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The Change of Institutional Logic in the European Commission Research

Funding Instruments

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Abstract

This paper is dedicated to analyzing the evolution of the European Commission (EC) research funding instruments for Information and Communications Technologies (ICT) research in Europe. Combining an interpretive analysis of the official European Commission documentation as well as an in-depth analysis of a new, experimental research Programme, Future Internet Public-Private Partnership (FI PPP), this paper describes the evolution of the funding Programmes over the past decade, and constructs a view on how the underlying institutional logic behind the EC research funding has changed. The analysis illustrates a significant change in the institutional logic of the funding schemes, reflecting the changes in the operating environment, as well as the evaluations and critique of the preceding Programme results and impact. The analysis identified several solutions for changing the EC approach in managing larger scale research projects and verified the change in dimensions of Added value, Structures, Agency, Action, Legitimacy, and Finance & funding. Hence, the change in these dimensions is reflecting a change of institutional logic from Knowledge Logic to Market Development Logic. The change is derived from events in both the internal and

external operating environment, consisting of the Programme evaluations and recommendations, along with the Commission's consequent actions. Based on the findings in this paper, we argue that understanding and awareness of the institutional logic change, enables the Commission to better appreciate the complexity of research and innovation partnerships, and design the future Programmes and evaluation criteria as a conscious choices in line with the prevailing logic.

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**The Change of Institutional Logic in the European Commission
Research Funding Instruments
– Case Future Internet Public-Private Partnership**

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Abstract

This paper is dedicated to analyzing the evolution of the European Commission (EC) research funding instruments for Information and Communications Technologies (ICT) research in Europe. Combining an interpretive analysis of the official European Commission documentation as well as an in-depth analysis of a new, experimental research Programme, Future Internet Public-Private Partnership (FI PPP), this paper describes the evolution of the funding Programmes over the past decade, and constructs a view on how the underlying institutional logic behind the EC research funding has changed. The analysis illustrates a significant change in the institutional logic of the funding schemes, reflecting the changes in the operating environment, as well as the evaluations and critique of the preceding Programme results and impact. The analysis identified several solutions for changing the EC approach in managing larger scale research projects and verified the change in dimensions of Added value, Structures, Agency, Action, Legitimacy, and Finance & funding. Hence, the change in these dimensions is reflecting a change of institutional logic from Knowledge Logic to Market Development Logic. The change is derived from events in both the internal and external operating environment, consisting of the Programme evaluations and recommendations, along with the Commission's consequent actions. Based on the findings in this paper, we argue that understanding and awareness of the institutional logic change, enables the Commission to better appreciate the complexity of research and innovation partnerships, and design the future Programmes and evaluation criteria as a conscious choices in line with the prevailing logic.

Keywords Institutional logics, Research, European Commission, technology management, Innovation, Change management, Professional services

Paper type Research paper

1. Introduction

This paper is dedicated to analyzing the evolution of the European Commission (EC) research funding instruments for Information and Communications Technologies (ICT) research in Europe. By case study analysis, this paper describes the evolution of the funding Programmes over the past decade, and constructs a view on how the underlying institutional logic behind the EC research funding has changed. The analysis illustrates a significant change in the institutional logic of the funding schemes, reflecting the changes in the operating environment, as well as the evaluations and critique of the preceding Programme results and impact (Idea Consult, 2010). Drawing from the official Commission documentation as well as an in-depth analysis of a new, experimental research Programme, Future Internet Public-Private Partnership (FI PPP), the authors demonstrate the change in the institutional logic, followed by a discussion on its' implications on the future research Programme, and corporatization of the European research area.

The European Commission's main instruments for implementing the jointly agreed research priorities have since 1983 been the Frame Programmes for Research and Experimentation (FP). In an attempt to respond to the US and Asian developments, the funding schemes increasingly emphasize systemic, large scale projects, innovativeness and the analysis of the societal and political contexts (European Commission, 2010b). For ICT innovation in particular, the fundamental unpredictability of products and services usage has revealed a clear demand for European level research. The Commission has answered the challenge by establishing more open and networked forms of collaboration between industrial, government and academic stakeholders on the one hand, and public sector on the other (i2010 EU policy framework). Consequently, the Europe 2020 Innovation strategy emphasizes the investments not only in corporate R&D and science and technology driven research, but also on public-private collaboration and innovations to address the major societal challenges of our time (Europe 2020, Flagship initiatives).

One of the main motivations for funding collaborative ICT research on the European level is advancing and accelerating the digital single market development in Europe. The digital single market initiative emphasizes the role of well-functioning public sector and services as key components for safeguarding Europe's economic and social model and citizens' well-being (European Policy Centre, 2010). However, the recent Programme evaluations evidence that the European research funding Programmes have not been as effective as anticipated in terms of their technical, societal and economic impact (European Commission, 2010b). Following the critique,

the European Commission has incrementally introduced improvements both in terms of structures and contents of the research Programmes. The changes have been considered mainly as technical and structural, and not much emphasis has been given for the evolution of the overall Programme's purposes and institutional logic.

Despite this broad based agenda setting for the Frame Programmes, to date, the Programmes have been pre-dominantly a research instrument, whereby a significant amount of scientific knowledge has been created. However, the Programmes have been increasingly criticized for the lack of impact on the markets and actors outside the research consortiums. The Commission has addressed these identified challenges through incremental improvements in administrative structures and focus of the Programmes, but more radical changes and renewal is called for. The latest Commission initiative, Horizon2020, is expected to introduce these anticipated radical changes in 2014 (European Commission, 2011c). In the meanwhile, new approaches and gradual improvement in research funding are experimented with. Representative examples of such approach are the Public-Private-Partnerships (PPP) for research, whereby various new structures are tested and validated before broader implementation within the Horizon2020.

The Public-Private Partnerships (PPP) for research are separate from the traditional partnerships, which refer to different types of contractual agreements between the State and the private sector for the purpose of public infrastructure development and services provision. The Programme focus on the research Public-Private Partnerships springs from the market development where private sector is increasingly taking on activities previously considered as the responsibility of the State, and the State becomes the "buyer" rather than the supplier of the services (Bointon, 2009). With this, public sector participates in research partnerships in one hand, as a service contractor, co-creator, and regulator on the other (Hwang & Thorn, 1999). The new PPPs for research simulate real market environments, where the public sector participates in a co-creation process with the private sector, and thereby can experiment and simulate the changing roles and relationships.

Institutional logics are the fundamental principles whereby social systems work and interact. Institutional logics create the relations of things and actors and dictate sets the deontic status to different actors. The institutional logic itself, as well as the actors constructing it, are in a constant flux of change. In order to illustrate the change in the institutional logic, we depict the evolution of the funding instruments as a gradual process of adoption to occurrences and events and present a representative case that can be viewed as the latest "release" in the series of attempts to increase innovativeness and impact of the funding Programme. Through the case study analysis of the Future Internet Public Private Partnership (FI PPP) Programme we inspect what occurrences altered the basic underlying assumptions in European research funding, and how the new institutional logic differed from the preceding one.

By building on the case study analysis, this paper argues that the implemented changes in the funding instruments' structures and articulated objectives in fact provide evidence of a significant change in the institutional logic in the European Commission research funding. It is important to identify the characteristics of the change in order to make informed decisions of the coming funding Programmes. With this argument, the paper then depicts "lessons learned" and provides recommendations for the future funding Programmes, most notably the recently published Horizon 2020.

The paper proceeds as follows: Firstly, the research context is described, followed by a brief review of relevant literature. Secondly, the corpus and the methodological approach are presented. Thirdly, the representative case study is described. In the last section, the results are disclosed in the conclusions and discussion section of the paper.

2. Institutional Logics

The European Commission research Programmes consist of complex cross-functional, multi-organizational and multi-level relationships and communities in which, the activities are targeted towards a commonly shared objectives. With this, the institutional logic a suitable grounds to analyze the related instruments (Kuhn,1962) and the wider socio-economic structures and their interlinked coexistence. In this paper, the focus is on the institutionalization on the system level, namely on the European Commission as a public funding agency.

In "pluralistic orders" like the European frame Programmes, the decisions regarding the structure, amounts and focuses of the Programmes are made at the system level, while the implementation of the Programmes is shaped by reliance on bargaining process among organizations. The system includes also second order organizations, whose role can be understood as integrative nodes of the system as a whole. In the frame Programmes these organisations are typically the Coordination and Support Actions, whose function is to steer the system and manage the environment of the primary organizations, and their outputs are coherent macro-policies directed towards solving collective problems. (Metcalf, 1974, 653 and 657-658). The interlinked relationship between these intermediaries and the other actors in the field presupposes considerable societal guidance capacities, like extensive consensus building, information processing and decision making power, and influence capacities that "are essential for the

successful mobilization of support behind technically feasible and politically acceptable collective decisions" (Metcalfe, 1974, 658).

At the system level, one of the basic building blocks for coordinated action is the institutional logic, which guides the behavior and action of the system members. According to Scott (2001, 139) institutional logics refer to belief systems and related practices that predominates in the studied context. The concept of institutional logic is a set of "material practices and symbolic constructions which constitute organizing principles and which are available to organizations and individuals to elaborate" (Friedland & Alford 1991, 248). Institutional logics are "the socially constructed organizing principles for institutionalized practices in social systems" (Nigam & Ocasio 2010, 823).

Institutional logics guide "what goals or values are to be pursued within a field or domain and indicate what means for pursuing them are appropriate" (Scott, Ruef, Mendel, & Caronna, 2000, 171). It is a shared logic, including causal beliefs on how to successfully operate in a given environment is created both within the organization and also in connection to the wider views of a larger population of organizations (Porac, Thomas, & Baden-Fuller, 1989, 399-401; Sutcliffe & Huber 1998, 801). The concept of institutional logic has been seen also to be consistent with the concept of logics of action (DiMaggio, 1997, 277).

The action taken, observed as a coherent set of repetitious behavior, can be isolated as a concentration of shared meanings and interpretation of the Programme and its environment. This can be seen as logic of action, as Bacharach, Bamberger, & Sonnenstuhl (1996, 477) have defined, the specific ends and specific means for achieving them and the underlying general logic that guides each party's behavior. While the logic of action is for the most part taken for granted, it becomes manifest when parties try to explain to themselves or justify to others the selection of specific means, ends, and the linkage between the two. It provides the "rationalization of action", when such an explanation or justification is needed. In this sense, logics of action may be seen as the more normative, cultural, sociological, and less economic component that actors bring to an exchange relationship (Bacharach et al., 1996, 477).

The European Commission Programmes are shaped by multiple stakeholders and with that, the formation and change of logics are long term processes. Institutional logics determine which issues and problems are salient and the focus of actors' attention. Additionally institutional logics determine which answers and solutions are on the focus of those involved (Thornton, 2002, 83). Thus, a change in the underlying institutional logic is a change in the whole ecosystem, when all the participants have to alter their behavior and activity to correspond the renewed situation.

DiMaggio (1988) suggested that “new institutions arise when organized actors with sufficient resources see in them an opportunity to realize interests that they highly value”. Thus organizations that embody existing logics must also face situations where they have to respond to changing logics that often take the form of changes in external demands (Scott & Davis, 2007, 273). However, as Douglas North described, “the changes at the margin may be so slow and glacial in character that we have to stand back as historians to perceive them, although we live in a world where the rapidity of institutional change is very apparent.” (North, 1990, 6). Such a change is triggered by the existing inconsistencies, which according to Seo and Creed are four: Technical inefficiency, non-adaptability, institutional incompatibilities and divergent interests (Burns & Nielsen, 2006, 451).

In the European research landscape severe inconsistencies have been identified in the periodical evaluations. This has triggered profound changes in the means that how the Programmes are defined and how the funds have been distributed. These changes are a product of more profound changes in the European level political priorities and pressures from external operating environment. Institutional logics are effective at a variety of different levels, for example organizations, markets, industries, interorganizational networks, geographic communities, and organizational fields (Nigam & Ocasio, 2010, 825). Hence, applying the institutional logics approach, we depict and explain the change in the principles and practices how the system is operated, and as such, constitute a change in the institutional logic of European Research funding.

3. Research Method

This study has been carried out following the case study protocol, as described in Yin (1989). Case study method is used to describe the characteristic of a particular organization or phenomenon under study. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used. (Yin, 1989, 23) As a research strategy, case study approach is concentrated on understanding the dynamism within single, even unique settings. (Eisenhardt, 1989, 534).

The analysis of the research data was concentrated around two research questions that drove our analysis ahead. Firstly, *what are the reasons for the Commission to execute improvements in the frame Programme?* Secondly, we looked the data for an answer to the question of *what are the characteristics that have changed in the frame Programmes, constituting the identified change in*

the institutional logic? This served to identify the contextual requirements of the successful projects in the new logic of operation, and gave us possibilities for a wider description of the components of research and innovation projects. These questions were aimed at clarifying at a more abstract level, what were the principal reasons for the chosen direction to develop the funding instruments.

The collected data was analyzed according to case study protocol (Yin, 1989) with a connection to the interpretive and grounded theory approaches, in which data collection, analysis, and theory stand in reciprocal relationship with each other (Strauss & Corbin, 1990, 23) We began by the analysis of the past evaluations of the frame Programmes in order to identify the areas of improvements in the Programmes. This exercise allowed us to develop categories of characteristics by which to further strengthening the analytical structure of the analysis.

We used researcher triangulation in validating the analysis by presenting an interpretive description of historic data, along with participatory observations by the authors and other participants in a central role in the case study, in order to produce compelling analytical conclusions, and to rule out alternative interpretations. (Yin, 1989, 106)

The quality of case study the study according to Yin (1989, 40-46) is built on construct validity, internal and external validity and reliability. (Cf. also Gibbert, Ruigrok, & Wicki, 2008) Construct validity means the establishing of proper operational measures for the concepts being studied. Internal validity deals with causal relationship whereby certain conditions are shown to lead to other conditions. External validity is about establishing the domain to which the study's findings can be generalized. Reliability is about demonstrating that the operations of the study can be repeated producing the same results.

In the case analysis the internal validity was ensured through selection of reliable and closely involved data sources. External validity was ensured by a selection of a representative case, and thorough analysis of the operating context for generalization. Inference typical to case studies (Yin, 1989, 43) was overcome by direct participatory observations of the case. Special efforts were made to make conclusions based on broad discussions and pattern-building among the research group and external stakeholders, making use of grounded theory approach (Strauss & Corbin, 1990). In the spirit of grounded theory, we developed and tested our working propositions and emerging findings on all material. Thus, the findings we propose later on in this report reflect not only a single event or case, but the European Frame Programme evolution as a whole. The reliability of our study is guaranteed in a twofold process. Firstly we have documented the procedural steps in our case study process. Secondly, this study was done in accordance of

accepted case study methods and protocol, which are also reported in the methodology session of this paper.

As van Maanen, Sørensen, & Mitchell (2007) have argued, theory and method are interlinked. The point of theorizing is not simply to produce validated knowledge but, rather, to suggest plausible connections and relationships that have not yet been caught (van Maanen et al. 2007, 1148). The data should be sufficiently detailed, rich, and complex so that the organizing processes and causal conjectures can be approached and explained as to why they appear plausible (van Maanen et al. 2007, 1149). In explanations, universal theorizing and interpretations of actors' intentions and actions are required to be investigated against events of the past. This can be theories that encapsulate both explanation and description (Üskiden & Kieser, 2004, 326). Although some researchers arguing for processual methods see the generalizability of the results as an ideal of scientific explanation (Van de Ven & Poole, 2005, 1384; Goldman, 1994, 623), others underline the uniqueness of the situation and context – not "to generalize as such but to specify" (Strauss & Corbin, 1990, 191). The analysis of the process data requires conceptualizing the events and detecting patterns among them. (Langley, 1999, 692)

4. Data Collection and Analysis

We used data from different sources. In the macro level, the documentation included the conceptual development of the European innovation policy was followed by official public EU documents, such as OECD Economic Studies No. 35, 2002/2, Production And Use Of Ict: A Sectoral Perspective On Productivity Growth In The OECD Area, Dirk Pilat, Frank Lee and Bart van Ark, Economic Impact of a European Digital Single Market, Hans Martens, European Policy Centre, Final Report, The European Policy Centre's Digital Single Market (DSM) project COM(2010) 245 Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions A Digital Agenda for Europe, The European 2020 Strategy, the Digital Competitiveness Report 2009 - COM(2009) 390; the Commission's 2009 public consultation on future ICT priorities; the Conclusions of the TTE Council of December 2009, the own-initiative report of the European Parliament on 2015.eu, E-Europe 2010 evaluation and the Declaration agreed at the informal Ministerial meeting in Granada in April 2010. The internal organization of the Framework Programme and the FI PPP were investigated by researching official project documents, press coverage of the subject and internal memos and documentation from 2009-2012. One of the

authors participated in the preparation of the FI PPP project and had a deep insight of the incremental development of the Programme.

The micro level data was collected following the case study approach, whereby the authors participated in the Programme preparation and implementation in a central role as a part of the Programme Facilitation and Support action, CONCORD¹. The analysed data includes participant observations, reviews of the official project documentation, informal knowledge exchange and interviews with the project participants, as well as review of relevant EC documentation, collected in a period of 1,5 years between October 2010 and February 2012. The authors lead the design and negotiation of the FI PPP Programme level objectives and management structure, and were responsible for implementing it through the various official governance organs. The authors further facilitated the design and negotiations for the FI PPP Collaboration agreement, which set the rules for the engagement between the Programme participants. The authors further represent FI PPP in the official boards of the broader European Future Internet research community, Future Internet Assembly (FIA). With this insider stance the authors were able to gain a comprehensive and holistic view of the Programme and its' position in the Future Internet Research landscape in Europe.

The authors main entry to the data was the Concord project, in which they participate in the capacity of the Coordinators. Reflecting the past experiences on the importance of coordination, the authors designed Concord project as a key knowledge aggregator and broker within the FI PPP community. It also was designed to serve as a single point of communication to the Commission. The Concord project offered the authors an exceptional and unlimited access to the data regarding the implementation and activities in the project, and with that a thorough understanding of the Programme.

5. Setting the Scene: Implementing the Digital Single Market

Digital Single Market provides the European integration process a tangible vision (European Policy Centre, 2010). It is a market that encourages cross-border online trade, investments in new online services, applications and digital infrastructures, and promotes high level of e-skills and e-readiness. It is defined as a harmonised and integrated European market without barriers between member states hindering the use of digital and online technologies and services. The vision

¹ Project acronym: CONCORD, Coordination and Collaboration Facilitation for Next Generation Future Internet Public Private Partnerships, Grant agreement number: 285266

pictures a modern, pro-competitive and consumer-friendly market, supported by legal framework and a number of related policies (Suranovic, 2010). In financial terms, the digital economy can potentially provide at least 4% of EU-27 GDP.

OECD has shown that besides the fragmentation of markets, one reason for the disparity in the productivity between the United States and Europe stems from the better use of ICT in the United States, which resulted in them outgrowing the EU. (Pilat, Lee & van Ark, 2002) The Digital Single Market is aimed at providing competitive services and infrastructure, accessible across Europe, and thus targeted at increasing competitiveness against similar services being provided by US operators (Kroes, 2011).

One of the key initiatives in supporting the Digital Single Market Initiative is the Digital Agenda. The Digital Agenda for Europe is one of the seven flagship initiatives (Europe 2020) of the Europe 2020 Strategy, set out to define the key enabling role that the use of Information and Communication Technologies (ICT) will have to play if Europe wants to succeed in its ambitions for 2020. (i2010 EU policy framework) The overall ambition is deliver sustainable economic and social benefits from a digital single market based on fast and ultrafast internet and interoperable applications (European Commission, 2010a). The Commissioner for the Digital Agenda is the Esteemed Nelly Kroes, who is also the owner of the selected Case study initiative, Future Internet PPP Programme.

Since 1983, the funding of research and experimentation by the European Commission is channeled mainly through the Framework Programmes for Research and Technological Development (FP). The Commission's commitment to research, promoting as a critical platform to support innovation and a dynamic knowledge based economy is manifested through the radical increase in the research funding in the past decade (Eurostat, 2009). The current Frame Programme 7 (FP7) witnesses the European Commission (EC) investing more than EUR 50 billion in over 10,000 European projects.

The structure, management and steering of the Framework Programmes have been progressively updated both in strategic and operational terms, reflecting the societal and economic development as well as periodical evaluations and policy options by external stakeholder. In 2011 The European commission published a report that presented the main performance of the FP7 up to 2010 (European Commission, 2010b). The report evidenced of a lack of clarity in how innovation is incorporated in the Frame Programmes, and how alignment and coherence between the FP research aims and the Europe 2020 innovation strategy are ensured. The report further underlined

the need of ensuring the transforming of the scientific achievements into economic and societal impact.

From the strategic direction and content of the Programmes, the critical events are the publications of the European Commission communications, as well as the releases of new strategic European initiatives. The recent Europe 2020 flagship Initiative 'Innovation Union' communication (Idea Consult, 2010) emphasizes the importance of the European Research Area (ERA), which has become a key reference for research policy in Europe (Commission of the European Communities, 2007). It states that the European digital single market can only be realized through increased integration across the European Research Area, in the spirit of the EU's 'broad-based innovation strategy (Commission of the European Communities, 2006). This strategy improves the framework conditions for improved performance of research systems in Europe.

In the referred 'Innovation Union' communication the Members States are recommended to further open up and align their research and innovation policy and governance systems in order to support the initiative. Especially for the Information and Communication Technologies the supra-national character of the policies requires European coordination and orchestration of related research and regulations. The recommendations for medium to short term include:

- Variable configurations depending on the priorities, competences and types of involvement of interested Member States and stakeholders;
- Priority setting and joint programming based on shared foresight exercises;
- Flexible funding mechanisms combining, as appropriate, grants with specific tax incentives to support business participation and other instruments such as pre-commercial procurement of R&D services;
- Common principles of implementation, notably with respect to peer review, ethical standards, exploitation of results, quality control, accountability and evaluation, and where appropriate a joint management structure.

The Frame Programme funding will be significantly renewed again by the "Horizon 2020" Framework Programme for Research and Innovation for 2014-2020 (European Commission, 2011c). "Horizon 2020" brings together all existing Union research and innovation funding, including the Framework Programme for Research, the innovation related activities of the Competitiveness and Innovation Framework Programme, and the European Institute of Innovation and Technology (EIT). This approach is widely recognised by stakeholders as the way forward (European Commission, 2011a) and has also been supported by the European Parliament in its Resolution of 27 September 2011 (European Parliament, 2011), the European Economic and Social Committee (2011) and the European Research Area Committee (2011).

6. New European Public Private Partnerships

Public-Private-Partnerships (PPP) is a form of cooperation between the public authorities and the business and industry. There is widely spread consent that collaboration and user driven research, development and innovation is required for radical innovations and sustainable economic growth (Bourgon, 2009). Furthermore, public participation has been considered to have intrinsic value by increasing public sector accountability, broadening the sphere in which citizens can make or influence decisions and build civic capacity (Bourgon, 2007). The primary aims of this cooperation between the Public and the Business are to fund, construct, renovate or operate an infrastructure or the provision of services. PPP therefore describes the structure of the relationship combining the best capabilities of the public (legislation, regulations, social concern) and private (innovation, efficiency, finances) sectors to find an optimal solution to infrastructure-related public need.

At European level, Public-Private partnerships are aimed at helping the implementation of the European Initiative for Growth and renewal. However, the number of PPPs in Europe has been in decline since 2007 (Kappeler & Nemoz, 2010), and currently contributes only 4 per cent of the European public procurement. The European Union has taken an active role in supporting the development of new partnership models to replace the traditional public-private partnerships. Numerous instruments (Europa, Summaries of EU legislation) like the Competitiveness and Innovation Programme, smart cities initiative, PreCommercial Procurement Programme and The European Public Private Partnerships for Research have been launched in the recent years in an attempt to explore new methods and partnership models for increased impact and innovativeness of the Programmes.

As part of the European Economic Recovery Plan, the Commission launched in 2009 three Public-Private Partnerships for research (PPPs) on Factories of the Future (FoF), Energy-efficient Buildings (EeB) and Green Cars (GC). The aim was to boost research efforts in large industrial sectors - automotive, construction and manufacturing - which were particularly affected by the economic downturn and where innovation is considered to significantly contribute towards a greener and more sustainable economy (The Commission of the European Communities, 2008). Industry participation is greater in the research PPPs than in general FP7 projects, which implies a greater implementation potential in research PPPs than in general FP7 activities.

The recently launched European Commission Public Private Partnerships for research purposes further aims for sustainable European level impact in socio-political front in forms of increased harmonisation and standardisation, accelerated market acceptance, as well as creation of a solid evidence base for European level policy recommendations. While the PPPs cover many different forms of organisations, the focus is on public sector infrastructures and services. The Programmes are also expected to influence specific policies or regulatory frameworks. Simultaneously, the Programmes are expected to initiate meaningful multilateral conversations with counterparts around Europe, whereby raising questions that increase awareness regarding overseas colleagues' priorities and research Programmes, which does lead to ad hoc knowledge transfer and policy contributions.

Research PPPs differ from normal collaborative projects in the FP7 in that industry has an important role in developing the Multiannual Roadmaps. Unlike the Joint Technology Initiatives (JTIs), the PPPs have not been setup as legal entities. Research PPPs have the potential to address the whole value chain. The current research PPPs have been set up on the basis of existing industrial European Technology Platforms such as ECTP, Manufuture, EPoSS, ERTRAC and Smartgrids. In the research PPP approach, there are numerous advantages over the traditional forms of funding research and experimentation:

- renewed confidence to invest in long-term research even when faced with short-term economic problems;
- a leading role for industry, including SMEs, in the definition of the strategic priorities and the implementation of the research;
- a multi-annual integrated work Programme with a pre-defined budget, ensuring continuity and allowing industry to make long-term investment plans,
- a cross-thematic approach going from basic and applied research through to validation and large-scale demonstration, with an increased emphasis on impact and exploitation;
- increased opportunities to support innovation in SMEs; and
- a single-stage submission of proposals leading to a faster evaluation process and time to contract.

The first evaluations of the initiatives, 'Factories of the Future', 'Green Cars', and 'Energy Efficient Buildings' found that the research PPPs have been an effective response to the crisis: However, it was assessed that they unlikely will achieve the aim of making a difference to the competitiveness of European industry unless they are given longer term support (European Commission, 2011b). The research PPPs have facilitated a closer working relationship between the Commission and industry in the setting of goals and longer-term research Programme objectives. These have been defined in the so called Multiannual Roadmaps prepared by the Ad-Hoc Industrial Advisory

Groups. As an outcome of the evaluations and goal-setting, it was realized that much tighter collaboration between the stakeholders is necessary in achieving the targeted industry level transitions and impact.

Particularly on the Programme governance, the current informal arrangements were considered to lead to some uncertainties and insufficient transparency of the processes. The reviewers recommended that partnership should be formalised and the roles of the partners defined. The governance should be more representative of the wider stakeholders and include complementary competences e.g. foresight, emerging technologies, commercialisation of research results, and co-ordinated through a single point of entry to the Commission for each research PPP.

7. The FI PPP - Future Internet Public Private Partnership Programme

Following the success and limitations of the before mentioned PPPs, the Commission initiated preparations for a similar structure for ICT research in Europe. The work was organized through the Directorate General for the Information Society and Media (DG INFSO). The unit's mission is to make every European digital by achieving the digital single market, reinforcing Europe's competitiveness by increasing investment in ICT research and, innovation, and by promoting the access and use of ICT to the benefit of EU society. One of the key impact areas for DG INFSO is the Future Internet Research (Objective 1), which is positioned as enabler for numerous related objectives in the DG INFSO Work Programme.

DG INFSO invited an expert group representing the major European industry actors including SAP, Telefonica, Siemens and France Telecom to articulate the priorities for the Future Internet Research for the rest of FP7. The group, called 'The European Future Internet Initiative' published in January 2010 a white paper intended to convey the vision of the European Future Internet Initiative (EFII) for the Future Internet Dedicated call (PPP) and lay a structure for a new instrument for the ICT research. This paper initiated the Objectives 1.6-1.10 in the FP 7 call ICT2010-7. The main objective for this Future Internet PPP was articulated as a significant contribution to advancing the European implementation and uptake of Future Internet services by 2015 and, establishment of European-scale markets for smart infrastructures.

As detailed in the EC Communication COM(2009) 479, the Future Internet (FI) Public Private Partnership (PPP) would boost the European development on Internet, contribute to close the gap between technology and applications, and contribute to close the EU innovation and

competitiveness gap. FI PPP was especially designed to address the identified weaknesses in the prevailing FP7 research Programmes. The Future Internet Public Private Partnership Programme (FI PPP) addresses technical, economic, policy and regulatory barriers, and seeks to advance the implementation and uptake of European-scale markets for future internet enabled services and technologies, with integrated communications functionality by 2015. As such, the FI PPP Programme is cross-disciplinary, involving numerous project communities, fields of research and beneficiary groups. The Programme has strategic linkages with several related initiatives.

The novelty of the Programme structure lies in the broad based industry participation, as well as the novel combination of various public and private side participants in a single Programme. The participants predominantly represent industry with a share of 68%. Academic partners contribute 18 percent of the participation, while the rest is occupied by SMEs and public sector, 8 and 6 percentages respectively². The articulated motivations for the participants emphasize also real business creation and new opportunities through horizontal alignment. This is mutually accepted both by the European Commission and the participating organisations, and articulated consistently in all Programme documentation and the Programme performance indicators. The Programme combines European ICT community with different industrial sectors that increasingly rely on Internet technologies, such as logistics, automation. The expected outcome will be a better understanding of the 'client logic' of the end-users and their expectations and requirements on the future internet technologies and associated business opportunities. The realization of cross-breeding between business opportunities and ICT development in services requires cross-functional and cross-sector projects which at the moment do not exist in the sector-driven structure of Programmes.

Reflecting earlier the critique regarding low levels of exploitation, the FI PPP Programme stresses societal and economic impacts, innovation and exploitation of the generated foreground. It focuses on short to medium term impact in terms of technology and business exploitation, and thus better resonates with the participating companies' business acumen. In terms of immediate project outputs, the partners are expected to gain access to new tools and development methodologies, make significant contributions to the development of new products and processes, as well as create formal elements of intellectual property. New start-up companies on niche technologies and spill-over innovations are expected to emerge on the jointly developed foreground. For this, the Programme collaborates with the various Future Internet Communities. The key Programme partners are deeply rooted in the Future Internet Assembly (FIA), and continuously collaborate and share with various FIA support groups. In terms of scale, a typical FI PPP Trial would involve

² FI PPP Factsheet at www.fi-ppp.eu

multiple simultaneous trials across Europe, involving all relevant stakeholders the value chain in a real life experimentation that simulates the real market conditions. Such actors involve Living Labs, regional communities, SME associations, chambers of commerce, public sector and developer communities. Budget wise the trial size for one installation exceeds 15 million Euros.

The FI PPP Partners will be sharing project foreground seamlessly across all projects when such project foreground is needed for the implementation of research goals. This sharing is enabled by a collaboration agreement detailing the rights and obligations of each partner, signed by all participants. Such an agreement between the over 150 beneficiaries in the Programme is itself an unprecedented achievement in a European Frame Programme. This was ensured by the Special Clause 41³ set by the commission as a pre-requisite for grants. The special clause states that for coherence of the work undertaken under complementary grant agreements, the beneficiaries are required to create and participate in boards and advisory structures together with representatives from complementary grant agreements. The beneficiaries collectively address collaboration and synchronisation of activities, including on issues such as management of outcomes, common approaches towards standardisation, SME involvement, links with regulatory and policy activities, and commonly shared dissemination and awareness raising activities.

8. Conclusions

Our analysis revealed that in the case of European research funding, the system level institutional logic has moved from 'Knowledge logic' into 'Market development logic'. This change in the logic is a result the changing requirements in the markets and the European research landscape, paving way to the joint European Research Area, and ultimately the European Digital Single market. Innovativeness and increased industry involvement have been highlighted in the Programme design with an attempt to create broader impact in both socio-economic and technical terms.

The challenges in the Frame Programmes have traditionally been the low levels of exploitation of the results. The divergent interests of the various parties in the projects have resulted lead to sub-optimization and dominance by technology providers, although in ICT research and system level innovations the social and political aspects override the technology determination. Hence, the outcomes might also be unambiguous and hard to measure or validate. With the new objectives

³ FI PPP Special Clause for Complementary Grant Agreements
http://ec.europa.eu/information_society/activities/foi/library/docs/special-clause41.pdf

also the related evaluation criteria has been changed, and emphasize tangible economic outputs, contributing to the digital single market development and European prosperity.

The peculiar dimensions of the institutional logics in European Commission research funding are built on Added value, Structures, Agency, Action and Source of Legitimacy. Table 1 summarizes the dimensions of the preceded and the emergent new institutional logics.

TABLE 1. Old and new institutional logics in European Commission led research funding and their dimensions.		
Dimension	Knowledge Logic	Market Development Logic
Added value	Scientific knowledge creation, knowledge networks, cohesion policy	Market development, innovation, new business, single market development, close to market
Structures	Loose coordination, vertical structures, clear scope	Strict governance structure, horizontal collaboration, integration
Agency	Predominantly universities, low turnover in participation	Predominantly companies, high amount of new beneficiaries
Action	Thought leadership, continuation of earlier research in the field, incremental innovation	Alignment across calls and objectives, systemic and disruptive innovations, broad scope
Legitimacy	Scientific excellence, historical continuation, impact through value creation	Efficiency, business impact, scale, impact through value capture
Finance & funding	Investment in Research and development	Investment in development and business creation

The Programme structure was designed to initiate tighter collaboration and centrally governed formal governance structures. This was further ensured through the special clause 41 and a dedicated Facilitation and Support Action project acting as a Programme Secretariat. As the case study revealed, the formal Programme governance model was designed to generate consent and minimize dominance by any participating project group through a set of rules for participation and interaction in the various governing boards. In the case study the applied collaboration mechanism was designed to be adaptive and evolving in order to accommodate the changing circumstances and maturity of the partnerships during the five-year project span.

The new organizing principles included a facilitator, who overlooked the implementation of the governance model in the Programme and simultaneously served as a single point of contact for the Commission. In the FI PPP case study, Concord, as the facilitation and support action was mandated to have a key role in establishing and institutionalizing this *modus operandi*. As a University lead project it represented an independent facilitator with no vested interests in the developed commercial results. This was aimed at helping build the much needed transparency and trust, and thus support the participating projects to achieve their objectives and collaborate in an open and trusted environment.

A reconfiguration of actors and participants was required to implement the renewed Programme focus. Moving towards economic impact and market-driven success, the share of industry participants was raised to be significantly higher than what it used to be in the traditional research Programmes (68%). The participation was designed to be broad based in order to have a clear understanding of the future requirements and demands changing technological requirements had altering business model needs. This included the over 60 new organization that had never attended a Frame Programme before. In the future instruments, the SME and public sector participation will be having a larger quota in order to ensure also the socio-economic impacts and contributions to the European cohesion policies as generally expected from the European Commission Programmes. In addition, the increased industry and innovation focus was fostered also through inclusion of a large number of new actors, participating in frame Programmes for the first time. This brought fresh ideas to the Programmes and enabled changes in the traditional discourses and ways of framing alternative choices of development.

Emphasizing impact and market development steered the activity towards innovation and re-use of mature technologies in new configurations. Real business opportunities and market creation through co-creation were the principle motivations for the participants to join the programmes, as well as measures of success for the Programme. With a broader front of participants also the potential impact was expected to grow, but also the potential risks of the Programmes had multiplied. The risks had been mitigated with the new, more competitive and flexible arrangements, whereby the funding is not guaranteed for the whole duration of the Programme. Instead, there are open calls during the Programme, whereby the participation must be re-confirmed.

The new logic also emphasizes horizontal alignment across the various parts of the Programme, as well as with its' external stakeholders and related research Programmes and communities. This knowledge sharing is targeted to overcome communication gaps and strick one-sided dedication to isolated but parallel work. The new Programme arrangements allow for open exchange of data and co-creating on earlier created foreground and concepts, but did not rule out collaborations also with

the other related initiatives, including FIA. In the spirit of the Horizon2020, the Programme also collaborated closely with SME sector and other development and innovation communities like Living Labs, Smart City initiatives and Testbed communities.

The legitimacy of the new Programmes is based on results and contributions to market development and business creation as opposite to older assumptions of creating thought leadership or the developing dominant technologies. This profound change emphasized value capture and exploitation of results over the creation of solutions and innovations. The philosophy emphasizes open interfaces and co-creation with the market actors, and thus the developed innovations and solutions are opened to market at earlier stages in order to get developer communities and users involved in the development process. This accelerates market acceptance and harvesting of the potential societal and political impacts of the solutions. It is noteworthy that the size of the Programmes have steadily increased following the quest for broader impact (European Commission 2011a). The motivation to participate has changed to emphasize more the economic gains and thus enabled business potential. Other motivations have emphasized access to attractive professional networks, and participation to a new, experimental Programme.

In conclusion, the research data provided solid grounds to suggest new plausible connections and relationships between the studied characteristics that could be generalized in system level which constructed the institutional logic. The first research question of *'what were the reasons for the Commission to execute improvements in the frame Programme'* was answered by the case study analysis of the development of the Programmes at the macro level, as well as interconnected events in external and internal environment. The events in the internal operating environment consisted of the Programme evaluations and recommendations by external reviewers, along with the Commission's consequent actions. The Commission has been sensitive in responding to the changes in the markets and the European single market development, and updated the research Programmes focus and priorities following the official statements and communications from the stakeholder groups, including politicians, industry associations and content experts. These statements constitute the second part of the studied critical events in the Programme evolution. From this we can detect the change in the logic of the Programmes, moving from the knowledge logic to market driven logic. While the purpose of the Programmes earlier was predominantly to develop scientific knowledge, the recent Programmes increasingly emphasize innovation and market impact through broad based industry participation and market creation. Hence, the change in institutional logics was constituted endogenously. This change reflects the various economical and efficiency demands from the markets, as well as the renewed overall direction in the European research area. With this, we named presented old and new institutional logics as 'Knowledge Logic' and 'Market Development Logic'.

The evidence for the second research question of *'what are the characteristics that have changed in the frame Programmes, constituting the identified change in the institutional logic'* was drawn from the case study analysis, and reflections to the earlier Programmes. While the Frame Programmes earlier emphasized the creation of scientific knowledge, in the latest Programme, Future Internet PPP focus is clearly on capitalizing on created foreground and earlier research results, in order to create impact on markets through technologies for new business models, entrepreneurship and SME engagement. Thus, the Future Internet PPP Programme is designed to respond to the critique from the earlier Frame Programmes. With the renewed structure of the call for tenders, the European Commission has laid the foundations and the frame for its' implementation. In the capacity of the funding agency, the European Commission is in this way steering the Programme to the desired direction. Changes took place in multiple aspects of the Programme. For the sake of clarity, the changes in the various Programme characteristics were described using an applied model of Thornton's (2004) ideal types in change in institutional logic.

9. Discussion

The European Commission Funding instruments have been iteratively developed by the European Commission in terms of their structure and agenda setting. The Future Internet PPP represent the latest, exploratory form of Programme structure as the last Programme funded under the traditional FP7 funding, before the more radical paradigm change in the funding instruments in the upcoming Horizon2020 Programme. The Programme is one of the European Commission's instruments to advance the implementation of the digital single market in Europe.

This paper described and explained the change in the European Commission's research funding Programmes through institutional logic meta-theory. It identifies the Programme covariates that have changed as a consequence of the strategic and structural change in the logic in order to conform with the prevailing institutional logic. These Programme characteristics, or attributes in system level comprise the highest order societal logic in the research Programmes, whereby the actions of the participating organisations and individuals are embedded, enabled and constrained. Focusing on a limited set of issues and characteristics, we were able to draw generalizations and rules from the empirical evidence.

The evidence suggests that the increased importance of accountability for results, and transparency of the processes were the main motivators behind the changes in the institutional

logic. This process can be paralleled with equivalent developments in various professional fields, resulting in corporatization of the occupations. Thus the evolution process can be considered as a sign of corporatization of the European research Programmes. This development is consistent with the development in other professional fields and industries, and reflecting the changes and demands from the markets. The analysed case presents a representative case in this development, contributing to the development of the digital single market in Europe. Realizing the single market requires collaboration and consent building among the European industries in various levels, whether regarding technical standards, regulatory contributions or policy recommendations. Notable is that this development can not be accomplished by the private sector or public sector alone, but rather requires changes in the whole operating ecosystem. In order to better understand this phenomena, we draw various characteristics from the evidence, constituting the determinants of the institutional change. This classification enables us to analyze the various aspects of the change separately and understand their interrelations and links to the other levels of institutional logics underlying the system level logic.

Based on the findings in this paper, we argue that understanding and awareness of the institutional logic change, enables the Commission to better appreciate the complexity of research and innovation partnerships, and design the future. The analysis also enables the parties to better assess whether the taken direction is in line with the European values and societal and political objectives, like the mentioned digital single market. Programmes and evaluation criteria as a conscious choices in line with the prevailing logic. This would significantly increase the efficiency and impact of the Programmes through clear scope, better actor selection process, clear articulation of objectives and clear differentiation of basic and applied research and innovation.

The incremental development of the research Programmes laid foundations and prepared the ground for renewed assumptions of what kind the fundamentals of a successful research program would be. Such changes would not have been possible to overtake without the gradual development and adjustment process between the various levels and actors embedded in the institutional logic. In the case of FI PPP the changes made during the preparation of the FI PPP Programme resulted as new basic assumptions for next generation Programmes, and are thus results of the evolved institutional logic.

The limitation of this study is its' focus on the system level logic and interaction. The implications of the change are not articulated in detail for the various actors and system levels involved. The study is focused on the analysis of the change and its' foundations, without extensive speculations on its' implications to the future direction of the European research area. Especially the development direction towards the corporatization of the research, seconding the developments in USA and

Asia, shows clearly signs of mimetic isomorphism (DiMaggio & Powell 1983, 150) in a global scale, and as a phenomenon would be an interesting avenue to explore further. Other recommended areas for further research would be comparative analysis on the outcomes of the selected case study and other parallel innovation Programmes that are in another stage towards their change toward the new institutional logic, as well as the co-development of competing logics in various levels of the system.

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