

Sustainability Needs Service *Efficacy*

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Abstract

Today it is increasingly necessary to talk in terms of a circular economy. Design contributes through different disciplines by intervening in materials, production processes and product life cycles, but also through the design of services that develop models of exchange and reuse. The paper illustrates the contribution of service design in the implementation process of the *Efficacy* project. The first objective of *Efficacy* is to optimise the collection of bulky waste, through the development of a platform that catalogues and recognises the type of waste through its image. The second goal is to build an infrastructure to intercept the goods before they reach the landfill. *Efficacy* project is connected to the *Surpluse* reuse and repair centres, because *Efficacy* needs *Surpluse* spaces/social communities, otherwise *Surpluse* needs *Efficacy* digital process/social network to improve the network and service offer.

Keywords

Reuse

Service design

Circular economy

Ecological and digital transition

Behavioural changes

Context: The Circular Economy

For many people, the circular economy has been identified with waste recycling. But recycling is the least sustainable of all the circular economy activities, in terms of profitability and resource efficiency (Thackara, 2006). If we define a circular economy as all economic activities to extend the service life of goods, components and materials, through reuse and re-marketing, repair, re-manufacturing and technological updating of goods, it has always existed. The reuse activities have been perfected by operators in the *performance economy*, how to say Stahel: "In addition to design and reuse, the performance economy focuses on solutions instead of products, and makes its profits from sufficiency, such as waste prevention" (2016, p. 436). The second-hand market is constantly increasing even if there are no incentives and it isn't fully regulated, thus representing an underground market involving 23 million Italians in buying, selling and exchanging goods for a value of 23 billion equal to 1.4% of GDP (Bva Doxa, 2021). This trend is in line with the 2030 Agenda for Sustainable Development of the United Nations, in fact the 12th SDG, target 12.5 is described with these guidelines: "ensures sustainable consumption and production patterns, plans to reduce waste generation through prevention, reduction, recycling and reuse" (United Nation, n.d.). Europe is on track to become the first climate-neutral continent by 2050. Among Next Generation EU's goals there is *Make it Green* where it's possible to find different kinds of behavioural recommendations like "everyone can do their part [...] by buying second hand, recycling and reusing" (Next Generation EU, n.d.).

Within this context, the paper is focused on the *Efficacy* project, where the Architecture and Design Department of the University of Genoa is involved as a subcontractor to design a possible strategy for the application of re-use practices through the promotion of services that can foster the ecological and digital transition. The project is financed by the Regional Operational Program (POR) 2014-2020, co-financed by the European Regional Development Fund (FESR), that identifies the Liguria Region strategic priorities and objectives, for a multi-service, cloud-based ICT platform for the recycling and reuse of bulky solid waste in the urban area of the Genoa metropolitan area. Efficacy within Axis 1 - Action 1.2.4 - Poles of Research and Innovation has obtained funding in March 2021, presenting a proposal involving 7 subjects in partnership led by Amiu SpA, with different roles such as GIS mapping, waste collection, software design and data management (Amiu, n.d.). Amiu SpA is the company responsible for waste collection and management services and urban hygiene in the city of Genoa. The other partners are Algowatt S.P.A., Camelot Biomedical Systems Srl, Gter Srl, Circle Spa, Colouree Srl and Flairbit Srl. The primary aim was to create an IT platform that uses innovative technologies to catalogue data and make the system more functional and effective. A citizen who wants to dispose of a piece of furniture must take a picture using his smartphone which is read to derive a set of data and give some information. Then the software can manage and obtain details based on materials, size and weight, to organise and improve the collection. Finally, the data, using GIS, take on new value thanks to geographical positioning, which allows a better strategy to be defined for the

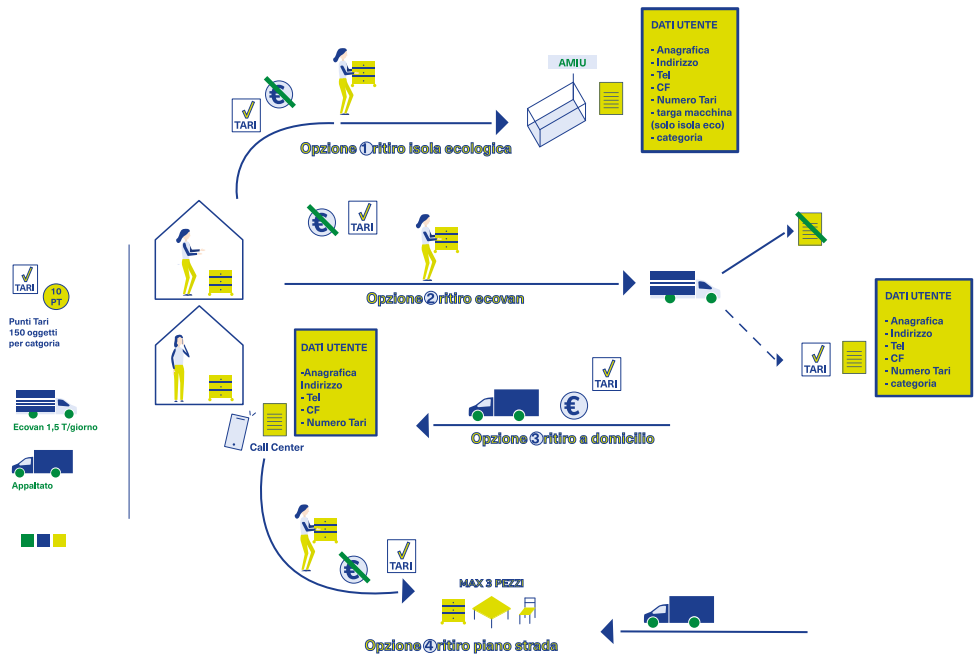
movement of bulky collection vehicles. In this project, it was important to shift the idea of channel/touchpoint, in this case the platform, from the channel as destination to the channel as an enabling moment (Risdon & Quattlebaum, 2018). The new goal of *Efficacy* is to create a virtuous path in the perspective of a circular economy, which aims on the one hand to optimise the bulky waste collection system, and on the other hand to activate a recovery and reuse process by intercepting the goods before they reach the landfill. In this field, design is systematising specific tools to manage actions in favour of the circular economy. One example is the dedicated Circular Design space within The Ellen MacArthur Foundation (n.d.). In this project, the discipline of service design comes into play, where design and its tools become a support for systematising different actions within the system (Meroni & Sangiorgi, 2011). Specifically, service design is also based on collaborative consumption models (Botsman & Rogers, 2010), with the aim of co-designing infrastructures with others in which sustainable actions can take place. On this subject, the research intends to trace the features of these economies characterised by models of C2C sharing economy, digital and material marketplaces, to converge all these unsystematized exchanges in a catalyst service of reuse and repair practices that can evaluate, reward, promote the swap power of citizens as the most useful way to reduce our impact on a planet. The head of the project Tiziana Merlino summarises the objective of the project in these words:

Just imagine having a bulky piece of waste and being able to give it a chance to not simply be thrown away. Just imagine being able to make it useful to someone else and thus being able to “live another story”. All while limiting pollution from cargo vehicles through optimization of logistics and transportation time. And this is through the application of information technology that can recognize different objects (Merlino, quoted by Amiu, 2021, tda)¹.

Methodology of Efficacy

The methodology is divided into three main phases: problem setting, scenario development and prototyping. In the first phase of problem setting, it was necessary to develop an examination of the strengths and weaknesses of the current doorstep collection system for bulky goods, as a result of a matrix of external customers and internal company points of view. The multi-disciplinary aspect of the project required alignment on the different steps from the outset. Through focus groups, it was possible to visualise and systemise the contributions of the different partners for a systemic self-assessment. In the Genoa area there are four different types of bulky pickup: Ecological Island, which is an urban free entrance area for citizens, dedicated to collecting different kinds of waste; Ecovan, a vehicle that stops for a while in a square or street in a neighbourhood to allow citizens to bring in items they no longer use; the home or street level collection, activated through a call reservation and scheduling an appointment Fig.1.

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Original text “Immaginate di avere un rifiuto ingombrante e di poter dare a quest’ultimo la possibilità di non essere semplicemente gettato via. Immaginate di poter far sì che risulti utile a qualcun altro e così poter “vivere un’altra storia”. Il tutto limitando l’inquinamento dei mezzi da carico attraverso l’ottimizzazione di logistica e tempi di trasporto. E questo grazie all’applicazione di tecnologie informatiche che sappiano riconoscere i diversi oggetti”.



These different modalities were examined by creating and sharing a visualisation of the different processes in comparison. For the moment the project currently focuses on door-to-door collection, as the most manageable mode for waiting time. Because the only one that requires a reservation and therefore contact before making the transition. To understand Amiu's perspective, it was important to start with an analysis of the four bulky waste collection systems. Each of these systems addresses the needs and requirements of certain targets, the aim was also to understand how and which system is most suitable for the project, but also what the future scenarios might be. For this reason, the local Amiu operators placed post-its on the four visualisations representing the different types of collection to better consider each phase. The colours of the post-its corresponded to categories: strengths, weaknesses, opportunities, and risks. Based on the results obtained, it was possible to reconstruct a SWOT Analysis according to the standard visualisation. At the end of the meeting, it emerged that there are not enough spaces and personnel resources to commit for the reuse, so the project must leverage the digitisation of the service to optimise both collection and reuse awareness. To understand the position of the citizen/customer, two surveys were prepared to be distributed over a month. The first one to observe citizens' views on their knowledge and evaluation of bulky waste collection, a service managed by Amiu, and what is the awareness of reuse. This was disseminated through the company's social network and UniGe's contacts. The other aimed more directly at those who already use the service to collect opinions and suggestions, and answers regarding reuse, a kind of customer satisfaction. The latter was distributed after the service through the call

Fig. 1 Visualization of cluttered pick-up systems of the Amiu collection service used for different surveys and swot analysis.

centre or during the service near the *Ecovan* and Ecological Island stops. An interesting result emerged is that users are aware of reuse platforms, but rarely choose them before disposing of their goods, because they consider them a waste of time and because they do not consider the option of repair or reinterpretation for items that do not work or are no longer needed. Thanks to the systemization of this data, an overall picture of the pain points of the current system emerged, allowing for a different framing of the initial problem. During *Efficacity* development the team involved - thanks to our support - change the first mission identifying effective reuse practices as the first real contrast to waste production. Through reshaping the problem setting, the designer's role shifts from solving the problem to redefining it (Diefenthaler, 2008). The starting problem was examined from different perspectives and then the solution was structured around the real weak point. The opportunity is to not only improve the efficiency of the procedure but to design a private-public co-responsibility. It is necessary to focus on a change of perspective, to consider a futile object for an owner, useful for another one and vice versa, allowing it to live another story, thus transforming from waste to resource. The IT platform focuses not only on tracking waste but also on reducing its impact on the environment. The real challenge is to choose the practice of reuse as a necessary and compulsory step before the landfill, thus focusing on waste prevention to promote the circular economy and environmental sustainability. The digital tool is the infrastructure to make virtuous behaviour implicitly convenient and rewarding. The second phase was the co-design of possible scenarios, discussed and analysed punctually in every single step both in the project team and with technical operators inside Amiu company. These "project simulations" (Manzini & Jégou, 2004, p. 204) made it possible to discuss the different elements of feasibility in the short and long term. The scenarios, mixed with the journey map tools, have been made shareable through synthetic visualisations. As Morelli says:

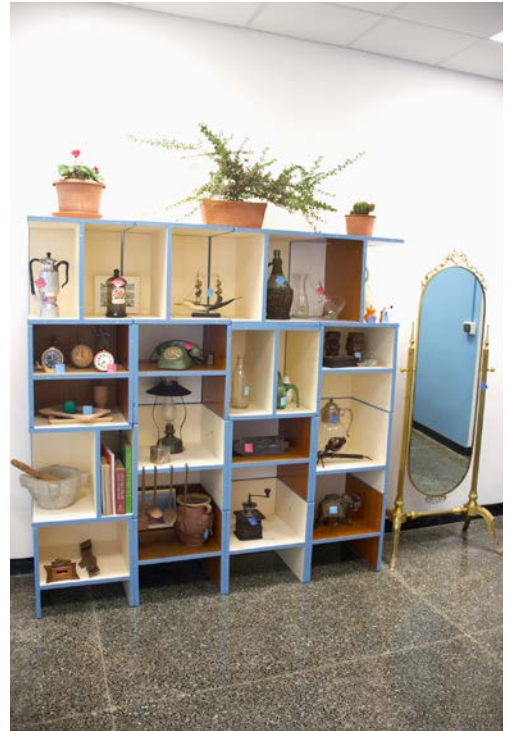
The design activity heavily relies on visual representation, which is critical in communicating a project to clients, in verifying the validity of the project, and in generating a plan that can be understood and executed by other actors involved in the design process (2002, p. 13).

The visualisation can level out the excessive specialisations that do not allow an overall view and encourage the formulation of cross-cutting and effective solutions to be tested in the next phase of prototyping and testing.

The Pilot Project: The Link With Surpluse

In the third in-progress phase of prototyping, a pilot area has been chosen to work together on territorial logistics and the needs of a range of users and to be able to implement design solutions developed both on a digital level, thus testing the user interface and on an analogue level verifying the effectiveness and feasibility for the urban area. This project becomes a link to the system of *Surpluse* reuse and repair centres active in Genoa - conceived by Amiu in a Force project (<http://www.ce-force.eu>) as a territorial system of spaces

for collection and repair - becoming a mutual and complementarity resource/touchpoint for a better service for citizens and therefore a potential format exportable to other cities. Fig. 2, Fig. 3



The name *Surpluse* is derived from the union of the words *Surplus+use* and was born together with the brand and corporate image during a workshop at the Architecture and Design Department, University of Genoa (Fagnoni et al., 2022). These centres have different sizes and are identifiable by different colours: *small* (light blue), *medium* (purple) and *large* (magenta). The visual identity, which identifies the different possibilities, aims to create a sort of *franchise* to spread a culture of reuse and reuse of objects throughout the city's neighbourhoods. The aim is to make citizens the main actors in this process, giving them the tools to direct their actions towards the circular economy. The first centre launched was in Coronata, a district of Genoa, in October 2020. The centre is managed with the shared administration tool called "Patto di collaborazione - Covenant of Collaboration" signed for the first time by: AMIU, Municipio Medio Ponente, Amici di Coronata, ARCI ragazzi APS, Associazione Pro Loco Cornigliano. The furniture for this centre was made by the Labour Education Centre Lab 85 from recycled wood, which was made available by AMIU, based on a project by the Department of Architecture and Design, University of Genoa. In summary: *Efficacy* research needs *Surpluse* spaces/social communities, *Surpluse* needs *Efficacy* digital process/social network to improve the network and service offer. The digital part of the *Efficacy* project becomes a fundamental support for *Surpluse* centres. On the

Fig. 2, 3
Inauguration of the
Surpluse centre in the
Coronata district, Genoa.
Credits by Chiara Olivastri.

one hand, because it would make it possible to digitally record exchanges, to account for how many and which types of items are left and how many and which are withdrawn, to have a wider showcase of the products available. On the other hand, the *Surpluse* reuse centres become the analogue spaces of *Efficacity*, which can be used, for example, as a storage area, even temporarily and to meet different citizens needs as emerged in the analysis phase. Once you have the data you can put a concrete value on the process and consequently you can evaluate a whole system of incentives and rewards, systematising them with other reward systems already in use. Digital space and data collection also make it possible to monitor the quantity of exchanges, the materials most put back into circulation, and even to quantify the amount of Co2 saved, as Swedish Environmental Research Institute calculated for the second-hand platform Subito.it (Economia circolare, 2021). Being able to measure and value these exchanges is very important. Consequently, it was decided to design the prototyping and testing phase with the citizens' and associations gravitating around the *Surpluse* centre. As a first step, a focus group was organised to evaluate the results and dynamics activated one and a half years after the inauguration, but also to discuss the problems and future visions. It emerged that *Efficacity's* digital infrastructure would be very useful to the *Surpluse* centre. However, support from operators with digital skills would be needed because currently *Surpluse* is run by voluntary retirees. The digital transformation of some services is increasingly necessary, in this transition the service designer is given the role of managing the interests not only of the user but of all the stakeholders that become part of the system (Tassi, 2019). The acceleration of these processes must, however, be accompanied by a social and relational focus on the contexts in which the service is embedded. In addition, *Surpluse* centres have the possibility of becoming social spoke, where proximity and relationships can be practised (Manzini, 2021). The social role of these spaces is already very evident, and it is the spirit with which they manage to exist and resist.

Results & Conclusions

Service Design's mission is to frame the initial problem from the right perspective, to avoid the development of apparent solutions based solely on digitization, but rather new patterns of behaviour are found, that use technology to be more widely deployed. The role of designers is to infrastructure value co-creation, which means suggesting tools for activating customers' own cognitive and creative resources, intercepting users who are sensitive to the issue and to enable them to act in a more sustainable way. In this context, design can play a role in generating elements of change that have the potential to trigger larger systemic changes, for instance, by scaling-up local initiatives, thus working from a lower scale — a community or a small institution — to larger contexts, such as a city administration or national policies (Morelli, 2020). The tools and the different strategies, the survey and the visualisation of the journey map/scenarios allowed the sense and the meaning of the project. For example, the effort was to understand how the project and the platform are

positioned to existing platforms. The utility of co-designing with the waste management company made it possible to act directly on an existing waiting time before the object goes to landfill and convert this time into something else. The last ambitious goal is to develop a service that allows, from the individual citizen to the company, to create its profile about sustainability, able to collect, measure and reward virtuous actions. The hope is that single actions can be converted from good practices to co-responsibility necessary behaviours for our planet. An interesting result was to connect and link realities already active in the territory. It often happens that through calls and fundings interesting actions are activated in the area, but they do not always manage to endure after the end of the project. Being able to start from the existing and optimise the resources already active takes on a new value, in this way helping each other. Several projects related to the circular economy are being set up in Liguria, and there is a growing need to connect them so that one becomes a stimulus and support for others, the network is an invaluable resource.

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