An Evidence-Based Business Model Applied to Urban Practice

The Case of Urban Void Regeneration

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Abstract: Understanding the processes that occur in the city of the 21st century is a complex task that involves different disciplines. A cross-scale interaction results from the urban texture, environmental aspects and social traits leads to a complex network of feedback loops among urban features, local ecosystems, and human health that needs to be understood to enhance design strategies for the urban environment. The paper offers an understanding of how an evidence-based business model can be successfully applied to an urban regeneration project, along with environmental morphology tools. In this sense, urban morphology, microclimatic analysis, and business model approaches are merged to explore how open and underused spaces in the city can be redesigned with a new set of assumptions, which suggests how the traditional design approach can create and deliver new values. The research offers a contribution to evaluating the cross-scale interaction of urban regeneration methods and the implication of an evidence-based business model approach in revitalising urban spaces. This approach is here described and tested to gain a richer perception of environmental aspects, urban patterns, and social interactions. The objective of this research is to explore the first application of a business model approach derived from business knowledge, that can act as a trigger in Environmental Urban Design. Operationally, this contribution focuses on the study of three regenerative solutions for an urban void in the city of Parma (IT).
Keywords: Business Model, Evidence-based Model, Urban Morphology, Urban Regeneration.

Introduction

Urban regeneration (UR) is a process of urban intervention which encompasses the reconstruction of old or underused urban areas and includes a large variety of intervention actions on buildings and adjacent urban spaces. Several definitions of UR can be found in literature, but according to Roberts and Sykes (2000) UR is defined as "a comprehensive integrated vision and action which leads to the resolution of urban problems, and which seeks to bring about lasting change in the economic, social, physical and environmental condition of an area that has been the subject to change" (Roberts & Sykes, 2000). In Couch's research (Couch, 1990), UR is described as an attempt to act on a city (or on a portion of it), and this action overcomes "the aims, aspirations, and achievements of urban renewal, which is seen as a process of essentially physical change; urban development (or redevelopment), with its general mission and less well-defined purpose; and urban revitalization (or rehabilitation), which whilst suggesting the need for action, fails to specify a precise method of approach". In this view, the concept of UR incorporates more than just the act of renewal.

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UR is today a topic of increasing importance, with recognized social, economic, and environmental consequences. Nowadays cities are experiencing many different issues that should be considered as a whole since they are deeply embedded within a complex network of feedback loops, that involve urban features, local ecosystems, human health, and social needs that must be assumed to enhance design strategies for the urban environment. The increasing acknowledgment of the importance of UR has been corroborated by diverse EU policies, legislation, and instruments such as: the Leipzig Charter (European Union, 2007); the Europe 2020 strategy (European Commission, 2010) the Paris Agreement (European Commission, 2015); the 2030 Sustainable Development Goals (United Nations, 2015); and the Pact of Amsterdam (European Union, 2016).

On these premises, innovative approaches in managing UR projects are deeply appreciated by academics, unless it is quite difficult to apply in a real-life case project. Innovation is increasingly seen as a helpful approach to the development of new service contributions, new business models, new processes or new management practices and today can be also applied to architectural practise. Applying a Business Model (BM) method to an urban redevelopment or UR project is a new and only partially investigated approach.

As a standard BM, which illustrates how a company can generate and deliver value to its customers while also generating profits, the idea of an Evidence-Based Business Model (EBBM) here defined and tested on a selected case study, can assist municipalities and architects in defining how they will create and provide public value through UR projects (Letaifa, 2015). Currently, a small amount of research mostly focuses on the smart city business model (Walravens & Ballon, 2013; Walravens, 2015; Díaz-Díaz, Muñoz & Pérez-González, 2017; Timeus, Vinaixa & Pardo-Bosch, 2020) but there is a gap in research on EBBM. The research presents the potentialities and verifies the constraints of EBBM in the case of an UR project, to provide city managers and local architects and urbanists with a smart and valuable procedure.

To conduct this research, this paper is divided into the following sections: i) intersection between Business Model and Urban morphology; ii) Aims and objectives of the research; iii) Urban Void identification in Parma (IT); iv) Business Model Canvas application for a selected urban void; v) Urban Void reuse projects; vi) conclusions.

The research aims to demonstrate, through a specific case study, the advantages of an integrated approach that can be used in urban regeneration projects to support a more comprehensive and holistic design that goes beyond traditional morphological assessment. This is achieved by incorporating Evidence-Based Business Model (EBBM) resources, which are derived from the Business Model Canvas method.

1. Intersection Between Business Model and Urban Morphology

Although urban morphology and business model are distinct disciplines and belong to very different environments of knowledge, some recent examples of the application of BM in smart cities unveil interesting insights into the possibilities and advantages connected to the joint application of the two disciplines to urban renewal and urban regeneration projects.

Urban morphology is the study of urban contexts through the examination of the urban fabric, which is a particular arrangement of local patterns consisting of streets, buildings, and open areas and is thought to be a one-of-a-kind result of the physical city's conscious and unconscious design (Caniggia & Maffei, 1979). Urban morphology is a discipline that was developed in the early 1950s to help understand the issues facing modern cities. However, it is now obvious that to be better equipped to meet the demands of citizens and the

challenges of a changing society, urban morphology should be integrated with other subjects and tools.

A trustworthy body of research (Manson & O Sullivan, 2006; Ortman, Lobo & Smith, 2020) has been developed in recent decades by the examination of the contemporary city, highlighting the role of urban morphology as an interdisciplinary field involving architecture, landscape architecture, architectural history, geography, history, urban planning, and archaeology, which faces significant challenges in depicting complex urban relationships. These days, it requires new analytical tools and a capacity for synthesis among different disciplines, needs, and information. Urban morphology refers to the study of urban form, which focuses on the development and transformation of urban structures in cities and neighbourhoods over time. It examines their spatial patterns at different scales and physical characteristics to inform appropriate urban interventions that promote sustainable urban development.

On the other side, the Business Model (BM) is defined as a conceptual tool that encompasses several interconnected elements. These mechanisms allow organisations to express their business logic, which describes how they conduct their operations and create value. BM helps organisations add value, attract customers willing to pay for this value, and effectively manage the profit generated from this relationship (Zott, Amit & Massa, 2011). BMs are not strategies as such, but rather guidelines that reflect a strategy. They are the primary factors for interpreting, comprehending, and efficiently conveying strategies, both internally within an organisation and externally throughout its business ecosystem. BM should reflect an organisation's strategic choices and operational implications (Wirtz, Pistoia, Ullrich & Göttel, 2016).

To effectively utilise a BM in public policy decisions for UR projects, it is crucial to align the methods and instruments with specific objectives and provide active support to public policy decision-makers and practitioners. For these reasons, recent studies have focused their attention on adapting the concept of the Osterwalder Business Model Canvas (BMC) to address urban needs and articulate their value propositions (Osterwalder & Pigneur, 2005; Carayannis, Sindakis, & Walter, 2015). According to Blank (2013), instead of engaging in complex planning and research or creating intricate business plans, hypotheses and strategies can be summarised in a framework called the Business Model Canvas (BMC).

Several recent studies have examined how business models can promote architectural advancements, including sustainable approaches (Boons & Lüdeke-Freund, 2013), sustainable innovation (Kuk & Janssen, 2011), urban mobility and smart city projects (Giourka *et al.*, 2019). The literature has paid less attention to the application of a BM in sustainable and innovative UR projects.

However, there is still a limited understanding of how to implement an evidence-based urban renovation project (EBUR) according to a BMC method. There is limited understanding of how to create economically feasible and sustainable business models for those involved in the UR project, while also successfully enhancing innovation.

2. Aims and Objectives

With these premises, the main research question is how to effectively utilise the BM to actively support a UR project. Consequently, the study aims to investigate the benefits of integrating a BM workflow into an urban morphology approach to support an urban renewal to be applied to more energy and environmentally oriented aspects. The Erasmus Plus

KAEBUP project (https://www.kaebupr2p.eu) provided the opportunity to apply the Business Model Canvas BMC to a UR project.

The purpose is to provide an initial overview of the benefits of integrating the well-known BM method with urban renovation to assist decision-makers and practitioners, integrating an approach that also emphasizes the practical application of the findings of available current research. By using environmental morphology instruments and methods, along with BMC, we can obtain accurate analyses of how specific urban areas can be revitalized and repurposed. This approach involves optimizing user needs, while also leveraging business requirements. To achieve our objectives, we have selected a significant urban area in the city of Parma as a case study.

The main objectives of the paper are as follows:

- assess how BM can be applied into architectural and urban practice in a real-life case study;
- assess three different scenarios of reuse;
- discuss integration potentialities and constraints applied to the case studies.

3. Urban Void Identification in Parma (IT)

Parma is a city with a population of about 200,000 inhabitants in the north of Italy. Like many other historic cities it has numerous urban voids, which have formed because of sedimentation and modifications to the urban fabric. Today, many urban vacant spaces require interventions for recovery and redevelopment, both for urban and strategic purposes, to meet the modern needs of citizens and tourists (Hwang & Lee, 2019). Several studies have recognized the importance and value of vacant urban spaces, commonly referred to as "urban voids".

Several recent local policies have focused on participatory methods for the redevelopment of public spaces (Geddes, Charalambous & Papallas, 2019).

What is still missing is the incorporation of a business model approach to the topic of urban renovation.

Thus, this research offers some preliminary reflections on the benefits and opportunities of using BM to address an urban voids project in the city of Parma. During the 3rd business model workshop held in Parma and hosted by the Authors as part of the KAEBUP Project, we examined a major urban void in the Oltretorrente Neighbourhood (Figure 1).

Despite the great canopy that covers the triangular open space, the actual square is deeply underused due to a large variety of issues.

The selected case study is Piazzale Rondani (Figure 1). It is a triangular-shaped square, adorned with a dense canopy of trees, and has a total area of 2900 square meters. Located in the northern part of the school district, it is frequented by approximately 2500 students daily. In the vicinity there are numerous school buildings, which is the primary reason for the abundance of parking lots in this area. On the east side, near the Torrente Parma (Parma River), there is a monument called the Barricades monument. Currently, the square is underused, principally because of the high traffic volume in the area, which is caused by the presence of numerous school buildings and students. The ample shade provided by the trees' canopy is highly advantageous during the summer months, as the square is one of the few green and unpaved spaces in this historic district. Nevertheless, no other activities take place in this vacant area, which is the main reason for its underutilization and deterioration.

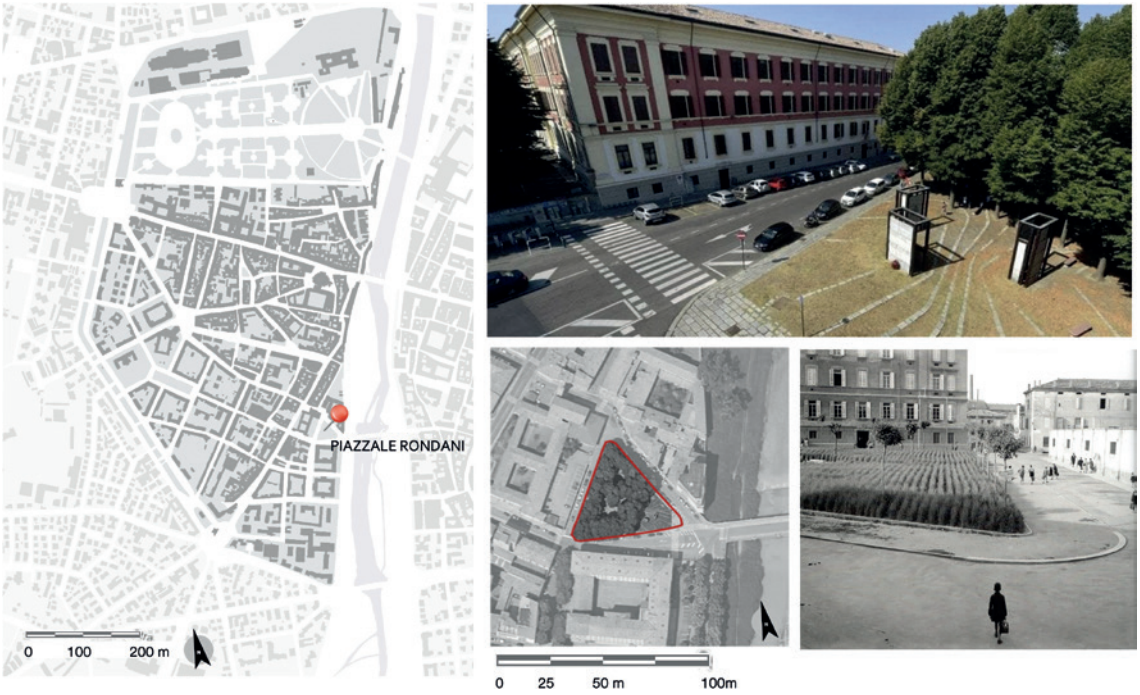


Figure 1. *Parma Oltretorrente Neighborhood and Piazzale Rondani. Actual view and Piazzale Rondani in 1942.*

3.1. *Walk-Through Survey*

The first part of the assessment involves conducting a site inspection to gather valuable data for the UR project. We conducted a site survey to gather information on the morphological characteristics of Piazzale Rondani. This included assessing the presence of specific elements, collecting data on vegetation (such as trees and grass), documenting materials used for finishes, and identifying urban furniture elements, light posts, and other urban features that can help us understand the strengths, weaknesses, opportunities, and threats of Piazzale Rondani. The site inspection allowed us to take pictures, evaluate the actual usage during different times of the day, and ask locals for suggestions on how to reuse the void. The features that were observed regarding the selected void attributes during the walk-through survey are discussed in Figure 2.

Similar research was carried out through a questionnaire survey and semi-structured interviews. The qualitative features of Piazzale Rondani were scored on a 5-point Likert attitude scale. Users who were identified as stakeholders in the study locations participated in some semi-structured surveys to investigate users' perception of the square.

3.2. *Morphological Assessment*

From a morphological point of view, Piazzale Rondani belongs to a fringe belt of the modern fabric of the Oltretorrente district. It is located immediately beyond the pertinent strip of the matrix route made up of the Nino Bixio Road and operates as a connection with the fabric parallel to the Parma River. Its triangular form is derived from these morphological characteristics as well as from the presence of "non-active facades" on the northern front (this is the back of the fabric built along the matrix route).

Morphologically, it is anti-nodal with respect to the Oltretorrente district, but it acquires a potentially nodal value of connection with the historic center thanks to the construction of the Caprazucca bridge. To this end, its radical rethinking is necessary, both with respect to the new role it can assume within the district, and with respect to the wider historical urban fabric. The functional analysis indicates a prevalence of school buildings rather than residential ones. The survey was conducted thanks to the GIS tool, which reinterpreted the investigation on site.

Current view of the urban void						
Weakness	Excessive unused space in front of the monument of the barricades	Square blind side with high wall	Poor and poorly maintained outdoor furniture	Uncomfortable, uneven and unsafe sidewalks	Lack of playground equipment or bike storage/stall	Lack of social /public identity
Strenght	Permeable open space	Noise protection and public space for Graffiti art gallery	Outdoor seating under the shade	Large sidewalks	Large Parking area (for people visiting the city centre)	Large sitting open area
Users' survey potential use	Open green space in the historic urban texture for outood activities and for school students	Graffiti art gallery and youth space	Outdoor safe space for outdoor activities	Sidewalks and bikepath space	Inclusive public park/ playground/ neighborhood ground	Inclusive public park for school district use

Figure 2. *Case study site features.*

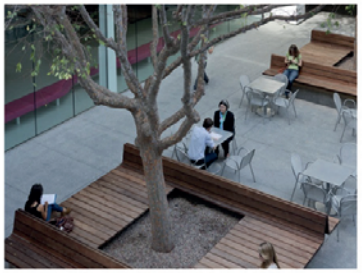
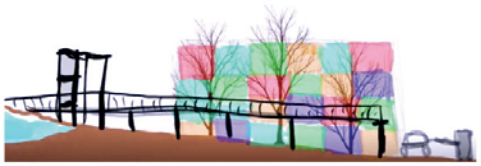
Project name	Theater of the Barricades	Tree Angle food court	REuse REenergize RE member
Main funtion	Open-air theatre 	Open-air food court 	Community garden 
Value proposition	Provide local users (mainly school kids) with a place of memory and a place for teenage users, where they can experience freedom in a safe place, by removing obstacles to comfort	Offer a safe space for students and staff to meet and eat at affordable prices after school; an original and alternative eating and meeting experience for locals, families and tourists during evenings and holidays A renovated public and safe space for the community	A convivial area to help the community safely use the space by providing sustainably powered infrastructure for social gatherings and environmental education
Expected impact	A diffuse sense of ownerships, socio-educational values, greater sense of safety and a new affordable space for teenagers	Parma is known for its high-quality food products and food is part of local identity. The project will reactivate the place in terms of social identity, by recovering an abandoned square for the student in school district.	Continuous integration of an IT structure for Object Self-service in the sustainable energy showroom, continuously innovating the energy production and sustainable design and providing a dynamic leverage of the space
Customers Relationships and Distributions	Intended users are teenagers, as they left the school district can find the in square a safe place where to gather and spend some outdoor time, In the evening theatrical shows can take place	Intended users are teenagers, as they left the school district and family and tourist in the evening/weekends	Intended users are students and residents
Resources & Partners identification	• Key partners: Local teather foundation 30% and Municipality 70% • Revenue: partial use of space for free and rental to theatres, associations, etc.	• Key Partners: Municipality, Food Providers, Food Producers, the Community • Revenue: Selling Products, Renting Spaces	•Key partners: Local energy provider ENEL, Parma football club •Revenue: Energetic Community funds (EU); Sustainable energy showroom including electric parking (ENEL) Renovation funds (Parma)

Figure 3. *Brief Projects description according to BMC. Credits project 1: I. Geddes, D. Panagiotou, L. Lima, V. Eliopoulos; project 2: A. Kalopedis, F.D. De Rosa, M. Tsangaris, M. Tuastad; Project 3: A. Riccioni, R. Shametaj, Ana M. Dias, C. Anthimou, K. Gregoriou.*

4. Business Model Applied to Piazzale Rondani

The main objective of the project is to reactivate an Urban Void in Parma by proposing the integration of a BM approach, based on an understanding of the space's needs and constraints in regard to urban morphology.

Consequently, the standard BM is applied in a simplified way and some alterations are considered to encompass the architectural and urban nature of the project to the Piazzale Rondani Case study, as follows:

1. Value proposition definition.
2. Customers' Relationships and Distributions:
   a. For whom do you create value?
   b. How do you establish and maintain a relationship with your clients/users?
   c. What are the best channels to reach your client/users?
3. Resources & Partner identification:
   a. Who are your key partners?
   b. What do you need to deliver your value proposition?
   c. What resources are needed to deliver your value proposition?
4. Financial aspects and expected impact.

From a practical point of view, the experimental design project is divided as follows: we firstly observe the opportunities and challenges in the case selected in Parma (1); propose an intervention according to Environmental Urban Morphology (2), evaluate the impact on users (3), define our business model (4), present a value proposition (5).

5. Urban Void Reuse Projects

Three different projects are defined with the aim of reactivating the urban void of Piazzale Rondani, considering the evidence-based data, namely the information derived from the surveys and Urban Morphological assessment. To keep things concise, specific projects' descriptions won't be covered in this article; instead, the focus will be on their goals, which result from a combined appraisal of morphological features and factors derived from the BMC's application.

The main features for each UR project are briefly described in Figure 3, following the BMC structure (Value proposition definition, Customers Relationships and Distributions, and Resources and partner identification).

The three projects were developed based on the information gathered during the inspection, through interviews with the users, and by applying a BM approach to the UR project. The projects aim to provide a recovery and reuse scenario based on an urban morphological approach, but also to apply an innovative method that considers, at the same time, functional, economic, user-related, and feasibility aspects of the project itself.

Project one, called "Theatre of the Barricades", aims at reducing actual barriers to ensure overall outdoor comfort conditions and giving local users – mostly schoolchildren – a space for gathering and an outdoor and protected location where teenagers can enjoy independence in a secure environment. The reuse project is modelled to provide the final users with a sense of ownership, socio-educational values, a greater sense of safety, and a new, affordable space for teenagers.

Project two, "Tree Angle Food Court", is derived from the fact that Parma is renowned for its fine culinary products, and that local identity is shaped by cuisine. Through the recovery of an abandoned square for the students in the school district, the project would revitalise the area in terms of social identity, offering a harmless space for students and school

staff to meet and eat at affordable prices after school – an original and alternative eating and meeting experience for locals, families, and tourists during evenings and holidays.

Project three, "Reuse-Reenergize-Remember", is the most diverse reuse project presented here, intended to define a convivial area to help the local community safely use the urban void by providing sustainably powered infrastructure for social gatherings and environmental-oriented education programs.

The three reuse design projects presented in Figure 3 aim to systematise the functional requirements of Piazzale Rondani. The urban square design illustrated here is based on a collaborative morphological interpretation that has previously identified the functional requirements concerning pedestrian paths, economic needs, and local constraints. Besides architectural and urban requirements, all three projects consider the users' requests and foreseen benefits by evaluating the economic feasibility in both present and future scenarios. Through a simplification of the well-known BMC, the projects presented here exemplify a practical and economically sustainable approach to reusing and revitalising abandoned urban spaces. The results of the three projects indicate that the effectiveness of the workflow does not depend on the functions envisioned by the reuse project. The definition of customer relationships, distribution, and identification of resources and partners (as defined in paragraph 5) is facilitated when the project includes an economic activity that allows for an easier assessment of revenue.

Conclusions

The research has highlighted the possibility of integrating traditional methods used in UR projects with a business-oriented approach. Although the projects are not yet realised, this contribution focuses on how the business model, usually applied in the case of business development or business-oriented projects, can be profitably translated into design practice. The established urban renewal approach can take advantage of the methodological workflow used in the business model canvas and be profitable for urban renovation projects by securing the quality of open public spaces, making their usage more profitable, and providing a more coherent treatment according to the user's expectations and economic outcomes. This approach offers several advantages, including a business perspective that considers the value proposition, the expected impact of the project, customer relationships and distribution, as well as resource, partner, and revenue identification. The experience offered by the KABEUP project on the regeneration of urban voids provided an opportunity to test the feasibility of applying a BM to an UR project. As evident from a critical evaluation of the three presented projects, integrating functional, morphological, and business-oriented aspects in an UR project is both promising and beneficial. Some further considerations should be made to thoroughly test the approach of applying the Evidence-Based Business Model to other urban renovation projects.

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References

Blank, S. (2013), "Why the lean start-up changes everything", *Harvard business review*, 91(5): 63-72.

Boons, F., Lüdeke-Freund, F. (2013), "Business Models for Sustainable Innovation: State-of-the-Art and Steps towards a Research Agenda", *J. Clean. Prod.*, 45: 9-19.

Caniggia, G., Maffei, G. (1979), *Lettura dell'edilizia di base*, Firenze: Alinea.

Carayannis, E.G., Sindakis, S., Walter, C. (2015), "Business Model Innovation as Lever of Organizational Sustainability", *J. Technol. Transf.*, 40: 85-104.

Couch, C. (1990), *Urban renewal theory and practice*, London: Macmillan Education Ltd.

Díaz-Díaz, R., Muñoz, L., Pérez-González, D. (2017), "The Business Model Evaluation Tool for Smart Cities: Application to SmartSantander Use Cases", *Energies*, 10 (3): 262.

European Commission (2010), *Europe 2020 – A Strategy for Smart, Sustainable and Inclusive Growth*, Brussels: European Commission.

European Commission (2015), *Adoption of the Paris Agreement*, Brussels: European Commission.

European Union (2007), *Leipzig Charter on Sustainable European Cities,* Leipzig: German Presidency of the European Union.

European Union (2016), *Urban Agenda for the EU – Pact of Amsterdam*, Brussels: European Union.

Geddes, I., Charalambous, N., Papallas, A. (2019), "Participatory methods in the development of public space: case studies review", in *Planning for Transition. AESOP Annual Congress*, Venice.

Giourka, P., Sanders, M.W.J.L., Angelakoglou, K., Pramangioulis, D., Nikolopoulos, N., Rakopoulos, D., Tryferidis, A., Tzovaras, D. (2019), "The Smart City Business Model Canvas – A Smart City Business Modeling Framework and Practical Tool", *Energies*, 12: 4798.

https://www.kaebupr2p.eu (Accessed 30 June 2023).

Hwang, S.W., Lee, S.J. (2019), "Unused, underused, and misused: An examination of theories on urban void spaces", *Urban Research and Practice*, 13(5): 540-556.

Kuk, G., Janssen, M. (2011), "The Business Models and Information Architectures of Smart Cities", *Journal of Urban Technology*, 18 (2): 39-52.

Letaifa, S.B. (2015), "How to Strategize SMART Cities: Revealing the SMART Model", *Journal of Business Research*, 68(7): 1414-1419.

Manson, S., O Sullivan, D. (2006), "Complexity theory in the study of space and place", *Environment and Planning*, 38(4): 677.

Ortman, S.G., Lobo, J., Smith, M.E. (2020), "Cities: Complexity, theory and history", *PLoS ONE*, 15(12).

Osterwalder, A., Pigneur, Y. (2005), "Clarifying Business Models: Origins, Present, and Future of the Concept", *Commun. Assoc. Inf. Syst.*, 16.

Roberts, P., Sykes, H. (2000), *Urban Regeneration*, London: SAGE Publication.

Timeus, K., Vinaixa J., Pardo-Bosch, F. (2020), "Creating business models for smart cities: a practical framework", *Public Management Review*, 22(5): 726-745.

United Nations (2015), *Transforming Our World: The 2030 Agenda for Sustainable Development (Sustainable Development Goals)*, New York: United Nations Population Fund.

Walravens, N. (2015), "Qualitative Indicators for Smart City Business Models: The Case of Mobile Services and Applications", *Telecommunications Policy*, 39(3-4): 218-240.

Walravens, N., Ballon, P. (2013), "Platform Business Models for Smart Cities: From Control and Value to Governance and Public Value", *IEEE Communications Magazine,* 51(6): 72-79.

Wirtz B.W., Pistoia A., Ullrich S., Göttel V. (2016), "Business models: Origin, development and future research perspectives", *Long Range Planning*, 49: 36-54.

Zott C., Amit R., Massa L. (2011), "The business model: Recent developments and future research", *Journal of Management*, 37: 1019-1042.