The changing organization of innovation in public services
The case of digital library

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Abstract:
Based on a longitudinal case study of virtual library development, we highlight three important aspects that characterize the links between governance and innovation in public sector innovation.
First, the examined case shows that the organizational complexities have increased in the transition from what could be considered as a spurious New Public Management approach, which incorporates elements of the traditional hierarchical model and elements of market-like competition, towards a "networked model" implying more emphasis on bottom-up decision making and a greater involvement of end users. Second, we provide evidence of increasing co-creation activities in which end users are involved not only in choosing out of a given menu of alternative solutions to given problems, but also in the definition of the menu itself, and in shaping and implementing innovative solutions. Third, the increasing involvement of users has created important innovation opportunities that are more and more characterized by their frugal/bricolage nature, hence more localized but not necessarily trivial and relatively easy to diffuse to different contexts.
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1. Introduction

The public sector has long been considered as characterized by low levels of innovation, largely lagging behind the business sector. This perception is partly motivated by the existence of some structural features of public sector that may hinder innovation, but does not correspond to the state of affairs in general, and is largely misleading in some areas.

Indeed, one might argue that innovation has always been present in the public sector, what changes in different circumstances and over time are the nature and intensity of innovation itself, as well as the role of actors involved. Circumstances that may affect innovation in the public sector include: technological factors, and particularly the massive introduction of ICTs in public services; economic factors, as public administrations (PAs) are increasingly forced to do better with less resources; and socio-demographic factors, ranging from ageing population, increasing needs to invest in knowledge intensive activities and in green technologies. This set of factors combines with changing ideological perspectives that have emerged and dominated in different phases of recent history. One way to characterise such perspectives is to distinguish: a) the "traditional" public administration model, dominating in the post-World War II (WWII) for more than three decades, that can be broadly sketched as state and producer centred and based on largely hierarchical relations within PAs; b) the "New Public Management" that has been pervading PAs since the mid-1980s and relies on the idea of emulating the private sector and of introducing market selection mechanism within PAs; c) the "Networked Governance" model , emerged in the early 2000's, which is much more attentive to civil society and is largely shaped by its pressures, for example by directly involving the users in the service development process (see Bennington and Hartley 2001 and Roste 2005 for more on this distinction). It has been argued that these paradigms can be associated to a very different nature of innovation, and with different roles of key players in innovative activities, including policy makers, public managers and users (Hartley 2005).

The purpose of this paper is to evaluate whether and how these different paradigms can be observed in a specific public sector domain, i.e. university library services, with a focus on the transition from a New Public Management approach (with elements from the Traditional Model still embodied in it) to the Networked Governance perspective.

Using a longitudinal case study of the introduction of new ICT related services at Roskilde University Library since the end of the 1990's through 2014, we will show how the transition from one paradigm to the other has taken place. We will highlight that while the distinction between paradigms is still rather blurred in the examined case, one can indeed detect some remarkable changes in the nature and intensity of ICT related innovations being developed and uptaken over time. In general terms, we will observe more and more emphasis on organizational innovation, a decreasing role played by radical technological innovation and increasing incremental, "bricolage" type of improvements in services, and a greater involvement of users in the co-creation of new services. It is suggested that analysing this experience in a long run perspective may help understand future avenues for innovation in both public and business services.

The remainder of this paper is organised as follows. Sections 2 and 3 illustrate different models to characterise the links between public sector governance and innovation, building on Hartley's seminal contribution and taxonomy. In section 4 we provide some introductory evidence on Roskilde University Library and describe the case study methodology we shall follow to shed some light on the evolution of governance and innovation in this specific institution. Section 5 will illustrate the transition from what could be roughly identified as a NPM phase, embodying elements from the traditional hierarchical approach, to the emergence of a networked approach to public public sector innovation, with specific reference to the case of Roskilde University Library. Section 6 will conclude.

2. Public sector governance and innovation

Hartley (2005) identifies three different phases in the evolution of public sector innovative activities in recent history, reflecting different governance models:
(a) a "traditional" model wherein innovation is initiated by political decisions at the highest level (policy makers as "commanders"), imposed to the public management, perceived as "clerks and martyrs", and delivered to passive users seen as "clients". This view is consistent with big technical changes and large purchases of technology, as visible efforts to innovate that can be used by policy makers as assets in political markets;
(b) a "new public management (NPM)" perspective that takes on board the issues of efficiency and the need to customize services to improve performance. Policy makers indicate objectives of improved performance, public managers are perceived as efficiency maximizers, and the emphasis is on organizational change and on the need to increase involvement of different organizational layers within PAs. Users are considered as "customers" whose needs must be explored and dealt with, as their satisfaction becomes a key element of public sector performance to be monitored;
(c) a "networked governance" view of innovation characterized by an involvement of innovators at both the local and central level, with a particular emphasis on incremental changes at the front-line level. Policy makers play the role of interpreting emerging technological and social innovation opportunities, thus "inspiring" innovation, public managers are key to exploring technologies and new avenues. This model is more consistent with a bottom-up approach to innovation, and users are increasingly seen as co-creators of new services and processes.

These different conceptions and related patterns of innovation in PAs indeed correspond to specific historical phases: the traditional model has dominated in the early decades of the post WWII period; the NPM approach has become a key reference in the late 1980s, while the emergence of the networked model can be observed in the early 2000s. However, such models can also co-exist in various ways in any given moment in time. On the one hand, elements of previous approaches tend to persist and mitigate the emergence of new models, thus blurring distinctions in the real world. On the other hand, the three approaches can be perceived as competing paradigms that tend to prevail according to the nature and intensity of changes in the (economic and technological) contexts in which PAs are active.

Hartley's framework has the merit of being rather comprehensive and systematic, and helps integrate different insights from the literature, and interpret ongoing developments in many public service fields. Some evidence on patterns of innovation in the public sector appears to be roughly consistent with this conceptualization. Examples cited by Hartley herself illustrate the emergence of these three models of public sector governance and innovation. Several studies have documented the the wide diffusion of top-down approach to innovation in PAs, providing indirect evidence of the fact that elements of the both the Traditional and of NPM approaches tend to persist in spite of important changes in technological paradigms (the ICT revolution) and in the presence of new and increasing pressures from civil society (EC 2011, Epsis 2013).. Nevertheless, there are some signals of the emergence of networked governance innovation offered by other studies, such as the Trends and Challenges Report (Rivera and Leon, 2012), and the Tech4i2 SMART report on eGovernment (Osimo et al 2013).

However, even though Hartley's framework provides a helpful and stimulating distinction of the different phases in the evolution of public sector innovative activities, it might be useful to identify some of its limitations that need be dealt with. A first set of limitations is that it does not fully account for the *complexities within PAs*. In particular it articulates the vertical process from policy makers to managers down to users, without considering the further distinctions between different layers of managers and employees involved in the design, development and provision of new services. This equals to underestimating the role of barriers, conflicts and interactions across these different levels which severely affect performance and effectiveness of services.

A second set of limitations is that it leaves rather underdetermined the *role of users*, even if identified with standard labels such as "clients", "customers" and "co-creators". One needs better clarify what could be beyond these labels, and show how these roles change in the presence of new technology and of emerging pressures from civil society.

A third set of limitations concerns the *nature of innovation* associated to the three different approaches of Hartley's framework. The underlying assumption is that radical innovation is favored by the first approach, whereas organizational innovation is required by the second one and both radical and "bricolage" innovation in the third case. It appears that such a distinction might be too sharp and that innovation patterns are becoming more and more complex in today's transition towards the so called networked model.

3. Elements for improving the framework

To overcome these limitations it might be useful to recall some ideas from the literature which help improve Hartley's framework.

As for the first limitation (*complexities within PAs*), one could refer to Jane Fountain (2001, 2007), who has focused particularly on eGov in the US and was perhaps the first who emphasized that it is not only nor primarily a matter of technology being implemented from the top down, but a matter of technology "enactment" involving all different levels of PAs (indeed she largely disregards the user, but develops an extensive analysis of the different actors involved on the supply side). See Arduini, Denni, Lucchese and Zanfei (2013) for a review of Fountain's approach and derivations. This set of issues connects to the literature on the distinctions between front office and back office innovation More generally, this Fountain's contributions connect to the stream of literature on the coevolution of ICT, organizational change and human capital development, which is reviewed in Seri and Zanfei (2013), and has so far been explored mainly in the area of private business, but has received some limited attention in the case of public sector too. There are links to the wide literature on Solow's paradox (that ICT can be seen everywhere but in productivity statistics). See inter alia Brynjolfsson and Hitt, (2000).

As for the second limitation (going inside the black box of *user driven innovation*), Scupola and Nicolajsen (2010, 2013) help better articulate how the user can be involved at different stages of the innovation process. Among the issues to be introduced, one could emphasize: the different roles played by users at different stages of innovation processes (Alam and Perry 2002), the benefits of face-to-face meeting in user-producer interactions (Magnusson 2013), the risks and challenges of user involvement in innovation processes (Nicolajsen and Scupola, 2011; Prandelli 2006), and several other insights . What makes this stream of literature important is that: it helps to identify different roles for the user, which go beyond the "co-creator role" mentioned by Hartley; it helps operationalize the different way of involving users in the different phases of the innovation process; and it points out that user involvement is not an easy task, especially in co-creation. From this perspective, one additional line of argument stems from Nathan Rosenberg, who was among the first scholars who emphasized the role of users in shaping the pace and direction of technical change through their technological expectations (Rosenberg 1978); and the importance of learning by using in the development of new knowledge especially in the presence of complex technologies (Rosenberg 1982). Even more interesting, Rosenberg (1982) shows that an important part of learning by using takes the form of "disembodied innovation", that is a stimulating category to be taken into account particularly when talking about innovation in services.

This line of argument on the circumstances under which users can be fruitfully involved in innovation, has been strengthened by the increasing perception of the revolutionizing role of ICTs and digital economy. Once again, some insights can be drawn from the literature reviewed by Scupola and Nicolajsen (2010, 2013), mainly referring to how ICT changes the role of users in business services. This literature shows that there is huge potential to involve users through ICTs and especially the World Wide Web and social media in the innovation process. The ways to involve users span from web based surveys and 'complaint areas' used in the idea generation phase to 'virtual product tests' in the product test phase (Prandelli et al., 2006; Prandelli et al., 2008;) to online idea competitions to create user-adjusted design of products (e.g. Ogawa and Piller, 2006; Franke et al., 2008). Virtual communities and social media networks are other examples to involve customers to help organizations to innovate products or services. Lego Mindstorm and online gaming are well known examples (Jeppesen and Molin, 2003). These communities may be user or company initiated. However, in both cases user involvement is based on the users' own interest and prestige in the community. In a different context, Osimo et al (2012) also emphasise the role of end users as promoters of web based innovation. In fact, with reference to eGovernment, they make a

big argument of the importance of users initiating innovation in public service provision in the age of web 2.0.

As for the third limitation (*nature of innovation* involved according to the innovation governance model), we could agree on the general statement that the 3 approaches singled out by Hartley do have different implications on the characteristics of innovation being undertaken (scale of investment, different emphasis on organizational change, incremental vs. radical innovation). Nevertheless one needs to emphasise that these changing characteristics of innovation are not exogenous, but are largely affected by the changing role of actors involved. Once again, some reference can be drawn from Scupola and Nicolajsen (2010, 2013) that by reviewing the literature on customer involvement and type of innovation conclude that innovations initiated by the users or developed with the involvement of the user are mostly incremental in nature. From this perspective, it should be emphasized that web 2.0 seems to favour incremental innovation and reputation, more than drastic technical change . In addition, there are insights on the importance of bricolage innovation in services (Fuglsang 2010) and for public service innovation in particular. 'Bricolage' innovation can be conceptualized as problem solving on the spot using existing resources. Changes occurring through bricolage in everyday situations can be building blocks to gradually and slowly create new solutions and structures. However, the question is how bricolage can be understood in an organizational context and how can bricolage activities integrate with more structured innovation planning within an organisational context (Fuglsang 2010)

An additional insight is that innovation requires a higher concentration of competences in the first approach (the traditional, hierarchical one) as it presupposes that lower level management and employees are mere executors; then it implies a higher diffusion of competencies in the second approach(new public management perspective) as it requires public managers at all level to be efficient in the use and implementation of new technology; and it benefits from an even higher dispersion of competencies in the third model (network type of governance) as it involves a strict interaction with users who become more capable to co-create innovation, the more they are themselves skilled.
The analytical framework we have developed will be used to articulate the case study, to show how different governance models and patterns of ICT related innovation have emerged in the recent history of Roskilde University Library. We will rely on qualitative data collected over more than a decade. This time span allows following the transition from a rather spurious New Public Management setting, which embodies several elements of the traditional hierarchical approach to innovation, to the first manifestations of the networked model. Although it might be a rough distinction we shall refer to these as Phase 1 and Phase 2. We will first illustrate the research method followed, and then we shall examine the changing context in which ICT based innovation have taken place, the different nature and intensity of organizational and technical innovation that have been developed in the library system in the two phases under observation, and the role played by the different actors involved (policy makers, library management and servants, users).

4. Applying Hartley's "augmented" framework. Research method and illustrative evidence on the examined case

4.1 Research Method

To investigate the transition from one paradigm to the other in Hartley's framework we conducted a longitudinal case study (Yin, 1994) of Roskilde University Library (RUB). The Danish research library sector was chosen as the empirical context of this study since in Denmark libraries have undertaken a huge transformative process since the mid 1990's due to the policy program "IT Society for all" launched in the 90's. The virtualization process of RUB was followed closely from 2004 to 2014 by one of the researchers. The data collection can be divided into 2 main phases connected to two main research projects, in which one of the researchers participated. The first research project focused on e-service adoption and the library virtualization process at RUB (2004-2007), the second had a more specific focus on user driven innovation in RUB service innovation processes (2008-2012). A third data collection phase took place in 2014 to follow up on RUB virtualization and service innovations processes . While the first data collection phase had an explorative focus, the second phase was characterized by a close collaboration between the library and one of the researchers with the aim to understand user involvement in library services innovation and together initiate and conduct activities to increase such user involvement.

Roskilde University Library was selected as a participating case in both projects according to the two criteria of : 1) being representative of the Danish research libraries in regard to service provision and virtualization process and 2) been willing to participate to the study. RUB is representative of the virtualization process of the Danish research libraries due to the fact that this process has been enforced top down by the policy makers and has involved partnerships and collaboration among all the Danish research libraries through an initiative called DEFF (Denmark's Electronic Research Library Denmark (wwww.deff.dk)).

As Rogers (1995, p. 390) states: "data about the innovation process are obtained by synthesizing the recallable perceptions of key actors in the innovation process, written records of the organization adopting, and other data sources". Accordingly the data of this study consists of primary data collected through qualitative explorative and semi-structured interviews with top management, middle management and librarians at RUB; participation in meetings; organization of workshops among one of the researcher and the library personnel, including the "user driven committee", top management, middle management and librarians; secondary data such as internal reports, minutes of meetings and surveys conducted by the library; different material retrieved on the library web page throughout the years about the library services and e-services provision, as well as different organizational charts and strategic plans; quantitative tables about number of books, journals, employees, physical space at the library; contents and online observations of a blog established by RUB for idea generation and co-creation with the library users; three future workshops (Jungk and Müllert, 1987) conducted with library employees and users and initiated and facilitated by one of the researchers; continuous observations and use of the library services, e-services, self-services, building facilities, etc. The interviews lasted circa 1.5-2 hours each, they were all tape recorded and most of them were fully transcribed. The three future workshops (Jungk and Müllert, 1987) were recorded and the posters and post-it produced were analyzed and summarized in Excel files and the results presented and discussed in a meeting with library managers. At the beginning of each data collection phase (in 2003; 2008; 2014) a contact was established with a top manager of the library. This top manager then investigated whether there were other library employees who had an interest in participating in the study. Several managers and librarians expressed their interests to participate. Subsequently top management also invited other librarians/library managers to participate in the meetings and workshops with the researchers. The criteria for respondents' selection included involvement in RUB virtualization process at top and middle management level as well as front and back office level (Patton, 1990). Thus the key role that the respondents had in RUB virtualization process gives high level of reliability and validity to the findings. The collected data were analyzed by following the "general strategy of relying on theoretical orientation" of the case study (Yin,

1994). Partial reports and papers published from the study have been continuously presented and discussed with RUB top and middle level managers.

4.2 The Roskilde University Library

Roskilde University Library (RUB) is a research library serving the students and staff at Roskilde University. Roskilde University is an academic institution accounting for about 9000 students, 650 teaching staff teaching staff and about 430 workers with technical and administrative tasks. It is located in Roskilde, a city about 35 km. from Copenhagen, the capital City of Denmark. The library was founded in 1971, as part of Roskilde University. As a research library RUB is responsible for providing Roskilde University staff and students access to information and materials needed for research, teaching and learning. Since RUB also is a public library, regional research and educational institutions, businesses and citizens have access to the library as well (www.ruc.dk). In 2001 the library moved into a new building, designed by Henning Larsen's Architects. Today the library counts 36 employees. The library consists of a 8,000 square meters building, of which 4.500 square meters are for public use, 930 for offices and 875 for closed stacks. In 2013 it had a collection of about 944,000 books and 218,000 AV media, while RUB counted about 4 million downloads in 2013 (Please refer to Appendix 1 for a detailed overview of the key figures of RUB over the last 10 years). Over the last decade RUB has conducted a library virtualization process, initiated by the government in mid 1990s that has substantially changed the organization, the services and the service delivery process of many of RUB's library services by substantially increasing self-service. Examples of new services and service delivery processes are access to e-journals and e-books, digital repository of all the student projects, and chat with a librarian. From an organizational point of view, the library has been reorganized several times over the last decade. In 2014 RUB organization consists of top management (a director and a head of reader services) and 4 lines (departments), each of which with a number of staff and a head of department also called line manager. Some employees might belong to different lines, thus creating a matrix organization.

The Danish Library Sector: Understanding the context
There are two types of libraries in Denmark: public libraries and research libraries. Danish research libraries are government institutions and serve mainly higher education and research, but most of them are also open to the public at large. The purpose of public libraries is to promote information, education and cultural activity by placing books and other media at the disposal of the public at large. In Denmark there are 20 major research libraries connected to universities and other institutions of higher-level education. There are also a large number of smaller research libraries that are connected to educational institutions.

The Danish library system is based on the concept of the citizen's fundamental right to knowledge and information. Basically both public and research library service is free of charge, but libraries can demand payment for special services. (Danish National Library Authority, www.bs.dk/publikationer/english/statistics/). The Danish library system is characterised by extensive and well-functioning co-operation, both within the individual library sector and between the different library types. The Danish National Library Authority, an agency under the Ministry of Culture, is responsible for advising the government on the organisation, co-ordination and strategy for the Danish library service and gives professional advice to ministers and public authorities, as well as local authorities, libraries and information services. In addition, the Authority has an active

role in international collaboration within the field of libraries, documentation and information. The major duties of the Authority consist of the administration of the Act regarding library services and a number of statutory government grants for library purposes. The Authority is also responsible for collecting and providing statistical information about Danish libraries as well as acts as the administrative base for Denmark's Electronic Research Library, a major institutional initiative for the Danish libraries virtualization process.

There are many definitions of virtual library as well as different terms are used to indicate the virtual library such as "digital library" and "Library 2.0" (Neal, 1997). In this paper we conceptualize the "virtual library" as a library that facilitates users to search for needed information from sources worldwide, to browse and retrieve selected information and request help at any point in the process, instantly from users' own network-connected computers, anytime, anywhere. In addition our definition is close to the "library 2.0" definition by Maness (2006) according to which the virtual library could be

- **User-centered**. Users participate in the creation of the content and services they view within the library's web-presence, OPAC, etc. The consumption and creation of content is dynamic, and thus the roles of librarian and user are not always clear.
- **Socially rich**. The library's web-presence includes users' presences. There are both synchronous (e.g. IM) and asynchronous (e.g. wikis) ways for users to communicate with one another and with librarians.
- **Communally innovative**. It rests on the foundation of libraries as a community service, but understands that as communities change, libraries must not only change with them, and they must allow users to change the library. It seeks to continually change its services, to find new ways to allow communities, not just individuals to seek, find, and utilize information.

It has to be noted that in the specific case of RUB, the library also has maintained its physical buildings and collection and number of services, becoming what some calls the "hybrid library". Such important transformation from physical to electronic libraries and relative innovation challenges has been widely dealt with in the literature on innovation (e.g. Scupola and Nicolajsen, 2010; Carr, 2009; Scupola, 2009) as well as library and information science (e.g. Wu and Abdous, 2013).

5. Applying Hartley's "augmented" framework. The case study

We will now illustrate the characteristics of the two phases of innovation diffusion and development at RUB library, which we deem can roughly correspond to a New Public Management setting (Phase 1) and to the first manifestations of the networked model (Phase 2). As we shall see, these phases are associated to rather different innovation patterns, and to distinct roles of policy makers, managers and end users.

5.1 Public governance and innovation in Phase 1: New Public Management

In the case of RUB the beginning of the library virtualization process largely coincides with what can be dubbed as the New Public Management period, starting around mind 1990's and spanning through the subsequent decade. This phase incorporates some elements of what Hartley calls the Traditional Public Administration period. These elements can be detected especially by examining the role of policy makers and public officers that respectively appear to resemble very closely the functions of "commanders" and "clerks and martyrs" of Hartley's Traditional model. See Table 1

(a) for an illustration of the ICT related innovations and the role played by different actors at RUB in this phase.

Innovation

Innovation Context
The period between the 1990s-early 2000s is characterized by an innovation context characterised by a) important technological transformations such as the emergence of Internet and World Wide Web, diffusion of broad band, high investments in ICT infrastructure by the Danish government (due to the policy plan Information Society for all); and b) institutional innovations such as the DEFF (Denmark's Electronic Research Library) established for the facilitation of the innovation and development of library electronic services and overall objective of improving the use of IT in support of research and education.

Organizational innovation
At the end of the 1990's -beginning of 2000s RUB starts an organizational innovation process involving several dimensions of change and especially enacted through five major initiatives. First of all, in 2001 RUB moves to a new, modern library building with double the size of the old one providing the library with a new modern image and much more shelf and office space. The new building facilities allow the increase in the number of open stacks in relation to closed stacks, thus increasing the number of library resources that can be accessed directly by the library users, therefore laying the grounds for an increase in library self-services. From an organizational point of view this period is characterized by an increase in partnerships and collaboration with several national and local actors. The most important initiative is the RUBs participation to the DEFF consortium. This implied the establishment of partnerships with different Danish research libraries with the common purpose to innovate the electronic services and library services both at national level and local RUB level. Such partnerships and service innovations were partly financed by government funding and partly by joint purchase of licenses (www.deff.dk). According to DEFF's web page, DEFF's initial strategy (in 2007) was:

*"To improve the end user's access to information through cooperation between the Danish special and research libraries. The cooperation includes joint development in cases where cooperation will result in a greater advantage than the sum of local initiatives, including a better and total utilization of the libraries' resources; further development of the joint network of information resources; collective dissemination of the research libraries' information resources to the public"(*www.deff.dk*).*

In addition in this period RUB starts collaborating with the IT service department of the University (Campus IT) and the department of education to start developing e-learning (Scupola, 2009). This organizational innovation was mainly desired by Roskilde university management (but originally originating from policy statements) due especially to two major trends: a new vision that research libraries had to become an integral part of the university organization; budget constraints both at Roskilde university and RUB level. These organizational innovations implied a heavy re-training of RUB's staff and changes in front office and back office tasks. In the attempt to cope with these organizational changes, RUB introduced still a new organizational innovation: the establishment of a blog to support the internal communication of RUB employees and to facilitate their knowledge exchange. This was an important organizational innovation in line with the transformation of RUB

towards a virtual library with the benefits and resistance that such ICT-based tools may generate (Interview with a top manager).

Innovation in service delivery
The most radical innovation in service delivery at RUB in this period is the possibility of searching, browsing and retrieving needed information remotely and instantly from the users' own computers, anytime, anywhere through the use of the World Wide Web, thus providing access to its e-journals and e-books collection 24/7 all the year around. This implies that the library users can themselves download the journal articles or book chapters from the library web page without necessarily needing to go to the physical library. Simultaneously RUB starts to innovate its face-to-face services as well in accordance to a shift to a more market and customer centered strategy as well as an increase in the customer focus. For example RUB had conducted 2 user surveys, one before and one after moving to the new building in 2001 in order to measure customer satisfaction with their service provision. Since the survey conducted after the move to the new building showed a decrease in customer satisfaction, RUB developed a new service concept, "book a librarian", which can be seen as one of the first examples of services customization at RUB. This service consists of offering the student individual instruction and support in literature and information retrieval within the specific subject/field of the student or project. The librarian can offer help in choosing appropriate search strategies, choosing relevant databases, guidance in selecting other relevant sources, advice in the evaluation of internet resources, advice in keeping track of the literature used in the project (http://ask-rub.altarama.com/reft100.aspx?key=bookbib_en). This service innovation is illustrated by the following quote:

"We have made two quite comprehensive user surveys and some smaller ones. We made one before we moved and another after being here one year. (..) There was bigger satisfaction being here, however, our advising and teaching was scored lower. .... We introduced this, in between thing, which is named project librarian. ... It is an answer to a reaction pattern that we saw. It originates from some concrete experiences." (Top manager)

Role of Policy Makers
In this period the case shows that policy makers mainly play a role of announcers and commanders of societal changes and innovation through the formulation of policy directives, but their roles also resemble the ones of commanders typical of Hartley's Traditional Public Administration model. They act as announcers in the Danish government vision and policy plan "IT society for all". This policy directive has been the main driving governmental force of the Danish information society. This has included the digitalization of the libraries to provide all the Danish citizens with access to electronic resources. However, policy makers act also as commanders when in May 1996 the Ministry of Culture, the Ministry of Education and the Ministry of Science established an IT working group with the objective of investigating how to transform a number of research libraries into electronic research libraries. In 1997, the "DEFF report" was published, creating the basis for a partnership effort for the Danish research libraries' IT development. The "DEFF report" described a model of reference for Denmark's Electronic Research Library (DEF) including the essential electronic functions and services to be delivered by such libraries. A budget was then allocated by the three ministers involved, a board of directors was appointed, and a vision and a strategy for the DEF project were developed. In 2003, DEF became a permanent activity with the objective of improving the use of IT in support of research and education.

Role of Public Officers/Servants

In this period we see a transformation of the role of RUB top management and some librarians into public managers. RUB's matrix organization implies that some librarians act both as top or middle managers (with related decision power), while simultaneously keeping their role of librarians with front desk responsibilities. In the role of top level managers, such library employees implement at RUB level the changes dictated by the university, government, DEFF and Library Authority. They act both as efficiency maximizers and cost minimizers, especially due to the pressure from cutting costs in the public sector coming both from the government and Roskilde university management. They are also responsible to implement at local RUB level the changes envisioned by DEFF, thus engaging into partnerships or collaborating on specific projects with other Danish Libraries. However, while some librarians take on the roles of top and middle managers, other librarians and library clerks become in a sense martyrs due to the changes in competences/job descriptions that the virtualization of the library imply. For example from the statistics on the number and types of library employees published on RUB web site (http://rub.ruc.dk/en/), it can be seen that while the number of librarian and subject specialists has been more or less constant in the decades from 1994-2014, the number of clerks has been cut by half by 2014. In accordance to Hartley's model, this period is also characterized by some emerging competition among top managers of different Danish libraries, as "you want to be a little bit better than your neighbour library" (Director of reader services, RUB).

Role of users
The library user in this period is still considered to be fairly homogeneous and a relatively static kind of client, even though some examples of service customization are emerging as in the case of "book a librarian" (see above). This is reflected in the fact that the customer's wishes and wants do not play a big role in the library innovation activities yet. The only ways in which the library takes into consideration the users' needs and wants is through a survey conducted every 5 years and the customer complaints box. The self-service philosophy introduced in this period corresponds to the idea of letting the user choose out of a fixed menu of alternatives; users are not involved in designing alternatives among which one can choose. The users are perceived to be mostly generators of smaller, incremental innovation ideas as the following statement shows:

"It is limited how much the users may contribute with ideas. I believe the users are too conservative... Well it is smaller suggestions, they are not trivial, they can be just as legitimate, but they are not high-flying" (RUB Top manager).

5.2 Public governance and innovation in Phase 2: Networked Governance

The Networked Governance period, that in RUB case can be thought of as starting in the mid-2000s, is characterized by continuous changes that are still on-going concerning the innovation context as well as an increased focus on customization and co-production of services. As the Danish Library Agency states in a report from 2008: *Such library support will entail a shift in focus from supporting the creation of truth to supporting the creation of value. This might mean a stronger focus on supporting inspiration and new ideas as opposed to focusing on quality in support of the search for truth.*
(http://www.kulturstyrelsen.dk/fileadmin/publikationer/publikationer_engelske/deff08/html/chapter 09.htm). See Table 1 (b) for an illustration of ICT related innovations and of the role played by different actors at RUB in this phase.

Innovation

Innovation Context
In our case of Roskilde University library, we distinguish 3 main levels at which the innovation context can be characterized: the governmental/society level, the university level and the library level (this last level is dealt with under organizational innovation).
At governmental/societal level the innovation context in this period is characterized by a capillary diffusion of Internet in the Danish society, government organizations and businesses as well as the widespread diffusion of e–services in all sectors (e.g. business-to-business, business- to-consumer, government-to-consumer and government-to-businesses, and customer-to-customer).
At university level, the innovation context is heavily characterized by a process of university transformation towards business like kind of organizations, with a board of directors and activity based budget. In this period Danish universities experience an increased focus on strategic management, and development of strategies. This trend is supported by the shift from elected to appointed deans and vice-deans in Denmark (Danish Library Agency, 2008, http://www.kulturstyrelsen.dk/fileadmin/publikationer/publikationer_engelske/deff08/html/chapter09.htm). Although the emphasis on business like procedures could be seen as a manifestation of the NPM approach, one should not overlook the fact that this institutional change is associated with a decentralization of decision making in the innovation area, which is more consistent with the networked model.

Organizational innovation
Much of RUB's organizational innovation in this period is centered around an increase in focus on how to best understand and meet the customer needs and wants. In this period RUB for example establishes the "user driven innovation committee" with the task to better understand the user needs and provide ideas on how to innovate the library services accordingly. In addition, RUB has extended its opening hours with the possibility of entering the library with the library card also when the library staff is not in service (until midnight all the year around). In this period RUB has also implemented a number of organizational changes especially in the back office and front office (front desk) to meet the organizational requirements dictated by the increasing electronic services and self-services provision. Finally RUB has been experimenting with social media such as a blogs and Facebook in an attempt both to get closer to the customer, engage into a two ways communication with them and as well as to involve them in the idea generation phase of the innovation processes.

Innovation in service delivery and new service development
Concerning service innovations, this period is characterized by smaller radical and incremental innovations in the library services and service delivery, but also by "new service development". The establishment of a coffee vending machine in the library is an example of a new service developed in response to the user wishes to be able to get a cup of coffee while in the library. Some service innovations are conceptualized, initiated and developed locally at RUB with or without user involvement, others take place within the broader context of DEF as for example the "Bibliotek vagt" service ("Library Call Service"), which was initiated by DEF in an attempt to harmonize the public libraries and research libraries' "Bibliotek vagt" service and successively designed and implemented locally at RUB. In addition, there is evidence of persistence of the old paradigm in this new perspective as in this period the focus shifts increasingly towards self-service both in terms of downloads of e-journals and e-books, self-checkout and self-returns as well as use of the

library physical facilities with access card when the library is not staffed. This is clearly evidenced by the following statement on RUBs web page:

"The library service is based on the principle of extensive self-service and access to open stacks. Self-checkout and self-return stations are located near the exit. All users are responsible for observing due dates and renewing and reserving material. It's possible to pay fees and bills through your library account." (http://rub.ruc.dk/en/about-library/the-library-from-a-to-z/, downloaded June 10th, 2014)

In this period RUB also develops a number of incremental service innovations in support of teaching, research and students. For example the librarians (subject specialists) can provide assistance to the faculty with research applications by helping conducting a literature review. RUB has developed tailor made courses for teachers and students on how to use reference programs such as End Notes, REFWorks and Mendely. In addition there has been a continuous refinement of the service "book a librarian", by making it much more user driven in its relation and content. Important service innovations in this period have been the virtual reference, including the electronic chat through which users can signal problems, difficulties, complaints and suggestions as well as ask for help to any question or problem they might have and experimenting with the virtual community feature of adding notes and comments to book chapters and journal articles. This reveals a fundamental change in perspective: from choice out of a fixed menu, to the actual design of the menu, i.e. the user is highly involved in the co-creation of the service, by adding new quality and content to the service that is being delivered.

Improvement
Especially front-desk service improvement is very important in this period. Such improvements are decided strategically at top management level as in the case of book a librarian or the chat service. However a lot of small service improvements take place at front desk level and middle managers level through continuous small changes in the services and/or service delivery process mainly based on bricolage (see also Fuglsang, 2010). In this case, bricolage innovation takes place as a means to satisfy the users, but also to make employees own work practices easier. Often such small incremental changes are discussed at lunch time among librarians and front desk employees, thus contributing to their diffusion within RUB. These are small changes that take place without the involvement and/or approval from top management.

Role of Policy makers
The policy makers in this period act as leaders and interpreters of the societal trends and define the general policy frameworks for the continuous innovation of the service provision in the public sector as well they involve the users into the innovation policy itself. An influential policy that has influenced many sectors of the Danish society including the library sector has been the "user driven innovation" that has developed in Denmark in late 2000's. (Ogawa et al. , 2011).

Role of Public Managers

In this period RUB managers take on the role of explorers by engaging in a number of activities aimed at developing the library services especially based on a co-creation process or at least high level of involvement of the user (user driven innovation). Top management provides inputs to RUB's strategy and development plans and are the initiators of most radical innovations taking place at RUB by implementing at local level the policy provided by the library authority, the government and the university. RUB's middle management and front desk employees also

develop many small incremental innovations (bricolage) that remain at the middle-management-front desk level. Some suggestions are taken to top management through the biweekly meetings of the coordination committee, and sometimes they get approval and get implemented in the whole RUB. From an ICT perspective, log files of electronic services, usability studies, as well as electronic positive and negative feedback and pop-up windows are used to understand how to improve RUB's electronic services.

Examples of initiatives where RUB managers act as explorers are the "user driven innovation committee" (see above), the establishment of a blog for the co-creation of new service ideas with the user, the conduction of a number of co-creation workshops involving library users and librarians, the use of supervision and teaching sessions to get inspiration on how to improve the library services and their provision, the use of electronic tools such as log files, electronic positive and negative feedback and pop-up windows to understand how to improve RUB's electronic services.

Role of users

In this period, RUB experiences a shift in users' role from being a static entity to become central in the service innovation process. This transformation is partially reflected in the dramatic increase of electronic downloads from about 270,000 in 2005 to over 3 million in 2013. The user's roles develop more and more from being a "resource" to being "a co-creator" and "user" of the service (as in the case of virtual reference). Users start being integrated in the New Service Development of library services by taking an active role in ideas generation as in the blog and future workshops initiatives.

6. Conclusions and implications

The paper has taken inspiration from Hartley's seminal contribution to develop some reflections on how technical and organizational transformations combine with changes in the roles played by policy makers, public managers and users in the development of public sector innovation. Using a case study on the Roskilde University Library to illustrate these patterns, we have highlighted three important aspects that characterize le links between governance and innovation in this field.

First, the examined case shows that the organizational complexities have increased in the transition from what could be considered as a spurious NPM, which incorporates elements of the traditional hierarchical model and elements of market-like competition, towards a "networked model" implying more emphasis on bottom-up decision making and a greater involvement of end users. The variety of government policies and instruments has considerably widened, public managers have increased their relative capacity to take relevant decisions on innovation uptake and new service implementation, library officers have become more involved in this process with a more active role to play.

Second, we have provided evidence of increasing co-creation activities in which end users are involved not only in choosing out of a given menu of alternative solutions to given problems, but also in the definition of the menu itself, and in shaping and implementing innovative solutions.

Third, the increasing involvement of users has created important innovation opportunities that are more and more characterized by their frugal/bricolage nature, hence more localized but not necessarily trivial and relatively easy to diffuse to different contexts.

As in the case of other case studies, ours can hardly lead to generalizable conclusions. However, it can be expected to provide useful insights on ongoing changes that would be more difficult to capture otherwise. Future research might benefit from a deeper analysis of the issues emerging from this experience of virtual library development.

Table 1: Public governance and ICT related innovation at Roskilde University Library from mid 1990s to 2014

	(a) NPM (mid 1990s-early2000s) with elements of Traditional Public Administration	(b) Networked Governance (mid 2000-2014)
Innovation	*Context for innovation* (Mid 1990s) Technological (Emergence of Internet; Broad band, High investments in ICT infrastructure); Institutional (Establishment of DEFF) *Organizational innovation* - participation to the DEFF consortium, with partnerships form of collaboration with other libraries - moving to a new building in 2000 - increase in number of open stacks in relation to closed stacks; - re-training of library staff and changing relationships between front office and back office - blogs for internal communication and knowledge exchange -increasing interaction with both the IT and pedagogy departments of the university *Innovation in service delivery* - introduction of e-Services: E-journals; e-books; e-booking; -book a librarian as an example of customization of services	*Context for innovation* (2000 and onwards): Technological (Strong diffusion of the internet) Institutional (DEFF as permanent institution under the Library Authority) *Organizational innovation* - user driven innovation committee at RUB; - extension of library opening times with possibility of entrance with the library card also when library staff is not in service -establishment of blog for co-creation with the customer; - Facebook; -Back-office changes *Innovation in service delivery* - self-service (self-checkout and self-return) - virtual reference (e.g. electronic chat) - support services for teaching, research and students (assistance with research applications, tailor made courses on library services) - evolution of book a librarian *New service development* -establishment of blog for co-creation with the customer; - Facebook; - Workshops for co-creation;
Improvement	Improvements in managerial processes related to innovation A starting customer focus produces quality improvements and new services such as "book a librarian" service as a result of a survey.	Continuous small changes in front line services mainly based on bricolage and listening to the customers Continuous improvements of electronic services based on electronic tools such as log files or pop-up windows to ask questions
Role of Policy makers	Act mostly as announcers, but also as commanders. The info-society for all (1996) creates the	Act as leaders and interpreters of the societal trends by also involving the users in policy development as well as define the guidelines

	guidelines for the starting and evolution of the Danish IT society (Announcers). Establishment of DEFF (Commanders)	for continuously changing the library landscape through policy initiatives such as user driven innovation (see Ogawa et al. ((2011). - See if there are policies specifically implementing user driven innovation at the university services or library level (See above comment)
Role of Public Officers	- Some librarians become top level/middle managers with relative decision power - top level and middle managers (officers) implement the changes dictated by the policy directories at local level and by so doing become efficiency and cost minimizers due to budget constraints - Librarians and clerks become martyrs due to the changes in competences/job descriptions that such policy directives imply in their local enactment.	-RUB managers (both Top and Middle level) act as explorers through a number of initiatives (e.g. "user driven committee"; the establishment of a blog for the co-creation of new service ideas with the user; the conduction of a number of co-creation workshops involving library users and librarians; the use of supervision and teaching sessions to get inspiration on how to improve the library services and their provision). Recognition that innovation ideas come from everywhere in the organization. Top management provides inputs to RUB's strategy and development plans and are the leaders in the most radical innovations RUB's; Middle management and front line employees develop many small incremental innovations (bricolage) that remain at the middle-management-front line level. Some suggestions may be taken to top management through the biweekly meetings of the coordination committee, and sometimes they might get approval for implementation throughout the whole organization
Role of users	The library user is still considered to be fairly homogeneous and a relatively static kind of client and only every 5 years get involved with a survey about the library service.	The library users become an important source of innovation ideas either through the interpretation by libraries employees of their needs, wants, wishes and behavior (e.g. User Driven Committee; supervision and teaching sessions; virtual reference sessions) or through NSD (e.g. blog; workshops). The library user has the three roles of "resource"; "user" and co-creator in the service innovation process.

Appendices: *Roskilde University Library key figures*

Building size (m2)

Year	Public area	Offices	Closed Stacks	Other	Total
2001–2012	4.500	930	845	1.725	8.000
1991–2000	2.120	710	610	600	4.040

Collection (No. of items)

Year	Books	AV-media	Serials	Total
2013	643.911	217.927	—	861.838
2012	641.183	217.852	—	859.035
2011	637.145	216.483	—	853.628
2010	631.835	215.901	—	847.736
2009	624.594	215.461	—	840.055
2008	618.543	214.680	—	833.223
2007	611.768	214.240	—	826.008
2006	605.227	213.500	—	818.727
2005	596.687	213.034	—	809.721
2004	588.896	212.302	—	801.198
2003	577.652	210.896	—	788.548
2002	562.962	215.581	—	778.543
2001	552.926	215.713	4.106	772.745
2000	545.307	213.813	4.610	763.730
1999	532.114	210.490	5.101	747.705
1998	517.554	207.453	4.698	729.705
1997	501.220	198.833	4.760	704.813
1996	487.555	196.858	4.894	689.307
1995	475.683	183.942	4.872	664.497
1994	457.079	172.415	4.824	634.318

Serials not included from 2002

Collection (Shelf meters)

Year	In stacks	On open shelves	Total
2013	8.120	10.900	19.020
2012	8.080	10.900	18.980
2011	7.950	10.900	18.850
2010	7.560	11.200	18.760
2009	7.423	11.200	18.623
2008	7.361	11.200	18.561
2007	7.455	11.200	18.655
2006	7.540	11.200	18.740
2005	7.712	11.200	18.912
2004	7.458	11.200	18.658
2003	7.120	11.200	18.320
2002	6.834	11.200	18.034
2001	6.600	11.200	17.800
2000	8.451	6.800	15.251
1999	8.322	6.600	14.922
1998	7.903	6.600	14.503
1997	7.211	6.800	14.011
1996	6.815	6.800	13.615
1995	6.484	6.700	13.184
1994	6.022	6.600	12.622

Circulation

Year	Loans	ILL	ILL (received)	Total
2013	99.396	43.543	5.150	148.089
2012	104.898	44.492	5.805	155.195
2011	110.667	44.793	6.310	161.770
2010	114.017	40.825	6.758	161.600
2009	121.259	43.193	6.698	171.150
2008	127.864	38.159	7.696	173.719
2007	129.661	31.291	7.777	168.729
2006	147.393	35.811	9.263	192.467
2005	165.854	35.826	11.176	212.856
2004	168.197	32.122	11.354	211.673
2003	172.503	37.099	11.984	221.586
2002	168.020	34.947	10.884	213.851
2001	337.470	27.883	11.264	376.617
2000	350.495	28.539	12.521	391.555
1999	333.937	27.897	11.011	372.845
1998	297.231	26.244	10.592	334.067
1997	289.468	21.692	10.809	321.969
1996	264.171	21.409	9.298	294.878
1995	246.860	17.876	9.075	273.811
1994	237.066	16.726	7.737	261.529

Figures from before 2002 include photocopies and renewals

Document downloads

Year	From own servers	From external servers	Total
2013	3.191.341	896.401	4.087.742
2012	1.023.277	807.988	1.831.265
2011	695.000	771.059	1.466.059
2010	897.422	535.451	1.432.873
2009	563.117	537.282	1.100.399
2008	904.710	475.521	1.380.231
2007	794.445	514.369	1.308.814
2006	261.748	617.748	879.496
2005	237.262	459.520	696.782

Staff

Year	Subject specialists	Librarians	Clerical staff	Other staff	Total
2013	9,6	11,3	8,7	6,7	36,3
2012	8,9	11,0	10,2	6,3	36,4
2011	10,1	12,4	10,7	7,8	41,0
2010	9,3	10,0	14,0	8,0	41,3
2009	9,5	10,1	13,0	8,0	40,6
2008	9,5	10,1	13,0	8,0	40,6
2007	9,5	12,2	14,0	8,0	43,7
2006	9,6	13,2	14,8	8,0	45,6
2005	9,6	12,9	14,5	8,0	45,0
2004	10,0	13,3	14,5	8,0	45,8
2003	10,0	13,3	14,6	7,5	45,4
2002	11,7	12,1	16,3	7,1	47,2
2001	11,7	12,1	16,3	7,1	47,2
2000	12,5	13,0	16,5	8,7	50,7
1999	12,3	13,0	16,5	8,5	50,3
1998	12,3	13,0	16,5	7,5	49,3
1997	11,6	14,5	16,6	7,5	50,2
1996	10,6	15,0	16,1	7,0	48,7
1995	10,6	14,5	14,5	6,1	45,7
1994	10,6	12,4	16,5	5,0	44,5

Budget Year	Staff	Acquisitions	Other expenditure	Total
2013	16.908	9.428	2.645	28.981
2012	16.444	9.474	2.095	28.013
2011	18.070	9.426	2.519	30.015
2010	18.215	9.773	2.467	30.455
2009	17.272	9.264	2.709	29.245
2008	17.303	8.725	2.267	28.294
2007	17.194	8.626	2.639	28.459
2006	16.883	8.827	6.721	32.431
2005	16.558	8.311	3.607	28.476
2004	16.107	5.646	3.620	25.373
2003	15.906	7.849	3.171	26.925
2002	15.895	6.103	3.687	25.685
2001	15.948	9.137	8.294	33.378
2000	15.359	7.529	3.924	26.812
1999	14.827	8.631	6.432	29.890
1998	15.184	7.522	3.705	26.410
1997	13.957	7.715	3.166	24.839
1996	13.236	7.254	4.859	25.348
1995	12.100	5.331	3.559	20.990
1994	11.946	5.377	3.096	20.419

References

Alam, I., & Perry, C., (2002). A customer-oriented new service development process. *Journal of Services Marketing*, (16: 6): 515-534.

Arduini, D., Belotti, F., Denni, M., Giungato, G., Zanfei, A. (2010). Technology Adoption and Innovation in Public Services. The Case of e-Government in Italy. *Information Economics and Policy*, 22, pp. 257-275.

Arduini D., Denni M., Lucchese, Nurra A., Zanfei A. (2013) The role of technology, organization and contextual factors in the development of e-Government services: an empirical analysis on Italian Local Public Administrations, Structural Change and Economic Dynamics, n.4 2013

Brynjolfsson, E., Hitt, L. (2000). Beyond Computation: Information Technology, Organizational Transformation and Business Performance. *Journal of Economic Perspectives*, 14(4), pp. 23-48.

Carr, P. L., (2009). From Innovation to Transformation: A Review of the 2006-7 Serials Literature, *Library Resources & Technical Services*, (53:1): 3-15.

Fountain, J. E. (2001). Building the Virtual State. Information Technology and Institutional Change. Washington, D.C.: Brookings Institution Press.

Fountain, J.E. (2003). Information, Institutions and Governance: Advancing a Basic Social Science Research Program for Digital Government. Cambridge, MA: John F. Kennedy School of Government, Harvard University.

Fountain, J.E. (2005). Enacting Technology in Networked Governance: Developmental Processes of Cross-Agency Arrangements. Bond University Working Paper Series. Bond University, School of Business, Queensland, Australia.

Fountain, J.E. (2007). Challenges to Organizational Change: Multi-Level Integrated Information Structures (MIIS). In D. Lazer and V.M. Schoenberger (Eds.), Governance and Information Technology: From Electronic Government to Information Government. Cambridge, MA: MIT Press.

Franke, N., Keinz, P. & Schreier, M. (2008). Complementing mass customization toolkits with user communities: How peer input improves customer self-design. *Journal of Product Innovation Management*, 25, 546-559.

Fuglsang, L. (2010). Bricolage and invisible innovation in public service innovation. *Journal of Innovation Economics*, *1*(5), 67-87.

Hartley, J., 2005. Innovation in governance and public services: past and present. Public Money and Management 25, 27–34

Jeppesen, L. B. & Molin, M., (2003). Consumers as Co-developers: Learning and Innovation Outside the Firm. *Technology Analysis & Strategic Management*, (15:3): 363–383.

Jungk, R., Müllert, N., (1987): Future workshops: How to Create Desirable Futures. London, England, Institute for Social Inventions ISBN 0-948826-39-8

Ogawa, Susumu and Pongtanalert, Kritinee and Flowers, Stephen H., Drawing Users into Innovation Policy: A Study of the Danish Policy on User-Driven Innovation (September 1, 2011). Available at SSRN: http://ssrn.com/abstract=1920818 or http://dx.doi.org/10.2139/ssrn.1920818))

Magnusson, P., (2003). Benefits of involving users in service. *European Journal of Innovation Management*. (6:4).

Maness, J. M. (2006), Library 2.0 Theory: Web 2.0 and Its Implications for Libraries, Webology, Volume 3, Number 2, June, 2006 (http://www.webology.org/2006/v3n2/a25.html)

Neal, S. (1997). The virtual library - a market perspective. *The Bottom Line, 10*(3), 100-106. Retrieved from http://search.proquest.com/docview/219164925?accountid=14732

Osimo, D., Szkuta, K., Pizzicannella, R., Pujol, L., Zijstra, T., Mergel, I., Thomas, C., Wauters, P. (2012). Study on Collaborative Production in e-Government, SMART 2010/0075.

Ogawa, S. &Piller, F.T. (2006). Reducing the risks of new product development. *MIT Sloan management review.* (47:2): 65-7

Paela D. Morrison, John H. Roberts, and Eric von Hippel, Determinants of User Innovation and Innovation Sharing in a Local Market,Management Science 2000 46:12, 1513-1527

Prandelli, E.,Verona, G. & Raccagni, D. (2006). Diffusion of Web-Based Product Innovation. *California Management*, vol 48, no 4, pp. 109-135.

Prandelli, E., Sawhney, M. & Verona, G. (2008). *Collaborating with customers to innovate*, Edward Elgar., UK.

Rosenberg N. (1978) Perspectives on technology, Oxford Univ. Press

Rosenberg N. (1982) Inside the black box, Oxford Univ. Press

Scupola, A. (2009) E-Services in Danish Research Libraries: Issues and Challenges at Roskilde University Library in Scupola A. (Ed.) ”*Cases on Managing E-services*”, pp. 204-217, Idea Group Inc., USA.

Scupola, A., Nicolajsen, H.W. (2010), Service Innovation In Academic Libraries: Is There a Place for the Customers? *Library Management*, Emerald, Vol. 31, No. 4/5, pp. 304-318.

Nicolajsen, H.W., Scupola, A., (2011), Investigating issues and challenges for customer involvement in Business services innovation, *Journal of Business and Industrial Marketing,* Vol. 26, No. 5; pp.368 – 376

Scupola, A., Nicolajsen, H.W. (2013) Using Social Media for Service Innovations: Challenges and Pitfalls, *International Journal of E-Business Research*, Vol. 9(3), pp. 27-37, ISSN: 1548-1131

Seri, P., Zanfei, A., (2013), The Co-evolution of ICT, Skills and Organization in Public Administrations: Evidence from new European country-level data. , Structural change and economi dynamics, n.4, 2013

Svend Vesterli and Jason King (1996) Ministry of Research and Information Technology, The info-society for all - the Danish model : IT policy statement 1996 to the Folketing and IT policy action plan 1996, 72pp.(http://rub.ruc.dk/en/about-library/the-library-from-a-to-z/, downloaded June 10th, 2014)

Wu, H., & Abdous, M. (2013). An online knowledge-centred framework for faculty support and service innovation. *VINE, 43*(1), 96-110. doi:http://dx.doi.org/10.1108/03055721311302160

Yin, R.K., (1994). *Case Study Research Design and Methods*, Second Edition, Vol. 5, Sage Publications.