

Towards Contributory Development by the Means of Services as Common Goods

Anastasiya Yurchyshyna^(✉)

Institute of Services Science, University of Geneva, Battelle,
Batiment A, 7 Route de Drize, 1227 Carouge, Geneva, Switzerland
Anastasiya.Yurchyshyna@unige.ch

Abstract. This paper describes our exploratory approach to enable and sustain the environments-oriented creation of services as common goods. We first discuss the characteristics of services, which allow them to be envisaged as engines of innovation and we study the role of economy of contribution in this innovative development. Second, we present an approach supporting the collaborative innovation-oriented work of actors from multiple domains, which facilitates concretizing services. This is achieved by virtue of “Tiers-Lieu”, collaborative environments of service innovation, where services are envisaged as common goods. To illustrate the organization of Tiers-Lieu, we present its conceptual framework, and discuss an example from the domain of mHealth. The paper is concluded with the perspectives of the ongoing work for contributive development within service society.

Keywords: Service exploration · Services as common goods · Economy of contribution · Co-creation of services · Tiers-Lieu · Co-creative environments

1 Introduction

The role of technologies is well-established as a dominant factor in the development of contemporary society. Information and communication technologies (ICT) have been integrated into all spheres of contemporary life and established their leading role as an engine for development of the world’s economy, guided by an exponential growth of innovations. Developing societies which lagged behind the technological revolution can also gain the potential to leap directly into the connected world with the introduction of mobile technology. Innovations often help to simplify the implementation and usage of traditional services in different sectors of the economy (e.g. supporting services in transport, education, health care sectors) and are the main factors allowing the creation of a conceptually new range of information-based services (e.g. Internet providers, mobile communications, social media, etc.).

The phenomena of facing new, challenging situations and finding ways to address them reveals the importance of innovations in, for example: economical science, management, informatics, technologies and social networking.

Society today is guided by creation, distribution, diffusion, use, integration and manipulation of information and knowledge [1], and it is crucial to investigate all the factors defining the progress of Society and tackle them to optimize such a development.

Moreover, this analysis should go beyond simply admitting the leading role of services in our economy to explore how interactive exchange and functioning of interoperable services [2] enable services to become the main engine for co-creative development within the service-oriented society.

This paper is organized as follows: in Sect. 2, we discuss how the requirements of service orientation within our society are addressed by Service Science. The role of services as engines of innovation is argued in Sect. 3. By analyzing collaborative development and environments supporting innovation, Sect. 4 discusses how innovative ideas are concretized with the help of services. In Sect. 5, we present our exploratory approach for contributory development of services by envisaging them as common good and suggest supporting this by Tiers-Lieu, collaborative environments of service innovation. The conceptual framework of Tiers-Lieu is consequently introduced. To conclude, this exploratory paper synthesizes the discussed principles of supporting creative development of services and identifies the scope of future research.

2 Service-Oriented Society and the Role of Service Science

Even in the early days when the existence of a new type of Society was recognized, it was clear that some definite scientific ground was needed, on which one could perceive, investigate and develop this new type of Society, something that could integrate the main disciplines and non-disciplinary approaches enabling development. This role was taken by Service Science, first introduced by a team of IBM researchers in 2007 [3].

The notion of Service Science, or as it was initially referred to as Service Science, Management, and Engineering (SSME) by IBM, is a term to describe an interdisciplinary approach to the study, the design, and the implementation of service systems. SSME includes three parts: Science, Management and Engineering parts and is, in fact, the science exploring the complex interdependence of these parts. Today, Service Science exceeds the scope of SSME and integrates all the aspects related to: (i) Service Oriented Technologies; (ii) Business Architecture and Process Innovation; (iii) Complex Service Systems Modeling and Simulation; (iv) Service Quality and Experience; (v) Service Business Design and Strategy; (vi) Business Componentization; (vi) Business Modeling, Monitoring & Management; (vii) Service Delivery and Operations; (viii) Business aspects of Service Composition; (ix) People in Services; (x) Service Innovation Management [4].

Service Science offers a scientific framework to tackle new challenges of Society, thanks to its methods of transforming ideas into concrete services. Service Science requires account to be taken of social and economic contexts at the design level, thanks to Service-Dominant Logics [5, 6], and its focusing on knowledge and skills. Service Science allows Society to leave the passive “static” position, where Society only passively contemplates or applauds ICT successes, and to take the active “dynamic” position, in which Society has to actively re-design its organizational parts. It is a great challenge of innovation to open information through services and create new economic values, by respecting the principles of cognitive social responsibility [2] to strengthen the sense of inclusion and to contribute to social stability.

In its complexity, such service orientation is introduced at different levels of service science from traditional project management dimensions (e.g., scheduling, quality management, service marketing, etc.) to unique topics that are specific for idea development and management [7]. Services are incorporated into the core of all economic processes and are widely used in paradigms of conceptual modeling and technical implementation. As a result, it becomes possible to conduct a multi-dimensional analysis of innovation activities, by tying their economic, business, social and IT aspects, so that timely, friendly, proactive services are sought to enhance future business or economic growth from one hand, and from the other, to ensure their dynamic adaptability for the environment.

In other words, services are now seen as the utilizations of specific competences such as the knowledge, skills and technologies of one economic entity for the benefit of another economic entity [8]. As value creation occurs when a resource is turned into a specific benefit, it is now a service system which becomes the main value creation entity. Consequently, the traditional supply chain is re-conceptualized as a network of service systems, called a service value creation network [5].

3 Services as Engines for Innovation

Despite the importance of information in design and innovations, on its basic level it is somewhat arid, which can inhibit human innovations. Thus, the concept of informational service offers the means of comprehensive appropriation. Even if an informational service is defined upon the concept of information, it provides deeper conceptual semantics by describing how to access information, as well as some easy ways to execute its treatments.

Generally, an information service is seen as a part of an information system that serves data/knowledge/information to customers and collects it from its contributors, to manage and store it by optionally using administrators.

Services are characterized by four main factors [8, 9]. They are as follows:

- information is the core element of the design, production and management of services; so services are information-driven;
- customers are co-producers of services, they may require the adaptation or the customization of services, so services are customer-centric;
- digital orientation of services is explained by the achievements in information and communication technologies, the (semi)automation of main services-oriented activities and the creation of new domains: e.g. e-commerce, e-business, e-collaboration, e-government, e-environment; and
- services are driven by their performance criteria and as such are productivity-focused.

We argue that these phenomena related to services can be analyzed in the wider context of a service-oriented society in general and as such, are seen as characteristics of this service society.

Guided by the current experiments in developing economies and the evolution of the underlying technologies, our society is based on information and knowledge that

becomes the main sources for value creation. New, emerging situations lead to new challenges we should now face; and new ideas addressing these challenges require to be identified, analyzed and – more important – concretized. This is achieved thanks to services [10]. Generally speaking, the phenomenon of service innovation mirrors the requirements of the knowledge society where knowledge is both the primary production resource and the tool of value (co-)creation and in which information lies in the centre of service creation and functioning. We point to the practical importance of this phenomenon that is implemented by informatics: it supplies not only the tool for IT development but also guarantees the consistency of the sustainable co-creation of its fundamental concepts [11].

4 Collaborative Development Supporting Innovation

The next questions, which naturally arise in the context of our servitized society, are the dynamics of the society, the engines that move its development, and the new aspects of innovation guided by knowledge and spread by virtue of networking.

An idea of joint efforts aiming to develop our society or its different domains is not new. Indeed, a large number of collaborative groups, public-private partnerships (PPP), and other forms of organizations have already proved to be a successful answer in innovative projects [12]. It is also noticeable that these recent works are not exclusively focused on the institutional principles of PPP functioning [13], but particularly address the core elements of different types of partnerships, which guarantee their success: skills and knowledge from both private and public sector [14].

Traditional PPP are beneficial for complex projects involving the government and the private sector. In this context, what are the challenges and advantages brought by industrialization and globalization, and by open and big data, that become more and more important for the development of enterprises and society?

To analyze this phenomenon of collaborative development, we investigate the 3 levels of classical PPP. From one side, PPP represent a tool to structure and maintain PPP projects. From the other side, PPP are working environments allowing the definition and examination of different processes leading to the creation of projects-oriented PPP. Thirdly, PPP are defined by their concrete aim: achieving a defined result. By its dynamics, PPP help to make our society “stable”, in the meaning of guiding and controlling its sustainable development, according to the current working environments.

We also underline that classical collaborative partnerships are mainly focused on infrastructure projects, when the return on investments is not expected at the moment of signing the PPP contracts or even finalizing the projects. It is throughout a certain number of years after the projects are terminated that the private partners have an exclusive right to exploit and/or maintain the results of the project and as such, receive the return on their initial investments. (Indeed, a private company financing the construction of the public road that does not have its investments returned during and after the project is finished will be benefiting from exclusive rights on its maintenance and/or receipt of pay tolls during its functioning).

The principles of collaborative development within classical PPP create a solid background for extending this vision of exploring the process of service creation, where results are intangible and often more complex to be valorized.

To do this, we first refer to the principles of development of services, or more precisely, sustainable services. In [11], a sustainable service is defined as a service that is capable of adapting to its environment, to dynamically integrate the ever-changing conditions of this environment and as such, to be sustainably coherent with its evolving challenges. It is important to underline that, according to this approach; sustainable services are dynamically built by virtue of all the relevant semantics: i.e. the information kernel that relies on domain, legal and knowledge ontologies and defines the semantics of services. This semantics is verified and enriched through usage-based validation and existing by practices of usage and as such, a new semantics will be identified and integrated into the information kernel.

This implies that service creation relies on its sustainable development, enabled by co-creation of its members; the process similar to the one traditional to PPP. As such, those PPP, which are oriented towards creation of services (PPPS), have naturally become sources of sustainable creation through a service capacitating process for all the involved actors and stakeholders. Indeed, such PPPS benefit not only from the advantages of traditional PPP, but also enable contributory service empowerment process for all their partners (the government, private partners, individual experts, etc.).

By their composition and through their functioning, PPPS create an innovation-oriented environment and as such, are themselves both the source and the result of innovation. Moreover, the results of contributory development within PPPS are increased, thanks to contributions of actors interested in developing new services. Furthermore, the resulting new services are themselves likely to be sustainable, as they are developed on the basis of sustainable services within PPPS.

In other words, PPPS extend the advantages of traditional PPP: when the government provides direction, the private sector provides the drive to ensure success, and people (actors) provide initiatives and skills to concretize ideas. As the result, PPPS allow concretization of initiatives through services.

Following the increasing impact of collaborative development, it is important to underline that it is mainly due to the creativity and motivation of actors (individual persons, formal working groups, as well informal groups of civil society) in PPPS, that innovation-oriented processes are now not restricted by the “desired” pre-defined results, and are as such, given the freedom of exploration, such development represents the common interest and turns to be more sustainable within the developing society.

In this context, the services developed through PPPS are, in fact, common goods (i.e. rivalrous and non-excludable goods shared by and beneficial for all or most members of a community), or more precisely, the myriad of common goods, which serve the common interest and are free.

5 Towards Contributory Development of Services

Whilst the central concept of innovative approaches is a service, the main innovative activities are focused on service design with its major goal: to establish the consonance

between activities and ICT. For this purpose, it is essential to establish the context of any service. In particular, it requires the determination of the activities which will be executed through the intentioned service; to explore their legitimacy and their soundness considering their environment, the new forms aiming to execute and to coordinate them; the new business models and the new values being created. Often, it is necessary to invent new activities and new ways of coordinating them. Such exploration endeavors to research and find out upon which foundations services will be built. These foundations can be expressed in terms of knowledge, as well as in terms of culture. Thus, services can establish a more or less appropriate consonance between activities and ICT, depending on their design. However, behind this concordance, the issue is in fact the concordance between persons and institutions in charge of these activities, the cognitive serenity of each involved person and the cognitive unity and identity of each involved institution.

5.1 Services as Common Goods, or Why We Should Share

In the context of the traditional economy, guided by added value and the copy-right principles of protecting the rights for the goods developed by businesses, it becomes unclear why they should be encouraged to contribute “free of charge”; why the actors need to share their own knowledge, skills and make efforts to develop something, the results of which do not belong to them.

Indeed, in the world of commercialized services, the notion of a service as common good seems to be lacking sense. The hot questions from the traditional businesses are focused on the following:

- Who is the “consumer” of free services?
- Who “pays” for service creation?
- What outcome can the businesses have from them?
- Which are human and economic values of services?
- Why are Enterprises interested in having co-creators?
- Why should Enterprises agree to pay for creating anything, from which they cannot profit?

By implementing the vision of the traditional economy, no positive answers to these questions can be given. Instead, we argue that this problematic from be addressed from a different viewpoint.

According to our exploratory approach of Service Science, we change the accents of this discussion from seeking the answers to these questions within the traditional economic vision and focus on the analysis of how to address the existing situations.

Indeed, with the growing impact of services in identifying and enabling our society, one cannot ignore the importance of creating services. However, the lifecycle of services is very different from that of tangible goods, it is impossible to have clear criteria on the material value of services, neither to have classical return on investments from their creation. Consequently, it is impossible for the private sector to accurately evaluate the risk of participating in projects of service creation, or to estimate the expected income as the result of creating a free common good service.

We argue that this, in fact, is not needed... In the context of our knowledge-based and service-enabled society, the main risk is not the one of not returning one's investments, but the risk of "no innovation"; the risk of being outside the revolutionary tendencies identifying the dynamics of society and participating in innovations arising around them, the risk of losing the knowledge and skills allowing sustainable leadership in each domain.

5.2 Economy of Contribution: Can It Really Work?

It is first important to underline that the economy of contribution does not aim at putting into question the traditional market economy but to broaden its vision by taking into account the new phenomena, such as technological progress, networking, and social media, allowing more possibilities to create and share value.

The economy of contribution is described in [15] as the one having the following characteristics:

- No longer is there separation between economic actors as producers and consumers; all actors are now seen as contributors
- The value produced by contributors is not totally monetizable, it is a 'positive externality'
- It is as much an economy of existence (as the production of 'savoir vivre') as it is an economy of subsistence.

It is remarkable that the economy of contribution does not exclude alternative means of production and exchange, but rather combines with them, whilst its contributors participate in chosen activities, creation of social value and have an interest in selflessness [16].

The main challenge here, in comparison to the traditional approach, is to accept the vision that a service is not a product, that PPP oriented products cannot be applied, and that this classical vision should be extended.

In other words, each actor (private, public or individual) is not any more seen as just a consumer or creator of a service, but has become a co-creator: "paying" by their commitment and efforts in service development and by being "paid" through an exclusive right to define the dynamics of the development of the domain, access to the most recent technologies and methods, as well as initiatives of various actors, and finally by forming the cognitive unity in service creation. In other words, in its complexity, the contributory approach in service development through PPPS allows the creation of a new market for initially planned and completely new services, which is not dependant on the initial estimation of the utility of a service but coordinates itself sustainably, according to new situations and guided by democratically developed initiatives.

In this context, Internet and new technologies offer collaborative multicultural environments whose actors are put in the position of active participants, supported by free and open source software. It thus represents the source of collective creative practice and new value-creating mechanisms, whilst digital technologies have intensified the exchange of information and knowledge.

Creating a new market for services as common goods has a crucial effect for commercial activities of the involved actors. Indeed, “free” services allow the development of a new market, which offers an environment for further development of a vast amount of commercialized services with economically defined added value, based on and disseminated by virtue of the initial common goods services.

5.3 Tiers-Lieu of General Interest for Creating Services as Common Goods

Creating services of the “common good” nature can be possible thanks to a collaborative environment which offers the possibility to identify the initiatives-oriented common goods, and detail them and develop the corresponding services for commercial projects, research or business-oriented methodologies.

The first results were discussed in our previous research [10], which introduces the concept of Tiers-Lieu (extending the initial concept of “third place” from [17]) and argues the characteristics of Tiers-Lieu, which reveal its added value in comparison to other collaborative environments.

In our approach, Tiers-Lieu are envisaged as an open environment that motivates collaboration, intellectual creativity and surpasses the limits of traditional disciplines-defined collaborative spaces, by allowing defining new services. We underline that all initiatives of Tiers-Lieu must be:

- inter-organisational (by representing a general interest),
- inter-disciplinary (not related to the only domain, but aiming to address interdisciplinary situations),
- take into account international/intercultural aspects; lead to value creation in human, social and economic spheres and, finally,
- all initiatives must be concretized in the form of one or several trans-organizational and trans-disciplinary services.

The participants of Tiers-Lieu share “think contribution” vision, supporting creating services of the “common good” nature, which are also characterized by human added value.

This also includes understanding by all the participants that these services are created under Creative Common License [18], and no exclusive ownership rights can be demanded by any actor of such service innovation environments.

5.4 Organization of Tiers-Lieu

Firstly, it is important to underline that Tiers-Lieu are developed as collaborative environments, which aim to overcome the typical problems potential actors may face. This includes the so called “resistance to change” when actors are invited to change their way of work, communication, usage of systems, in order to find a “better” way of doing (even if they do not particularly want to change them). Instead of this, in Tiers-Lieu actors receive a possibility to take part in co-creation as active participation in changes, and as such define by being which (if any) changes are really needed.

Moreover, within Tiers-Lieu, absence of immediate tangible results is not seen as blockage, since all actors share “think contribution” vision, with added human value, and the results are, in fact, achieved through concretization their initiatives as services.

The activities that are supported by Tiers-Lieu are naturally discussed during the meetings of co-operative nature concerning strategic questions typical for complex competition-based environments. As an example, we refer to the domain of mobile healthcare (mHealth) [19], and more precisely, analyze the actors involved into defining services for aged people (Fig. 1).

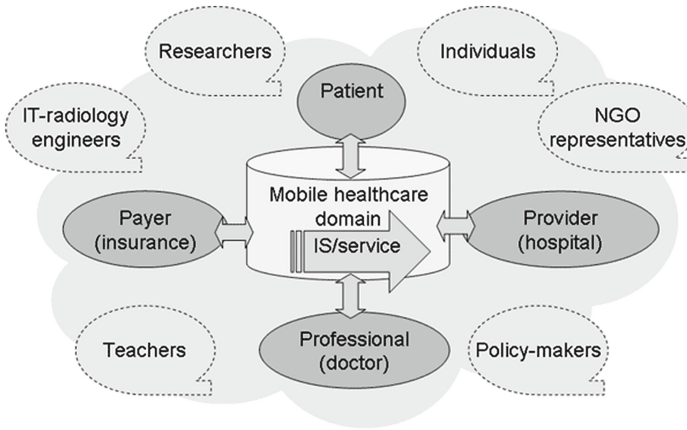


Fig. 1. mHealth actors

There are 4 main groups of actors, 4P:

- Patient
- Provider (hospital, care house)
- Payer (insurance companies)
- Professional (doctors, nurses, other medical professionals).

Along with these 4P actors, we should also consider other involved actors. They are providers of technology (IT-radiology specialists), policy-makers, researchers, actors related to education, representatives of different organisations, legal administration officers, or just interested people, who would like to participate in developing services (for example for aged people).

Despite certain contradictions between the value intentions of each actor, Tiers-Lieu are characterized by a high level of collaboration in achieving common objectives. For example, while introducing new forms of medical services, IT standards or compliance norms, the necessity of coherent collaboration between direct competitors (e.g., leading companies in the sector), standardization organizations, policy-making bodies and other interested parties has become a crucial factor.

The forms of meetings within Tiers-Lieu are multiple: they can be face-to-face, diffused by Internet, supported in real-time or asynchronous, or a mixture of different

forms. The participation is open for other contributors: actively interested people, and is highly beneficial if various interesting – and multi-domain – ideas are exchanged.

In this context, it is important to underline that the participations in Tiers-Lieu are based on the acceptance of its members of the main principles of team creativity, their desire and ability to create collectively, to share the expert knowledge and the acquired results, to avoid innovation resistance [20] and to ensure participative safety, to improve the quantity and quality of attempts to introduce or develop new ideas.

One of the most important conventions within Tiers-Lieu are the mutual agreements between all the involved actors that innovative ideas are represented through initiatives which can dynamically change, according to the discussions. Each actor should share the interest in selflessness [16]: before being selected and approved by all actors, initiatives can be modified, reorganized, abandoned, etc.

In order to guarantee smooth functioning of Tiers-Lieu in creation and implication of initiatives for service creation, it is necessary to establish its infrastructure, allowing tracking the history and dynamics of ideas exchange, some principles for regulating roles and access of actors.

A few crucial aspects should be underlined.

Firstly, Tiers-Lieu are motivated by the spirit of the PPPS approach: they are supported by private (P), public (P) partnerships (P) and are oriented to service (S) creation.

Secondly, to ensure the balanced organization of discussions and the effectiveness of taken decisions, there should be a system of roles within Tiers-Lieu.

We start by identifying the following 6 roles:

- **Initiators:** actors, who come with a new innovative idea, define an initiative and invite other actors to discussions. Initiators are those who take the final decision, once the initiative is discussed and developed by others. For example, there is an initiative to develop a special watch for aged people, which would evaluate their blood pressure, as well as speed and amplitude of their movements, analyze the results and trigger the other related services, if necessary.
- **Participants:** actors, who actively contribute in discussions and help to develop the proposed initiative. These can be patients, psychologists, IT-developers, etc.
- **Moderators:** actors supporting the process of Tiers-Lieu functioning, i.e., “neutral” actors who guide the discussion towards concretization of initiatives.
- **Observers:** actors, who assist at discussions and follow them, but are not actively participating in them, i.e., the ones who do not have a word. Observers might have educational purposes (e.g., students in medicine) or just share the general interest for the discussed subject, without offering any concrete solutions (e.g., public who would like to participate in creating services for aged people).
- **Historians (or secretaries):** actors who play a supporting role: helping to register and track discussions and contributions of participants, introducing required information, keeping in order the agreed planning, etc.
- **Developers:** actors, whose aim is to develop a service, once the initiative has been defined and validated. These can be the same actors as initiators and participants, after having accepted the validated initiative and acting within the defined framework for service creation.

The role of the initiator is characterized by a high level of responsibility and is crucial for functioning of Tiers-Lieu. Indeed, it is the initiator who not only introduces a new initiative as a subject of innovation, but also defines the scope of participation within the scope of Tiers-Lieu. The initiator is also the one who evaluates the expressed ideas and has the final word on accepting or refusing them.

To facilitate the discussion procedure and to minimize the uncertainty in discussions, the initiator has a set of measures to keep the discussions fruitful, by attributing the participants a yellow card (warning about the semantic inconsistency or non-respect of the ethics of Tiers-Lieu) or a red card (serious breach of the rules or consistent contradiction with the main idea of the current initiative; this leads to the exclusion of the participant from this Tiers-Lieu). Analogically to football rules, two yellow cards in the same meeting constitute a red card.

A participant with a red card (or in fact any participant at any time) may leave this initiative and eventually launch an alternative initiative and a different Tiers-Lieu, which might have the same participants of the initial Tiers-Lieu. All initiatives are launched under the Creative Commons License [18], used when an author wants to give people the right to share, use, and even build upon a work that they have created.

It is remarkable that there are no limitations for the participants to contribute for multiple initiatives, as well as to leave them at any time.

It is important to develop a balanced system of ethics principles concerning the supported activity, and, consequently, the ethics principles defining the developed service.

Despite the self-motivation of the actors to participate in Tiers-Lieu, there should be developed a balanced approach for supporting their interest in sharing and increasing their knowledge about complex situations which require common effort, even under the risk of competition. Tiers-Lieu are thus becoming a good choice for a neutral environment, which can put together various actors for their “winning-winning” collaboration.

6 Conclusion and Future Work

This exploratory paper addressed the challenge of supporting creative development of services, in order to ensure sustainable development of the service society.

In order to do this, we discussed the main aspects of the economy of contribution, analysed the environments oriented service creation and proposed to develop Tiers-Lieu (collaborative environments for service creation) of different domains. This allowed us to address different situations facing our society, to develop situational method components, which would offer the possibility to all the actors to collaboratively and effectively co-create services, in particular services of “common good” nature.

We described the conceptual aspects of organization of Tiers-Lieu and illustrated it with the example from the mHealth domain.

Our ongoing and future works include the further conceptualization of Tiers-Lieu within the economy of contribution and the analysis of the impacts of the proposed approach for societal development. We also aim at developing multiple Tiers-Lieu in different domains: mobile health, relationships between the University and service

society, and green transport, to mention but a few. We envisage Tiers-Lieu becoming a sustainable environment for exploring the phenomena of service society and all the situations we face, by offering all the actors the possibility to collaboratively create services of “common good” nature.

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