Service Idea: Creating Mobility Scenarios Through Service Design

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Abstract The chapter discusses the initial stages of the development of the Green Move research. In particular, the authors focus on the generative phases developed in the early stage of the research process. The content mainly describes the different stages of the service idea development: (i) the research phase aimed at collecting examples of mobility solutions worldwide, (ii) the creative session aimed at sharing ideas among participants to identify design opportunities to be developed in the next steps of the process and (iii) the development of the service ideas in order to describe possible scenarios to support the implementation phase. Moreover, few considerations on challenges and opportunities to deliver the service are outlined. To describe the framework that influences the design choices, the chapter briefly introduces few concepts on service design approach used in the journey.

1 The Service Design Approach: Putting Users at the Centre of the Process

Nowadays service design is becoming a crucial element to differentiate businesses and public organization around the world. The first attempt of defining what a service is came from the service marketing and management field.

In this disciplinary area, some scholars have built the basis of service design starting from interpreting and defining new service development and delivery process (Shostack 1982, 1984; Scheuing and Johnson 1989; Gummesson 1990), service design still lacks a unique and common definition (Nisula 2012). Nevertheless, scholars and practitioners agree on considering service design as a multidisciplinary process characterized by a user-centric approach and by the

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interactions and the encounter between providers and users (Holmlid 2009; Stickdorn 2010; Meroni and Sangiorgi 2011). Negro (1992) describes the service as an interchange process aimed at solving problems for users through the reciprocal flow of information, knowledge, skills and work done in a period of time. Lovelock and Wirtz (2004, p. 9) define a service as an "act or performance offered by one party to another" that creates value for providers and customers.

Thus, service design discipline can be considered as a huge field of intervention that implies collaboration between different disciplines to propose, design, develop and deliver a holistic experience targeted to specific users or communities and provided by a system of stakeholders playing different roles.

Mager and Sung state

> … Service design aims at designing services that are useful, usable and desirable from the user perspective, and efficient, effective and different from the provider perspective. It is a strategic approach that helps providers to develop a clear strategic positioning for their service offerings. Services are systems that involve many different influential factors, so service design takes a holistic approach in order to get an understanding of the system and the different actors within the system… (Mager and Sung 2011, p. 1).

Service design is based on the idea that users are the core of the service design process, and it uses a great variety of tools and techniques to involve different stakeholders in the creative process. The collaborative processes are also supported by visualization methods and prototyping techniques that enable people to share ideas, define solutions and make concepts visible. In some cases, we can describe this journey as a real co-design processes where experts and non-experts work together in order to provide innovative solutions derived from the participation and representation of different perspectives (Jégou and Manzini 2008), like those of citizens, enterprises and institutions. This helps to share different types of diverse expectations and expertise that different stakeholders might have and stimulate a dialogue among different disciplines and group of people. Moreover, service design is a holistic approach (Stickdorn and Schneider 2010) that means that service touchpoints (such as digital interfaces, physical elements, people and places) and intangible elements (such us the user experience, the service values and people interactions) need to be coherent and well orchestrated in order to provide a performance that creates values both for providers and users.

The Green Move approach is based on these service design drivers: it is aimed at developing a mobility service using a collaborative approach, involving different stakeholders with different roles (such as public administration, researchers, firms, users) to envision and experiment a new mobility service able to fit with specific users' needs and based on electrical vehicles sharing (Villari and Luè 2013).

In particular, the service design process within its development has been focused on different levels: the creative phase, the service idea and the business model development, and the design of the system of touchpoints.

In the following paragraphs, we describe in detail the approaches and the tools used to frame it.

2 The Service Context: Sharing Economy and Collaborative Services

One of the main Green Move research hypotheses is based on the idea that collaborative and participatory approaches are fundamental to the development of innovative solutions for electrical vehicle sharing, in order to face urban challenges. This could be an innovative way to fuel new connections among social, environmental and economic issues. Accordingly, to orient the generative phase about service ideas, particular attention was given to define the concept of collaborative consumption and sharing economy (Botsman and Rogers 2010) and to include the social innovation and sustainability issues (Mulgan 2007) to create value for local communities and citizens. Since the beginning of the project, we put emphasis on the importance of peer-to-peer activities and the opportunities to adopt sharing concepts to orienteer mobility solutions. Another input to boost the idea of sharing was to consider the ICT as an enabler of people activities and as a way to create more tailored services.

The sharing economy models are generally based on the idea of access (especially using a pay-per-use approach) rather than ownership to promote a more efficient use of tools and resources. Since the past few years, the debate on sharing and collaborative economies has grown constantly (Pais and Provasi 2015) also due to the fact that some companies such as Airbnb, Uber, eBay or Etsy are climbing the market in a very fast way. But this has also shifted the focus on the possible critical issues about the sharing economy models, such as the IP regulation, the transformation of the labour market and the international tax regulations. Notwithstanding, many companies are investing in a sharing economy approach, and many start-ups are entering the market allowing consumers to play new roles and tasks that were normally conducted by businesses (Dervojeda et al. 2013).

In the mobility area, sharing economy has totally changed the way of accessing transport systems. We are progressively moving from owing a car (B2C model) to new business models and services based on rental or sharing (B2C services). Milan has led the way: in the past few years, the use of car sharing and bike sharing has rapidly grown. Hybrid and electric vehicles such as cars, motorbikes and bikes are offered by the municipality and by private companies to support urban mobility in accordance with the idea to offer even more citizen-centric services. This shift is especially true in the emergent area of the collaborative platforms, where P2P services are growing faster. Examples such as Uber and BlaBlaCar are interesting phenomena related to these new ways of using transports, based on peer-to-peer approach.

The main drivers related to sharing economy and shared mobility have influenced the Green Move service concepts. In particular, some aspects were considered as crucial ones:

- the central role of digital platforms as enabler of new user behaviours focused on matchmaking between demand and offering of mobility;
- the importance to have different service possibilities to access the service itself, i.e. renting, lending, subscribing, donating and so on;

- the change in consumption models based on collaborative social interaction;
- the value of a well-recognizable identity and process able to create trust and activate and maintain reliability and continuity in users' engagement.

The development of Green Move concept for an electrical vehicle sharing has been influenced from this emerging framework and from the holistic approach of service design putting together users' needs and perspective with value creation process of the enterprises.

3 Defining Service Design Scenarios for EV Mobility

One of the early stage activities of the Green Move development process has been dedicated to the service idea development. The process involved all the academic stakeholders and the external players such as experts, mobility companies and public administrations.

The ideation phase has been strictly connected since the initial steps to a literature review process and to a collection of best practices cases of mobility services to support the service ideas development phase. In particular, this phase supported the understanding of the most important design issues related to the technology choice, vehicle performance, service (user) experience and the nexus between the service offerings and the contexts of use. To structure the service ideas, some phases have been structured:

- Organizing and systematizing the best practices collected about mobility services (Sect. 3.1);
- Generating ideas of product-service systems through participatory workshops (Sect. 3.2);
- Developing mobility scenarios based on electric vehicles (Sect. 3.3).

In the following paragraphs, these activities (the design process and the tools used) are described.

3.1 Organizing and Systematizing the Best Practices Collected About Mobility Services

The research teams selected thirty-three existing cases of worldwide mobility services. These have been divided into four categories describing the main characteristics of the service offering and the mobility model: (i) services which use traditional vehicle sharing, (ii) services which use peer-to-peer approaches, (iii) services that use electrical vehicles and (iv) services that offer direct production of energy (Maffei et al. 2011). The first category includes mobility services that are characterized by innovative models in service or in business and use non-electrical vehicles; the second category encompasses that services characterized by a

collaborative approach in experiencing or delivering the service; the third focuses on "green" vehicles; the last one considers some cases that include energy production as an element of the service system.

The analysis of best practices and the study of the literature have been useful to define the main design problems to be discussed during the creative phase and understand what are the current business models and the solutions adopted to make the services efficient and user-centred. In the following boxes, main characteristics of services analysed are presented.

Autolib (Paris)—The pioneer of electric car sharing

Autolib started in 2011 in the inner circle of Paris. In the recent years, the served area expanded so that now the whole Paris area plus some of the surrounding towns are included. The service aims to fulfil mobility needs for citizens, commuters and tourists. Today more than 2000 vehicles are shared in the city of Paris by more than 150,000 subscribers. The vehicles, named "blue cars", are electric and have a 250 km range. The parking places are well spread in Paris and in the surrounded cities and are equipped with electric charge station, partially available also for private electric cars. With the registration, the user receives a smart card which is required to open the vehicles. The reservation of a vehicle can be performed 20 min in advance or in real time at a station, online or with a proper app. The car has to be returned to a station where the lot can be reserved in advance with a one-way approach. Autolib, a multi-nodal car sharing, is designed to foster the sharing concept, facilitating short and frequent uses of the cars. To pursue this objective, Autolib offers a quick and automatic system to reserve, unlock, drive and return cars. One-way trip is essential to allow an easy and instant use of the car sharing. Also a variety of subscription fees and fares help to wide potential users.

Car2Go—An easy replicable urban car sharing model

Car2Go started in 2009 in Ulm, Germany. After 6 years, the service is in more than 30 cities in Europe and North America. Since 2013, Car2Go is available also in the main Italian cities. Depending on the characteristic of each city, Car2Go offers either ICE or EV cars, while a mix of the two has not been set yet. The fast growth of Car2Go is mainly due to the successful, simple and innovative system that can be replicated in different urban environments. Car2Go does not have its own parking places, but it defines a wide area (e.g. the whole municipality area), called Home-Area, where the trips have to start and end. The one-way trip configuration guarantees a strong flexibility to users. The available cars can be searched on the map on the Website and on the app. Then the car can be reserved for half an hour. Once reached the parked car, the doors can be opened with a smartphone or with the Car2Go card. Car2Go fleet is made only by Smart cars models to facilitate the driving in the

city and the search for the parking. In the car, there is a touch screen that controls the communication user-vehicle-central station and helps the driver with a navigation system. It also evaluates the environmental sustainability of the driving style based on acceleration, constant pace and braking.

Enjoy—An integrated urban mobility model of car and scooter sharing
Enjoy is an Italian car sharing available in Milano, Roma, Firenze and Torino. This service is a joint venture between Fiat, Eni and Trenitalia, and this fact enhances the opportunities linked to car, fuel and train activities. Fiat can provide cars and the related system of services (e.g. maintenance stations), Eni can offer special price in its gas station for Enjoy cars, while Trenitalia can provide special offers for a combined use of trains and shared cars. The cars can be parked everywhere within the operating area, and one-way trip is allowed. The cars availability can be checked on the Website and on the app, and a reservation can be set. The fleet is composed by Fiat 500 and Fiat 500L, which is a car bigger than 500 and is useful for extra carriage. Moreover, Enjoy is the first scooter sharing in Italy with a fleet of 150 Piaggio scooters. Each scooter is equipped with two helmets and disposable cuffs for the driver and the passengers. The service covered a huge area of user needs that were not yet satisfied by the current car sharing and bike sharing services.

Hereafter, the cases were described through brief descriptions (cards) and clustered using some parameters such as the partnership characteristics, the pricing, the use of energy, the capillarity of the infrastructures, the community of users, the service accessibility, the quality of touchpoints and the presence of support assets.

The main characteristics of each case were described also through a scheme illustrating the customer journey (Fig. 1): this has pointed out the user interaction through the main touchpoints. Some elements were considered: (i) the access to the service and the vehicle (using desks, Web, smartphones, RFID), (ii) the service elements that support users while using the service and during the returning/leaving the vehicle in the station/parking (using internal/external drives, key box) and (iii) the infrastructure and parking areas (considering charging stations).

3.2 Generating Ideas of Product-Service Systems Through Participatory Workshops

The idea generation activity has been based mainly on the results of the context analysis (characteristics of the mobility system and electrical vehicle offering in Milan) and the best practice collection.
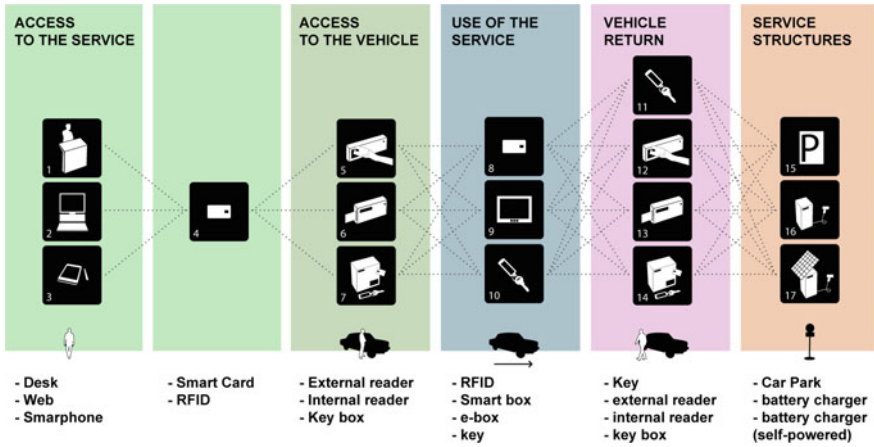
Fig. 1 Example of the general steps of customer journey derived from the case analysis

The concept generation has been developed through a participatory workshop that involved different stakeholders: the complete Green Move research teams together with some representatives of institutions and companies. This activity focused on sustainable urban mobility solutions describing the user experience, the use of technology and energy, the development of new business models and the possibility to include cooperative and participative models between users and user/service providers. Imagining new service solutions and new ways to structure service offer have an impact on vehicles design and performances, the whole service system and its organization, and the users' behaviours and experiences, moreover on the urban context and its mobility system.

For these reasons, the idea generation process has been structured in order to propose a large number of service ideas that consider future challenges for electrical mobility and urban sustainable mobility scenarios.

The creative phase of Green Move research involved, beyond some institutional and entrepreneurial stakeholders, a multidisciplinary team composed of designers, engineers, researchers and students that actively participated in brainstorming phase and in the subsequent reflection on service proposals. The brainstorming activities have been done during a design workshop to imagine—in a collaborative way—new service and new business models and new offering structures.

In order to facilitate the brainstorming activity, three cross schemes have been proposed each defining four design directions considering three main levers of innovation:

1. the user experience (active/passive users—community/single users);
2. the use of technology (relieving/enabling system—personal/shared technology);
3. the energy production/energy management (energy producers/consumers—B2B/B2C approach).

Participants were asked to propose different service ideas/mobility models for each of the cross schemes presented in order to obtain a large number of concepts. The collaboration between researchers with different backgrounds and external actors helped the creative process, the knowledge sharing and the discussion on different design perspectives and strategies considering, for example the users' experience, the technology and the technical issues related to the energy production.

3.3 Developing Mobility Scenarios Based on Electric Vehicles

The rough ideas generated during the brainstorming activity (total number of 67) were subsequently clustered into six design scenarios (areas of innovation). The description of the service scenarios considered the design challenges derived from the case study analysis and the heterogeneous stimuli derived from the concept generation.

In particular, the final six macro scenarios for mobility services are based on six innovation areas: (1) business model, (2) information management, (3) user interaction, (4) cooperation/peering, (5) co-production services, (6) energy infrastructure/energy management. These scenarios included the main design topics to be considered while defining the choice of a new electrical vehicle, coherent with the urban system and resources and the needs of users and communities involved.

For each scenario, some promising service concepts have been identified as starting point to be further developed in the next stages, these are:

- Pricing/incentives (adopting different fares for urban zones and trips);
- Fleets management (using external firm fleets to widen the service offering, for example during the night);
- Procurement/Consulting (defining specific offers for B2B services);
- Education (fostering education about the use of the EV sharing also through social technologies);
- Real time on the move (intercepting a wider demand connecting car pooling and car sharing);
- Feedback management (improving the idea of service community using the users' feedback);
- Customization/profiling (designing services for specific users'
- communities);
- Communities (adapting/scaling the service to particular communities such as co-housing models);
- Coop (proposing collaborative models for the service production, delivery and management using peer-to-peer approaches);
- Micro-entrepreneurship (expanding the service offering including other small companies—as co-producers—that can provide additional services).

The above-described ideas have been discussed within the different research teams (designers, engineers, managers) in order to select the most promising service concepts considering the complexity of the mobility service systems including infrastructures, vehicles, organization, interactions, capillarity, economic, social and environmental sustainability.

Successively the most promising scenario was clustered in order to define and select some interesting service concepts and configurations that are characterized by the aim of offering a service that is more tailored on users' needs. In the end, four service configurations have been structured according to different users' mobility behaviours and contexts of application (Arena et al. 2015). These are:

1. the condominium car sharing: the idea of a fleet of vehicles shared among people that share spaces and expenses and live in a small area like a neighbourhood or a condominium;
2. the network of services: a network that can be connected to other service providers in the vehicle sharing initiatives by positioning the stations of Green Move in key areas of the city;
3. the new business fleet: the idea to substitute the business fleets owned by local companies with a shared fleet receiving a mobility kit from Green Move;
4. the peer-to-peer car sharing: the idea to enable users to share their private cars with other members of the system through a Web platform.

All of these concepts are described more in depth in Sect. Vehicle sharing configurations (configurations 1, 2 and 3) and in chap. 5 (configuration 4).

4 Conclusions

Car sharing and electrical vehicle sharing are very interesting business areas and development areas where design can intervene at different levels: service design, interaction design, product design and communication design as well as strategic design.

We could define this as an intervention on a product-service system in which designers are not only rethinking the entire car mobility system (Pearce 2010) but also they are contributing in promoting an efficient way to use fewer resources and deliver sustainable services and platforms in order to change from a vehicle owner's perspective to a vehicle sharing one.

For the designers, these challenges do not concern only the classical design task about the improvement of the efficiency and the performance of the vehicle (e.g. reducing the energy consumption and the ecological footprint impact) but also the change of the whole mobility system. This means that the tasks are related to the behavioural changes (linked to the emergent lifestyle trends), the quality of users' interactions, the capacity to orchestrating new users' experiences.

The final Green Move design proposals can be considered as a possible suggested strategic solution that could help in finding complex answers to a wider problem (Luè et al. 2012).

These solutions should also face the difficult task of interacting with the macro-systemic levels—which are strongly linked with policy issues (e.g. urban policies, industrial strategies, sustainable development models) and design strategies (users' behaviours and consumption models)—and interrelated micro levels—such as the competitive scenario of new service and product solutions.

Thus, the design intervention has defined a sort of ideal process to which a service design mobility process should refer in terms of level and scale:

- the general mobility system (in terms of regulatory rules) in which new products and services will be delivered;
- the design strategies related to the general mobility system and their adoption/diffusion;
- the setting and the implementation process of the final solutions that need to be coherent to the macro problem setting and to the service industrialization perspective;
- the application of a complete suite of service design tools that need to be used to support the overall objectives of the design process and the related collaborative activities.

All these recommendations have been integrated in the subsequent steps of Green Move process, which involve the definition of a targeted value proposition.

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