

Product-Service Systems across Life Cycle

“Product-Service System as an instrument for territorial and urban Planning: from a literature review to a preliminary methodology”

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Abstract

The growing importance of different kind of services in urban and wider contexts highlights the need for integrated, designed and managed service systems. A methodological framework based on Product Service System, can aid in better understanding and organizing services, supporting the identification of strategic urban actions, and prescribing system design choices that respond to citizen needs. This approach can be strategic if applied to the management of services and products in the high complexity of a city, characterized by coping with different layers of digital data and integrated flows of people, economic and social information. This research aims to investigate and classify the literature on PSS for identifying applications of products and services for different scale of territorial planning. A PSS-based methodology is proposed that allows to respond to the complex need of the territorial and urban planning process and to guide stakeholders toward shared and transparent decision-making. The paper is a useful reference for policy makers and academics that want to have a clear and critical understanding of the use of PSS in urbanism and territorial governance.

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1. Introduction

A Product Service System (PSS) can be defined as ‘an innovation strategy, shifting the business focus from designing and selling physical products only, to designing and selling a system of products and services which are jointly capable of fulfilling specific client demands’ (1). The attention to customer needs is a central concept, together with sustainability (both social and environmental) (2) (3) and total cost reduction for many authors. For these reasons, PSS is considered valuable for manufacturers (2), but has also the potential for many applications in different contexts. In particular, urban planning could represent an interesting area for the application of the Product Service System approach.

The urban planning is becoming more service-oriented (4) also to respond effectively to the lack of resources and the growth of the proportion of world’s human population living in cities. Consequently, the management of urban areas with

new sustainable and service-oriented approaches is an increasingly important issue (5).

This reveals the presence of a certain overlap of interest and a mutual sharing of aims between the two fields (i.e. user/citizen centricity, cost-containment and sustainability).

Nevertheless, a knowledge gap affects dynamics, mechanisms and factors driving the implementation and the diffusion of PSSs in territorial governance. Consequently, no proper strategies, approaches and tools and also no formal approaches, are available to strategic designers, project managers and management consultants to take advantage from this innovative strategy. Services of the cities and for the citizens and their associated products, are complex, various and interconnected.

Frequently this kind of product-services are not formally integrated to different scales of territorial planning. Specifically, a demonstrated theory that associates in a structured way the PSS to territorial and urban planning does not exist.

This study is focused on this poorly explored area of research.

Starting from an analysis of existing cases of PSS developed in urban context, the research questions that the paper addresses are: which are the main reference applications of PSS that satisfy the needs emerged from the territorial assessment phase? Which are the main steps for PSS development in the urban field?

To answer at the research question a narrative literature review has been carried out. Scientific publications, reports and other official documents have been explored and classified using a set of defined attributes. Suggestions and remarks for future studies are then described.

In the first section of the paper territorial and urban planning features are summarized. The second section introduces the research approach. The literature findings, a preliminary methodology and some conclusions end the paper.

2. Contemporary features of Territorial and Urban Planning

Aaron Wildavsky (6) tries to give a complete definition of planning and explains his concerns about the vast knowledge domain of this discipline entitling its provocative work “If planning is everything, maybe it’s nothing”. Even if urban planning and territorial governance have such a broad area of interest, they have always been linked to the satisfaction of the needs of a community located in a specific area.

Nevertheless, the focus of urban planning and territorial governance has evolved from the two main topic of infrastructure design and spatial planning, through the design of functions linked to the territory (inspired by the theory of *zoning* that suggests the allocation of different permitted uses on different mapped zones) towards the management of a complex multilevel net of needs emerging in a specific area.

In fact, as explained by James and Holden (7), the focus of urban management *on the infrastructure question rather than the broad domains of social life that include economics, ecology, politics and culture* is reported as limiting, and a cross domain approach for a successful technical planning is instead supported.

The most recent definitions of territorial planning and management are less focused on the physical shaping of land, buildings and infrastructures and include even the management of new technologies to perform a valid territorial assessment (8).

The knowledge domain of planning is deeply investigated by Sanchez and Afzalan (9) with the theory of networks and graphs. In order to define this domain, the authors analyzed the areas of expertise and interests of over 900 regular faculty listed in the Guide to Undergraduate and Graduate Education in Urban and Regional Planning (20th Edition, dated 2013).

The resulting list of “Top 20 topics by degree and betweenness centrality” features among others fields: policy, community, environmental, land-use, transportation, housing, social and sustainable. In addition, the 25-mode network and the 8-mode network feature “Services and Governance”, “Infrastructure Services”, “Resource management” and “Social Justice” among central nodes .

The Association of American Planners (10) explains the centrality of the wealth of the community as first aim of planning and dedicated services as a mean to reach this goal.

To sum up the contemporary planning needs to face the following 6 main challenges (11):

- Providing space for economic activities and habitat
- Building the necessary urban infrastructure
- Ensuring social integration and equitable distribution of goods, services and other benefits
- Ensuring environmental sustainability
- Improving the quality of life
- Guaranteeing good governance

In addition to these challenge, contemporary planning needs more and more to be characterized by participative practices (12) (13) aimed at involving the stakeholders will in the process.

In the contemporary urban fabric, frequently challenged by social, environmental and economic issues, where administrations have transformed into “service providers” and the citizen into a “customer” (4), the PSS can be a tool to bolster the ability of the city itself to cope with the necessary changes needed to face these challenges (urban resilience) (14).

In the literature review, detailed in paragraph 3, it has been investigated whether PSS answers properly to the main challenges and characteristics of contemporary urban planning when developed in one of the fields of the related knowledge domain and if a specific methodology for developing PSS for urban planning exists.

3. The literature review approach

A literature review is based on an interest in a given context and on the need to know what is already known about it (15). In this study, the literature review has been used to learn about the diffusion of different PSSs in a geographical space. Between the systematic and narrative literature review types, the choice has been the narrative literature review that allows to have a wider scope to include all the possible contributions relevant for the research scope (15) and to enrich the human discourse (16) by generating a better understanding on the knowledge of this field.

Following the guidelines suggested by Green et al. (17), and the general literature review techniques suggested by Creswell (18), a set of attributes to classify the literature has been proposed.

It has been performed a web search in scientific databases of publications, reports of institutionally funded projects and Institutional webpages aimed at identify PSSs that had been designed in response to a urban/territorial need in collaboration with a public authority with planning power. The analysis of selected PSSs has been performed by checking a set of main attributes indicative of the responsiveness of each PSS to the main challenges and features of contemporary planning deduced from the analysis in paragraph 2, i.e.: participative process; social, economic or environmental sustainability; development in one of the fields of the knowledge domain of planning.

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