Barcelona

Source : https://fr.wikipedia.org/wiki/Place_d%27Espagne_(Barcelone)

Barcelona's innovation policy is mainly based on open data. Catalonia passed a new law on transparency and access to public information at the end of 2014. The law, whose implementation at the level of municipal government in Barcelona took at least three years, gives citizens the right to request and receive public information. Barcelona City Council has now developed a repository of open data: the Open Data BCN portal. It includes more than 450 open datasets on many subjects and gives citizens a form of empowerment. The portal has many goals, one of which is to achieve transparency. Access to and use of the data hosted on the portal is free of charge and not subject to legal restrictions. Therefore, any citizen can download public data and develop a service or app that mixes individual data and public data.

In addition to fostering innovation in a collective and collaborative way, Barcelona City Council is paying special attention to entrepreneurship. Barcelona Activa, a local development agency, supports this process by promoting entrepreneurship and offering support to companies and startups.

We awarded Barcelona above-average scores across the majority of the eighteen dimensions. It performs especially well in technological dimensions, but it is clear that the Catalan city may have not efficiently communicated and promoted initiatives that would fall within the following five dimensions: Business-Led Job Creation, Welcoming of Minorities, Air Pollution, Recycling Services, and Cultural Activities.

Barcelona was one of the world's first cities to have a public network of fab labs, which are small-scale workshops focused on digital fabrication. Citizens appear to be playing a vital role in the city's development and have many options to participate in change at grassroots levels. For these reasons, Barcelona can rightly be described as the **Digital City** among our six.
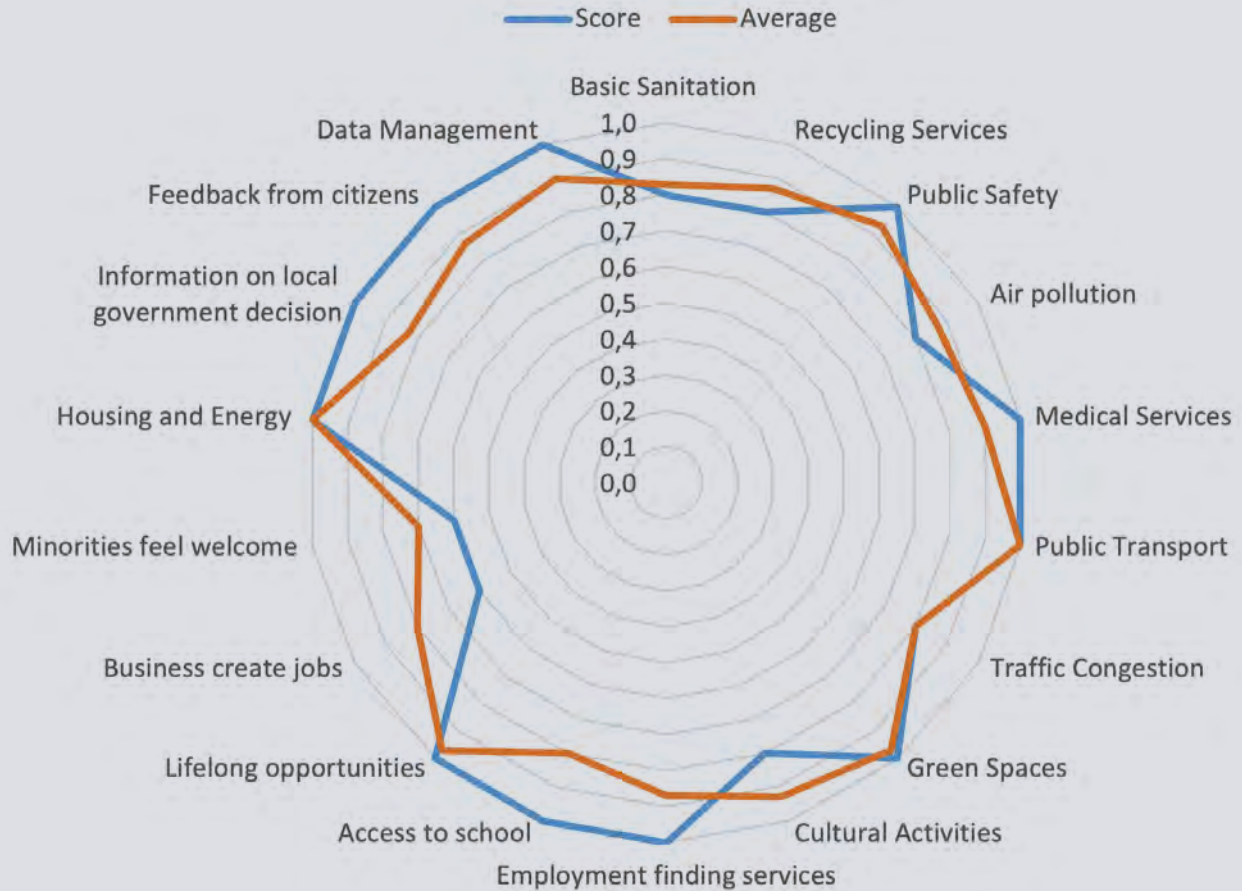
Barcelona

Chart type designed to plot 18 factors translated into values over multiple quantitative variables.
Blue line is about the city and Orange line is the average value for the six selected cities. It should be used with care.

Executive summary

Barcelona is the capital city of Catalonia. It is well known both as a tourist city with a strong brand and as a leading smart city. In 2017, the biggest event that happened in Catalonia was the independence referendum, which the Spanish Supreme Court held to be illegal. Moreover, in 2017, around 74 percent of people were dissatisfied with democracy in Spain, and within that sample, 81 percent of Catalans were disappointed too (Dorothy Manevich, 2017).

A city that has had renewed success in attracting tourists since the 1992 Olympic Games, Barcelona has become one of the most distinctive international tourist destinations over the past twenty-five years. Barcelona is the only city in the world with nine UNESCO World Heritage Site buildings. It is also the fourth most important cruise port in the world. In recent years, however, tourist inflows have raised social concerns and sparked resident-led campaigns against the continuous growth in visitors that the city has been experiencing.

Barcelona is also a leading smart city. In 2011, it was selected as the GSMA Mobile World Capital for the 2012-2018 period, and it was awarded European Capital of Innovation (iCapital) status by the European Commission (2014) for "introducing the use of new technologies to bring the city closer" to its citizens.

The city was awarded the Bloomberg Philanthropies 2014 Mayors Challenge Grand Prize for Innovation. The prize was five million euros of financing for a digital and community "trust network" for the city's at-risk elderly residents. In addition, Barcelona won the City Climate Leadership Award 2014 in the category of Intelligent City Infrastructure for its new ICT architecture, which connects the entire city via a single platform.

The European Parliament (2014) selected Barcelona in its first group of smart cities. The main selection criterion for cities was their running a large number of initiatives that address a variety of issues. The European Parliament selected the six most successful cities for further in-depth analysis: Amsterdam (Netherlands; see Chapter 2), Barcelona (Spain), Copenhagen (Denmark; see Chapter 4),

Helsinki (Finland), Manchester (UK), and Vienna (Austria; see Chapter 7) (European Parliament, 2014).[1] We can also classify Barcelona as a transversal city because it has developed projects focused on areas such as telecommunications networks, urban platforms, and intelligent data (the Open Data BCN portal).

Barcelona's smart city agenda rests on two pillars. The first pillar is digital transformation. This pillar focuses on how the city's government should make use of technology. The core idea is to give citizens and startups access to data. The second pillar is a fundamental shift in the web of relationships between city stakeholders. In this case, the aim is to modernize the links and interactions between public bodies, the private sector, and citizens. This shift is therefore characterized by moving away from a purely technology-led agenda toward the creation of a disruptive city that is capable of undertaking urban projects involving both private companies and citizens. The expected effect of transforming the city-business relationship is to drive local economic growth. Moreover, this new policy, set up in 2018, should allow citizens to control their own data. The underlying idea of Barcelona's strategy is to "develop the digital empowerment of residents," as Francesca Bria, Chief Technology and Digital Innovation Officer of Barcelona, has stated.[2]

This shift had also meant reworking procurement agreements to reflect that data is something like a collective good—or, potentially, a right for people. Barcelona municipality aimed to set a new policy able to improve the common good. As a consequence, Barcelona has envisaged a new environment in which a partner company or any stakeholder will transfer good-quality data to the city platform. Therefore, the municipal government can reuse specific data in its open and free-access data platform. An interesting example could be how all the operators of scooters, bikes, and even ebikes could share data with the city platform, allowing entrepreneurs to create new opportunities or business models focused on multimodal transport. This deep improvement leads to a greater protection of privacy, so citizens and local companies can create value out of it. It is about the optimization of data for business and citizens.

(1) https://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET%282014%29507480_EN.pdf (Accessed in June 2020 and on 13 July 2021).
(2) https://www.connective-cities.net/aktuelles/how-barcelonas-smart-city-strategy-is-giving-power-to-the-people (accessed in June 2020 and on 13 July 2021).

A modern approach to governance?

Barcelona's strategy is to respond to the two main challenges the city was facing in terms of its own organization and the integration of citizens, private companies, and the local administration (Gascó-Hernandez, 2018). Josep-Ramon Ferrer, a former director of Barcelona's smart city program, described that program as aiming to obtain a better coordination between place, people, the private sector, and the public administration (Ferrer, 2017). Barcelona's smart city strategy aimed to obtain a better launching and implementation of cooperation between private and public partners. It facilitated collaboration between companies, research centers and universities, and international organizations (Gavaldà and Ribera, 2012; Mora, Deakin, and Reid, 2019).

One of the strengths of Barcelona's smart city strategy has been its use of a crosscutting or horizontal approach rather than a top-down one. Additionally, the city has deployed an innovation-based model in order to provide new and useful services to citizens (Bibri and Krogstie, 2020; Smith and Martín, 2021). The collaborative projects undertaken have developed some replicable processes (Ferrer, 2017). Three characteristics define cooperation here:
- Bringing the city closer to citizens;
- Launching initiatives through open data;
- Offering valuable information to citizens, private companies, and, more generally, stakeholders.

For instance, some scholars describe the City Operating System (City OS) as a decoupling layer between data sources and smart city solutions. The platform supplies different open sources and offers modules that can be added to and connected with each other (Bibri and Krogstie, 2020; Carrasco, Ricart and Berrone, 2017). This open data platform, called Smart Citizen, is a remarkable example of the replicable process that have been implemented in Barcelona. This open data platform is designed to generate participatory processes in the city (ajuntament.barcelona.cat/digital).

However, to go beyond the traditional smart city approach, technology cannot be seen as a goal in itself: it is simply a tool and a facilitator. The purpose of data collection, analysis, and platform management is to help decision making. Digital collaboration should ease policy making at the city level (March and Ribera-Fumaz, 2016; Smith and Martín, 2021). To be sure, technology is at the core of the current smart city transformation in Barcelona. Most importantly, this technological approach represents a tool to better govern and organize the city in a smarter way (Ferrer, 2017). Two features are critical: focusing particularly on engaging and empowering citizens (Francesca Bria, March 2018), and making them actively participate in the policy-making process.[3]

A strategic and transformational city project

Barcelona's strategy has been embedded into an ambitious transformational plan (March and Ribera-Fumaz, 2018). Ferrer (2017) describes a plan named "Barcelona N.0." It has followed two main steps, taking advantage of both the Olympic Games (1992) and the annual Mobile World Congress organized in Barcelona. The post-Olympic era, named "Barcelona 4.0," was a step that involved the geographical expansion of the city center to the seashore. To achieve this, the city started the building of new transport infrastructure (ring roads, an airport, and so on). It aimed to include the historical city in a larger metropolitan area (Ferrer, 2017; Mora, Deakin and Reid, 2019).

Source: enes-f-DvU93UhTs-unsplash

The second step of this plan was named "Barcelona 5.0." It was implemented between 2015 and 2018 (Gavaldà and Ribera, 2012). The aim of "Barcelona 5.0" was to make the city become more inclusive, more productive, and more

self-sufficient (March and Ribera-Fumaz, 2016). Barcelona expected to be an innovative city, favoring citizens, creating business communities, and offering public spaces (physical or digital). This urban transformation project relied on a long-term and ambitious vision (https://ajuntament.barcelona.cat/digital/en/about-us).

A city attempting to design an action plan to tackle local challenges

At a local level in all cities, many specific attributes count. In the context of booming international competition between cities, each must develop a long-term vision. The vision for each must guarantee resources (physical, financial, and human), secure a fair redistribution among people, and run welfare policies. Vision relies on relevant urban planning and the city's capacity to develop solutions to environmental challenges. However, each city is singular and cannot rely on a single template. In Barcelona, the city executives have developed a transformational city vision to try to embrace all areas and parts of the city. After 2013-14, the starting point focused on data and ICT, thanks to the digital and mobile orientation of Barcelona (Bibri and Krogstie, 2020; Carrasco et al., 2017). Then, since 2018, the smart city strategy has enlarged the vision of the city, putting at its core citizen participation and an open-data policy. This second step of the approach has involved the launch of twenty-two programs (Ferrer, 2017; https://ajuntament.barcelona.cat/ecologiaurbana/22barcelona/ca/). It includes different initiatives, projects, and strategies, and it pays attention to engaging all types of stakeholders.

Engaging citizens in the process

Ferrer (2017) suggests that the premise "no smart city without smart citizens" might be a fitting motto for Barcelona. Compared to other cities (Mora, Deakin and Reid, 2019; Noori, Hoppe and de Jong, 2020), Barcelona has started an impressive urban transformation: the first move was focused on ICT, while the second was a much more society-focused program (March and Ribera-Fumaz, 2016 & 2018). The city envisioned that citizens could play a growing key role in the development of Barcelona. Many specific programs have been developed to encourage the adoption of new policies. The following examples perfectly illustrate the citizen-driven nature of these innovation policies. First, there is the implementation of Barcelona a la butxaca (Barcelona InYourPocket) (https://www.inyourpocket.com/barcelona/features), a program promoting the development of mobile-supported apps and services. Second, municipal fab labs have been designed as places where people can learn and collaborate. They form part of the city's social development because they are conceived as a public service focused on technology and digital activities (https://ajuntament.barcelona.cat/digital/en/digital-empowerment/digital-education-and-training/fab-labs ; https://iaac.net/fab-labs/fab-labs-bcn/). For many scholars (Gascó-Hernandez, 2018; March and Ribera-Fumaz, 2018), this innovation environment is one of the reasons why Barcelona won the European Capital of Innovation Award in 2014 (https://ec.europa.eu/commission/presscorner/detail/en/IP_14_239).

The policy of engaging citizens also means enhancing transparency through managing the city in a more open way, implementing more inclusive methods, and favoring participation. Barcelona seems to be prioritizing engagement with upstream citizens in the definition of city programs. It is making them participate in programs' design, execution, and subsequent evaluation. In Barcelona, smart governance appears to be more about citizen engagement rather than simple citizen participation (Calzada, 2016; Smith and Martín, 2021).

Building a sustainable ecosystem

At a global level, Barcelona competes to attract capital flows, investments, talent, and so forth (Barcelona & Catalunya, 2017).[4] Competition across cities is also about quality of life, leisure activities, and lifestyle offered to citizens. Therefore, the different types of collaboration (public-public, public-private, and tripartite with civic organizations) have been strengthened. Barcelona has set up new standards to attract and encourage industrial players to invest in the development of innovative services, goods, and products that can gain critical mass. As an instrument, spaces fully dedicated to innovation (for example, urban innovation labs and fab labs), aimed at testing urban solutions, are critical. These innovation labs also represent a way to engage

citizens in the innovation process.[5] From this perspective, Barcelona has succeeded in becoming a knowledge hub and a social lab.[6] These initiatives have transformed the city as a whole into a creativity center that is focused on innovation and encouraging entrepreneurship.

Our analysis of Barcelona centers on the following main topics:

Basic sanitation: Barcelona's smart irrigation system, implemented in parks and gardens within the city, has been efficient because it helps to anticipate plants' needs and correlate water supply with the weather. The municipalities of Barcelona's metropolitan area estimate that this system has enabled them to lower their water bills by almost 25 percent through reduced water usage (Sree Venkitesh, 2016).

Recycling services: In 2012, the city of Barcelona approved its Waste Prevention Plan (WPP) 2012-2020. The plan aimed to reduce municipal waste by 10 percent and deliver a saving of one hundred thousand tons by 2020 (WPP, 2012). In 2016, the Zero Waste Strategy (ZWS) was launched to improve the quality of recycled products. The strategy has a strong focus on organic matter (Ajuntament Barcelona, 2020), and it aims to reduce the amount of waste being produced by enhancing product reusability and recycling systems. The ZWS is aiming for 60 percent of waste collection to be carried out on a selective basis, in line with the European Union Waste Management Plan (Ajuntament Barcelona, 2020).

Medical services: In Barcelona, the My Health platform is a personal digital space for citizens in Catalonia to access and interact with Catalonia's health system (Generalitat de Catalunya, 2020).

Mobility: Barcelona's Urban Mobility Plan (PMU) is organized into four main pillars: Safe Mobility, Sustainable Mobility, Fair Mobility, and Zero Emission City. Those four pillars define the vision of Barcelona's PMU and include every form of mobility within the city, namely pedestrians, bicycles, public transport, delivery vehicles, and private transport. Barcelona's streets are mostly laid out as blocks of buildings. The PMU's objective is to reduce the amount of traffic within those blocks and create "people-first" areas where only emergency vehicles, bicycles, and pedestrians are allowed. These new areas correspond to the "Model Superilles" (see Figure 3.1 below) and are also known as "superblocks" (Rotondo, 2018).[8] With the improvement of streets, roads, green hubs, squares, neighborhood facilities, green spaces, and buildings, and a strong focus on sustainable modes of transport, the plan follows the "ecodistrict" principle that is also present in the Sidewalk project in Toronto (see Chapter 6). It will help to make pedestrians and the most vulnerable vehicles (for example, bicycles and motorcycles) safer and promote these transportation modes.

Smart city exposition: Between November 19 and 21, 2019, Barcelona hosted an international smart city exposition. The event brought together experts, city mayors, and multinational businesses in the same place. There were 24,399 attendees from more than seven hundred cities and 146 countries, as well as 1,010 exhibitors (Fira Barcelona, 2019), a 15 percent increase in attendance compared to the 2018 event. The exposition had an economic impact of over ninety million euros for the region (Fira Barcelona, 2019).

Access to schools: Barcelona's Adolescence and Youth Plan (AYP), developed in 2017 and 2018, comprises over 328 projects that provide benefits to over forty-five thousand young people (Ajuntament Barcelona, 2020). The plan's four main pillars are "the facilitation of emancipation, the contribution towards young people's welfare, the promotion and participation of their social transformation and work at the local level of the neighborhoods" (Ajuntament Barcelona, AYP, 2020).

Business-led job creation: Barcelona City Council has set up a new economic agenda called BCN Green Deal, which "aims to create 103,000 quality jobs in the city" (Ajuntament Barcelona, 2020). Within the original plan, ten priorities and thirty-eight measures are identified. They aim to strengthen three key dimensions for the city: "competitiveness, sustainability, and equity" (Ajuntament Barcelona, 2020). Regarding competitiveness, the idea was

(5) https://www.bcnuej.org/ ; https://www.urban-hub.com/cities/smart-city-3-0-ask-barcelona-about-the-next-generation-of-smart-cities/ (accessed on 14 July 2021).

(6) https://www.uclg.org/en/media/news/transforming-barcelona-imagining-future (accessed on 14 July 2021).

(7) Superilles" can be translated as "superblocks." This program aims to reclaim for citizens part of the space occupied by private vehicles, in order to create a healthy and greener public space and promote social relations. https://ajuntament.barcelona.cat/superilles/en/ (accessed in June 2020 and on 14 July 2021).

to foster economic activity via two plans: Easy Barcelona and the Zero Tax plan. Moreover, the BCN Green Deal will upscale the digital ecosystem and create new talent. In practical terms, the plans target the training of three thousand digital professionals over five years (2020-2024) (Ajuntament Barcelona, 2020). (Ajuntament Barcelona, 2020; https://www.barcelona.cat/internationalwelcome/en/news/bcn-green-deal-a-new-economic-agenda-to-create-103000-quality-jobs_909203).

Housing and energy: In Barcelona, a strategy to foster local and renewable energy in housing was defined by the City Council within the Transition to Energy Sovereignty (TES) plan, which was approved in 2016. The City Council allocated 130 million euros to the implementation of its energy model, which is based on making 100 percent of the city's energy come from renewable, zero-emissions sources and affordable for everyone (TES, 2015).

Citizen participation: Decidim.Barcelona is a participatory democracy platform that allows Barcelona's citizens to view and discuss proposals made by the City Council. They also have the facility to submit requests. Decidim is being used to create Barcelona's government agenda, with over 70 percent of suggestions coming directly from over forty thousand participating citizens (Ajuntament Barcelona, 2020).

Digital transformation: The city's digital agenda will ensure that Barcelona has the infrastructure required to respond to all citizens' needs. This infrastructure will be put to use to fight issues related to unemployment, social exclusion, health, energy, and mobility, and it is considered a tool to enhance citizens' quality of life. The City Council is also aware that people leave digital footprints and that it is necessary to regulate and ensure open and democratic management of data.