nurturing service designers

Ten years of the Specializing Master in Service Design at Politecnico di Milano.

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NURTURING SERVICE DESIGNERS

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The last few years have challenged the world in a way that hasn't happened for a long time. As a result, new standards of services are quickly taking over, paying attention to serious globallevel problems. A new service design era is arising, exploring new complexities and embedding into theory and practice further cross-disciplinary influences. In the wake of the acknowledgment received in the last decade, service design will be confirmed as a crucial discipline of our times, thanks to an approach that has improved and evolved following the challenges and the needs of the economy and society.

Created ten years ago in response to the growing demand for professionals capable of handling the complexity of services, the Specializing Master in Service Design by POLI.design - Politecnico di Milano started to respond to the growing demand from public and private organizations. This is the first report on the evolution of the training course since its foundation. The study provides an elaborate representation of the various teachings and topics covered in the educational path, the profiles and skills of the alumni, and the relationships with public and private organizations built and consolidated over the years. The analysis was carried out through the collection of quantitative data and interviews with alumni and representatives of organizations and design agencies that are part of the Master's network. The interpretation of the data is also contextualized in relation to the evolution of the discipline analyzed through some of the main scientific publications concerning service design.

oi_the Specializing Master in Service Design

The Specializing Master in Service Design is an international training program established in 2013 and delivered by POLI.design - Politecnico di Milano.

The vision

The program is based on the idea that service design can contribute to service innovation processes, improve processes and organizational culture, and contribute to fair and sustainable growth. The course aspires **to provide a complex vision of professional practice and to train service designers capable of managing the complexity of the design process**, dealing with innovation models, and therefore having a transformative role in organizations and society. In particular, the path is based on a hands-on approach through which the participants acquire the theoretical knowledge and skills necessary to manage the entire design process and to apply the operational tools, through a path also carried out in collaboration with companies, public administrations, third sector organizations, and consultancy agencies.

The curricular activities

The learning process proposed by the Master is divided into various modules of a theoretical and experimental nature aimed at transferring the knowledge and skills of service design, integrating them with extradisciplinary knowledge and practices. In particular, the modules are divided into different types, such as: Lectures, Service Design Pills, Service Design Masterclasses, and Service Design Workshops. The educational program is completed with the Curricular Internship and the Final Exam to obtain the qualification.

In brief, **Lectures** are theoretical lessons aimed at providing the disciplinary background and introducing extra-disciplinary knowledge. **Service Design Pills** are short design sessions aimed at putting into practice methods and tools on a simulated design challenge. **Service Design Masterclasses** are lectures on cutting-edge topics emerging inside and outside the service design community. Finally, **Service Design Workshops** are design labs that cover all the phases of the service design process, from research to prototyping, experimenting on a real brief proposed by a partner organization. The **Curricular Internship** consists of 475 hours of training experience in a Master's partner, or other organizations, and it is part of the students' learning path. The **Final Exam** consists of the presentation of the final project work. It is an individual assignment useful to assess the analytical, theoretical, and practical skills acquired by the students throughout the Master program.

In January 2023 the tenth edition of the Master started with a renewed offer that includes more than 30 learning modules clustered into different categories (called "Didactic Units"). This new offer has been proposed to integrate the key skills of service design with some emerging topics that service designers must necessarily begin to deal with, such as new technologies, systemic and speculative thinking, and the principles of equity and sustainability.

In particular, the structure is articulated as follows:

Service Design Basics & Tools

This didactic unit aims to provide basic knowledge about the main methodologies and tools used in service design. The goal is to create a common ground for all students, regardless of their background. This gives them a foundation of knowledge and is fundamental for enabling for other courses. The modules that belong to this didactic unit are concentrated in the initial stages of the Master.

Service Business & Management

The modules of this didactic unit are structured to provide the business, marketing, and management skills necessary for the design of the service as a whole, adopting a holistic approach that goes beyond the user experience as the only area of design interest. The objective is therefore learning how the project elements are framed into Business Design, such as the design of the business model and the management of the economic and commercial aspects of the service.

Future Studies, Systems Thinking & Sustainable Design

This didactic unit is made up of modules that investigate the relationship between service design and some of the most relevant disciplines in the world of contemporary design. The objective of the unit is to provide the knowledge and tools useful for managing a conscious and integrated approach to design, incorporating elements of speculation on future scenarios, systemic reasoning and holistic vision, analysis and evaluation of the impact, and circularity and sustainability from a social and environmental point of view.

Human-Centered Innovation & Participatory Futures

The objective of this didactic unit is to provide the theoretical and practical foundations related to the humancentered design approach, through the learning of participatory design techniques and the integration of elements related to social sciences, inclusivity, and the world of public services in the design of the service.

Emerging Technologies & Digital Services

This didactic unit includes a series of modules that deal specifically with a variety of technologies, both established and cutting-edge. The goal is to provide a technological background, useful for managing and implementing emerging technologies as enabling factors for innovative services and new experiences.

Service Design Workshops

This didactic unit includes the workshops, which deal with the different phases of the service design process: primary and secondary research, insights analysis and interpretation, concept generation and validation techniques, and development and prototyping of the service idea. Each workshop focuses on a specific design challenge to give students different opportunities for experimentation and investigation.

Emerging Service Culture

This didactic unit, of a highly experimental nature, deals with frontier issues and emerging areas connected to the world of service design through the Masterclasses. These seminars aim to explore the potential application and the different perspectives on the topics addressed with service design.

Labs and experiments

In parallel with the Master's curricular activities, other initiatives have been successfully carried out in these years. In 2019, a Service Design Lab was launched in collaboration with H-FARM - a platform where innovation, entrepreneurship and training coexist. It was aimed at supporting a cross-fertilization process with the purpose of promoting entrepreneurship and innovative service ideas. The Lab was addressed to young talents willing to challenge themselves in the development of new potential businesses thanks to the mentorship of expert professionals. From 2020 to 2022, a joint initiative with Oblo - a hyperspecialized service design studio based in Milan - was developed. The initiative was focused on the Service Design Tools (SDT) platform. Created in 2009 by Roberta Tassi, founder of Oblo, SDT is an open collection of tools and tutorials that helps students and practitioners approach service design and deal with complex design challenges. Due to the involvement of the Master Board and students, an updated release of the platform was issued, integrating updated tools and supporting the platform's evolution.

The outcomes of the service designers' profiles

The program trains service designers to be able to manage complex projects and processes, and to have leadership skills combined with a critical and reflective attitude. Within organizations or as external consultants, **service designers will be able to cover various roles**, including strategic ones, focusing on the innovation of solutions and processes and enabling a solid design culture and vision. The programme also aims to foster entrepreneurship, through the transfer of skills related to the business world and startups. Since its launch, every edition of the Master program has revealed a different scenario: the class composition, the background of students, the companies involved in workshops, and the topics treated underwent an evolution process - hand in hand with the evolution of the service design approach. Back in 2013, the most relevant drivers of the Master's foundation were the affirmation of the service - versus the industrial - society and the resulting growing importance of the service economy. In the past few decades, many changes occurred that relentlessly reshaped organizations all around the globe, as well as entire economies and ecosystems. The industrial world shifted from a product-centric to a service-centric logic, generating the phenomenon of "servitization" where the user first, and the human afterward, acquired increasing importance in the design realm and far beyond that. It is not by chance that the very first claim of the Master was 'Servitize Yourself!'. Thanks to the very core features of the service design approach - its human-centered, participatory, systemic approach turned out to be a very good fit for the emerging needs that organizations faced with the shift to the service society - service design not only started to be the talk of the town, but most importantly started to be understood and valued as a key strategic asset in both the public and the private sector.

During the last decade, service design has seen its highest moment of development, which the Master program, edition after edition, has tried to capture and embed into its teachings, ensuring design professionals are trained to interpret and master the complexity of our times.

As we move forward, and are now entering another era - a postpandemic era - the change process has accelerated and the global economy and societies are being reshaped once again. In the next chapters we look back at the past ten years (and more) to trace the history and evolution that service design, and the Master following it, have seen during this growing decade.

o2_the Growing Decade of Service Design

Today, talking about human-centricity, user experience, and codesign has gained significant popularity, to the point that for the most advanced contexts it starts to be even a bit outdated. By now, these concepts are rooted not only in the service design discipline, but in the design field as a whole, as well as in the management field and other social sciences, oftentime playing a role in the innovation process. The same happens with several tools of the service designer's toolkit - like personas, empathy maps, customer journies, etc. - which are now part of the vocabulary and the practice of a large number of practitioners, not only belonging to the design field.

This widespread adoption is just the most evident outcome (at least to those operating in the field) of a much deeper maturation process in service design that began around 30 years ago, but that in the last decade has seen a tremendous acceleration. Going beyond just being considered a driver of innovation - incremental rather than radical - useful to design better service experiences, **service design is now regarded as a transformative force able to handle more systemic transformations** (Patrício et al., 2020).

Historical notes

But how did we get here? And what are the outcomes of this acceleration? Some historical notes: the term 'service design' was firstly mentioned by scholars in the field of service research, belonging to marketing and management studies, in the beginning of 1980s, when Lynn Shostack (1982) with the article "How to design a service" proposed the blueprint as a "[...] system for marketers which can lead to the kind of experimentation and management necessary to service innovation and development". The transfer of this early approach to service design to the design discipline happened in the 1990s at Politecnico di Milano, thanks to the intuition of Ezio Manzini. He and his research group began exploring the application of design methods to a new object of design: product-service systems (Pacenti and Sangiorgi, 2010). This was clearly summarized in his article published in Design Management issue n.7, June 1993, titled "Il design dei servizi. La progettazione del prodotto-servizio". Around the same time, the Polytechnic University of Cologne launched an advanced study programme in design that included service design for the first time, with Birgit Mager as the first professor appointed to the course, who later founded the Service Design Network in 2004 (Erlhoff, 2020).

During this first experimental phase, design academics and practitioners had the chance to experiment, and be inspired and enriched by other disciplines, free from predetermined constructs, concepts, and definitions (Mager, 2020). They sought dedicated definitions, approaches, and methods able to make more clear the design contribution to the design of services (Penin, 2018). This is why many of the tools we currently name 'service design tools' are actually borrowed from other fields such as: service marketing, service operations, anthropology, interaction design, and participatory design, among others. Such experimentations led to the formalization of what we now recognize as design language, principles, methodologies, and tools, and the constitution of the first service design agencies (Mager, 2020). Following this formalization phase, after years of struggle and resistance - for those who were there and firmly believed in the value of service design - we finally arrived at the phase of maximum expansion of service design, coinciding with the second decade of our century.

During this decade, **service design gained importance in both research and practice**; thanks to the initiatives and the communities that have been set up around the world, the distance between the academic and professional worlds has been narrowed (Sangiorgi, Patricio and Zurlo, 2018). Just to mention a few facts that have contributed to the consolidation of service design and favored its growing decade, particularly in Italy and probably also in the rest of Europe, we can remember the following ones:

the Master Degree in Product-Service System Design was established at the School of Design of Politecnico di Milano, as the first university program for Italian and international students interested in following

multicultural design program.

2005 2007

an interdisciplinary and

the UK Design Council launched a social innovation program called **Designs** of the Time (Dott), which brought service designers together with communities and service providers to tackle problem areas such as dementia, sexual health, schools, and unemployment. The success of the initiative, probably the first explicitly involving service designers in the design of public services, led to the establishment of an interdisciplinary team, RED, in charge of exploring approaches to economic and social issues through design innovation.

the **DESIS** (Design for Social Innovation and Sustainability) network was established, connecting Design Labs based in design schools and design-oriented universities worldwide, with the mission of accelerating social change towards sustainability.

ServDes, the first academic conference entirely dedicated to service design and innovation, was held for the first time in Oslo, Norway. Born as a yearly Nordic conference, in 2014 it turned into a bi-annual international conference with the aim of bringing researchers and practitioners together.

servicedesigntools.org - the first digital platform collecting service design tools - was published.

2009

service design was included among the design categories awarded by ADI Compasso d'Oro, the oldest and most distinguished international design prize in Italy.

2010

at Fabbrica del Vapore in Milan the first national event entirely dedicated to service design was

organized by ADI and DES Centro Design dei Servizi of Dipartimento INDACO of Politecnico di Milano. It was the first experiment explicitly connecting people and organizations dealing with service design at a national level, and provided the first mapping of design agencies and companies (still very few at that time) with service design competencies.

the first **Global Service Jam** took place in more than 50 cities around the world, with more than 1200 participants, creating around 200 unique service designs around the Theme "(Super)HEROES". Global Jams are 48hr international workshops organized by an informal network of volunteer service design practitioners, dedicated to people interested in service and customer experience. They are invited to generate ideas and prototype on a shared topic in the spirit of experimentation, innovation, co-operation, and friendly competition.

Flanders DC and Yellow Window (a department of Enthoven Associates NV) created **the first Service Design Toolkit**, later translated into English and made international thanks to the European SPIDER project.

TEN YEARS OF THE SPECIALIZING MASTER IN SERVICE DESIGN AT POLITECNICO DI MILANO

2011

the Royal College of Art in London introduced the **Master** of Art (MA) in Service Design.

John Wiley & Sons published the book **"This is Service Design Thinking"**, gathering the knowledge of 23 renowned personalities in the service design community, and which soon became a best seller and point of reference in the field.

POLI.design - Politecnico di Milano launched the first edition of the first level Specializing Master in Service Design. the UK Government Digital Service released a **Service Design Manual** to support people working in local government or other organizations in the delivery of local public services.

2013 2014

2012

the EU Horizon 2020 "Service Design for

Innovation (SDIN)" project worked to integrate service design and service innovation approaches into an innovative research training framework aimed at creating researchers who could drive the application of service design in European organizations.

the Italian Government created a Digital Transformation Team in charge of the PA's digital transformation and tasked it with rethinking digital public services for citizens and businesses, which for the first time explicitly included service designers.

"Rethink! Service Design

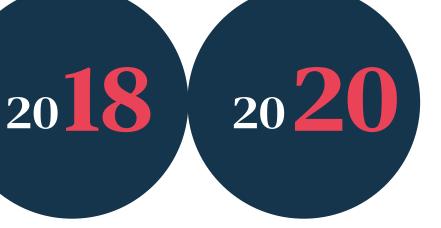
Stories" the first Italian festival dedicated to service design and service innovation was presented during the Milan Design Week.

2015 2016 2017

the School and Department of Design of Politecnico di Milano hosted the ServDes

conference with the title "Proof of Concept", namely declaring that service design can finally be considered a consolidated discipline, ready to be assessed and reviewed in terms of effectiveness and impact on the economy and society.

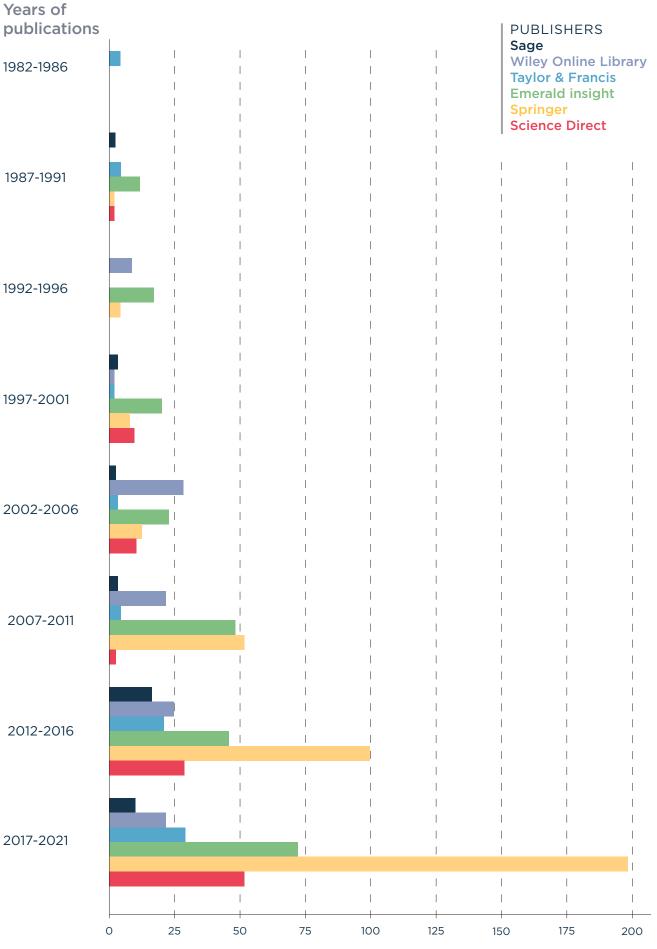
the **Future of Service Design Conference** took place in Cologne.



Meanwhile, many other conferences have arisen, such as the Service Experience Camp in Berlin, Service Design Days in Barcelona, and the Service Design Fringe Festival in London. Bottom-up initiatives have also emerged, such as the Service Design Drinks movement, believed to be born in Berlin and then becoming an international event format adopted and replicated by spontaneous groups of practitioners around the world in an attempt to attract attention to service design in their own cities.

Furthermore books such as: This is Service Design Doing (Stickdorn et al., 2018), Designing the Invisible (Penin, 2018), Customer-Driven Transformation (Heapy, King, and Samperi, 2018), Orchestrating Experiences (Risdon and Quattlebaum, 2018), and Designing Better Services (Foglieni, Villari and Maffei, 2018) were written.

Service Design publications | Chart 1



Average number of published articles about Service Design

Also, in light of the expansion of the discipline in both the academic and business fields, publications on the topic massively increased (see Chart 1) and some scientific journals dedicated special issues to service design, such as the International Journal of Design (in 2011), The Design Journal (in 2015), and The Journal of Service Research (in 2016). There was also the proliferation of toolkits, training initiatives, and PhD studies (Sangiorgi, Patricio and Zurlo, 2018).

As a result of those fervent years, **specialized design agencies soared**, **and those that previously focused on other branches of design began including service design into their offering to clients.** This phenomenon was well captured by the "Service Design Landscape" research project¹, developed by Politecnico di Milano for the ServDes conference in Milan in 2018, with the aim of mapping the educational programs, consultancies, and research centers dealing with service design at a worldwide level. The success of these agencies quickly led to their acquisition by big management consultancies (like Accenture Song, PwC, Capgemini, McKinsey, etc.) to better respond to the increasing demand by their client companies, which in turn recognized service design as a powerful asset to become more competitive and innovative; they eventually embedded such capabilities with the creation of inhouse specialized units (Mager, 2020).

¹ https://www.servicedesignmap.polimi.it/

Now that the expansion phase has reached its peak, and there are no more doubts about the value of what we do and how we do it, **we need to understand how to adapt and evolve**; on the one hand by overcoming the weaknesses that have emerged along the journey, and on the other hand by further expanding the multidisciplinarity that has always characterized our approach, in order to be better prepared to respond to/answer the contemporary and upcoming challenges.

The popularization of co-creation and co-design practices, for example, supported by the multiplication of tools used for facilitating participation and engagement, has caused the myth that everybody can play the service designer's role. Just as using a tool does not coincide with designing a service, so reading a book or taking part in a short training course does not turn someone into a service designer. On the contrary, this sometimes leads to projects and solutions of poor quality that, besides unsatisfied clients, generate reputational damage for the entire community (frog, 2021). Because of its capacity to foster creativity and to convey intangibility and complexity, **service design is often misleadingly considered as a soft skill or mindset rather than a structured approach that requires professional expertise** (Morelli, de Goetzen and Simeone, 2021). Such expertise doesn't only consist of knowing what tool to use and using it properly, but, more importantly, also being able to analyze the context, understand the problem, and structure the design process so as to reach the best solution for the problem at hand. Thus, **a key challenge for the future of service design becomes to define clear quality standards and to reframe its core capabilities**, which might then be incorporated into the specific educational programs currently available or still to be founded. The feeling of responsibility for training qualified and up-to-date professionals, is why the Specializing Master in Service Design is not proposing a static program, but instead has always tried to capture signals from both research and practice.

o3_the Master Ecosystem

This chapter shows an evolving snapshot of teachings, teachers, students, and partner organizations. The data reconstructs the progress of the training path through the analysis of the Master's ecosystem and provides a summary of the evolution of the demand for training in service design over the last ten years. The following paragraphs report the research, analysis, reconstruction, and systematization of data intending to describe, on the one hand, how the training offer has expanded and diversified in response to the different needs of the market and socio-economic changes; on the other hand, it aims to outline the main areas of application, the characteristics, and the specific skills of the professional profile.

3.1.

Methodological Note: Research Approach & Tools

To figure out the complexity of the Master's ecosystem, data collection was carried out with three types of research: quantitative research (Master Database), mixed quantitative and qualitative research (Surveys), and qualitative research (Semi-structured Interviews).

Specifically, the activities concerned:

Creation of the Master Database

A reconstruction of numbers, facts, and data of the first nine editions of the Master². The quantitative research has been systematized through the creation of the Master Database: a repository of data and information on students and alumni, faculty members, courses, and partnerships. For its creation, the official documents were reviewed and analyzed, including registers, educational plans, calendars, communication materials, and collaboration and sponsorship agreements. Part of the research has been integrated online via LinkedIn. What emerged was a systemic representation of all the elements that make up the Master and its evolution over the years - in other words, its DNA.

 $^{\rm 2}$ When the database was created and analyzed, the tenth edition of the Master hadn't started yet.

Alumni Survey

A snapshot to monitor alumni career paths and the role of the Master as an enabler of skills. The survey was conducted through an online form sent by email to all the alumni that graduated from 2013 to 2020³. Out of a total of 119 correctly delivered emails, 61 recipients replied to the questionnaire, representing 51.3% of the sample, of which about $\frac{2}{3}$ females and about $\frac{1}{3}$ males.

³ The survey was sent in January 2022. At the time the Form was sent, students of the eighth and ninth editions had not yet completed their studies.

Alumni Interviews

A qualitative study to analyze professional profiles and skills, understand the new fields of experimentation and application of service design, and gather points of view on the future of the discipline. The interviews, carried out between March and April 2022, were aimed at a selection of alumni identified as a representative sample of the various editions of the Master. The semi-structured interview sessions took place via video call and lasted approximately 30 minutes.

Partners Interviews

An in-depth analysis that involved companies, agencies, and institutions that make up the Master's network, aimed at bringing out the main needs of market demand and sharing reflections on the consolidated or emerging role of service design within organizations. The partner organizations have been involved through semistructured interviews, differentiated for companies and consultancy agencies, carried out between March and April 2022. The selected sample is representative of different industries and market sectors. The sessions were held via video call lasting about 30 minutes.

3.2. Didactic Contents & Faculty

This section provides the data concerning the teaching contents and the profiles of the teachers involved in the various teaching modules. A summary of the topics addressed in the courses is described below, with a focus on Workshops and Masterclasses, and an overview of the composition of the faculty.

Didactic Contents

Teachings modules | Chart 2

Service Design Basics Service Design Tools Data Visualization & Analysis **Concept Generation & Development Rapid Prototyping** Interaction Design, UX & UI Service Business & Management Social Innovation Sustainable Design **Collaborative Services** Service Blueprint Design for Public Sector Service Storytelling CV & Portfolio Design Service Branding & Digital Communication Emerging Technologies (AI, IoT, VR, Blockchain) Design Leadership **Design Fiction & Design Futures** Service Evaluation Facilitation & Improvisation Techniques Design for Health Co-design, Co-production & Co-creation Inclusive Design **Public Speaking** Design for Policy System Thinking Behavioural Design

Circular Economy

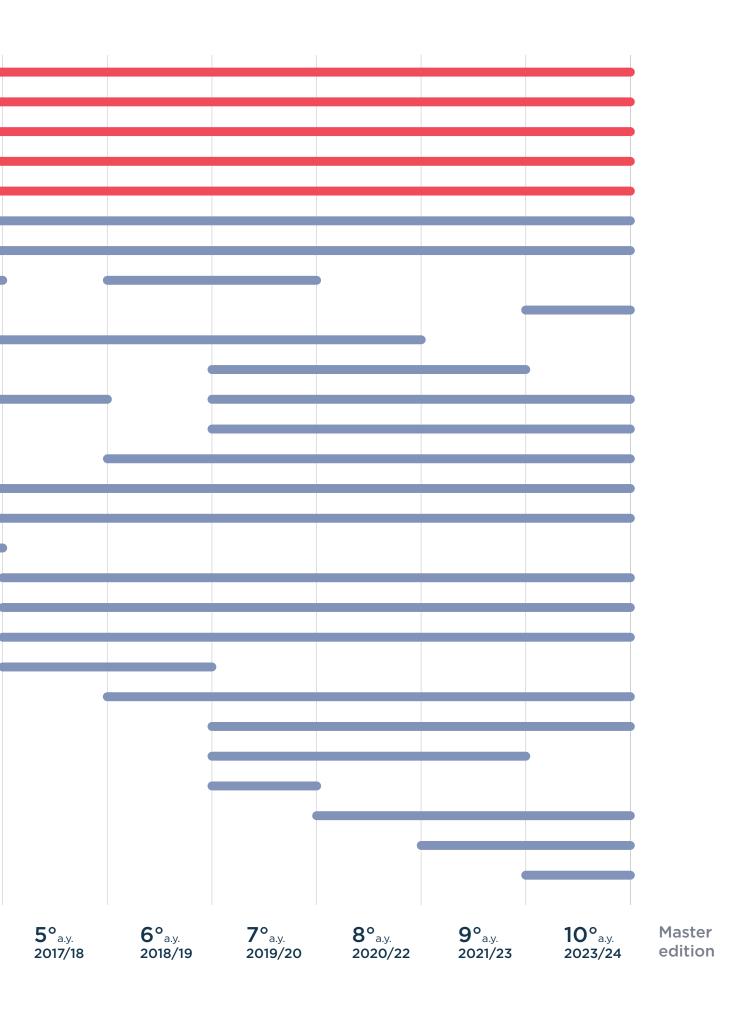
DIVISION Service Design core teachings Complementary teachings

1°_{a.y.} 2013/14





4°_{a.y.} 2016/17



The structure of the didactic contents is divided into four types of modules which differ in terms of duration and methods of deepening the contents: Lectures, Service Design Pills, Service Design Masterclasses, and Service Design Workshops (see "The curricular activities" paragraph for more details). Each module explores a different topic in relation to the core competences of service design and various themes converging on the discipline from other fields of knowledge.

Chart 2 describes all the topics addressed in the teachings starting from the first edition. Over the years, **the training course has maintained and consolidated the teachings considered fundamental for the formation of the service designer profile**; it addresses the basic theoretical principles and the main tools, user research and data representation, concept generation and idea development, together with user experience and interface prototyping, and business-related aspects (Service Design Basics & Tools, Data Visualizations & Analysis, Concept Generation & Development, Rapid Prototyping, Interaction Design, UX & UI, Service Business & Management). In addition, **new teachings have progressively been integrated in response to the interests of the market or to the evolution of the socioeconomic context** (e.g. Design for Policy, Circular Economy, Emerging Technologies); **in relation to the emerging themes subject to further study by the community of service design** (Design Fiction & Design Futures, Inclusive Design, Behavioral Design, System Thinking); **and in relation to methodologies, practices, and tools** (Service Blueprint, Service Evaluation, Facilitation & Improvisation Techniques, Codesign, Co-production & Co-creation). Teachings from the world of communication are also an integral part of the educational path, intended both in terms of design and of the students' communication skills (Service Storytelling, Service Branding & Digital Communication, Design Leadership, CV & Portfolio Design, Public Speaking).

Indeed, for each edition of the Master, the training offer is renewed in response to the emerging challenges of the market, society, and new disciplinary frontiers, in order to train profiles updated with respect to the context in which they will operate, capable of responding to the request of new skills and roles.

Focus on Workshops



45+

different professors and practitioners



different workshops



different organizations across 20+ industries Within the didactic landscape, workshops play a particularly important role. In fact, these are design laboratories aimed at experimenting with the main phases of the service design process, from research to prototyping. During the first nine editions of the Master, the workshops lasted from one to three weeks. Starting from the tenth edition, they now last two weeks. Through the joint work between Board, teachers, and partners, a design challenge is defined, simulating the professional activity from the interpretation of the brief to the delivery of the solution. During the activities, the class stages a real "junior agency". Thanks to the support and leadership of the teachers, the students have the opportunity to consolidate methods and tools previously learned, experiment with the various design steps hands-on, and deal directly with the customer on an agreed challenge. In nine editions of the Master, the topics covered in the workshops were numerous and significantly different from each other: future scenarios of healthcare services, experiences in food products, alternative ways to access banking services, co-working experiences, large-scale logistics, new forms of local tourism, and collaborative scenarios for sustainable mobility, to name a few.

The response to the challenge takes place through a collaborative approach that develops throughout the implementation of the workshops in which teachers, students, and various key figures of the companies participate in the process. This allows participants to experience and evaluate the skills acquired firsthand and, at the same time, to develop the ability to manage complex processes, working on hard and soft skills. The experimental approach also offers the partners the opportunity to explore innovation paths on emerging topics or little-explored areas. **The results are often used for future implementation of real solutions or for further research and development paths.** Furthermore, the workshop represents a moment to dedicate, within the organization, resources to paths of critical reflection and research, even exploratory. **Focus on Masterclasses**



Masterclasses across the 3 former editions

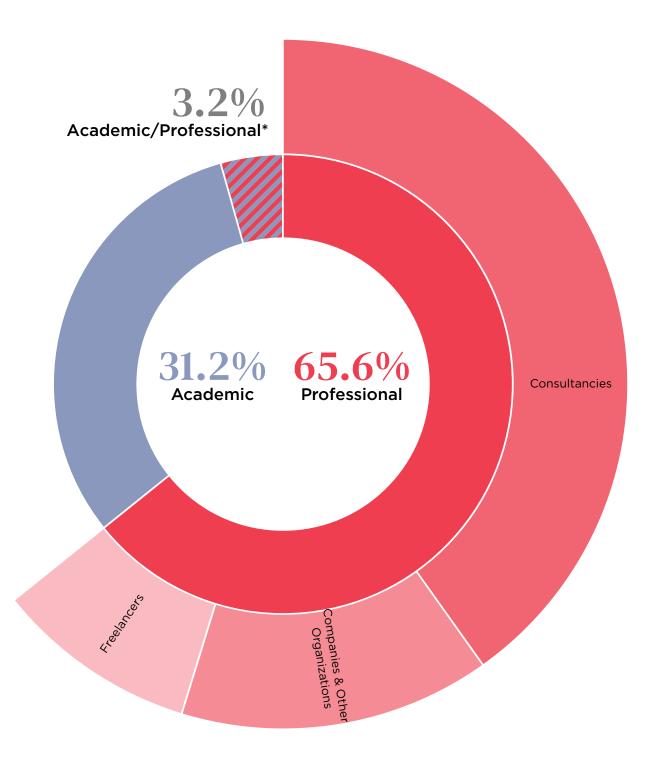
150+ hours of lectures, discussions, and mini-workshops



participants, involving practitioners, academics, and students from all over the world Service Design Masterclasses are provided by renowned experts on cutting-edge topics debated in the service design community and other extradisciplinary fields. Launched in 2019 as a special format of lectures, **Masterclasses are the only Master module typology open to external audiences.** In fact, Masterclasses refer to the worldwide design community, and are dedicated to attracting practitioners, students, and researchers from different disciplines. Each event and its format is uniquely designed by the guest; it can be a lecture, as well as a workshop or an open discussion. The topics tackled by Masterclasses so far have been varied, from artificial intelligence to data-driven service design, from design for policies to critical and speculative design. Indeed, **Masterclasses represent an initiative to foster critical reflections and disciplinary integration**, useful to enrich the service designer profile with new competences and skills.

The Faculty

Faculty background | Chart 3

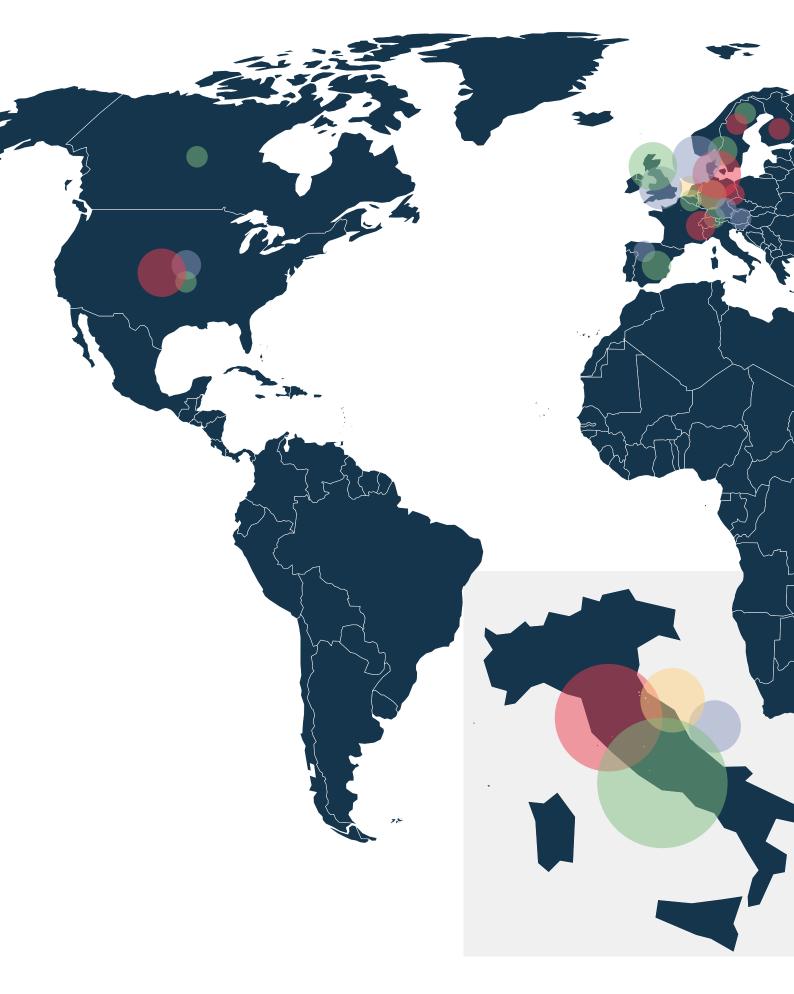


FIELD Professional (82) Academic (39) Both (4)

FOCUS ON PROFESSIONALS** Consultancies (55) Companies & Other Organizations (20) Freelancers (13)

FOCUS ON ORGANIZATIONS 40 consultancies 20 companies & other organizations, both for-profit and not-for-profit 20 universities

* faculty members that are both and equally in the academic and the professional fields ** some of them (including 4 A/P*) work for two different types of institutions



FOCUS Universities Companies & Other Organizations Consultancies Freelancers The faculty is made up of a network of 125 academics and practitioners from renowned international organizations and institutions (Charts 3 and 4). The university professors (about 30%) come from 20 different universities around the world, while the practitioners (about 65%) are divided between freelancers, those who work in studios and consultancies (40 different realities), and those who work in companies and other organizations (20 in total between for-profit and not-for-profit). The total number of teachers for each edition is constantly increasing: it exceeded 30 during the fifth edition and reached 38 during the ninth. The involvement of a large community of professionals ensures a wealth of approaches and perspectives, and offers continuous opportunities for professional and cultural relationships and exchanges.

Teachers have an active role in defining the teaching modules, which are developed in cooperation with the Board to verify specific training objectives and contents. This, along with the students' feedback, allows for continuous improvement of the teachings. On the one hand, the constant renewal of the faculty supports a continuous development of topics, processes, and tools, including interdisciplinary ones; on the other hand, the continuity of teaching on a group of courses throughout the various editions allows for the consolidation of certain contents and the structure of the modules. **This balance between updating and consolidation makes it possible to strengthen the offer and experiment with new formulas**.

3.3. Students & Alumni

There were 161 students across the first nine editions of the Master⁴. This section displays and analyzes the numbers and data regarding the community of students and alumni. The first part describes the number per edition, the geographical origin, and the profiles of the students entering the Master. The second part reports the occupational survey aimed at understanding the evolution of alumni's careers once they have completed their studies. The third part provides an analysis of prospects regarding the professional practice resulting from qualitative research. The goal is to provide an overview of the current profile of the service designer and generate food for thought to imagine possible growth trajectories.

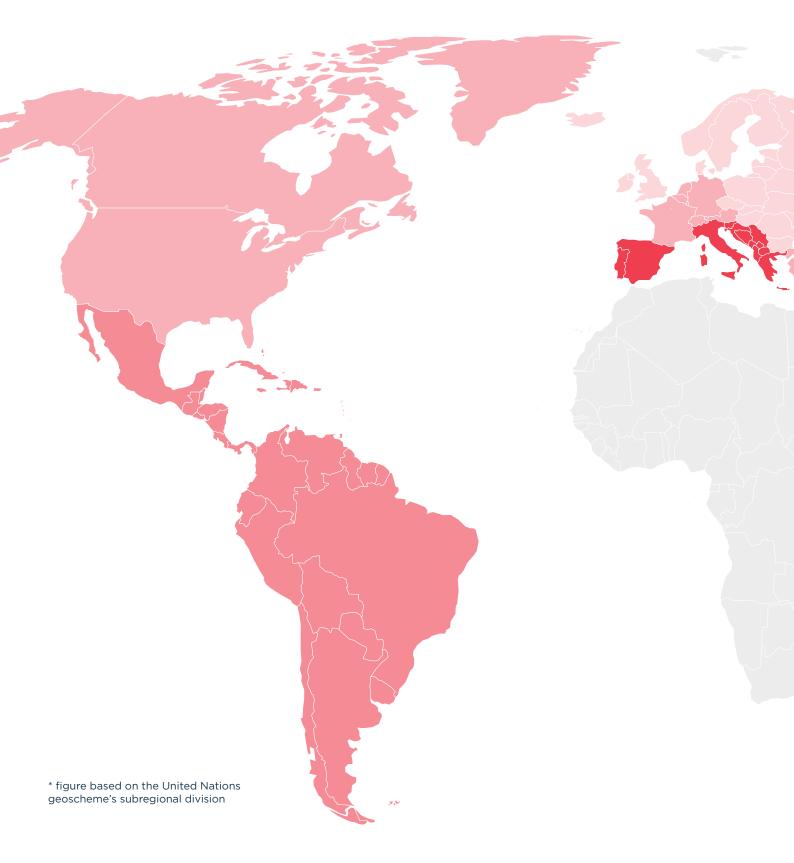
⁴ In the report, the terms "students" and "participants" are used when the focus is on their profiles at the time of entry and participation in the Master; the term "alumni", on the other hand, is used when the focus of the data is on outgoing and post-Master profiles.

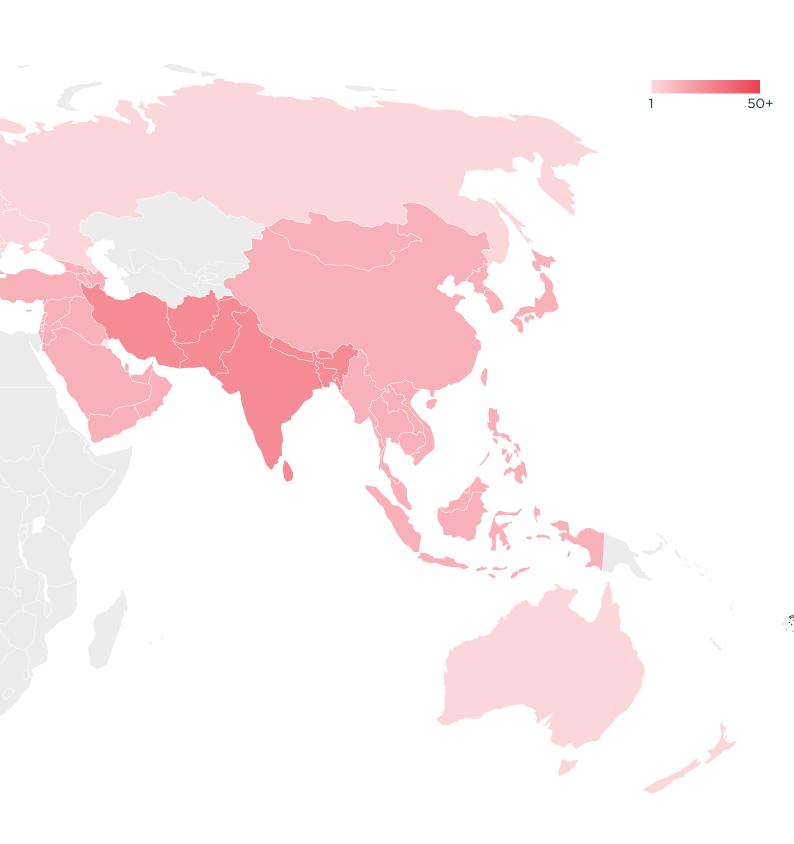
The Students Identikit 3.3.1.

This section outlines the characteristics of the profiles entering the Master, in particular through the analysis of the students' geographical origin and academic background.

Students geographies

Students birthplaces | Chart 5





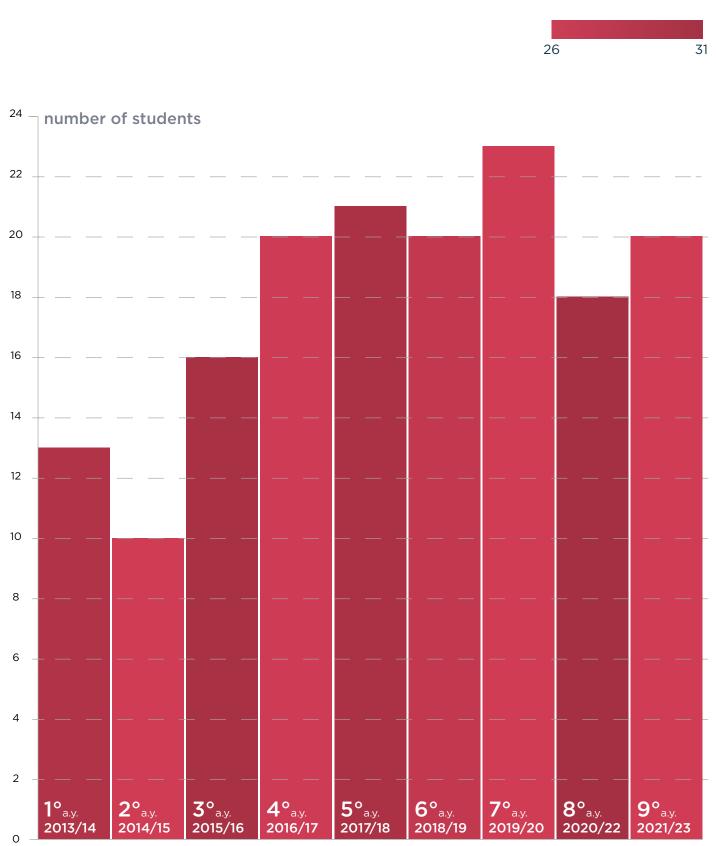
As shown in Chart 5, the Master's student population is distributed in 38 countries on 4 different continents (excluding Africa). Italy is the main base area with 58 participants (36% of 161 students). In other words, about ¹/₃ of the students are Italian and about ²/₃ non-Italian, demonstrating the Master's internationality. The geographical distribution shows a fairly even balance of international origins between Europe, Asia, and the Americas, with the consequent formation of geographically heterogeneous classes.

Master population

Analyzing the population of students by edition (Chart 6), three distinct phases of growth can be outlined. The first is that of startups, relating to the first three editions of the Master, in which the number of attending students is the lowest. The second phase is the expansion, which includes the fourth to seventh editions, from which a growth trend emerges in the number of incoming profiles. The largest class ever is from the seventh edition, 2019-20, with 23 students. The third and most recent phase is the consolidation, which includes the eighth and ninth editions, in which the number of admissions remains substantially stable (between 18 and 20).

To better interpret these three phases, it is necessary to contextualize the data. The first phase takes place at the beginning of growth of service design worldwide, when awareness of the potential of service design as a lever of innovation and the consequent importance of specialized training in this area is growing. The second phase, from 2016 to 2020, develops in the full maturity of service design, both on a disciplinary and a training level; this is demonstrated by the number of participants in the individual editions and by the growth in training demand. The third phase coincides with the outbreak of the Covid-19 pandemic and the consequent dynamics that it triggered on a socioeconomic level. Uncertainty and general instability have affected the population of the Master, which, despite the crisis, has maintained a good number of participants. In line with the post-pandemic recovery, the ninth edition marks a growth trend which, however, will need to be verified in the light of the current economic and energy crisis.

average age: 28.5



Master edition

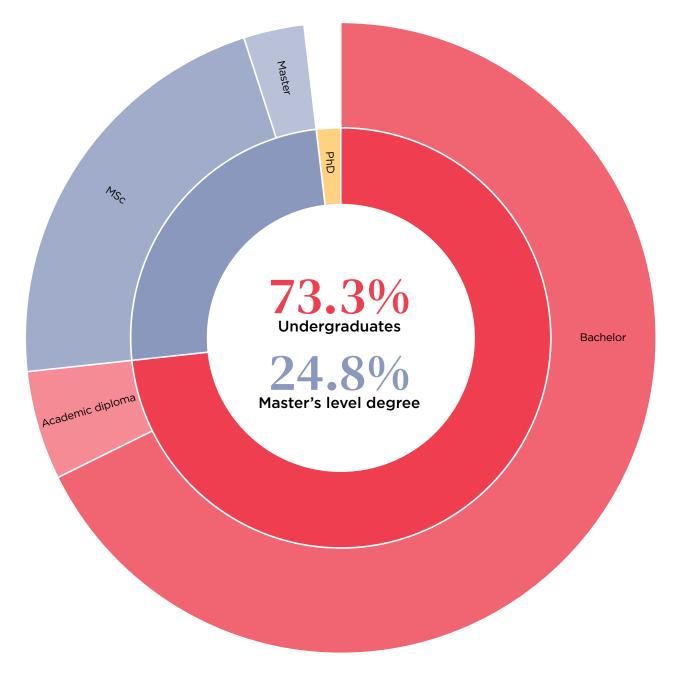
Regarding the age of the participants (Chart 6), it is found that the overall average is 28.5 years. Taking into account that an objective requirement necessary to access to the Master is the achievement of a three-year degree (or equivalent qualification), the minimum age for accessing it is generally 22 years old. In this framework, the age range of the participants is very wide, with one case being 21 years old (youngest age) and one being 49 (oldest age).

Differentiating the average age of participants for individual editions allows for a more detailed analysis. The youngest class, with an average of 26.7 years, was that of the seventh edition (which curiously is also the one with the most participants). This figure does not differ much from the overall average, denoting **a community of users who access the Master after gaining a few years of work experience following a three-year or master's degree.**

The highest average age (30.7), on the other hand, was marked by the eighth edition (2020-22), i.e. the one that coincided with the first year of the Covid-19 pandemic. This could be a consequence of the trend that during the pandemic many people made life and career changes, in many cases leaving their jobs to devote time to other interests or update their skills (McKinsey, 2022).

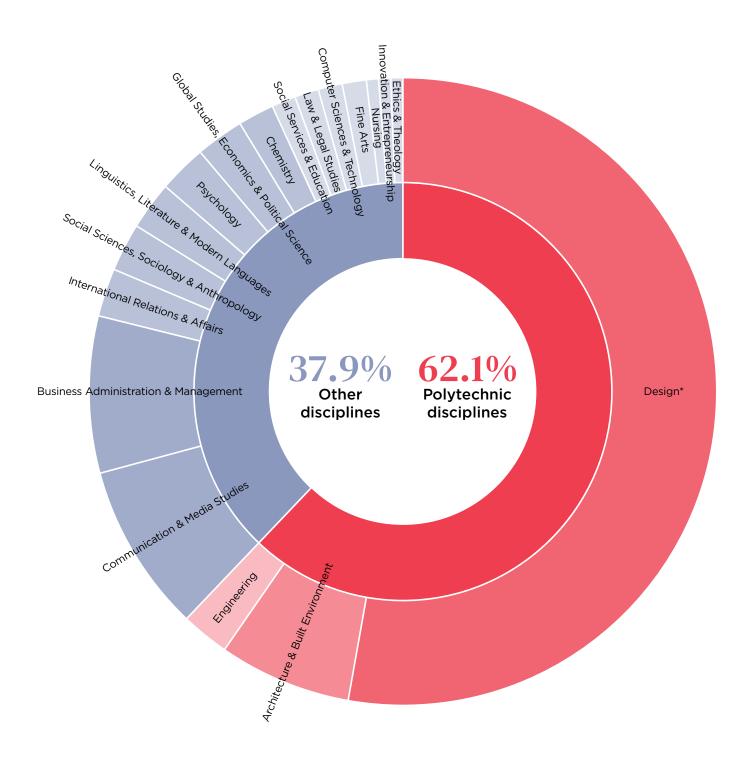
Students academic backgrounds

Students academic titles | Chart 7



FOCUS Bachelor (109) Academic diploma (9) MSc (35) Master (5) PhD (3) As regards educational qualifications (Chart 7), about 3 out of 4 students have a three-year degree or equivalent academic diploma. The remaining quarter, instead, obtained a master of science or another master of the same level as the Specializing Master in Service Design. Out of 161, only 3 students hold a Ph.D.

If cross-referenced with data on the average age of the participants (see Chart 6), **the results reveal different enrollment profiles.** On the one hand, the Master is attractive for those who, once they have obtained the three-year degree, want to embark on an alternative path to the two-year master of science. On the other hand, some profiles have had some work experience after the bachelor's and seek a specializing and qualifying path. For those who enrolled with a master's degree or doctorate, the Master is attractive as a path for professional advancement, for a change of working environment, or for integration of specific skills.



FOCUS** Design (85) **Communication & Media Studies (14) Business Administation & Management (13)** Architecture & Built Environment (11) Engineering (4) **International Relations & Affairs (4)** Social Sciences, Sociology & Anthropology (4) Linguistics, Literature & Modern Languages (4) Psychology (4) Global Studies, Economics & Political Science (4) Chemistry (3) Social Services & Education (2) Law & Legal Studies (2) Computer Sciences & Technology (2) Fine Arts (2) Nursing (1) **Innovation & Entrepreneurship (1)** Ethics & Teology (1)

* Design alone is 52.8% of the total ** subjects classification adapted from the QS World University Rankings by Subject

The 161 students and alumni come from more than 120 different universities located around the world (except for the African continent, as mentioned). In terms of student origin, **the main source of recruitment for the Master is the Politecnico di Milano**, with 24 students continuing their studies following their three-year course or specialist degree program.

The field of study for incoming profiles is balanced between studies related to polytechnic subjects and other disciplinary fields. Chart 8 shows that students with qualifications in the fields of design, architecture, and engineering are around 60%, and those from other fields correspond to around 40%.

3.3.2. The Alumni Occupational Inquiry

This section outlines a detailed occupational picture of the alumni and a retrospective of their careers, providing some food for thought, resulting from the conducted interviews, concerning the profile of the service designer of the near future.

98.4%

employment rate

Data in a nutshell

80.3%

employed on a dependent contract (employee)

97.6%

employed within 1 year of graduation

85.2%

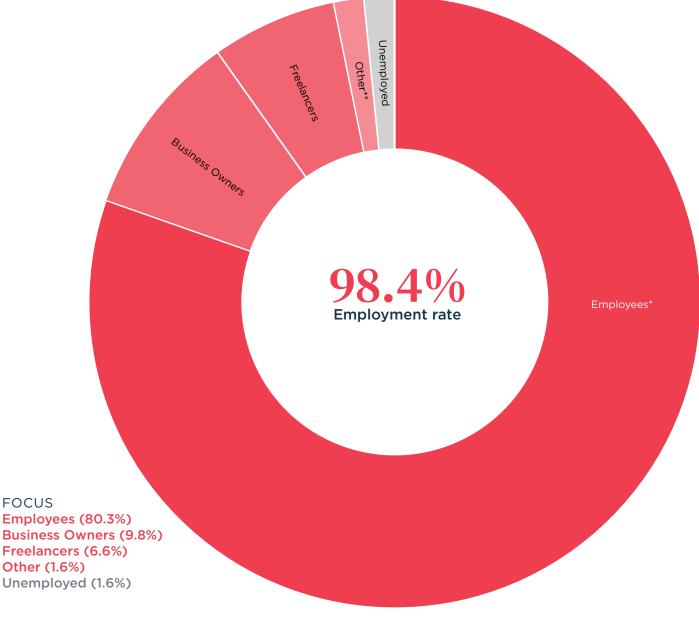
working in the private sector



TEN YEARS OF THE SPECIALIZING MASTER IN SERVICE DESIGN AT POLITECNICO DI MILANO

Employment

Alumni employment | Chart 9



* 91.8% of which have a permanent contract ** particular cases of more than one type of occupation



Internship

Fixed-term

Project-based

Other*

Permanent

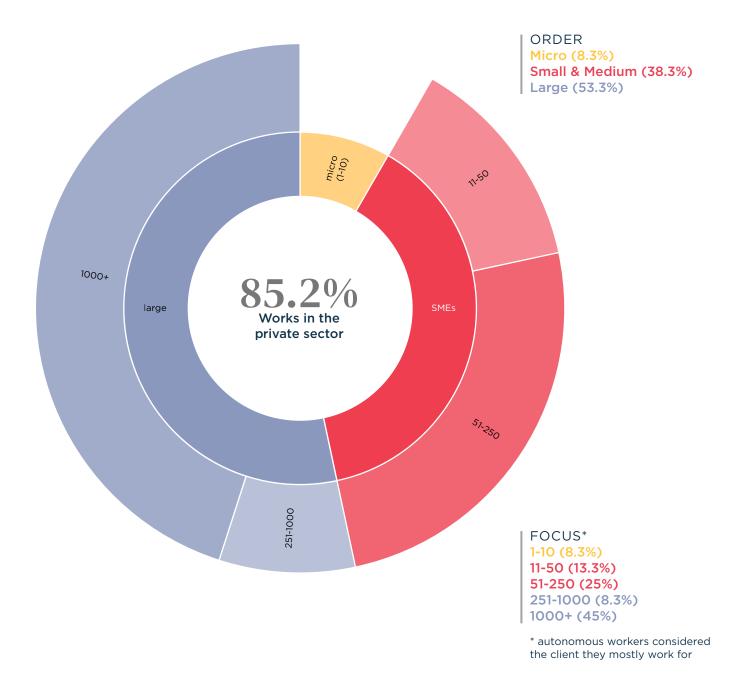
FOCUS Permanent (81.7%) Project-based (8.3%) Fixed-term (3.3%) Internship (1.7%) Other (5%)

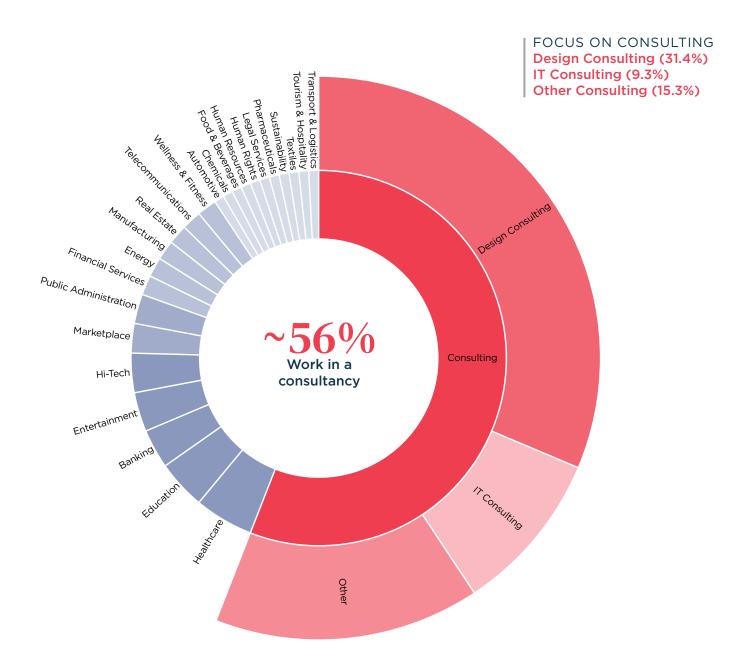
* particular cases of more than one type of contract or other forms of contract, not specified

The data on the employment rate (Chart 9) and the types of contracts (Chart 10) of the Master's alumni are aligned with those of other fields of design and architectural and engineering disciplines (Politecnico di Milano, 2022). The employment rate for graduate alumni is 98.4%; this data includes both employee jobs as well as entrepreneurial and consultancy activities. Of all the employed (employees, freelancers, business owners), 81.7% have permanent contracts. Within those who specifically have a dependent contract (employees), the value rises to 91.8%. This demonstrates the attractiveness of Master's alumni to employers, particularly to organizations and consulting firms, which are able to absorb outgoing profiles and ensure stable working collaborations.

In particular, approximately half of the alumni find work in Italy (50.8%). The next most important destinations are India, Germany, and Canada, which together account for 16.4%. As seen above, with Italian alumni accounting for roughly a $\frac{1}{3}$ of the total, **there is a strong potential for the Italian market to take in service designers**, including those from abroad.

The ability to hire service designers is particularly high in large organizations (Chart 11), which acquire service design skills much more frequently than small and medium-sized companies. Approximately 85% of alumni currently work in the private sector, while the remaining 15% work in the public sector. Of this 15%, Italy and Canada are the countries with the highest number of alumni working in the public sector. This is a very interesting figure for the Italian market, as **it denotes a growing interest in service design skills also in the public sector**.



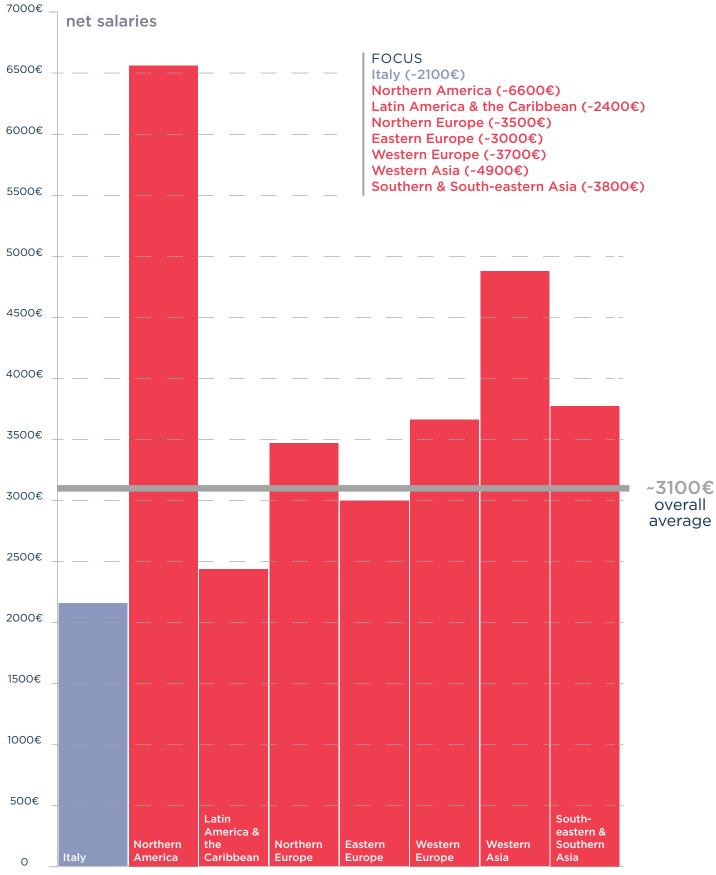


* the figure does not consider those who are self-employed ** industries classification adapted from the Global Industry Classification Standard In this scenario (Chart 12), the consultancy sector remains the main employment area, which accounts for around half of the sample size (56%)⁵. Within this sector, around ¹/₃ of the respondents work in a design consultancy (31.4%), while approximately 10% work in IT consultancies, and 15% have a service or UX designer role in other types of consultancies. The remaining respondents work across more than 20 different industries, ranging from healthcare to tourism, from humanitarian organizations to hi-tech, and from banking to real estate, to name a few. **This denotes the pervasiveness of service design** (in its broadest sense) within organizations and a strong differentiation as regards the areas of application.

⁵ The figure does not take into consideration self-employed workers.

Salaries

Alumni salaries, world areas | Chart 13



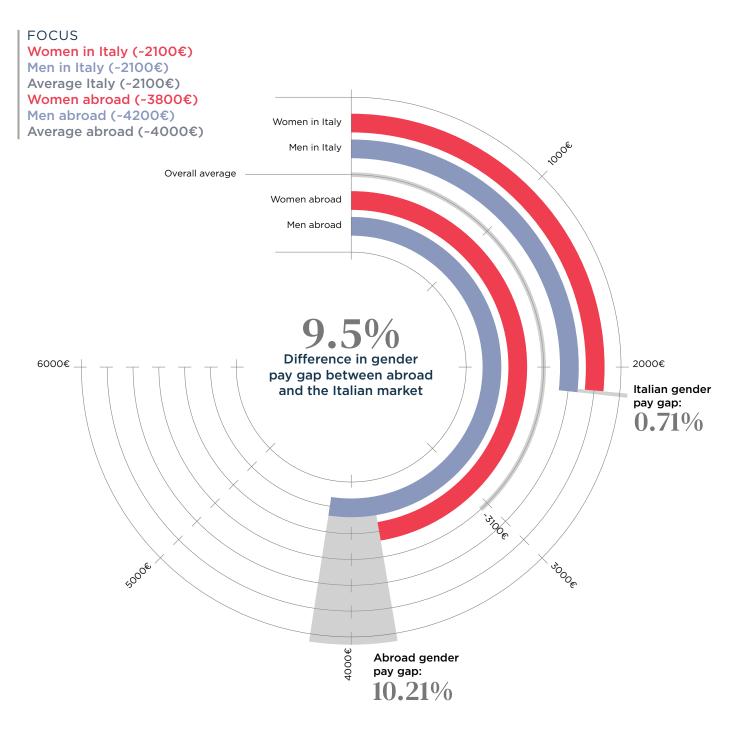
world areas

In terms of remuneration, the emerging picture is uneven since it refers to different geographical areas. Focusing on the Italian context, the data reported in Chart 13⁶ shows a clear difference between Italy and the other contexts. The average salary of service designers employed in Italy is lower than that of their colleagues abroad. The overall average value of the net salary in Italy is around €2,150, against an average of around €3,000 internationally.

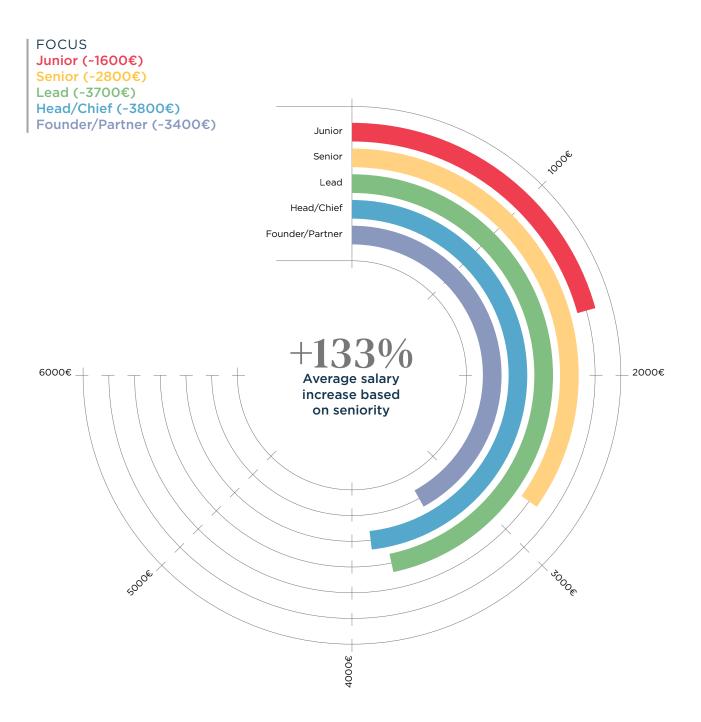
With some differences, the international picture can be considered homogeneous, if we exclude the upward peaks of Northern America and Western Asia and the downward peaks of Latin America & the Caribbean along with Italy (Chart 13). For example, it appears that the average for the North American context is around €6,500, which must be correlated to the positions held in the sample. In fact, in this geographical area are concentrated senior and top management profiles. Furthermore, in general, **the data must be interpreted considering the different national taxation systems which influence the net value of the salary.**

⁶ The figure on monthly net salaries is expressed in absolute terms and is not adjusted for inflation or relative to the earnings-cost of living ratio in a given country.

Alumni salaries, gender | Chart 14



In contrast, a positive note for the Italian context concerns the gender pay gap (Chart 14). In fact, while for alumni in Italy it is almost zero (around 0.7%), abroad it is around 10.2%. Furthermore, the Italian gender pay gap found in the service design sector is lower than the national average, which stands at 4.2% (Leythienne et al, 2021).



Regardless of the gender, geography, and organization's size, seniority is a factor that significantly impacts remuneration. Indeed, the data shown in Chart 15 indicates that the various positions (junior, senior, lead, etc.) correspond to a substantial salary increase. From an average of around €1,700 for junior profiles, we move on to an average of between €2,800 and €3,800 for senior figures. In other words, advancing to positions such as Chief Design Officer or Head of Design of an agency or company results in a salary of more than 230% compared to the beginning of one's career.

Career path

Alumni employment, within 1 year of graduation | Chart 16

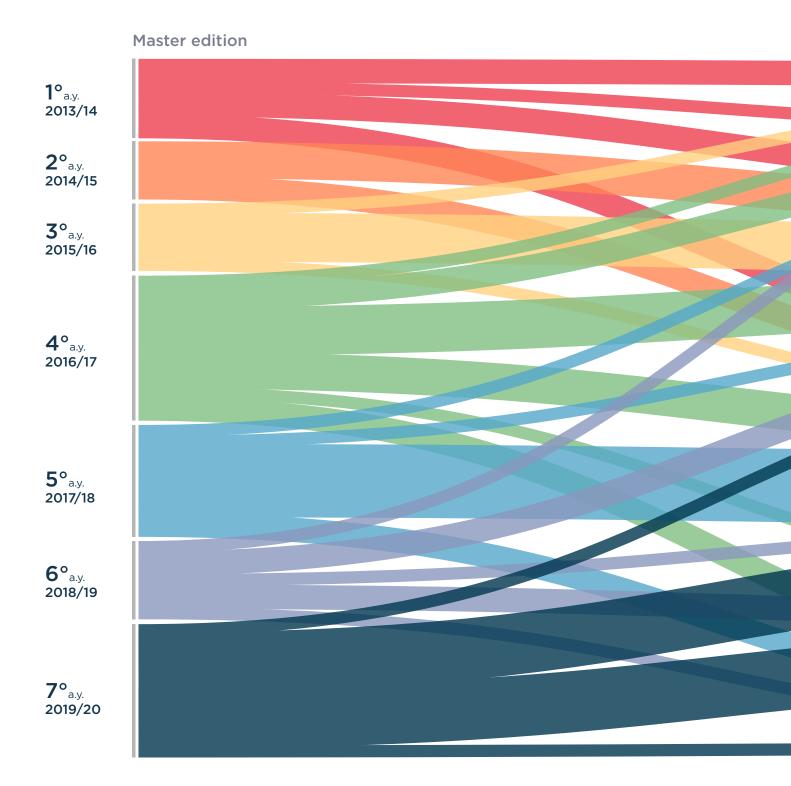
97.6%

Employment rate within 1 year of graduation

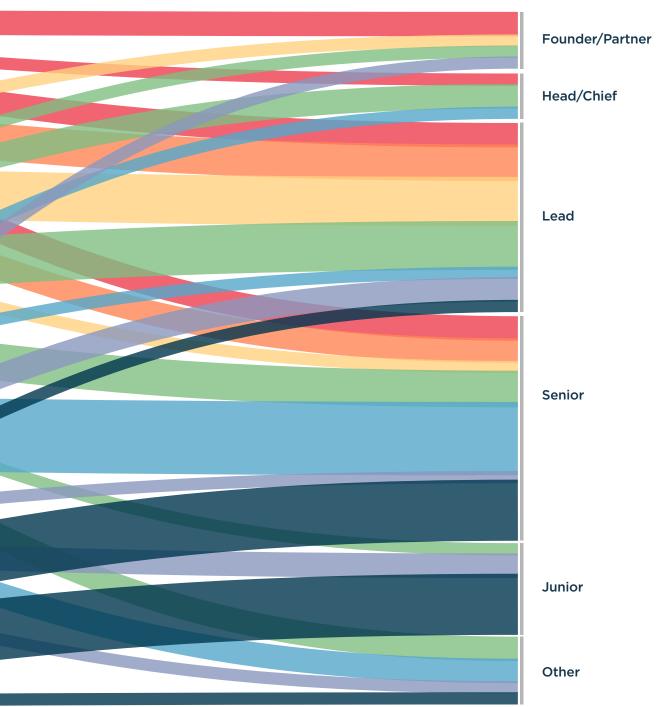


A positive trend regards the employment rate: it appears that the figure for employed alumni - within one year of completing the Master - is 97.6% (Chart 16). This data includes both employee jobs and entrepreneurial and consultancy activities. This figure generally confirms the overall employment rate previously reported (98.4%). This underlines the market's ability to absorb service designers early in their career or recent graduates, offering them good opportunities for professional growth (see also Chart 17).



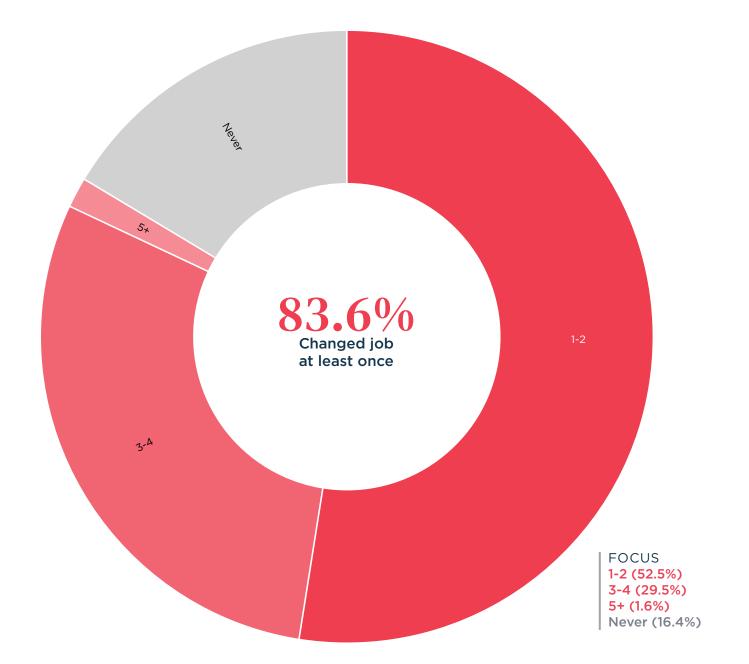


NURTURING SERVICE DESIGNERS



job titles

As far as career advancement is concerned, a large proportion of alumni hold senior and top management roles. Their professional growth path seems to take place in a relatively short amount of time. As expressed in Chart 17, **several alumni hold senior positions a few years after completing their training course.** For instance, a few students from the sixth and seventh editions have secured Lead Designer positions within two or three years of graduating. This rapid progress may also be related to the theme of occupational mobility (see Charts 18 and 19). More than four out of five alumni (83.6%) have changed jobs at least once during their careers; the reasons include professional growth and a salary increase. These data are, in fact, in line with those reported in the five-year employment survey conducted by the Politecnico di Milano on its alumni (2021) and confirm the rapid pace of professional growth in this sector.



Survey question, for which more than one answer was allowed: "Why did you changed job, organization, and/or employer since your graduation? If you're an autonomous worker, please consider radical changes (for es., stop working for your most important client or changing your field of work)"

Unsatisfying environment	Change co		Other*
31.4%	23.5%		6%
Professional growth 76.5%		Earning increase 45.1%	

* impact of COVID-19, starting a business, opportunities

Fields of work

Alumni fields of work | Chart 20

Survey question, for which more than one answer was allowed: "Which are the fields you mostly work in?"

Concept Development 55.7%		Trend Research 26.2% Design Ethnography 27.9%		Other 11.5%	
	Design 27.9%			Business, Strategy & Management 9.9%	
UX/UI 59%	Prototy 47.5%	/ping		Service 37.7%	Delivery
User Research 80.3%	Facilitatio Stakehold 67.2%	n & Engaging lers	Co 63	-Design 5.9%	

With regard to the activities carried out (Chart 20), the service designers almost all declare that they are involved in User Research (80.3%), then in Facilitation & Engaging Stakeholders activities (67.2%), Co-Design (63.9%), Digital Interfaces & User Experience Design (59%) and Concept Development (55.7%). Among the other activities considered, a smaller percentage concerns Prototyping (47.5%) and Service Delivery (37.7%). The contribution to Business Strategy & Management (9.9%) remains almost marginal. Not all of them are involved in specific research activities such as Design Ethnography (27.9%) and Trend Research (26.2%), which, however, cover a substantial part. This demonstrates how service designers are certainly engaged in the qualitative research phases and in the facilitation and empowerment activities that design requires, as well as in the creative and implementation phases, effectively **covering the entire development process, even if with varying weights and roles.**

Service designers soft skills

Alumni soft skills | Chart 21

Survey question, for which more than one answer was allowed: "Which are the soft skills you acquired during the Master?"

Decision Making 46.7%		Self-control 16.7%			
		Social Skills 43.3%		Self-confidence 38.3%	
Communication 58.3%					
Teamworking 83.3%	Problem Sc 66.7%	blving	Critica 65%	al Thinking	

Through the online survey, alumni were asked to identify one or more soft skills⁷ developed during the learning process which proved to be useful and necessary for carrying out the professional activity of a service designer. In addition to technical skills, during the Master it is essential to acquire and develop that set of personal qualities and skills useful for completing the outgoing professional profile, for proactively relating with other collaborators and achieving the objectives outlined. In particular, eight soft skills have been proposed, which concern the personal level and the relationship with other collaborators: Teamworking, Problem Solving, Critical Thinking, Communication, Decision Making, Social Skills, Self-confidence, and Self-control. Among these, those considered most important in the profession are Teamworking (in 83.3% of cases), Problem Solving (66.7%) and Critical Thinking (65%) (see Chart 21). In terms of relations with others and with the project system, this confirms the collaborative and relational dimension in which service designers operate, also in relation to the co-design and facilitation activities described above, and the ability to deal with problems and complex processes. On an individual level, the importance of adopting a reflective and critical attitude, typical of design, emerges.

⁷ Soft skills refer to a broad set of skills, competencies, behaviors, attitudes, and personal qualities that enable people to effectively navigate their environment, work well with others, perform well, and achieve their goals. These skills are broadly applicable and complement other skills such as technical, vocational, and academic skills (Lippman et al., 2015).

Post-Master education

Alumni post-Master education | Chart 22

FOCUS No other qualification or degree (88.5%) Another master or grad school (8.2%) Other (3.3%)

* Generic courses or bootcamps

88.5% Obtained no other degrees or qualifications after the Master

Other*

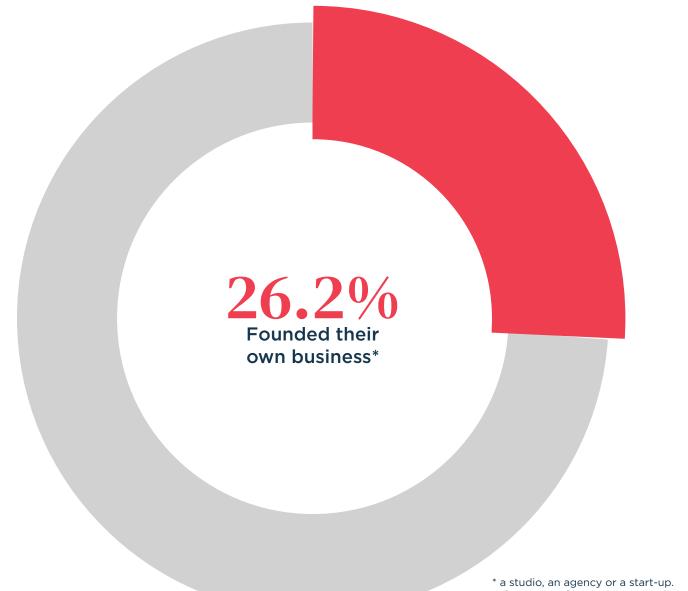
Regarding the possibility of accessing other training experiences once the course has been completed, in Chart 22 it can be seen that **for the vast majority of alumni** (88.5%), **the Master represents the final goal of their studies.** This figure is consistent with the type of training program and the outgoing profile, as it is aimed at providing an adequate theoretical and planning framework and at training professional figures capable of entering the world of work with a high qualification.

Entrepreneurship

Alumni entrepreneurship | Chart 23

Among the educational objectives of the Specializing Master in Service Design is the promotion of entrepreneurship and self-entrepreneurship. This is an important area for the profession, whether it concerns, for example, the foundation of a startup or a design consultancy. As shown in Chart 23, about ¹/₄ of alumni (26.2%) have started their own business. In almost all cases these are realities linked to the world of service design (studios, consultancy agencies, and startups), but it's interesting to note that some cases also concern entrepreneurial initiatives connected to other areas⁸ not directly linked to the discipline.

⁸ Not specified within the Survey.



A few cases of businesses not related to design

Service designers as trainers

Alumni experience as trainers | Chart 24

Exploring the alumni ability to transfer the acquired knowledge to other contexts, we realize that a large number of them are involved in training activities. These concern both collaborations with training bodies and institutions in which alumni have the role of teachers, and company training activities provided in a consultative form. As can be seen from Chart 24, around 53% of alumni have carried out training activities as consultants or teachers. This implies **an evident growth in the demand for training in service design by professionals and organizations**, which is, on the one hand, absorbed by structured courses (e.g. degree and master courses, advanced training courses, etc.), and, on the other hand, provided in training courses within organizations.

In this context, **the alumni, therefore, seem to also have an adequate profile for sharing the knowledge acquired during their training and their professional activity in other contexts.** There are also several cases of alumni who have become faculty members of the Master itself. This is a great added value in terms of legacy between the Board and students to strengthen the sense of community, consolidating existing relationships and initiating new ones.

 $\sim 53\%$ Had an experience as teacher or educator*

* some of them at the Master itself

Alumni network

Alumni design network | Chart 25



* most of them in SDN and SDD

Beyond structured training through participation in masters, advanced training courses, boot camps, etc., **the community of service designers demonstrates a marked propensity for updating and continuous debate.** As shown in Chart 25, around 34% say they are an active part of a local or international network (eg: Rethink! Service Design Festival, Service Design Drinks, or Service Design Network). From the qualitative survey, several strategies emerged that service designers adopt to keep up-to-date on methodologies, tools, and reflections on the discipline, as well as to create and maintain a relationship with the community.

As already mentioned at the beginning of the report, the service design community offers a wide range of initiatives of a scientific or popular nature which represent **important hubs for meeting and discussion between members of a community that can still be defined as relatively small.** We recall events on different scales, such as the ServDes conference, the Service Design Global Conference, the Service Design Drinks community, Rethink! Service Design Stories, Service Design Days, and the Service Design in Government initiative, to name a few.

3.3.3. The Alumni Perspective

The alumni perspective provides a dynamic view of how the application and definition of 'service design' have changed over the years. From the interviews carried out, three points emerge that summarize what it means for them to be a service designer today and how the profile could evolve in the future.

The first element to emerge concerns the extension of the areas of application: **service design acts at various levels within an organization and with different roles.** It's not only used to design and implement new services and experiences, but also in the transformation of the organization itself, from the (re)definition of strategic and business objectives to the (re)design of methodologies and ways of working. In these transformative paths, service designers often also act as 'dialogue enablers' between professional figures, units, and areas of competence of the same organization. Thus, service design acts also as an activator of intra-company dialogue and as an engine of internal change processes.

"

Service designers have the **ability to zoom in and zoom out**, to choose in a very conscious way on which strategic level to work.

- A, 35

"

Service design has found its way into different fields. [...] My

studio worked with different organizations on interventions in the workspace and organizational environments, and we saw that service design works very well when applied to internal elements, within the organization itself.

- A, 35

A second element of reflection is the differentiation of areas of employment. After an initial phase, in which service design was mainly used in the private and industrial sectors such as banking or retail, today service designers are increasingly employed in the public sector as well. Collaborations with government and administrative bodies have grown abroad, as in Italy, working in the social sphere or contributing to policymaking processes and the delivery of public services (an example is the work done by the Department for Digital Transformation). In recent years, the opportunities to contribute to business innovation and support social and public innovation have multiplied, and organizations seem to be increasingly receptive to service design skills or activating different forms of collaboration.

Service design is most effective in environments that are **ready** for change.

- A, 35

"

Service design is an approach that could be applied to everything. My ambition is that it will be applied increasingly more in the public context, in government channels, in the digital transformation of public administration, both on the administration and the planning levels.

- A, 36

The third element on which the alumni reflect on is the greater awareness of service designers on their own role and the contribution that the discipline brings on a social, technological, and sustainability level. In fact, a design attitude emerges that considers the design of new solutions as integral parts of larger and more complex systems. As a result of the greater diffusion and adoption of service design, the impact that this generates - or can generate - in the medium and long term becomes an important element of reflection. In this perspective, the measurement of direct or indirect effects on organizations, communities, and society itself becomes the object of experimentation and analysis. This scenario opens up to further development of professional skills and connection with other domains of knowledge.

"

The power of service designers is the ability to maintain different perspectives and create a structured way of working with that complexity, therefore to face all those challenges that are defined as systemic.

- A, 35

Attention to sustainability is certainly a growing area and the first that we should be more concerned with. Right now, we recognize its importance, but we don't know yet what could be done concretely. In this context, systemic thinking is crucial.

- A, 34

Some notes

Despite the global turbulence of recent years, the survey confirms that the demand for training by recent graduates and professionals, on the one hand, and for skills by organizations, on the other, remains high and widespread, both nationally and internationally. The assimilation of new Master's graduates by the market is good, with a very high percentage of employment at the end of the course (98.4%) and an equally good geographical distribution. In fact, **throughout the ten years of the Master there has been a growing presence of service design skills in public and private organizations and in varying industries.** Furthermore, the possibilities for professional growth appear promising both in Italy and abroad. Therefore, an image of a buzzing community emerges, robust even if relatively young, expanding and characterized by a strong sense of belonging.

Nonetheless, there are still some barriers to tackle before the complete adoption and diffusion of service design as a lever of innovation is complete. These concern the different levels of understanding regarding the disciplinary contribution in the processes of change and its benefits in economic and social terms. For example, despite the transformations that organizations are undergoing in approaching the digital and sustainable transition of processes, the role of service design still remains marginal in many cases. This suggests a need to connect the world of research and training even more with policy makers, the business world, as well as third sector organizations. This path has already been started and strengthened by the community of **alumni who have become true ambassadors of the design culture and of the impact that service design can have on institutions, companies, associations, and civil society.**

Design did not exist in the company, or rather, it was externally sought especially by external consultancies. The first thing I worked on is to figure out how to integrate service design into the company activities and specifically into the digital team.

- A, 30

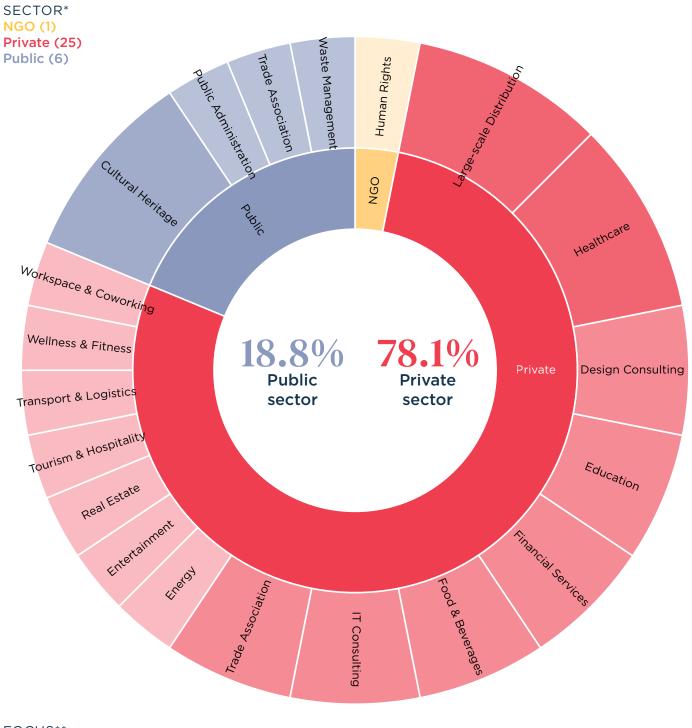
Service design activated the dialogue between different stakeholders who previously did not know and did not speak to each other, despite working on the same thing in different project phases. - A, 30

3.4. Partners

This section aims to analyze the profiles of the partner organizations, their adoption maturity regarding service design, and the motivations to partnering with the Master. The section opens up reflections on the role that service design plays - and will play in the future - within private and public organizations.

3.4.1. Partners Landscape

Partners industries | Chart 26



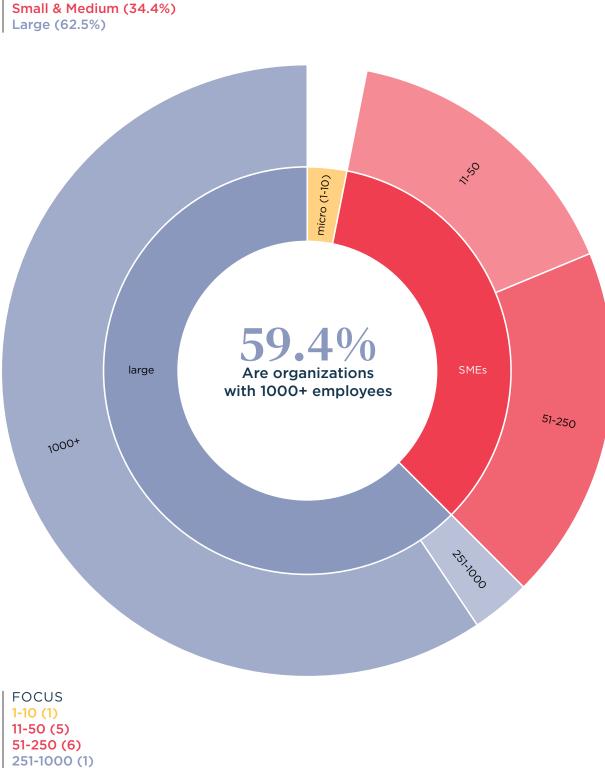
FOCUS** Large-scale Distribution (3) Healthcare (3) Cultural Heritage (3) Design Consulting (2) Education (2) Financial Services (2) Food & Beverages (2)

IT Consulting (2) Trade Association (2) Human Rights (1) Energy (1) Entertainment (1) Real Estate (1) Tourism & Hospitality (1) Transport & Logistics (1) Wellness & Fitness (1) Workspace & Coworking (1) Public Administration (1) Trade Association (1) Waste Management (1)

* some partners share a common industry but in a different sector

** industries classification adapted from the Global Industry Classification Standard

ORDER Micro (3.1%)



There were 32 official partners across the nine editions of the Master. Each edition is supported by different entities that participate in the training course with different purposes and contributions. Their motivations behind the collaborations are linked to innovation and growth strategies, as well as the desire to forge stronger bonds with the service design training and research system.

Partners usually vary from one edition to another, with some cases in which the collaboration lasted for two consecutive editions or more. The different collaborations guarantee students the ability to face topics and challenges of different natures and complexity, in addition to dealing with organizations that differ in size, industry, maturity of service design adoption, and area of interest.

Partners contribute to the Master's didactics, participating in workshops and providing the class with a precise brief to experiment on a real challenge (see "Focus on Workshops" paragraph for more details). Among the partners (Charts 26 and 27), the majority operate in the private sector (nearly 80%) and are large organizations (nearly 60%). As stated in the previous paragraphs, this typology of organization represents the largest employment area for graduates (see "The Alumni Occupational Inquiry" section for more details). **This allows participants to better know the environments in which they will grow as professionals.**

Concerning the industries (Chart 26), partners operate in more than 20 different fields, ranging from human rights to food & beverages, from financial services to cultural heritage, from healthcare to IT consulting, and more. Almost all of them do not explicitly operate in the design field, but somehow adopt service design, recognizing its innovation value. Also concerning the industries, there is a correspondence between the training offer - and related partnerships - and the data that emerges in section 3.3.2. "The Alumni Occupational Inquiry".

Internship and job opportunities

Internship into employment | Chart 28

32.8% Of internships we provide turn into an employment contract

Partners usually offer internship opportunities for the students. As mentioned, the training program includes a mandatory curricular internship that lasts at least 475 hours. This implies the connection with an international network of partners and organizations who already adopt service design internally or are potentially interested in developing such skills. Over the years there has been a strong consolidation of relationships with international agencies, companies, as well as start-ups and public sector organizations that want to host the Master's students for internships.

A significant statistic, shown in Chart 28, is that roughly $\frac{1}{3}$ of the curricular internships convert to employment contracts, effectively guaranteeing an almost direct continuity between training and the job.

3.4.2. A Multifaceted Network

The relationship between supply and demand in service design in Italy has visibly changed since the birth of the Master, as has the awareness of organizations about the potential of service design to innovate their offer and internal organizational processes. Over these ten years, we have witnessed an initial phase in which the Master's relations were mainly with product-oriented companies (e.g. in the food or packaging sector) which were beginning to integrate a servitization process into the company portfolio by introducing a service component, enabled also by the introduction of technology. Over the years, the interest in service design has been greater in some industrial sectors, such as banking, logistics, and the healthcare sector, where organizations began to progressively integrate a user-centered perspective into their offer, also due to market changes. The capability of the discipline to permeate the private, public, and third sectors has expanded in recent years, thanks also to the strengthening of the service design system at the national and international level, as highlighted in the initial part of the report.

In recent years, there has been an evident growth in requests for service design skills from organizations. In response to the expansion of the market, new consultancy agencies have arisen, large companies focused on other sectors have acquired agencies specialized in service design (e.g. Capgemini acquired Doing and frog), and new internal units have been created to broaden the consultancy offer (e.g. the creation of Deloitte Digital in Italy). On another scale, "boutique agencies" have further specialized (e.g. Oblo, Commonground) by creating strong relationships with the territory in which they operate. In general, consultancies have responded to the change through hyperspecialization strategies in specific sectors (e.g. healthcare) or with cross-industry activities. This expansion has led to a wider diffusion of the use of service design within organizations to innovate products and services, and improve internal processes. This has favored the start of new collaborations between the Master and consultancy agencies and with companies of different productive sectors, and has strengthened the relationship with the public and third sectors.

As previously mentioned, the partner companies of the Master differ from each other in terms of activity, size, and approach in the usage of the discipline. There are product-oriented companies operating in Italy, service companies, design consultancies, and organizations that have experienced service design for the first time in light of their relationship with the Master. Therefore, the adoption of service design principles and tools varies according to the diverse organizational contexts. In particular, regarding the service design adoption maturity, partners can be segmented into three groups: **service design natives** (i.e. service design agencies and consultancies), **service design experts** (i.e. companies and organizations that, whatever the industry in which they operate, adopt service design internally or use external resources), and **service design beginners** (i.e. companies and organizations that have little to no experience with service design).

As regards the first category, the collaboration with the Master arises in particular from the interest in experimentation and research. Service design natives use the collaboration with the Master mainly as an activator of new possible project areas or to validate work hypotheses that are not yet fully mature, and to fuel a constant dialogue with the university. In general, expert organizations collaborate with the Master, on the one hand, to test, validate and improve internal processes and tools and, on the other, to further disseminate the culture of service design within the organization. The category of beginners includes those organizations that perceive the value of service design, even if they have not used it in their processes yet. In this case, the objective of the collaboration is to start an experimental pilot in which, through practice, reflections are made on current or future work environments, areas of expertise, and specific projects in which to invest. In many cases, the concrete result of the partnership is the integration of service design skills within the company, the creation of internal working groups, the integration of collaborative processes, and the integration of qualitative research into existing innovation paths. For each of these categories, the value created through collaboration goes beyond that which concerns the validity of the solutions that emerged.

This perspective, which arose from reflections within the Board, was compared with the perception within the organizations. Some semistructured interviews were carried out with a selection of partner organizations to understand how they perceive the value of service design. A differentiated picture emerged from these conversations, ranging from organizations that adopt service design pervasively internally, to others that approach the discipline in an exploratory or embryonic way, confirming a picture of the still-evolving national landscape.

Consulting firms (defined in the report as "service design natives") describe a varied clientele, fragmented and differentiated by the level of service design adoption, which is not always integrated as a strategic and innovation asset. This depends on a variety of factors, including the industry, the organization's size, and the organizational culture of the clients themselves. Despite the different levels of maturity encountered, **the agencies nonetheless outline a strong growth in demand, especially in recent years and, in particular, for end-to-end solutions.**

From the discussion with companies (both "experts" and "beginners"), a growing use of service design has been confirmed, often correlated to the customer experience, the understanding of user needs, and the integration with business objectives from a strategic perspective, even in the long-term period. Service design is increasingly perceived as a system of skills capable of accompanying change and supporting adaptation to sudden changes in the market and society. Furthermore, more and more companies internally adopt the principles of service design to provide solutions closer to the needs of end users and support the relationship between the various actors involved in the service, adopting more agile and collaborative processes that include continuous and iterative prototyping cycles and verification. Organizations that use service design in a structured and continuous way underline an ever greater awareness of the added value brought by service design in supporting innovation and transformation processes. In fact, in more mature environments, service design skills are also used to improve the employee experience and promote internal processes of knowledge sharing and creation, integrating human-centered aspects with those of business and human resources.

Within this framework, the further strengthening of the relationship with public and private organizations and institutions goes hand in hand with the evolution of the role of service design as a lever for transformation. The Master can thus share with organizations a culture of service design that integrates vision and research, combined with the ability to propose implementable solutions and a critical and responsible attitude toward innovation.

04_Challenges & Opportunities for the Near Future

Service design has rapidly spread as a lever for change within organizations by supporting innovation processes that concern not only individual solutions but also complex system of interactions and behaviors, ultimately leading to the organizational culture. The reflections on the discipline's evolution, therefore, move from the single interaction or service interface, to multi-stakeholder and multi-level value co-creation processes, from individuals to organizations, to cities, and finally to addressing major global challenges (Sangiorgi, 2010; Patricio et al., 2018; Villari, 2022).

In light of this transformative and systemic evolution of service design, we can identify some signals that come from service design research, the market, and design practice, and **reflect on possible areas of development for service design, and therefore on the evolution of the educational path and professional profiles.**

A first level of reflection, of a disciplinary nature, concerns the revision of service design processes and tools to update and adapt them to contemporary challenges (Anderson et al., 2013; Patricio et al., 2017; Vink et al., 2021). A second level includes the connection with methods and theoretical approaches from other fields of knowledge (Sangiorgi, Patricio and Zurlo, 2018) to investigate how the potential of service design can be expanded through integration with other disciplines. Below we report some reflections on which we have based the development of the educational path in the near future.

Transforming complex systems

Service designers are increasingly asked to work in areas that have huge social implications (Westerlund and Wetter-Edman, 2017) and be able to act in complex systems, modify them, or even design new ones (Vink, 2021). This perspective connects to what Banerjee (2014) proposes as a design of large-scale system transformation, whose process requires a multidisciplinary and multi-objective approach as well as the engagement of a large community of experts and innovators. The daily comparison, for example, with the challenges posed by climate change, environmental degradation, social and economic inequalities, and ethical issues implies that the value generated (or not) goes beyond the relationship between provider and user but involves a varied network of actors and resources to be enabled. As stated in the report "System-shifting design" published by the UK Design Council: "We need to evolve our current practice, designing not only in a systems-conscious way but a system-shifting way" (Design Council and The Point People, 2021; p.16).

This broadening of disciplinary horizons implies an adjustment and rethinking of processes and practices, shifting the focus from the individual's needs to the complex system of relationships that these people produce, the organizations in which they operate, and what these relationships generate, from the micro to the macro scale. Therefore, considering the systemic aspects as elements of service design involves being able to understand and interpret such systems. representing their complexity by identifying tangible resources (e.g. places, tools, physical infrastructures) and intangible resources (e.g. standards, rules, knowledge, ways of interacting) and enabling new connections. In addition, it is necessary to anticipate the impact and repercussions that the solutions and processes will have on systems and how they will influence their modification. There will be an increasing demand for the ability to evaluate the proposed changes, and therefore to integrate models and measurement tools that involve social, economic, and environmental aspects into the design of the service, integrating measures and metrics also based on people's happiness and well-being.

In terms of training, **the transformative role of service design is thus characterized by an expansion of scope and territory of action.** This implies a continuous shift towards a research-based approach (Irwin et al., 2022) through which to integrate principles deriving from other fields of knowledge, such as the theory of change (Simeone et al., 2021) or the living system theory (Irwin, 2015), thereby strengthening the contribution of service design in the transformation processes of complex systems.

Designing for equity and sustainability

Service design aims to play a decisive role in building future development trajectories in terms of sustainability, equity, and social well-being. The current growth model is the one proposed by the United Nations Sustainable Development Goals (SDGs). The 2030 Agenda is a plan of action for people, the planet, and prosperity. It aims to overcome the limits of the current production and consumption model, counteract the progressive depletion of natural resources and the consequent impoverishment of biodiversity, guarantee access to natural resources, and ensure social justice and equality. The principles describe sustainable development through environmental, socio-ethical, and economic dimensions. These dimensions encompass the resilience capacity of the biosphere and geosphere, the equal redistribution of resources, and the issue of decent work for all.

In this context, the design of sustainable, equitable, and inclusive services is particularly relevant. This involves integrating a morethan-human perspective (Clarke et al., 2019) in which man-made and non-human environments interact collaboratively with each other. From another angle, sustainable development is associated with technological development in what is described as a "twin transition", in which sustainable product-service systems integrate and use the potential of technology, while also assessing its critical aspects. Take, for example, resource consumption derived from digital services. In this scenario of (even drastic) changes in production and consumption models and new forms of social integration and collaboration, **service designers must deal with new economic and social models** (e.g. circular economy) **and act on behavioral change.** This occurs at the level of the individuals and communities, at an organizational level, and at the same time also intervenes on a policy one.

Within the discipline, a critical reflection is underway on how the themes of inclusion, oppression, colonialism, or the ethical use of data (to name a few) can and should be integrated into design and how we can translate good intentions into concrete actions. In terms of fair and sustainable development, service design will therefore have to question the validity of the conceptual and operational tools adopted so far in the face of different forms of distribution of power and knowledge.

Expanding the future thinking potential

Design is intrinsically a future-oriented discipline, as it has in its DNA the mission to improve the contexts in which it operates. The complexity and uncertainty of the conditions in which we design generate an increasing difficulty in the decision-making process and a greater unpredictability of the final result. In this unstable scenario with contours that are difficult to outline, the integration of future-oriented visions can inspire unexpected and diversified project trajectories, leading also to a collective and interdisciplinary reflection (Dunne and Raby, 2013; Kimbell and Vesnić-Alujević, 2020). To act in these conditions, it is necessary to increasingly adopt critical and reflective processes capable of enabling the ability to problematize design processes and solutions through multiple scenarios. In this framework, in which the design of future scenarios also becomes a decisionmaking and strategic orientation tool, it appears necessary to enable and support empowerment and co-creation processes by citizens, organizations, and institutions to stimulate bottom-up development processes. Integrating future-oriented perspectives can also foster greater awareness and the ability to adapt to sudden or abrupt changes and therefore make uncertainty a design resource.

The evolution of service designers' skills also concerns the ability to map possible development trajectories, imagine solutions capable of responding to complex challenges, devise alternative development models, and evaluate their effectiveness, outlining different ways to address change (Ojasalo et al., 2015). The speculative potential of service design can be strengthened in terms of training and also experienced through professional practice, creating specific profiles capable of supporting decision-making processes in situations of uncertainty, both in the public and private sectors.

Embedding uncertainty

Designers and service designers are increasingly aware of acting in fragile and complex systems. Particularly, in recent years it has been realized that the tools through which service design is applied, in various contexts and on different scales, often appear no longer adequate to respond to social, technological, environmental, and economic challenges and the complexity that these challenges entail. In this framework, the need emerges to rethink the theoretical and operational tools of service design to enable innovation scenarios in continuously evolving systems, and to contextualize these tools with respect to different territories and cultures. It is necessary to overcome the logic of the sequential process to outline different processes able to tell the transformative nature of the actions and include multiple perspectives concerning, for example, the use of technology, the relationships between organizations and the well-being of the individual, and political factors. To put it as Mazzuccato (2018) would: it is necessary to reshape the project towards a mission-oriented strategy, in which the solutions require flexible, integrated and resilient processes and systems, considering the solutions as non-definitive results, but incremental parts of a broader change. New tools, capable of incorporating the elements of uncertainty, representing the complexity of ecosystems, and anticipating different and complementary development trajectories, will be integrated into professional practices and educational paths. The unpredictability of the context, the process, and the results of the design action requires the rethinking of processes and tools, implying new ways of doing service design and being a service designer.

The outlined areas describe a perspective in which service designers will face increasing difficulty in managing processes and adopting preestablished design schemes. Therefore, it will be necessary to adapt to new contexts and circumstances and accept the intrinsic difficulties of these processes, with the awareness of having a partial view and knowledge. Recently, Sangiorgi et al., (2022) described multiple identities of profiles that integrate technical, specialistic, leadership, and strategic vision roles. Therefore, the training course can also evolve in this direction, imagining **the creation of different profiles of service designers with several multidisciplinary skills** capable of responding in a more punctual and specific way to the different needs of public and private organizations and socio-economic contexts in which we design.

o5_Final Remarks

The objective of the Specializing Master in Service Design is to help form a community of service designers able to face the challenges posed by the society through a critical, reflective, and proactive attitude. The ambition to be able to support change towards better, more sustainable, inclusive, equitable, and pleasant futures and to stimulate the community to reflect on the role that service design can play in this transformation is clear. It means that **the learning process not only concerns those who participate in the Master as students, but involves each of us and the vast community of researchers, teachers, professionals, organizations, and institutions that make up the Master's ecosystem**. Over the years, we have seen the service design community grow and transform, strengthening previous relationships and building new ones.

Ten years is a good timeframe to reflect on what to improve and how to do it, and to think about the next ten with optimism. This report is a helpful prototype to capture what happened and encourage a broader and more articulated reflection on how the Master and the related ecosystem can take shape in the coming years, and how the profile of the service designer can (or should) evolve.

references

Anderson, L. et al. (2013) 'Transformative service research: An agenda for the future', *Journal of Business Research*, 66(8), pp. 1203–1210. Available at: https://doi.org/10.1016/j.jbusres.2012.08.013

Banerjee, B. (2014) 'Innovating large-scale transformations', in Bason, C. (ed.) *Design for Policy*. Routledge, New York, pp. 71-86.

Clarke, R. et al. (2019) 'More-than-human participation: Design for sustainable smart city futures', *Interactions*, 26(3), pp. 60–63. Available at: https://doi.org/10.1145/3319075

Design Council, The Point People, (2021) *System-shifting design. An emerging practice ex-plored.* Available at: https://www.designcouncil.org.uk/fileadmin/uploads/dc/Documents/System-ic%2520Design%2520Report.pdf

Dunne, A. and Raby, F. (2013) *Speculative everything: Design, fiction, and social dreaming, Speculative Everything: Design, Fiction, and Social Dreaming.* MIT Press. Available at: https://doi.org/10.1093/jdh/epv001

Erlhoff, M. (2020) 'Anecdotes, Status Quo, Perspectives', in Mager, B., Sistig, M., Chen, Y., Ruiz, K., & Corona, C. (eds.) *The Future of Service Design*. Prof. Birgit Mager, KISD | TH Köln, Gustav-Heinemann-Ufer 54, 50968 Köln, pp. 8–13.

Irwin, T. (2015) 'Transition design: A proposal for a new area of design practice, study, and research', *Design and Culture*, 7(2), pp. 229–246. Available at: https://doi.org/10.1080/17547075.2015.1051829

Irwin, T., Tonkinwise, C. and Kossoff, G. (2020) 'Transition Design: An Educational Framework for Advancing the Study and Design of Sustainable Transitions', *Cuadernos del Centro de Estudios de Diseño y Comunicación* [Preprint], (105). Available at: https://doi.org/10.18682/cdc.vi105.4188

Kimbell, L. and Vesnić-Alujević, L. (2020) 'After the toolkit: anticipatory logics and the future of government', *Policy Design and Practice*, 3(2). Available at: https://doi.org/10.1080/25741292.2020.1763545

Koskela-Huotari, K. et al. (2021) 'Service system transformation through service design: Linking analytical dimensions and service design approaches', *Journal of Business Research*, 136, pp. 343–355. Available at: https://doi.org/10.1016/j.jbusres.2021.07.034

Leitch, J., Brown, B., Herchek, C., Petronelli, F., Montjin, M., and Hung, J. (2021) *Demystifying Service Design in the U.S.* frog - part of Capgemini. Available at: https://go.frog.co/the-state-of-service-design-in-the-us?_ga=2.178845671.295331963.1678718068-1185654730.1678275910

European Commission, Eurostat, Pérez-Julián, M., Leythienne, D. (2021) *Gender pay gaps in the European Union: a statistical analysis: 2021 edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2785/98845

Lippman, L.H., Ryberg, R., Carney, R., and Moore, K.A. (2015) 'Key "soft skills" that foster youth workforce success: Toward a consensus across fields', *Workforce Connection*, pp.1–4. Available at: https://www.childtrends.org/?publications=key-soft-skills-that-foster-youth-workforce-success-toward-a-consensus-across-fields

Mager, B. (2020) 'The Future of Service Design', in Mager, B., Sistig, M., Chen, Y., Ruiz, K., and Corona, C. (eds.) *The Future of Service Design*. Prof. Birgit Mager, KISD | TH Köln, Gustav-Heinemann-Ufer 54, 50968 Köln, pp.14–19.

Mazzucato, M. (2018) 'Mission-oriented innovation policies: Challenges and opportunities', *Industrial and Corporate Change*, 27(5). Available at: https://doi.org/10.1093/icc/dty034

Morelli, N., de Götzen, A., and Simeone, L. (2021) 'Service Design Capabilities', Springer Nature. https://doi.org/10.1007/978-3-030-56282-3

Ojasalo, K., Koskelo, M. and Nousiainen, A.K. (2015) 'Foresight and service design boosting dynamic capabilities in service innovation', in *The Handbook of Service Innovation*. Springer-Verlag London Ltd, pp. 193–212. Available at: https://doi.org/10.1007/978-1-4471-6590-3_10

Pacenti, E. and Sangiorgi, D. (2010) 'Service Design Research Pioneers: An overview of Service Design research developed in Italy since the '90s', *Design Research Journal*, 1, pp. 23–33.

Patrício, L. et al. (2018) 'Service Design for Value Networks: Enabling Value Cocreation Interactions in Healthcare', *Service Science*, 10(1), pp. 76–97. Available at: https://doi.org/10.1287/serv.2017.0201

Patrício, L. et al. (2020) 'Leveraging service design for healthcare transformation: toward people-centered, integrated, and technology-enabled healthcare systems', *Journal of Service Management*, 31(5), pp. 889–909. Available at: https://doi.org/10.1108/JOSM-11-2019-0332

Patrício, L., Gustafsson, A. and Fisk, R. (2018) 'Upframing Service Design and Innovation for Research Impact', *Journal of Service Research*. SAGE Publications Inc., pp. 3–16. Available at: https://doi. org/10.1177/1094670517746780

Penin, L. (2018) An Introduction to Service Design: Designing the Invisible, Springer, London.

Pillan, M. (2022) 'Embracing Human Complexity in Service Design for Inclusive and Sustainable Smart Cities', in *New Generation of Sustainable Smart Cities*. IntechOpen. https://doi.org/10.5772/inte-chopen.107250

Politecnico di Milano (2021) *Occupazione laureati - databook 2021 - 5 anni dopo*. Available at: https://indd.adobe.com/view/5e5de060-8a67-42d3-936f-fb85691c9ba5

Politecnico di Milano (2022) *Occupazione laureati - databook 2022*. Available at: https://cm.careerservice.polimi.it/dati-occupazionali/

Sangiorgi, D. (2011) 'Transformative Services and Transformation Design' International Journal of Design', *2011*, 5(2), pp. 29–40.

Sangiorgi, D., Holmlid, S., and Patricio, L. (2022) 'The Multiple Identities of Service Design in Organizations and Innovation Projects', in *The Palgrave Handbook of Service Management*, Palgrave Macmillan, Cham, pp. 497–529. Sangiorgi, D., Patricio, L. and Zurlo, F. (2018) 'Envisioning and evolving : Future evolution of the concept and the practice of service design', in *Service Design Proof of Concept ServDes2018*. Available at: http://www.servdes.org/wp/wp-content/uploads/2018/07/85.pdf

Simeone, L., Drabble, D., Junge, K., and Morelli, N. (2021) 'The potential of Theory of Change to visually model the underlying logic behind service design projects', in Di Lucchio, L., Imbesi, L., Giambattista, A., and Malakuczi, V. (eds.), *Design Culture(s): Cumulus Conference Proceedings Roma 2021*, 2, pp. 3795-3809. Available at: https://cumulusroma2020.org/proceedings-files/DC(s)_PROCEEDINGS_full_vol2.pdf

Villari, B. (2022) 'Designing Sustainable Services for Cities: Adopting a Systemic Perspective in Service Design Experiments', *Sustainability*, 14(20), p. 13237. doi:10.3390/su142013237

Vink, J. et al. (2021) 'Service Ecosystem Design: Propositions, Process Model, and Future Research Agenda', *Journal of Service Research*, 24(2), pp. 168–186. Available at: https://doi.org/10.1177/1094670520952537

Westerlund, B. and Wetter-Edman, K. (2017) 'Dealing with wicked problems, in messy contexts, through prototyping', *Design Journal*, 20(sup1), pp. S886–S899. Available at: https://doi.org/10.1080/14606925.20 17.1353034

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