



## PhD in DESIGN - 38th cycle

**PNRR\_351\_DOTT\_RICERCA Research Field: DESIGN FOR SUSTAINABILITY IN THE DIGITAL ERA. THE DESIGN OF S.PSS & DE IN AND FOR A SUSTAINABLE DIGITAL TRANSITION**

<b>Monthly net income of PhDscholarship (max 36 months)</b>
<b>€ 1195.5</b>
In case of a change of the welfare rates during the three-year period, the amount could be modified.

<b>Context of the research activity</b>	
<b>Motivation and objectives of the research in this field</b>	<p>As an individual life-changing revolution and a social transition trend, digitalization offers opportunities to improve both environmental protection, social inclusion and economic prosperity, while simultaneously bringing new conflicts and challenges to the same sustainability dimensions. Researchers demonstrated the environmental benefits of smart and digitalized services (Li and Found 2017). It is also acknowledged that Information and Communication Technologies (ICT) have a heavy environmental impact (Lucivero et al. 2020). The personalized demands accelerated by digital media may exacerbate unsustainability (Long, 2020). Socioethically, data inequality, privacy issues, questions of data misuse and political misuse of surveillance arise (Seele and Lock 2017; Sun et al., 2020). Data privacy and the danger of exposure have become a global societal phenomena (Sheng, 2019). Economically, digitalization creates new potential for local economies to improve consumer relationships, establish new models (Li et al., 2021). At the same time, the disappearance of many industry boundaries has led to significant layoffs (Li et al., 2021). Recently researchers suggested the digital era has enabled some Sustainable Product-service Systems (S.PSS) &amp; Distributed Economies (DE) models, e.g. car sharing (Vezzoli, 2021; Jiang, 2022). In fact, S.PSS &amp; DE (and their coupling) are known as promising win-win sustainability approaches (Vezzoli et al., 2021). S.PSS are</p>



	<p>models "incentivizing product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle"(EU,2020)and DE are locally-based "small-scale production units,shifting the control on essential activities towards or by the end-user"(dos Santos, et al., 2021;Ranjani et al.,2021;Vezzoli et al., 2018;Johansson et al.,2005).Some authors, on the other hand, recently started to argue that S.PSS and DE design approaches applied to digital systems may contribute to a sustainable digital transformation for all.According to former considerations, the main research questions are: RQ1.What role S.PSS &amp; DE models may play in the digital era to promote sustainable solutions?1.1 How does digitalization influence S.PSS &amp; DE?1.2 How do S.PSS &amp; DE models applied to digital systems, promote win-win sustainable benefits?1.3 Which potential scenario could be envisioned for S.PSS &amp; DE in digital era?RQ2.What are the new roles of S.PSS &amp; DE design in the digital era?2.1 What are the existing roles of design for sustainability in the digital era?2.2 What new knowledge-base(framework, theory, model)of S.PSS &amp; DE design are needed in and for a sustainable digital transition?2.3 What new know-how(methods,tools)of S.PSS &amp; DE design are needed in and for a sustainable digital transition?For what above it is clear the adherence of the program to the objectives of the PNRR,both for what concern the ecological and the digital transitions.</p>
<p><b>Methods and techniques that will be developed and used to carry out the research</b></p>	<p><b>Methodology</b></p> <p>To answer the research questions and fill the gap of lacking specific knowledge-base and know-how to design S.PSS&amp;DE in and for the digital area, a design-based research is applied, with three main research stages:1) Preliminary research,2) Prototyping and assessing,3) Reflection. The main scientific community of reference is the LeNS-Learning Network on Sustainability, counting on nearly 150 design Universities distributed in all the continents</p> <p><b>Research stage 1: Preliminary research</b></p> <p>The aim of this stage is to understand how the process of introduction and diffusion S.PSS &amp; DE can be influenced</p>



and influence the digital transition (which are the dynamics and mechanism and the associated influencing factors), and how it can be successfully managed. This stage seeks to provide an answer to RQ 1.1, RQ 1.2 and RQ 2.1.

This stage is based on the review of literature, on the development of a conceptual framework (aimed at providing a comprehensive overview on how S.PSS & DE should be successfully managed to be influenced and influence the digital transition), and a case study research, followed by semi-structured interviews (to validate, adjust and refine the conceptual framework itself).

### **Research stage 2: Prototyping and assessing**

The aim of this stage is to develop a design scenario and approach (and related method and tools) to enable design for S.PSS & DE in and for the digital era, as well as build up the design knowledge-based necessary to support practice. This stage focuses on answering to RQ 2.2, 2.3 and 1.3. In order to validate the approach, three strategies are followed. The first one is based on the implementation and evaluation of the approach in real projects. The second one is based on the implementation and assessment of the approach in a design workshop with design students (LeNS network). The third strategy is based on the involvement of experts and practitioners, in assessing the potentialities of the approach. The continuous application and evaluation of the approach and tools will bring to reflect and build up the knowledge-based needed by designers to operate in such contexts. Finally, the research identifies and develops a specific scenario where digital transition can empower S.PSS & DE and vice versa. The research period abroad will be during this stage of the research at the Brunel University London, College of Engineering, Design and Physical Sciences, Brunel Design School, UK.

### **Research stage 3: Reflection**

The aim of this stage is to undertake a retrospective analysis of the study. In fact, the reflection takes place during all stages. At this stage a retrospective analysis of the entire study is undertaken, bringing to the specification of the contribution to theory, the generalization of research results, and the identification of the promising directions for further research.



<p><b>Educational objectives</b></p>	<p>The project will be carried out within the LeNS - the Learning Network on Sustainability, launched in 2007 and nowadays counting on nearly 150 universities/institutions worldwide. The LeNS Network aims at diff using design for sustainability in world-wide design universities by promoting a learning-by-sharing knowledge generation and dissemination and adopting an open access ethos. These will promote new knowledge diffusion (and a research debate on it), and in particular curriculum development in many potentially interested university members of the network.</p> <p>In fact, all project-generated learning resources (a course made up of videos and slides, design tools, case studies, strategies and guidelines) will be uploaded on the LeNS web platform (<a href="http://www.lens-international.org">http://www.lens-international.org</a>). Design teachers and students as well as designers can access to view and download for free all learning resources. In particular, teachers can download and then modify, remix and reuse such articulated set of open access learning resources, to adapt to her/his own context and learning approach. These will strengthen the diff usion of curricular courses on the key topic of design for sustainability in the digitai era.</p>
<p><b>Job opportunities</b></p>	<p>The new competencies and skills could make a designer equipped with the proper competencies and skills to contribute in designing and developing sustainable solutions for digitai artefacts and systems. In particular, competences at the cross-link between two major contemporary issues: the sustainable and the digitai transitions. By providing such prof essionals in an area where we will see an increase in request far new particular competencies and skills. The research is facused on an area f acing an increase in request of new specific competencies and skills, i.e. it will open up new job opportunities in different companies, research and institutional organizations.</p>
<p><b>Composition of the research group</b></p>	<p>2 Full Professors                  2 Associated Professors                  1 Assistant Professors                  1 PhD Students</p>



<b>Name of the research directors</b>	Carlo Vezzoli
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<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

<b>Scholarship Increase for a period abroad</b>	
Amount monthly	834.85 €
By number of months	6

<b>National Operational Program for Research and Innovation</b>	
Company where the candidate will attend the stage (name and brief description)	
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	Brunei University London College of Engineering, Design and Physical Sciences Brunei Design School UK
By number of months abroad	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p>Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences):</p> <p>financial aid per PhD student max 4.872,90 euros per student (total for 3 years)</p> <p>Teaching assistanship: availability of funding in recognition of supporting teaching activities by the PhD student there are various forms of financial aid both for research and teaching activities. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.</p> <p>Computer availability: 1st year, 2nd year and 3rd year: Each research group will supply PhD student with a computer, if necessary.</p> <p>Desk availability: 1st year, 2nd year and 3rd year: Each research group will supply phd student with a desk</p>