development is mostly based on the IT sector, specifically the development of hardware and software.

Finally, the conclusion is that the missions within the Digital Single Market are missions only partially described by definitions that Mazzucato (2017, 2018) stated. However, this is primarily because the great challenge itself is narrowly technologically determined, thus it is impossible for a mission to be entirely cross-disciplinary and cross-sectorial. Furthermore, due to the universal societal networking and the speed of changes within the digital industry, in some cases of observed missions, it is impossible to determine a clear and measurable goal, with clear and measurable phases. This is based on the fact it is very common for new digital technologies, as well as new innovative ways of conducting business online in a very short time span, to completely flip social trends.

Since this is based on the IT technology, for which we can say is the technology of general use, horizontally available and integrated in all aspects of life and business, and in the future more accessible and more integrated, could we say that the case of the IT technology is a "Sectorial mission", respectively the higher goals, missions and projects, which might not fully satisfy all the conditions for selection and realization of mission as stated by Mazzucato (2018).

References

- Atkinson R.D. and Ezell S.J., 2014. *Ekonomika inovacija*, Mate d.o.o. Zagreb
- Cory N., 2018. The Worse Innovation Mercantilist Policies, Information Technology and Innovation Foundation. Available on http://www2.itif.org/2018-worst-mercantilist-policies-2017.pdf?_ga=2.88391195.1014499415.1543486215-546657317.1541769478
- Etzkowitz H. and Leydesdorff L., 2000. The Dynamics of Innovation: From National Systems and „Mode2“ to a Triple Helix of University-Industry-Government Relations. *Research policy* 29, 109-123

- EK – European commission, 2015. Strategija digitalnog jedinstvenog tržišta. Available: <https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:52015DC0192&from=EN>
- Ezell S., 2018. Why Manufacturing Digitalization Matters and How Countries are Supporting it, Information Technology and Innovation Foundation. Available: http://www2.itif.org/2018-manufacturing-digitalization.pdf?_ga=2.157269307.1014499415.1543486215-546657317.1541769478
- Foray D., David P.A. and Hall B.H., 2009. Smart Specialization. The concept, Knowledge Economists Policy Brief No. 9, June 2009, 5pp.
- Freeman C., 1988. Japan: A New National Innovation System?, in G. Dosi, C. Freeman, R.R. Nelson, G. Silverberg and L. Soete (eds.) Technology and Economy Theory, London: Pinter
- Lundvall B.A., 1992. National System of Innovation: Towards a Theory of Innovation and Interactive Learning. London: Pinter.
- Malerba F., 2002. Sectoral Systems of Innovation and Production. Research policy, 31, 247-264
- Mazzucato M., 2014. The Entrepreneurial State, Debunking Public vs. Private Sector Myths, Penguin Books, UK
- Mazzucato M., 2017. Mission Oriented Innovation Policy. Challenges and Opportunities. RSA Action and Research Centre in partnership with UCL Institute for Innovation and Public Purpose, London
- Mazzucato M., 2018. Mission-Oriented Research & Innovation in the European Union. A problem-solving approach to fuel innovation-led growth. European Commission, Directorate-General for Research and Innovation. Publications Office of the European Union, Luxembourg.
- Morris C. and Pehnt M, 2016. The German Energiewende Book, Heinrich-Böll-Stiftung, Berlin. Available: <https://book.energytransition.org/>
- Nelson R.R., 1993. National Innovation Systems. A Comparative Analysis, Oxford University Press, New York and London
- Schwab K., 2018. The Global Competitiveness Report 2018, World Economic Forum, Geneva, Switzerland
- Vlačić, E., Dabić, M., Aralica, Z. 2018. National innovation system: where do government and business diverge?, Drustvena Istrazivanja, 27(4), 649-669.
- Vlačić, E., Dabić, M., Daim, T., Vlajčić, D. 2019. Exploring the impact of the level of absorptive capacity in technology development firms. Technological Forecasting and Social Change, 138, 166-177.
- Wintjes R., 2016. Systems and Modes of ICT Innovation, Joint Research Centre, JRC Science for Policy Report, EUR 28005 EN; doi: 10.2791/58656