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A FRAMEWORK FOR ANALYSING SERVICE ECOSYSTEM CAPABILITIES TO INNOVATE[1]

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Abstract

Electronic services delivered over the Internet are gaining importance in the business world. This area has seen an increase in scientific interest over the past years under the labels "Internet of Services" and Web-service ecosystems. The paper develops a conceptual framework of actors and their roles in an open innovation system for a networked ecosystem of Web-services. The framework illustrates how open innovation can be implemented in a Web-service ecosystem to increase innovation performance. Simultaneously this research closes a conceptual gap in current reasoning about Web-service ecosystems that neglects innovation processes. The utility of the framework is demonstrated by two case studies of Web-service ecosystems in which the framework was used to identify gaps in the implementation of open innovation processes. Our research results identify specific functions to support innovation processes.

Keywords: Open innovation, service science, service ecosystems, Internet of services, networked innovation, actors.

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1 INTRODUCTION

Service innovation is a primary concern for many businesses. The importance of innovation is increasing through shorter product life cycles, increased competition, changing customer behaviour, and technological progress (Leimeister/Glauner, 2008). Consequently, the management of new service development is a prime concern for companies in the service sector. Innovation is even more important in the area of Web-based services where barriers of entry are particularly low, services can be copied easily, and technological advances are especially rapid (Menor/Tatikonda/Sampson, 2002).
Moreover, through the development of service oriented architectures (SOA) and Web-services the process of new service development changes. Through the development of SOAs individual service components become more fine-grained and can be re-used which affects the way new services are developed. This becomes especially apparent when looking at the vision of Web-service ecosystems or the "Internet of Services." These visions include repositories of services that can be re-used, re-combined, and re-purposed to create new, innovative services (Janiesch/Ruggaber/Sure, 2008; Riedl et al., 2009). The emergent Internet of services promises opportunities for new service development.
Notably, such an environment provides a fertile ground for open innovation in which Web-service ecosystems act as catalysts. Open innovation proposes principles for the design of innovation systems in which innovation processes are open for external collaboration with a network of customers and suppliers (Ebner/Leimeister/Krcmar, 2010; Leimeister et al., 2009). It has been shown that implementing these principles increases innovation performance (Gassmann, 2006). The inter-organisational networks that are formed by Web-service ecosystems have many links with the idea of open innovation (cf., Vanhaverbeke/Cloodt, 2006). Consequently, Web-service ecosystems provide a promising environment for the implementation of these principles and thus maximising the benefit derived from open innovation. To accomplish this it is necessary to understand the actors involved in service innovation in Web-service ecosystems and how these parties can contribute to and benefit from an open innovation system.
The paper develops a conceptual framework of actors and their roles in an open innovation system for Web-service ecosystems; the framework illustrates how open innovation can be implemented in a Web-service ecosystem to increase innovation performance. The framework also shows how the current conceptual thinking about Web-service ecosystems can be evolved to incorporate findings of open innovation research. With the development of this framework it is our objective to close a conceptual gap in current thinking about Web-service ecosystems that neglects innovation processes and one-sidedly focuses on processes for service delivery.
The utility of the framework is demonstrated using two case studies of Web-service ecosystems. The framework allows the identification of both white spots in open innovation networks and specific improvements in the implementation of innovation processes.
The rest of the paper is structured as follows. Section 2 reviews the theoretical background of Web-service ecosystems and open innovation. Section 3 presents the collaboration framework followed by the framework's application to two case studies in Section 4. Section 5 concludes the paper with deriving practical implications for implementing open innovation processes in Web-service ecosystems.

2 RELATED WORK

2.1 Web-Service Ecosystems

Web-services have become extremely popular in recent years and the success of Web-service-centred business models such as Amazon.com, Google, and Salesforce.com demonstrate the real commercial success of these models. Building on their wide-spread use new composite services are created that span across business boundaries in order to implement end-to-end business processes. This phenomenon of a large collection of Web services has been described as a service ecosystem and a growing interest in academic research is emerging as a consequence (Barros/Dumas/Bruza, 2005;

Barros/Dumas, 2006; Riedl et al., 2008; Riedl et al., 2009; Sawatani, 2007; Wu/Chang, 2005). Although the terms used may differ, phenomena similar to service ecosystem have been researched in other areas, for example under the label "Service Value Network", "Business Webs" (Steiner 2006; Tapscott et al., 2000), and "Internet of Services" (e.g., Dorn et al., 2007; Zhang/Chen/Zhou, 2005; Janiesch/Ruggaber/Sure, 2008; Schroth, 2007). The composability of existing services into new and innovative value added services that implement end-to-end processes is a central attribute of these ecosystems whereby services are provided and integrated by different actors of the ecosystem which leads to a division of supply and delivery (Barros/Dumas, 2006). Although the research on Internet of services and service ecosystems is just emerging, existing theories from inter-organisational systems can be drawn on to explain these phenomena. Inter-organisational relationships of business firms are complex phenomena and as such difficult to conceptualise. However, there is a broad consensus that these systems can be best approached by factoring in economic, socio-political, structural, and technological variables (Bensaou/Venkatraman, 1996, Cunningham/Tynan, 1993). Many of these frameworks are modelled on industrial supply processes, such as in the automotive and retail industries, which have now been extended with processes for services delivered over the Internet.
This work analyses the innovation activities from the perspective of the overall ecosystem rather than from the perspective of a single organisation. Barros and Dumas (2006) and later adaptations by Riedl et al. (2008, 2009) propose that the following five actors have stakes in service ecosystems:

- **Provider** - Services are offered by service providers. These organisations provide the service implementation and offer the service by publishing a service description.
- **User/Customer** - Users request and invoke the services provided by service providers. These may be other applications (or other service providers) or the actual end-user of a service.
- **Broker -** Service brokers bring service providers and service consumers closer together. They might also integrate a service with certain delivery functions such as payment and authentication or combine other providers' services into a new offering.
- **Mediator -** Service mediators offer translations between different service formats and other routine functions to allow service brokers to concentrate on their core competencies by eliminating the need for additional technical transformations.
- **Specialist Intermediaries -** These are providers in the more technical sense as they offer services but distinguish themselves through the nature of the service they offer. Contrary to "normal" providers they do not offer services targeted at end-users but rather offer service delivery components that are used by other providers to create marketable services. Common examples for these kinds of services are payment, authentication, or monitoring services.

Another most obvious role, though not explicitly mentioned by Barros and Dumas is that of the platform provider who builds the overall platform on which the other actors operate. The role might include providing a computing infrastructure (such as Amazon's Elastic Compute Cloud EC2[2]) and a set of additional services such as a service registry. The main objective of the platform provider is the overall success of the entire platform.

2.2 Open Innovation

Open innovation is a phenomenon that is of increasing importance to both theory and practice (Chesbrough, 2003). Three core process archetypes in open innovation have been identified: the outside-in process, the inside-out process, and the coupled process (Gassmann/Enkel, 2004). The outside-in process enriches a company's knowledge and innovation base through the integration of external knowledge sources, particularly the knowledge sources of customers and suppliers, to increase its innovativeness. The inside-out process exploits a company's unused inventions in different markets and a managed trade of intellectual property, e.g., through licensing. The coupled process is a

[2] Amazon Elastic Compute Cloud (Amazon EC2), http://aws.amazon.com/ec2, accessed 2009-04-20.

combination of both the outside-in and the inside-out processes intended to maximise the benefits of both approaches.
These three archetypes are achieved through various means of perspectives on opening the innovation including: (1) globalisation of innovation, (2) outsourcing of R&D, (3) early supplier integration, (4) user innovation, and (5) external commercialisation of innovations (Gassmann, 2006). These open innovation processes lead to interfirm cooperation and development of ecosystems of networked firms sharing technology and trading intellectual property (West/Vanhaverbeke/Chesbrough, 2006; Stathel et al., 2008). The successful impact of open innovation processes has been described in several publications (see Gassmann, 2006 for an overview).
We argue that an open innovation paradigm rather than a closed innovation paradigm is necessary for successful innovation development within service ecosystems. This is due to their heavy reliance on re-use, their reliance on new business models, and knowledge leveraging as services are implemented as software (Gassmann, 2006).
The focus of open innovation, however, is a single firm that thus tries to open its own innovation process (West/Vanhaverbeke/Chesbrough, 2006). Furthermore, it says little about what other actors are involved and how they interact and collaborate regarding innovation development (West/Lakhani, 2008). Web-service ecosystems can be seen as a catalyst for open innovation and thus offer an opportunity to extend the firm-centric concept of open innovation developed by Chesbrough and others (Chesbrough, 2006; Chestbrough et al., 2006, Gassmann, 2006; Ogawa/Piller, 2006) by proposing a platform-centred interpretation.
The main aspect of service ecosystems is that of a central platform that brings all actors together. Companies try to extract ideas for service innovation from this central platform and use these ideas to create new or improve existing services. So, instead of a single organisation following the open innovation paradigm, a larger pool of companies bound together through a central platform follows the open innovation paradigm (Figure 1).

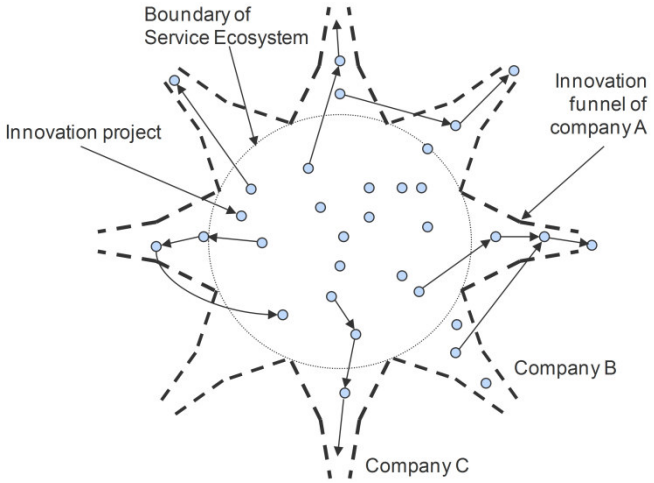

Figure 1 Platform perspective of the open innovation paradigm.

To jointly develop new products and services in an innovation network, different activities need to be performed by different type of roles. These roles characterise the types of activities involved and the type of contribution that are required. For successful innovation projects this is important to understand as the roles define the capabilities that actors need to contribute (Nambisan/Sawhney, 2008). In a general concept of "Network-centric innovation" Nambisan and Sawhney (2008) propose three types of innovation players:

- **Architect -** Architects trigger and catalyse innovation. Furthermore, they envision and direct innovation and attend to the innovation network. Architects are the central members in an innovation network; they provide the initial momentum, and define key elements of the network and the innovations to be carried out.

- **Adapter** - Adapters provide specialised knowledge or support services as well as infrastructure services. Nambisan and Sawhney call them adapters because they adapt to the direction given by the architect. Adapters may possess highly specialised knowledge and expertise to solve unique problems during the innovation development.
- **Agent** - Agents act as mediators by liaising interactions, mediating knowledge transfer, and mediating innovation.

In a similar approach Steiner (2005) differentiates between two roles. A *shaper* as an entrepreneur in a central role offering a dominant design or standard, and a multitude of other organisations, called *adapters*, offer complementary products to that central design.

Tapscott/Ticoll/Lowy (2000) differentiate between the following five classes of network participants:

- Customers who not only receive value but also contribute value through co-creation.
- Context providers play a leading role through facilitating the interface between customers and the other network actors and lead the choreography and value realisation in the network.
- Content providers contribute the main goods, services, or information that constitutes the intrinsic form of value.
- Commerce service providers facilitate trading processes such as financial transaction management, security and privacy, logistics and delivery.
- Infrastructure providers provide the infrastructure on which the platform operates.

While most open innovation studies have focused on the firm level (West/Vanhaverbeke/Chesbrough, 2006) the three works summarised above took a first step at analysing open innovation on an inter-organisational level. However, the resulting roles vary and need to be further conceptualised.

3 COLLABORATION FRAMEWORK

In order to answer the questions, who are the actors involved in such an innovation ecosystems and what are their core competencies, this section first presents a consolidated view on the network roles and second an interaction model for innovation in service ecosystems.

From the description of the network roles the considerable overlap in core competencies and contributions that are expected from each role can be identified. *Table 1* consolidates the roles proposed for both service ecosystems and networked innovation and groups them under four main paradigms according to their core competencies and their contribution towards the innovation space of service ecosystems. First, the customer judges the value created for her and has requirements for new services (Berkovich et al., 2009). Second, the platform provider pushes an innovation project forward in the role of a leading player and establishes the main environment for the service innovation. Third, service provides offer various support services and specialised knowledge and follow the driver within an innovation project. Lastly, the broker engages in brokering between the providers and customers and engages in transforming ideas within the innovation space without offering services on its own.

	Customer	**Platform Provider**	**Service Provider**			**Broker**
Barros/Dumas 2006	Customer	Provider	Mediator		Specialist Intermediary	Broker
Nambisan/Sawhney 2008		Architect	Adapter			Agent
Steiner 2005		Shaper	Adapter			
Tapscott/Ticoll/Lowry 2000	Customer	Context Provider	Content Provider	Commerce Service Provider	Infrastructure Provider	

Table 1 Consolidation of network roles.

According to their core competencies service ecosystem actors make different contributions to the innovation space. The innovation space represents possible service designs that may be reached (c.f., Millar/Demaid/Quintas, 1997). In a setting with a central platform, such as service ecosystems described above, the platform forms a collective innovation space that defines the boundaries of trans-organisational, or networked, innovation. We argue that the contributions of the actors to the

innovation space fall into three main areas: services, ideas for new services, and feedback related to service usage. This structure relates to studies of customer roles in product development where customer contributions have been classified as a source of ideas, as a co-creator through participation in product design and development, and testing and supporting products (Nambisan, 2002). Through the heavy reliance on re-using and re-purposing existing services, the variety of existing services strongly influences future service designs. The more services are available on the platform, the larger the innovation space of potential new services becomes. Thus, contributing a new service to the ecosystem may open completely new possibilities. Concrete service ideas or requirements are the most obvious source for service innovations as they directly imply possible design options. Finally, feedback from service users about existing services is a main source for incremental service innovations (Riedl et al., 2008). In addition to contributing to the innovation space, actors may also extract from and expand on knowledge from the innovation space to create new services. Brokers play a special role as they do not necessarily contribute new ideas but transform and refine already existing ideas in the innovation space (Hargadon/Sutton, 2000).
For our collaboration model we used the consolidated roles customer, platform provider, service provider, and broker presented above. Figure 2 shows the actors and their contributions to the innovation space as described above. Table 2 shows each actor's relationship with the innovation space.

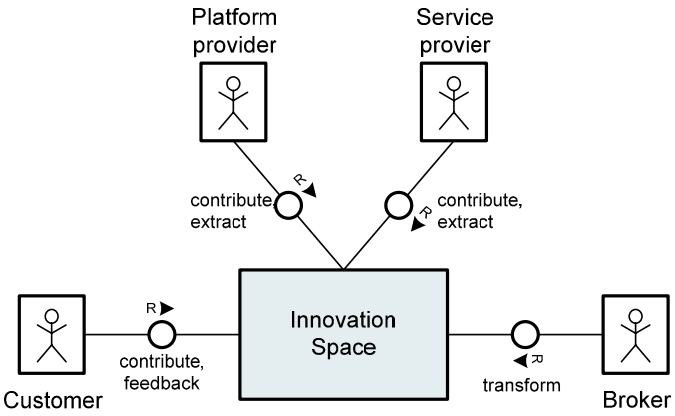

Figure 2 Interaction model for innovation in service ecosystems.

Customer	
Contribute	Customers contribute ideas for completely new services. Customers contribute refinements (e.g., in the form of comments and community evaluation). Contribute requirements and needs (e.g., via innovation communities or lead-user studies).
Co-production	Customers may become providers by developing new services on their own through end-user development (e.g., user generated mash-ups, cf. Dörner et al., 2008). Through providing new services, customers become service providers themselves.
Feedback	Explicit - Customers provide feedback regarding existing services through rating (e.g., five-star rating) or comments left through community tools provided by the platform. Implicit - Through actual service usage (e.g., if a service is used frequently users value the service which allows to derive ideas for service bundling; Riedl et al. 2008). In general, actual service usage indicates user preferences and willingness to pay.
Platform provider	
Contribute	Overall environment (i.e., platform APIs etc.) Platform providers contribute ideas and comments about ideas to the innovation space.
Extract	Just like a regular service provider the platform provider extracts ideas to be implemented and new services to be offered. However, the platform provider has a different evaluation function in that it is focused on overall platform success. Hence, the platform provider is likely to fund ideas that benefit the entire platform even if not economically viable on their own.
Service Provider	

Contribute	Services to a service repository. These services can be used as building blocks for new services thus shortening time to market and easing implementation. Service providers contribute an idea for which they seek community evaluation or refinement. They may also contribute ideas as a form of requirement communication, thus requesting a new feature and playing the role of a customer. Service providers contribute new/improved service (which might be based on ideas submitted to the platform).
Extract	Service providers extract ideas from the ecosystem for implementation. Every service provider rates every idea from its own perspective and decides which idea is valuable. An idea valuable for company *A* might not be valuable for company *B*. This might be due to different business models or available resources. Thus, different actors will have very different views on the same set of ideas, each evaluating ideas according to its own standards.
Brokers	
Transform	Brokers engage in transforming and refining ideas. This translates to a set of four sub-tasks: Capture good ideas, keep ideas alive, imagine new uses for old ideas, and put promising concepts to the test (Hargadon/Sutton, 2000).

Table 2 Actor relationships with the innovation space.

4 IMPROVING ECOSYSTEM INNOVATION – EVIDENCE OF TWO CASE STUDIES

Two case studies (Yin, 2003) were conducted to explore how the application of our collaboration framework can improve ecosystem innovation. From this case application we were able to identify gaps in the implementation of open innovation processes and propose management guidelines and implications for future tool support.

Since service ecosystems are a rather new phenomenon not many manifestations can be found in business life. Our rationale was to select cases that resemble early stages of service ecosystems. We chose two cases which show early manifestations of Web-service ecosystems. The first case was selected from a state eGovernment initiative, the second from the automobile industry. Both cases involve a network of actors, are concerned with offering electronic services delivered over the Web, and provide these services in an interconnected fashion, i.e., service offerings are interconnected and involve several actors for the service delivery. The case study data was gathered through face-to-face interviews with key informants: the manager for service integration in case 1 and the director for product management in case 2. The interviews were supplemented with publicly available data gathered through extensive desktop research following the methods proposed by Yin (2003) and Miles/Huberman (1994).

4.1 Case 1: The Need for Feedback and Brokerage

The eGovernment portal consists of a central service platform operated by a central government division. This platform is the single point of entry for various agencies offering services for the general public. One of these agencies, our case study partner, offers a search service which makes internal registry data available to the public. Until the start of the eGovernment initiative, registry data was only available on paper.

The portal provider plays the role of platform provider and is used by other departments (such as our case partner) to offer their raw services. A payment service is available which can be used by other agencies to design fee-based services.

The eGovernment portal was launched with an initial set of interfaces and the Web-service-based architecture. The central division providing the eGovernment portal plays a leading role in the service ecosystem by being the main architect. Agencies interested in offering services via the portal platform independently design and develop their services in internal project teams. The project team responsible for the search service was formed after deciding to offer a free interface to their existing database through the central portal. The free search service was chosen as a starting service to gather experience

in working together with the central portal for other, more complex services. Only limited interaction between our case partner and the central division took place during the development phase and this was limited to clarifying the technical interface. In case new requirements towards the portal emerged our case study partner would engage in talks and discuss if the required features could be added to the platform. Prior to launching the new service, the central division operating the portal performed a pre-launch test which included general functionality tests as well as performance stress tests to ensure that all services offered on their platform adhered to a certain quality standard and functioned properly. The search service of our case partner provides its own feedback form for users to comment or report errors in the service. A user community or an innovation community for actual or potential service providers is not offered by the central division.
In summary this case describes the innovation process from the point of view of a service provider offering a service on a central platform.

Actors:

- Central government division offering a portal platform open to other agencies to offer services.
- Government agencies such as our case partner, providing services delivered through the central platform.
- End-users using the services offered by individual agencies that are delivered through the portal.

Case Discussion

Several observations with potential for improvement can be made in this case. First, the role of a broker could not be observed in the ecosystem. The broker role would be vital in facilitating communication between the government agencies that could potentially offer services on the platform. Thus, valuable cross-fertilising between agencies and an exchange of knowledge and experiences gained through the services already offered could be achieved. Moreover, a broker could capture good ideas from within the agencies, keep ideas alive despite employee turnover, imagine new uses for old ideas, and sponsor and test drive promising concepts.
Second, a shared innovation space or innovation community, through with users, agencies, or the platform provider can communicate and exchange ideas could be offered. Apart from the community aspect, processes could be established to systematically involve service providers in improving the platform or systematically introducing new services on the platform. A central community or other central mechanism for collecting customer feedback could be offered. This mechanism could allow users to rate their satisfaction with the services they have used. This customer feedback could be used as a valuable source for improving and redesigning existing services. The single feedback form currently in existence offers only limited help to involve users in the development of new services. Furthermore, usage information could be forwarded from the central division to the individual agencies to highlight the popularity of specific services among users.
Third, interaction between the agencies regarding the re-use of services and service components is limited although this functionality of agency interaction was considered during the design of the ecosystem. Most services that that are re-used are those provided by the platform itself, thus, potential network effects could be leveraged and potential time and resource savings could be realised.

Role	Capability and Contribution	Gaps of Open Innovation Implementation
Customer	Feedback regarding individual services provided through online form. Demand for new services.	Central collection of explicit feedback through rating mechanisms and customer community. No implicit feedback on customer demand is collected and made available to service providers.
Platform provider	Overall platform environment Operational infrastructure Trade support processes for service delivery	No central innovation space through which ideas and feedback can be shared.
Service provider	Specialist expertise in service domain Contribution of various services to be	Limited interaction and exchange between other agencies.

	offered on the platform. Requirements for platform improvements (esp. Web front-end).	No re-use of existing components.
Broker	No broker activities were observed.	Lack of facilitated interaction and exchange between actors. No actor available to capture good ideas, keep ideas alive, imagine new uses for old ideas, and to put promising concepts to the test.

Table 3 Actors' contributions and gaps in open innovation implementation.

4.2 Case 2: Breaking up the Strong Platform Provider

Our case study partner is a platform and service provider for the automotive industry. Their platform provides Web-based services for supply chain management in the automotive and production industries. They serve both the source side (i.e., large automotive companies) and the supply side (i.e., suppliers of automotive companies). In addition to the services directly offered by the platform provider two external service providers offer specialised services that extend the functionality of the platform. Thus, our case partner is able to offer highly sophisticated services by relying on specialised knowledge from other actors which increase customer value of the platform.
In addition to providing the general platform our case partner strongly mediates between the source and supply side. Through an established internal innovation process they continually work at improving the functionality offered by their platform through close collaboration with customers from both the source and supply side. This innovation process involves expert workshops and various expert groups with participants from both sides. After gathering and sufficiently refining service ideas a formal selection process that relies on a large set of evaluation criteria is employed and ideas promising the best outcome are selected for implementation. After implementing the new functionality on the platform our case partner closely works with their customers on integrating the new features into their processes. The case partner concentrates on its core competency as an industry insider with special knowledge and experience of understanding both large manufacturers as well as suppliers of these companies. Although they act as platform provider, most of the operation and development tasks have been outsourced and the core competency is seen in industry insight and experience and thus the ability to support and enhance client processes.

Actors:

- Central actor acting as provider of the central platform and mediator between the source and supply side.
- Customers of the central automotive supply platform, both from source and supply side, provide input regarding new features they would like to see implemented on the platform.
- Two external companies offering services that extend the functionality of the central platform.

Case Discussion

The most prominent role in this case study is that of the central platform provider acting as ecosystem leader and the very active broker role. Although all actors of our collaboration framework are present in this case study several observations in the implementation of open innovation processes can be made. Two third parties offer services on the platform: they were invited to the central platform in a strategic partner selection process and the platform is not open to other service providers. The platform provider holds a rather strict guard over their platform. Consequently, there is no shared innovation space through which service providers could interact with each other and customers to drive innovation towards new services. In particular, service ideas that have been rejected by the platform provider's internal innovation process are not visible to others who could decide that offering a certain service might present a business opportunity. This close control of the platform may limit the potential benefits of the broker role as interaction with external service providers is restricted to selected

partners. As the amount of third party services offered on the platform is very low, the potential for designing new value-added services through the combination of existing services is also very small.

Role	Capability and Contribution	Gaps of Open Innovation Implementation
Customer	Judges perceived service quality through explicit feedback. Directly involved in innovation activities through interviews, expert workshops, and feedback requests.	Customer interaction only through central platform provider. Customer feedback is only limited available to service providers.
Platform provider	Service platform that defines general ecosystem environment Operational infrastructure	Limited platform functionality with regards to service offerings by third party service providers.
Service provider	Specialist expertise in service domain Specialised services	Closed selection of service providers. Limited amount of services offered by providers other than platform provider. Limited interaction between service providers, consequently no re-use of existing components by service providers.
Broker	Extensive industry insights Mediates between source and supply sides, aggregates innovation demands, facilitates communication, acts as catalyst	Broker activity too closely focused on own provision of service. Limited cross fertilisation between service providers.

Table 4 Actors' contributions and gaps in open innovation implementation.

5 CONCLUSION

The framework shows the capabilities of the individual actors with regard to service innovation and how these capabilities can be exploited by the overall ecosystem to advance service innovation. This highlights the potential advantages that can arise through the constellation of various actors bound together by a single ecosystem platform. Each actor benefits from the contributions of the other participants. End-users contribute knowledge about actual market demand either in the form of ideas or through feedback provided about the services used. The platform provider contributes the overall environment of the ecosystem platform and serves as an architect to drive innovation projects by extracting and implementing ideas that are likely to benefit the whole ecosystem. Service providers contribute services that extend the innovation space and may thus allow new value added services to be composed. Conversely, they extract and implement service ideas that a provider deems valuable. Finally, brokers engage in transforming ideas already present in the innovation space.

This paper proposed a new way of thinking about an innovation ecosystem where each actor contributes to a collective innovation space rather than single companies chasing their individual innovation projects. The framework serves as an interpretative scheme to structure and analyse each actor's contribution towards the innovation space. Therefore, we believe, this model can serve as a guide in leveraging the combined resources available in service ecosystems and can guide strategies for businesses to successfully participate in service ecosystems. Moreover, it was apparent that the different types of contributions require adequate tool support to facilitate the networked innovation. Furthermore, open innovation has severe consequences on intellectual properties and sharing thereof. Adequate mechanisms to govern the use and sharing of innovation related information are needed.

From the gaps identified in the case applications we derived several practical implications for the implementation of open innovation processes for service and platform providers:

1) Use explicit user-feedback to improve, re-design, and create new services.
2) Use implicit feedback for continuous improvement.
3) Rely on outsourcing, re-use other provider's services to save development costs, and get to market quickly and cheaply.
4) Cleverly recombine existing services to create value added services for your customers.

5) Look for service ideas outside your current customer base by looking at how you can complement services provided by others.
6) Evaluate service ideas in the service ecosystem's innovation space according to your competencies to find service ideas that might be profitable to you but not to others.
7) Work with brokers to get new ideas and refine ideas that are "not there yet."
8) Provide personalised tools that support the capabilities contributed by each actor.

In order to exploit the capabilities in this network of distributed innovation it is important to "find a governance mechanism that strikes a balance between order and chaos" (Sawhney/Prandelli, 2003). Thus, it becomes apparent that across multiple innovation projects a single actor may play different roles. While driving one project as a service provider or architect, in another situation the actor may only contribute end-user feedback about the services consumed from suppliers. This leads to a certain degree of overlap in the roles across different innovation projects.

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