

Preface

The Product-Service System (PSS) concept represents, theoretically and practically, a promising model to steer our production and consumption systems towards sustainability. PSSs are business models based on selling performance (i.e. results) rather than products. They can provide a range of economic and competitive advantages and, if properly designed, can support the dematerialisation of economy and hence provide environmental benefits.

However, it must be stressed that the uptake of this business concept by companies is still very limited. The key problem is that sustainable PSSs can be considered radical innovations. They may require a profound redefinition of the production and consumption modalities and hence their implementation may cope with the current and dominant socio-technical systems. In other words they may challenge existing customer habits, organisational structures and regulative frameworks. For this reason the introduction and scaling-up of such innovations are not completely under the control of a company (or a small network of actors), because changes in the factors that form the boundary conditions (i.e. existing organisations, institutions and networks that share dominant practices, rules and interests), are also required.

Although the concept of sustainable PSS has been discussed in the literature for over a decade, not much attention has been devoted to understand how the process of introduction and scaling-up takes place and how it can be managed and oriented. There is therefore a *knowledge gap regarding the mechanism and factors driving the implementation and diffusion of this kind of innovations and, consequently, there is a lack of strategies, approaches and tools to enable project managers, management consultants and strategic designers in designing and managing this process*. The research presented in this book aims at tackling these issues and in particular at answering the following questions: *How sustainable Product-Service System can be introduced and scaled-up? How this transition process can be designed, managed and oriented?*

The book seeks to answer these challenges by integrating concepts and insights from two research streams: one on *Product-Service System (PSS) design* and the other on *transition studies*. In particular the book, through industrial case studies and an action research project, explores and delineates the role of strategic design in supporting the introduction and scaling-up of sustainable PSS innovations.

A new strategic design role thus emerges, a role in which the ideation and development of sustainable PSS concepts is coupled with the designing of appropriate *transition paths* to gradually incubate, introduce and diffuse these innovations. A key role in these transition paths is given to the implementation of *socio-technical experiments*: protected spaces where radical innovations can be tested, become more mature, and potentially challenge and change dominant socio-technical practices, habits and institutions. The book contributes to clarify how these socio-technical experiments can act as incubators where PSS innovation can start, proliferate and develop. In particular the book focuses on the role of experiments as *Labs* (to test, learn and improve the PSS innovation on multiple dimensions and involving a multiplicity of actors), *Windows* (to raise interest on the innovation project and the related actors, disseminate results, build-up synergies with existing similar projects/initiatives, and attract and enrol new actors), and *Agents of change* (to influence contextual conditions in order to favour and hasten the societal embedding process).

The book outlines and discusses the new design approach and capabilities needed by strategic designers and project managers to design transition paths and socio-technical experiments. Finally, on a more operational point of view, the book presents a practical “how to do it” design process, and associated guidelines, to support practitioners in designing and managing the societal embedding process of sustainable PSS innovations.

The book is structured as follows.

Chapter 1 describes the nature of the problem addressed in this research. It shows that sustainability needs radical innovations, and it argues that Product-Service System (PSS) innovations represent a promising approach to steer the current production and consumption system towards sustainability. The chapter then illustrates the research goals and the research methodology adopted.

Chapter 2 provides an overview of the PSS field. It introduces the PSS concept, describes its potential benefits and the main drivers and barriers to shift towards a PSS-oriented business strategy. The chapter argues that, even if the PSS concept represents a promising economic model to decouple economic value from material and energy consumption, its application is still very limited. Therefore the challenge is not only to conceive sustainable PSS concepts (several methods and tools can in fact be used to support this task), but also to understand which strategies and development pathways are the most appropriate to favour their introduction and scaling-up.

Chapter 3 describes how radical innovations take place, and which are the related dynamics, processes and influencing factors. The chapter then illustrates the concept of socio-technical experiment and in particular its role in triggering transition processes. The chapter also discusses to which extent the concepts and insights from transition studies are valuable for the specific characteristics of sustainable PSS innovations. As a result, the chapter puts forward a conceptual framework to describe the process of implementing and diffusing sustainable PSS innovations, and its main influencing factors. The argumentation is accompanied by the illustration of several case studies.

Chapter 4 investigates the potential contribution that a strategic design approach can make in stimulating and supporting the societal embedding of sustainable PSSs. A new strategic design role emerges. A role in which the ideation and development of sustainable PSS concepts is coupled with the designing of appropriate transition paths to gradually incubate, introduce and diffuse these concepts. Starting from these considerations the chapter outlines and discusses the new design approach and capabilities required by strategic designers/project managers/consultants. The argumentation is accompanied by the discussion of an experimental design experience: the Cape Town Sustainable Mobility project.

Chapter 5 summarises the main findings and lessons learned, highlights and generalises the main contributions, and indicates potential paths for future research.

This book is thought for a broad audience interested in radical innovations towards sustainable production and consumption systems.

Firstly, the book may be of interest to the *academic and research communities* studying Product-Service Systems and (more in general) sustainable innovations and strategies, from both the design and managerial perspectives. The research provides in fact new theoretical knowledge and practice-oriented insights into how to understand, design and manage the societal embedding process of sustainable PSSs. This book is also aimed at the academic and research community in the field of transition studies: in fact it presents approaches and tools that could be adapted and used more in general to manage the introduction and scaling-up of radical innovations.

Secondly, the research may be useful for *practitioners* (strategic designers, project managers and consultants) who want to acquire the basic knowledge and the practical ‘how to do it’ competence to support and guide a company (or a small network of actors) in managing and enhancing the societal embedding process of eco-efficient and sustainable PSS innovations.

For the same reasons, this book is also aimed at *companies* that are shifting from product-based towards PSS-oriented business strategies, and want to acquire knowledge and competences about how to increase the chances to successfully introduce and scale-up PSS concepts.

Finally, the study may be of interest to *graduated students* (in the fields of design and management) dealing with PSSs and sustainable innovations.

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