

Digital Solution

FOR LOCAL MARKETS

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Glossary

Terms

Android: Android is a mobile operating system based on the Linux and other open source softwares.

Android Studio: It is the official integrated development environment for the Android platform.

AMG: Guadalajara Metropolitan Area.

App: Mobile application.

Benchmarking: Evaluation or assessment of something in comparison with the standard.

BMWSB: German Federal Ministry for Housing, Urban Development and Building.

Buffer: A buffer in GIS terminology is any area, whether spatial or chronological, that is defined from a point or a structure.

B2B: "Business-to-Business", from business to business.

B2C: "Business-to-Consumer", from business to a final consumer.

Checklist: Verification list.

Creative commons: It is the name of the global organization that regulates the licensing and use of these assets under open standards.

DNS: The Domain Name System (DNS) is a decentralized hierarchical naming system for devices connected to IP networks such as the Internet or a private network.

Docker: Open source project that automates the deployment of applications within software containers.

Elasticsearch: Is a free and open distributed analytics engine for all types of data.

Firestore Cloud Messaging: It is a cross-platform messaging solution that allows to send messages safely and for free.

Flow map: Navigation flow diagram of a mobile application or web system.

Frontend: Web development that converts data into a graphical interface for user visualization and interaction with the information.

GB: Gigabyte, is a standardized information storage unit used in the computing field. This unit is equal to 109 (1,000,000,000 -billion-) bytes, the smallest unit of information.

GIF: Image Interchange Format.

GIS: Geographical Information System or Geographic Information System.

Git: It is a version control software designed by Linus Torvalds.

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

GPS: Global Positioning System.

Hardware: Set of physical or material elements that constitute a computer or a computer system.

Host: It is the name, word or phrase that identifies the registration of a domain.

HTTPS: Hypertext Transfer Protocol Secure.

IP: It is a numerical label that identifies, in a logical and hierarchical way, an interface in the network of a device that uses the Internet Protocol or that corresponds to the network level of the TCP/IP model.

IIEG: Institute of Information, Statistics and Geography of Jalisco.

IMEPLAN: Institute of Planning and Development Management of the Metropolitan Area of Guadalajara.

INDESIG: Institute for Studies on Inequality.

IntelliJ IDEA: It is an integrated development environment (IDE) for developing Java and Java web programs.

Ionic: Ionic is an open source frontend software development kit for hybrid application development based on web technologies

iOS: Mobile operating system of the multinational Apple Inc.

ISCN: International Smart Cities Network

ISN: Payroll Tax.

Java Development Kit (JDK 1.11+): It is software that provides development tools for creating Java programs.

KPI: Key Performance Indicator.

MinIO: It is a file and object storage server.

Newsletter: Information bulletin.

Nginx: It is a lightweight, high-performance web server/reverse proxy for email protocols.

On-Premise: Refers to when local software is installed and run on computers on the premises of the person or organization using the software, rather than in a remote facility, such as a server farm or the cloud.

OS: Operating system.

OSI: Open Source Initiative.

reCAPTCHA: It is the Captcha system that Google uses to detect traffic from automated programs or bots.

SaaS: Software as a Service.

Software: Computer system that includes the set of necessary logical components that makes possible to carry out specific tasks.

Spring boot (JHipster): Spring Boot is a subproject of Spring, it seeks to facilitate the creation of projects with the Spring framework

Time-to-live (TTL): Shows the time interval options that the changes will take to take effect, within the domain configuration control panel.

Tomcat 9+: It is a servlet container developed under the Jakarta project at the Apache Software Foundation.

OKR: Objectives and Key Results.

Postgis: It turns the PostgreSQL database management system into a spatial database.

Postgresql 12+: It is an object-relational database management system, distributed under the BSD license and with its source code freely available.

SMTP: It is a network protocol used for the exchange of email messages between computers or other devices.

URL: It is the mechanism used by browsers to obtain any resource published on the web. URL stands for Uniform Resource Locator.

Xcode: A set of developer tools that allows you to create mobile applications for the iOS operating system.

Introduction

Transfer package sequence

The digital solution for local markets is a platform designed and developed under open-source standards. The purpose of this is to allow its replicability, as well as to improve the process of adaptation and continuous improvement of the platform. However, the process of adopting, replicating, and deploying the solution entails complexity beyond the requirements and technical aspects of the platform.

To address the challenges cities and markets might face adopting this digital solution, it is presented through transfer-ence, the documentation that collects learning, best practices, and suggestions to facilitate the process.

The transfer package is structured as follows:

Chapter 1. Project background. This chapter presents the preamble and origin of the platform, as well as comparable experiences.

After presenting the platform creation process, the transfer package lays out the generalities of the solution and its users.

Chapter 2. About the digital solution. The second chapter raises the objective, the co-creation processes, and the user groups related to adopting and deploying processes of the platform. Within this last segment, the socio-demographic characteristics of each group of users are detailed, the experience maps based on the degree of interaction of each user with the platform, to finally close the chapter with the first process of auto-assessment to consider whether the digital solution could be adopted in a given city or market.

The transfer package presents the way of linking and accessing the source code of the digital solution starting with the feasibility of the replicability and adoption of the platform.

Chapter 3. Roadmap. The third chapter presents the first list of areas and possible actors involved in the process of using the digital solution, based on the learning obtained in the “Mi Mercado AMG” pilot. Additionally, it presents the path to the source code and the suggested processes to be considered throughout the implementation phases:

1. Diagnosis
2. Planning
3. Configuration and piloting
4. Launch

Once access to the source code has been provided, the next step in the solution adoption process is the technical deployment of the digital solution.

Chapter 4. Technical development guide. The fourth chapter is a step-by-step guide that allows the understanding of technical requirements, platform structure, and processes for enabling and deploying the source code of the digital solution. This chapter is highly technical, for its interpretation it is suggested the accompaniment of software development specialists in charge of the solution deployment.

After enabling and using the instance, the transfer package gives way to the platform management processes. This chapter is suggested for those areas or users responsible for facilitating access to the platform for local market tenants.

Chapter 5. Management guide: Public servant. The chapter integrates the general requirements to consider for the deployment, the process of inviting or integrating new users (specific tenants), and possible ways to increase the process of adopting the digital solution.

After addressing the management processes and their users, chapter 6 is addressed to the end-users of the platform and is especially aimed at two profiles: (1) the tenants and (2) the delivery men and women of the platform.

Chapter 6. User guide. The purpose of this chapter is to present the interactions, functionalities, and forms of navigation of the digital solution for users who sell their products through the platform (tenants) and users in charge of distributing these products.

Finally, the last chapter (seven) presents additional tools that could be adopted or used to strengthen the socialization processes of the platform.

Chapter 7. Additional resources. The last chapter of the transfer package contains inputs that could facilitate the diagnosing, planning, and launching of the digital solution.

The transfer package, its structure, and contents are not limiting or exclude any user profile or any interested actor or reader. It constitutes a suggestion and way of approaching the content presented below.

1

**Project
background**

Project background

Mi Mercado AMG

The implementation of a digital solution for local markets is part of the “International Smart Cities Network” (ISCN) project. Despite the different contexts, cities around the world are facing similar challenges of sustainable digital transformation. Therefore, the division Smart Cities of the Federal Ministry for Housing, Urban Development and Building (BMWSB) of Germany, started the ISCN network in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. This network promotes the integration of digital solutions in citizen-centered urban development processes and facilitates the exchange of best practices and experiences between cities and ministries in charge of sustainable urban development.

At the end of 2020, the ISCN held, commissioned by the BMWSB, the #SolutionsForCities international and digital ideas competition to find answers to the challenges facing cities due to the COVID-19 pandemic, which are similar despite the different contexts of the member cities of the network. Representatives from Germany’s smart city model projects such as Bamberg, Kaiserslautern, Kassel, Süderbrarup and Wolfsburg participated in the competition. The ISCN network included the Metropolitan Area of Guadalajara in Mexico, Miraflores in Peru, Fortaleza in Brazil, as well as Kochi, Bhubaneshwar, and Coimbatore in India. In addition, the contest sought to contribute to the wide dissemination of digital solutions and the implementation of sustainable urban development objectives through scalability, replicability, and open-source standards.

In this context, the Institute of Planning and Development Management of the Metropolitan Area of Guadalajara (IMEPLAN) presented the challenge of how to strengthen local markets in the midst of the pandemic and prevent economic activities from decreasing due to confinement. It won the solution contest, obtaining technical and financial support to implement the digital solution.

The essential questions were:

How to design a sustainable transition to a digital business model to keep local markets running? How to reduce economic uncertainty and the risk of unemployment?

And how to support the urban centralities to remain vi-



Fig. 1
Mi Mercado AMG Logotype

brant despite the pandemic?

During the contest, seven digital solutions were nominated, resulting in the one from the Municipal Council of Kampala, Uganda (Kampala Capital City Authority, KCCA) “KSmartMarket” as the most appropriate to the challenge presented by IMEPLAN for the Guadalajara Metropolitan Area context. The team received the competition award for the contest “Best digital solution for vibrant, urban and local centres”. More information about the competition and the selection criteria used by the ISCN is available here: <https://www.smart-city-dialog.de/solutionsforcities-digital-ideas-competition-2020>

For the selection of the pilot market, representatives of the nine municipalities of the AMG were summoned through the Working Group “Construction of a Metropolitan Identity” of the IMEPLAN City Brand Management. It was through the metropolitan coordination mechanism that a co-creation process was carried out with the actors involved. As a result, it was concluded that the Mexicaltzingo Market had the characteristics that would allow hosting the piloting of the digital solution.

The Digital Solution responds to the challenge of strengthening local markets in the midst of and during the transition of the pandemic and aims to prevent economic activities in city centers from diminishing. It is a digital solution for tenants that allows them to sell their products online and seeks to create an alternative for people to continue consuming in local businesses, without risking their health and reactivating the community.

The Transfer Package of the Digital Solution for local markets aims to make available to other cities the products and data necessary to adopt the digital solution in their local entities. Therefore, the lessons learned from this citizen-centered innovation process were also documented, and an answer was sought to the following central question: “What products and data are necessary to facilitate the transfer of the Digital Solution for local markets to other cities Guadalajara Metropolitan Area, Mexico and internationally?”

General context: traditional markets, community, and COVID-19 pandemic

Municipal markets, also known as traditional or local markets, play a fundamental role for cities and their inhabitants, they are generally a reflection of the social life, culture, economy, and politics of a territory.

Latin American municipal markets –mostly built in the mid-nineteenth and early twentieth centuries– were conceived as a space to guarantee the distribution and exchange of fresh food for the urban population which was constantly growing. Since its conception, municipal markets have been evolving, adapting to social needs. Nowadays, a large number of municipal markets no longer exist or are believed to be in decline due to the rise and growth in the late 80s of supermarkets and other food chains.

Local markets –even when displaced by new consumption habits– are spaces of encounter and for the articulation of social bonds and local memory in the territories. However, the historical and cultural importance of local markets lies in their integration into people's daily lives. Likewise, the local markets are part of an urban and commercial space that combines tradition, gastronomy, and a meeting place for their communities.

Local markets do not constitute an absolute or universal reality, on the contrary, there is a great diversity of types of markets where they reflect the result of their historical, cultural, social, and urban context.

At the beginning of the current pandemic–COVID-19– there were total or partial closures in municipal markets, causing a significant decrease in sales or the suspension of sales. This situation has caused an economic imbalance for the market tenants throughout the country. This economic imbalance systemically affects the different production and food consumption chains and networks.

Now that cities and societies are in transition to a new post-COVID-19 normality, municipal markets could be a key element in building more resilient territories and societies. Strategies such as “Mi Mercado AMG” Digital Solution –through the use of digital tools– can contribute to improving consumption habits, generating fair relationships between urban and rural areas, and creating closer relationships between producers, sellers, and consumers.

Historic context: Mexicaltzingo market

The Mexicaltzingo neighborhood has had a historical evolution in parallel with the city of Guadalajara until it merged with it and became part of its historic center and a key element in its development.

In 1821, in full consummation of the independence of Mexico, Mexicaltzingo was declared a neighborhood, along with Mezquitan and Analco, thus belonging to the jurisdiction and management of the Guadalajara City Council.¹

The garden, the temple, and its current market are considered the center of the neighborhood. The market has historical records that go from 1914 to renovations in 1958 and 2005.²

Historically, the residents of the neighborhood have been the cornerstone of its development, from the planting of trees in the garden to the persistence of stalls that led to the construction of the Mexicaltzingo Market.

¹ Camarena, E. F. (1969). *Narraciones tapatías. Guadalajara, Jalisco, México.*

² Camacho, A. (2018, 11 agosto). *Mexicaltzingo: de pueblo de Indios a Barrio histórico.*

Comparable experiences: “Mi Mercado AMG” pilot

To understand the potential of the Digital Solution, it is important to learn about similar experiences in Latin America, how they work and what their practices and learnings are. The following benchmark considers similar projects, aimed at public markets and their users.

1. Madrid, Spain

The Spanish capital has positioned itself as a benchmark in the digitization of traditional markets strategy in Latin America, specifically through the Mercado 47 initiative. The initiative was launched in 2016 and –to date– documents more than 650 businesses attached to the platform and more than 6 thousand items in retail.

This initiative gets its name from the sum of the 46 physical markets in the city plus the digital platform as the 47th market.

In October 2021, the first national gathering of municipal markets was held in this same city.

As an extension of the success of Mercado 47, the doestaenmadrid.com Project was launched. This project aims to make visible all the commercial activity and services of the city –categorized according to its different activities– where the role of municipal markets is highlighted but not exclusive to them.

A parallel effort to Mercado 47 is Mercamad, the reference guide to Madrid's markets. It currently has complete information on the 46 municipal markets and more than 2,000 stalls.

[Mercamad](https://mercamad.com) allows the inhabitants of Madrid and its visitors to know the distance to the nearest market from their current position, among other offered features through the platform.

2. Medellin, Colombia

The initiative of the Department of Antioquia uses the Compra Local platform as a digitalization strategy for its local markets. This initiative originated in the Medellin Municipality to mitigate the economic impacts derived from the COVID-19 pandemic. The platform is logistically operated by an entity external to the Mayor's Office.

Unlike other similar initiatives, the platform has diversified the offer, transcending agro-products, and allowing local entrepreneurs to offer their handicrafts, clothing or books, and even services.

3. Bogota, Colombia

Bogota deployed the Mercados Campesinos strategy, which aims to connect agricultural producers with the final consumer. The Farmers Markets of Bogota –emerged in the beginning of this century (2003)– are a response from the peasant and district organizations as a new itinerant showcase and it is proposed in a district manner.

The platform allows the purchase of consumer products through the geographical localization of the community and the farmers' organization that will attend the order. In a hybrid way, it offers an itinerant physical space in the city for the sale of its products.

The platform is supported through the Secretariat of Economic Development of the Mayor's Office of Bogota.

4. Mexico City, Mexico

This platform is not a platform for all traditional markets in Mexico City, however, Click Abasto is a national benchmark for the digitalization of the “Central de Abastos de Iztapalapa” in Mexico City.

This platform dates from 2019 and showcases the offer of the products in a categorized way. As well, as wholesale purchases.

5. Buenos Aires, Argentina

In the capital of the South American country is the **Mercado Central** initiative, which has reached digital channels to strengthen the supply of fruits and vegetables that supplies the metropolitan region of Buenos Aires which has more than 12.8 million inhabitants.

Despite the efforts of the Central Market, the platform does not integrate electronic commerce (eCommerce) as a way to expand the market and its tenants.

6. Lima, Peru

With a focus on providing information on the retail prices of 75 agricultural products–sold in 31 emblematic markets– **Mi Caserita** is used regionally in Metropolitan Lima and Callao, in Peru.

Available to users in Lima since 2017, this effort was initiated by the Ministry of Agrarian Development and Irrigation (MIDAGRI) to provide updated information on the retail prices of agricultural products to housewives, heads of households, and the general public, for the benefit of the population economy.

The app aims to make retail price information available to final consumers, so they can make an assertive purchase.

7. Zaragoza, Spain

Promoted through the Government of Aragon and the Zaragoza City Council, mercadocentralzaragoza.com presents the information of 74 market stalls to be able to make purchases online.

2

About the Digital Solution

About the Digital Solution

The global economy has been transformed by new technologies in traditional sectors. The commercialization of goods and services from local markets is not the exception. There are currently different efforts that seek to provide new capacities and improve the working conditions of tenants of local markets.

Notable among these efforts is the collaboration between the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Institute of Planning and Development Management of the Metropolitan Area of Guadalajara (IMEPLAN).

The collaboration to implement the pilot of the digital solution allows the tenants of local markets to adopt and implement a digital platform for marketing and home delivery of the goods and services of these businesses, recovering the learning generated during the pilot.

Objective

The Digital Solution is an example of how the tools and digital solutions can be integrated into processes of citizen-centered urban development. The International Smart Cities Network (ISCN) promotes the exchange of these practices and experiences between urban development professionals around the world.

The Digital Solution responds to the challenge of strengthening local markets in the midst of and during the transition of the COVID-19 pandemic and aims to prevent economic activities in city centers from diminishing. The Digital Solution allows tenants to offer and sell their products, maintaining social distance with their customers and safeguarding their health.

Digital solution co-creation process of “Mi Mercado AMG”

The different phases of the co-creation and implementation process of the “Mi Mercado AMG” pilot are reflected below (figure 2). This process took place for about a year.

The phases do not follow one another strictly chronologically or sequentially but are intertwined to learn from the conclusions of other phases and thus optimize the Digital Solution accordingly.

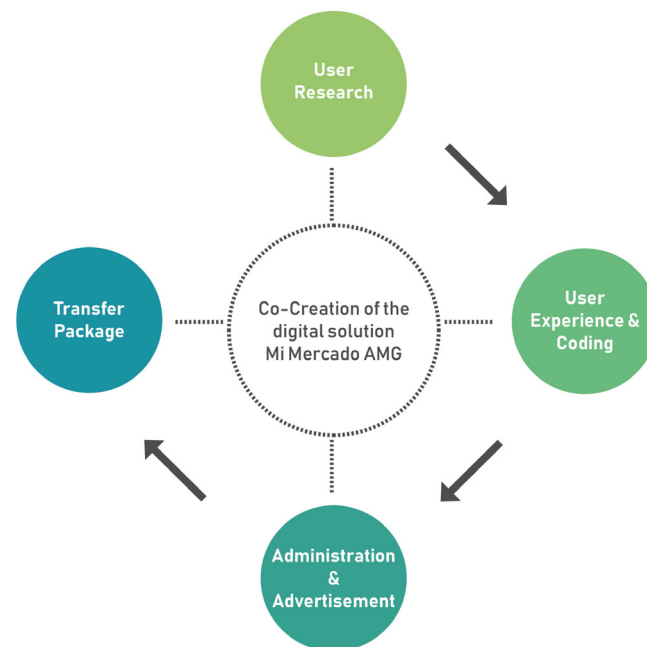


Fig. 2
Implementation phases “Mi Mercado AMG.” pilot

- 1. User research:** Starting with the user research phase, developing user personas from the market tenants, and carrying out Design Thinking workshops to reach the needs of the users of the digital solution.
- 2. Programming:** The process of digital solution development began in parallel. Thus, the results of user research were integrated into the user experience.

- 3. Training and communication:** The communication material was developed for the promotion and visibility of the Digital Solution, and the tenants received training in the use of the Digital Solution and commercial management, as well as the protection of personal data in the use of the Internet.
- 4. Transfer package for digital solutions for local markets:** At the end of the implementation process, this market digital solution transfer package was developed so that other cities can also benefit from the process and adapt the solution to their local contexts.

User typologies

The Digital Solution considers different types of users. Below is the description and the interaction level of users with the app identified during the piloting of “Mi Mercado AMG”.

Buyer

User description

The results during the initial phase of piloting the Digital Solution “Mi Mercado AMG” issued that there is not a unique buyer profile. The results show different sociodemographic factors. Therefore, potential users’ profiles were detected.

The User Persona methodology was used, which allows the construction of archetypes based on a qualitative analysis of information collected through different investigations and/or conversations in the digital sphere, resulting in four dominant profiles of people who could be early adopters’ of the Digital Solution:

- 1. Elena (goes to the market since her childhood):** She is a young woman who experienced the digital transition. She is 29 years old, and since the pandemic, she has used a mixed model of consumption, where the use of delivery apps has been part of it. However, she continues to make purchases personally from those businesses around her. According to the analysis of Sarape Social (2021), the use of the Digital Solution could mean a long-term tool that will impact her quality of life.

- 2. Carlos (foodie or food lover): He is a professional.** He is also a lover of food and the process of cooking it. He has high expectations about the quality of food and the eating experience.

He is a technologically hyper connected user. For this type of user, the Digital Solution means changes in consumer behavior.

- 3. Mar (amazed beginner): She is a young woman.** She is 25 years old, and she is newly independent and dedicated full time to her job. She is aware of her impact as a consumer on local micro-businesses. Her digital presence is changing, and the adoption and use of the Digital Solution could mean changes in consumer behavior for this type of user.


- 4. Gabriela (traditional buyer):** She is a 60-year-old woman who recently retired. After the first months of the pandemic, she reduced her social contact with the rest of her context. However, after the process of “returning to normality”, she has begun to resume her routine again. Although she uses applications such as WhatsApp to communicate with her loved ones and is familiar with the use of social media, it is still difficult for her to interact with other types of applications. The adoption and use of the Digital Solution could mean changes in learning and a solution that allows her to maintain social distance if she intends to.

There is a high potential for the use and adoption of the Digital Solution. It implies different efforts and ways of approaching the profile of each user. The Transfer Package presents below the detailed user’s profile with the highest potential for adoption and dissemination. The user presents characteristics such as having lived through the digital transition, a high degree of digital adoption, and an interest in their environment. For the buyer user profile, this user is Elena (goes to the market since she was little).

Early adopter: Early adopter is one of the first customers or users of a company, product, or technology. (Roggers Everett M., 1962).

User persona: buyer / client

Buyer



Elena Diaz

Publicist

I like my people and my community.

Demographics

- Guadalajara, JAL
- 29 years old
- Professional
- Bachelor Degree
- Monthly income \$20K MXN

Apps and Devices

- Mid-range laptop
- High-end cell phone
- Instant messaging apps
- Digital office tools
- Digital calendar
- Video call applications

About

Elena is 29 years old. She lives in an apartment near the downtown area of the city. Living in this area allowed her to diversify the places where she shops.

She has a permanent full-time job. During the weekend, she usually sets aside a good part of the morning to make these purchases.

Since the pandemic, Elena has migrated to a mixed model of consumption. She uses some delivery apps to buy groceries. However, she continues to make physical purchases of some specific products.

Rational needs

- Fresh foods
- Proximity and availability
- Variety of products
- Affordable prices
- Healthy food

Emotional needs

- On-time and quality and service
- Feel that she is helping the community
- Emotional well-being with her ecosystem

Identified problems

- Little time to shop
- High commission services
- Quality deliveries

What do we need to provide?

- Quick access to products
- Quality products and deliveries
- Good experience to become a loyal customer

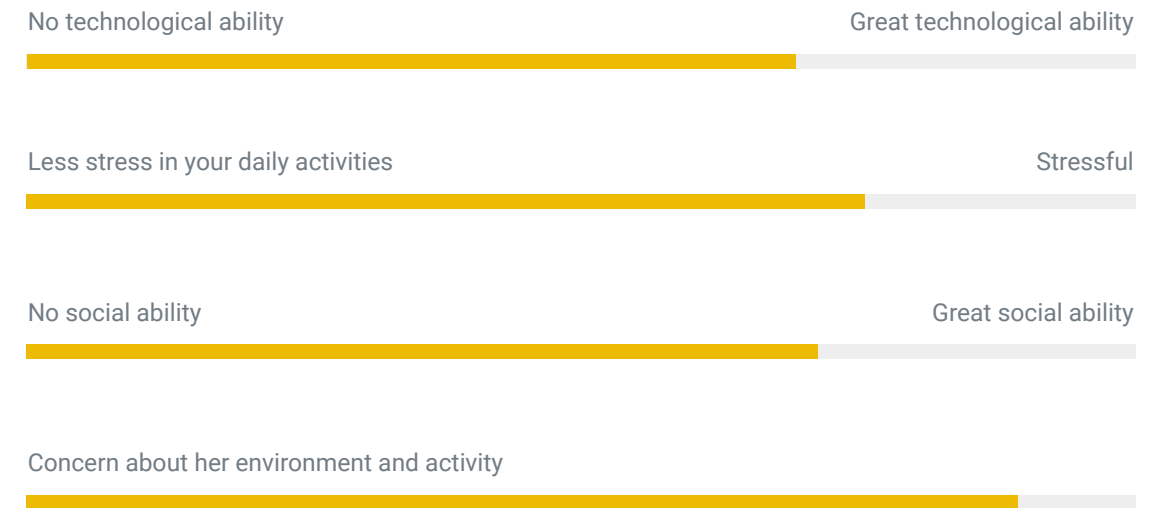


Fig.3
User persona: buyer / client

Ecosystem map: buyer / client

Through the user environment map, it is possible to identify all the actors, devices and tools with which buyers interact during the purchase processes in the different types of market that currently exist. The following analysis was carried out considering the “Mi Mercado AMG” pilot and its environment.

It is strategic to develop the environment map for each market that intends to implement the digital solution to understand the ecosystem of the buyers in their local context.

At the closest level to the buyer are family members, neighbors, and other close people who have certain similar and priority needs for the consumption of goods or services, such as the purchase of food. These needs are covered primarily by shops or stores that are in their closest context, which they can access by walking. As well as, in some other stores where commercial consumer products are found, which are also nearby, but the offer of fresh products is normally limited.

On a second level, there are the markets, which, although they are more distant, the community and culture have made them essential for obtaining fresh local food. At that same level, there are the supermarkets or commercial chains that are part of this same offer.

At a third level are the emerging markets. These markets do not have a physical space or point of sale for consumer products. But, through digital tools can offer their products to their target market.

Based on the learning obtained, the user analysis and analysis of the environment carried out during the pilot of the Digital Solution, through “Mi Mercado AMG”, highlights the use of different digital devices to maintain constant communication and transactions between people to order products, directly and safely.

The use of combustion vehicles is common as the main means of transportation for consumers to access the consumption of goods and services in their immediate con-

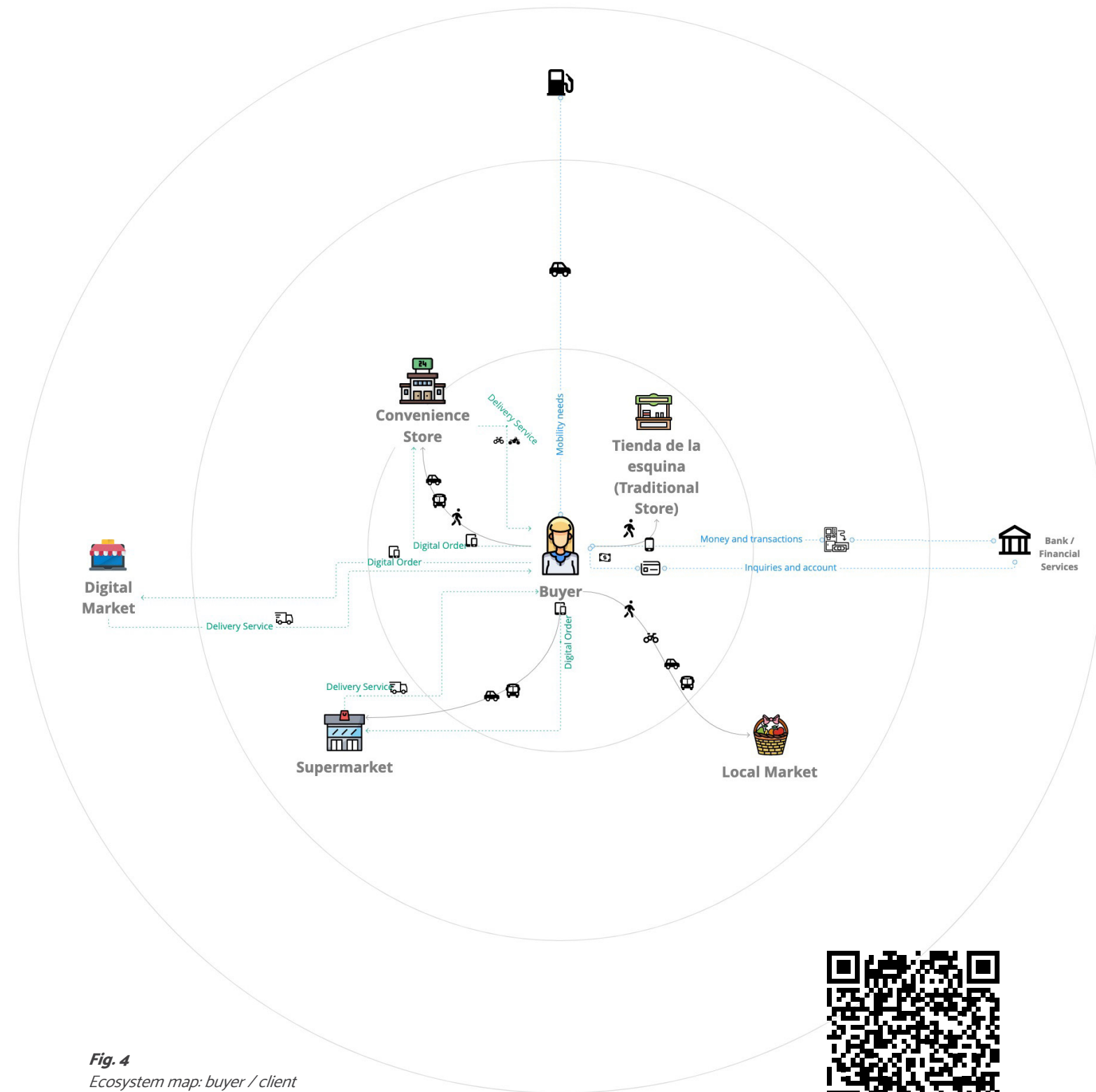


Fig. 4
Ecosystem map: buyer / client

text. As well as, the main transport used by businesses, to deliver products to their customers.

The Digital Solution represents a sustainable alternative in which the distribution process, in the last mile or last period of logistics delivery, could be carried out sustainably and replace how consumers currently access everyday products. It is an alternative that allows maintaining social distance, as a preventive measure against COVID-19, allowing safe purchases without exposing consumers during the logistics process and the consumption of their products.



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Note: The process and methodology indicated in section “7. Additional Resources. Tool for preparing maps of tenants, services and products”. The implementation of the said methodology is suggested so that each local market can map the key elements of its environment.



STAGE

For Elena, the mornings spent shopping can be her favorite part of the week, especially if it involves a visit to the market. For her, going to the market is not just shopping, but it means a complete experience: breakfast, talking with the people in the market, and shopping. Although digital shopping has solved some time difficulties for her, she is still really looking forward to having that direct connection.

OBJECTIVES AND EXPECTATIONS

Elena would like to shop at the market more often without having to go to it.

Journey map (experience map): buyer / client

The experience map is a synthetic representation that describes, step by step, how a user interacts with a service or product.

The process is mapped from the user's perspective and describes what happens at each stage of the interaction, what points of contact are involved, and what obstacles and barriers they may encounter.

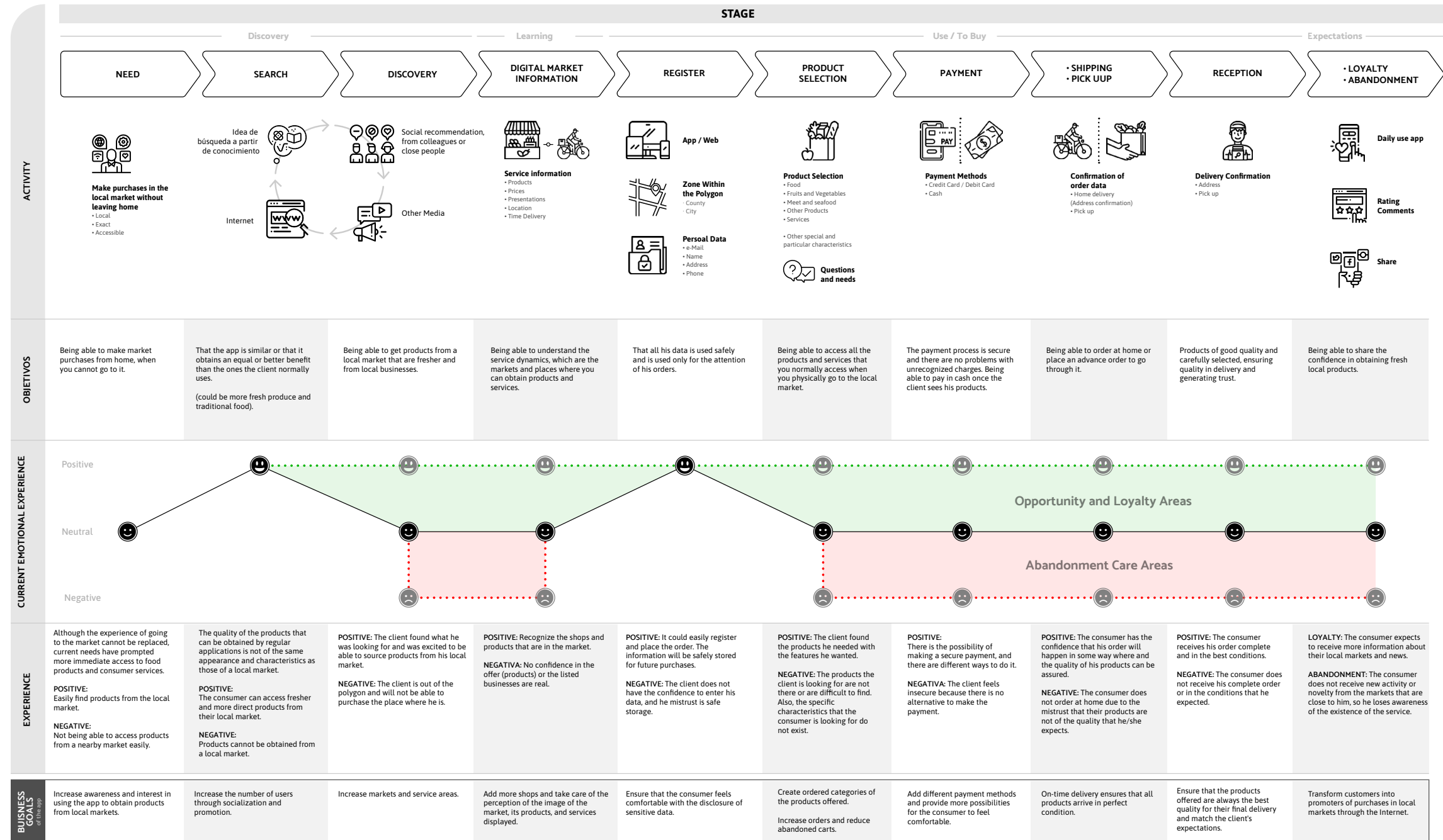
The journey map is often integrated into additional layers that represent the level of positive emotions/experiences lived throughout the interaction. These experiences are obtained by researching approaches to users, and their function is to identify points in the process that can be improved. The purpose of this is to build consumer loyalty through the lived experience, seeking to meet their expectations.

This map shows the general phases and activities that all users follow within the same context of the service that is carried out or coordinated by a mobile application. The map also shows the encounters and the flow of information between the main actors of the ecosystem from service.

This stage is the starting point. The first stage refers to the discovery, where in general, search and find activities of the digital solution are carried out.

The second phase is the learning phase. This stage refers to what the users will need to learn or the necessary knowledge they need to have. This will be what will lead them to make a decision and consume the services or products offered by the platform.

The third phase focuses on the usage of the application to complete the purchase process. It also focuses on all those minimum necessary activities that users must carry out to obtain a complete service and achieve their objective.



* The business objectives are described from the perspective of the manager or the entity that is responsible for the application, its operation, and evolution.

Fig. 5 Journey map: buyer / client

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User persona: tenant / seller

User description

The markets in Mexico and Latin America are built upon family businesses that remain and develop generation after generation. After the first sociodemographic research conducted by Sarape Social for the piloting of “Mi Mercado AMG”, three profiles of initial tenants were identified, as well as descriptive characteristics of their digitization process. The purpose of this process is to transform the production processes of his or her family business, generate new income and reach new consumers.

1. Business founder:

He or she is the member of the family that started the family business, he is part of the first generation in charge of the premises. He usually has no employees and has between 30 and 40 years of experience in the business. They do not have a high degree of familiarity with technology, so they use traditional processes for the attention and commercialization of their products. For example, they do not usually use electronic payments or make bank transfers.

2. Successor (2nd generation):

These users are considered the second generation of the business. They have experienced the digital transition, and therefore, they have implemented some innovations in their businesses. They are usually helped by a small staff in their business. They use digital media such as instant message, telephony and have electronic or bank payment methods. In addition, they understand that the digitization process is necessary to keep up to date and boost their businesses.

3. Digital successor (3rd generation):

They are considered digital natives users, and the third family generation to join the business. They usually work as assistants to the relatives responsible for the premises and are in the process of learning about managing the family business. Through digital tools, they seek to expand the ways of marketing the fam-

Market tenant / Seller



Pepe Flores
Market Tenant / Seller
Successor: Second generation

Respect is the most important value.

Demographics

- Guadalajara, JAL
- 42 years old
- Seller
- High School Degree
- Monthly income \$40K MXN

Apps and Devices

Cell phone | Mid-range

- Instant messaging apps
- Social networks
- Digital payments apps
- Digital sales platforms

About

Pepe is a family-oriented person dedicated to his business. He inherited the family business from his father and is the second generation in charge of it.

Pepe has experienced the transition to the digital world. Therefore, technology causes him curiosity and interest. He knows the potential and benefits that it could generate in its implementation. This is the reason why he is interested in transforming the family business.

What he likes most about his job is interacting with customers and maintaining the high quality of his products. During his spare time, he likes to be with his family and play with his children.

Rational needs

- Maintain the quality of his products
- Increase his income through his business
- Offer new products
- Grow his consumers
- Have a safe environment
- Improve the quality of life for his family

Emotional needs

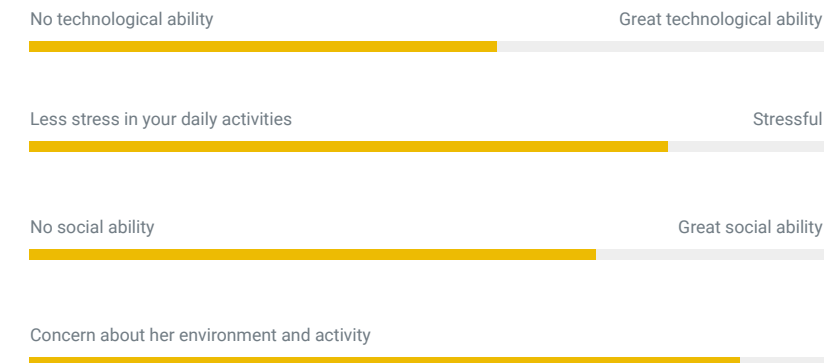
- To feel that he is covering the needs of his family.
- Enjoy his work environment.

Identified problems

- Low possibility of reinvestment in his own business
- Few or no staff
- Few financing options to grow his business
- High commissions on digital platforms to expand his products and services
- Inadequate technological equipment and insufficient knowledge

What do we need to provide?

- Training
- Digital and technological resources
- He is a self-taught person. Therefore, it is important to have an easy access manual
- Short-term benefits
- Cost and scope competitive advantages
- To ensure security and stability within the processes of the platform itself.



ily business. They have a high understanding of new technologies, such as mobile tools and social media. They are usually in charge of digital communications.

One of the Transfer Package goals is to make the adoption process as agile as possible. Consequently, the user persona corresponding to the second-generation successor

described above is considered an early adopter. They are the users who have decision-making capacity in the family business. As well, as sufficient openness to implementing new digital tools that might allow the growth and transformation of the family business.

Fig. 6
User persona: tenant /seller

Ecosystem map: seller / tenant

In the ecosystem of a salesperson, the tenants, their most crucial circle consists of the closeness of their assistants (if applicable), who help them to generate activities in the operation of customer service, from the reception of products, layout of merchandise, food preparation, customer service and all the activities required to be able to commercialize their products.

In the next zone of its ecosystem are the suppliers, from which the raw materials and/or products to satisfy the needs of its clients are obtained. In addition, in this area, we can find the people who distribute their products in the immediate context of their business, with whom they need to have very close communication to ensure a good service.

In the farthest zone are the providers of certain services that are essential for the technical execution of the entire service, which is the same for every business to function properly. For example, the electric service provider.

Based on the learning, analysis of the seller and the analysis of the environment carried out during the pilot of the digital solution, through "Mi Mercado AMG", the use of digital devices and channels stands out to maintain constant communication, either by messages or direct calls, with the different actors in their environment, for example, both with suppliers and with customers.

The supplier and the seller carry out transactions to be able to provide articles and products for their trade. The use of combustion vehicles as the main mode of transport to be able to carry out the transfer of articles and products stands out; whether the supplying person transfers them to the selling person or vice versa.

The seller usually makes home deliveries in their immediate context in a sustainable, but limited way, since they usually make these deliveries by walking. There is a small number of tenants that have sustainable delivery options through the use of bicycles. Therefore, the Digital Solution represents an area of opportunity by expanding its scope

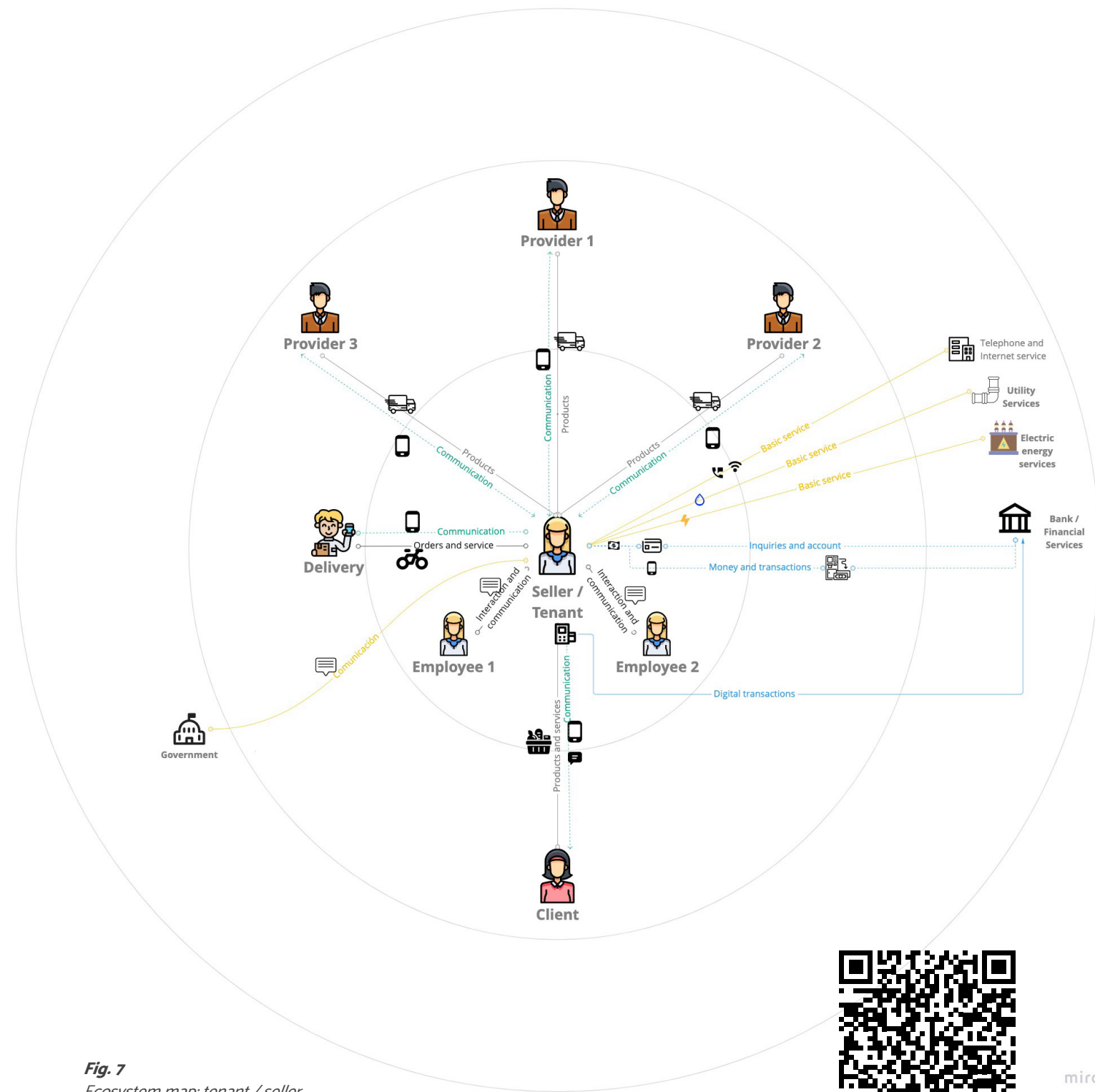


Fig. 7
Ecosystem map: tenant / seller

and range of home deliveries, without having to have an exclusive mode of delivery.

Note: The process and methodology indicated in section "7. Additional Resources. Tool for preparing maps of tenants, services and products". The implementation of the said methodology is suggested so that each local market can map the key elements of its environment.



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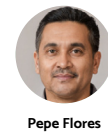
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Journey map (experience map): seller / tenant

Additional layers of an experience map are shown from top to bottom. The layers of information are added according to the analysis of the experience of the user and also respond to the possible gap that exists between the desired experience and the experience the user receives from the app.

Another type of layer is the one that allows prioritizing actions or objectives that must be executed by the entity that develops and manages the application, to improve the experience at each point of the scenario where the user or user has contact. It allows the design and development team to align under the same optics.

Additionally, layers integrate into the map of experience for the construction of a business vision inside out of the application.



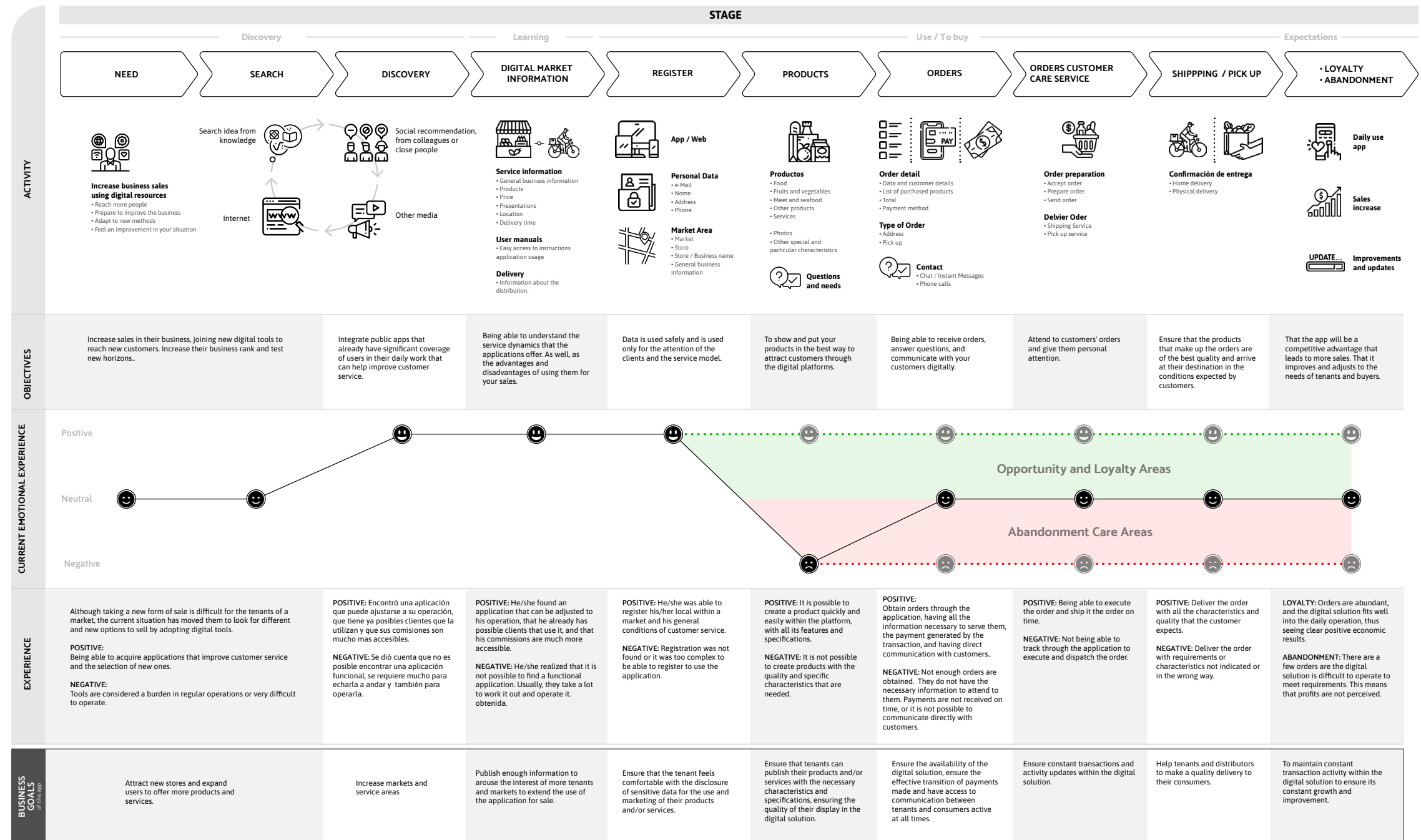
Pepe Flores

STAGE

Pepe is a family man dedicated to his business. He inherited the family business from his father and is the second generation in charge of it. Pepe has experienced the transition to the digital world and for this reason, technology causes him curiosity and interest. He knows the potential and benefits that it could generate, which is why he is interested in transforming the family business.

OBJECTIVES AND EXPECTATIONS

Pepe would like to increase his sales by satisfying the needs of his customers, looking for the possibility of taking his products to his customers' homes.



* The business objectives are described from the perspective of the manager or the entity that is responsible for the application, its operation, and evolution.

Fig. 8
Journey map: seller / tenant



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User persona: delivery

User description

The delivery person is responsible for delivering packages, merchandise, documents, or food to other people, companies, or institutions. According to OXFAM Mexico and the Institute for Studies on Inequality (INDESIG), in Mexico, there are an estimated 350,000 people who work in the delivery app industry, and there are 21 million people who have used applications to purchase goods and services through this type of app. This means 1 delivery person for every 60 consumers.

While at the regional level, in Jalisco, the “Survey of home delivery couriers” conduc by the Institute of Information, Statistics, and Geography of Jalisco (IIEG, 2021), the occupation of the delivery person in Jalisco focuses on young ages with 61.5 % of respondents who register 30 years of age or less. While 94.5% identify as men, 3.5% as women and 2% did not specify their biological sex. Of those surveyed, 77% of them declared that they were the economic breadwinner of their household.

For the pilot project, the direct hiring of delivery persons was the main human resources strategy, which allows coverage of labor rights and obligations of the delivery team.

Another reason why it was decided to contract directly is that the “Mi Mercado AMG” pilot has been approached from a sustainability perspective, so the vehicles used by the delivery service are non-motorized. Specifically, they carry out the distribution using a bicycle. To consult more details about the logistics cycle strategy, please refer to section “6. End-User Guide - Cycle-logistics

The sociodemographic detail of the delivery person for the Digital Solution is presented below. As well, as the ecosystem of users and elements that interact and communicate with him/her.

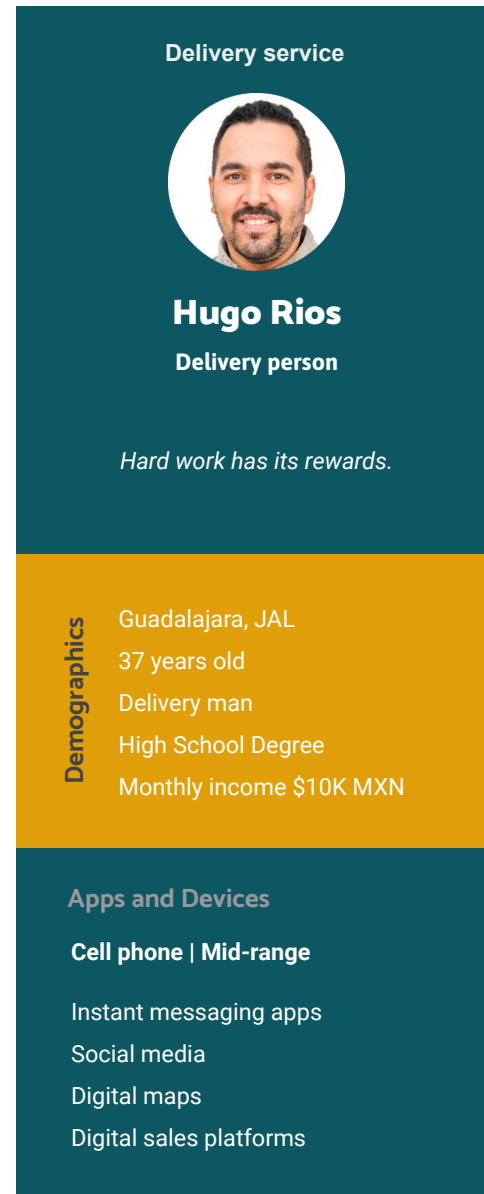


Fig. 9
User persona: delivery

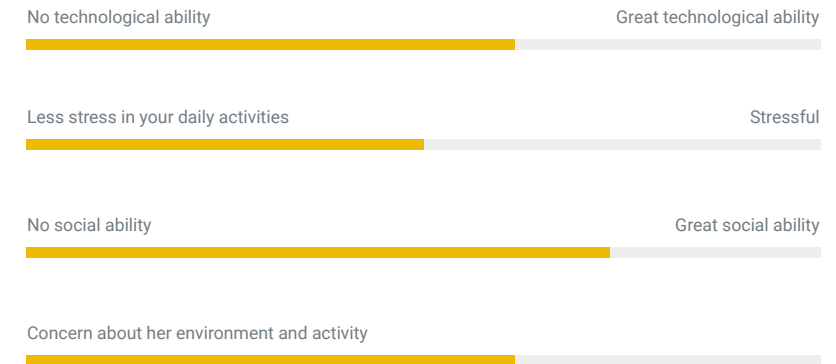
About

Hugo is single, unfortunately he lost his job due to the pandemic and decided to self-employ. To supplement his income, he trades some products on e-commerce platforms.

He likes mountain biking and getting to know his city on two wheels.

Hugo enjoys playing video games online with his friends, and his favorite food is charcoal burgers.

One of his priorities is to resume his studies and find economic stability for himself.



Rational needs

- Steady income
- Revenue increase
- Health care coverage
- Maintain his work autonomy
- Keep learning
- Time to continue studying

Emotional needs

- Economic stability to have emotional stability
- Active rest

Identified problems

- The work equipment is Usually his.
- Few resources to invest
- Wear in his work supplies
- High labor competition
- Little or no formality in employment
- High risk of self-employment activity

What do we need to provide?

- Digital and technological resources
- Self-paced learning content
- Quick activation on the platform to start receiving orders
- Higher profit for delivery service.
- To ensure security and stability within the processes of the platform itself.

Ecosystem map: delivery

In the case of the delivery person, in their closest environment, there are the tenants, and businesses for which they work, attending to the home orders that are requested. Their main work tools are their mobile device and their delivery vehicle (bicycle).

The form of contact with all the people who are in their work ecosystem stands out, where most of his communication is physical and direct, that is, they speak physically with the people involved in their environment. However, the use of applications and instant messaging is part of their communication.

For delivery, the Digital Solution integrates a series of tools that aim to facilitate and make their work transparent. For example, through the use of the solution's instant messaging tools that make communication between different users visible, particularly between consumers, sellers, and delivery people.

For the delivery, as for the manager, a close investigation (user experience map) has not been carried out, since the earliest stage of the pilot inhibits obtaining answers to the experience of the use and management of the delivery platform on significant results for these type of users.

However, it is through the description of the users (user persona) and the ecosystem map that a first approximation and general vision of their context and their initial needs is mapped.

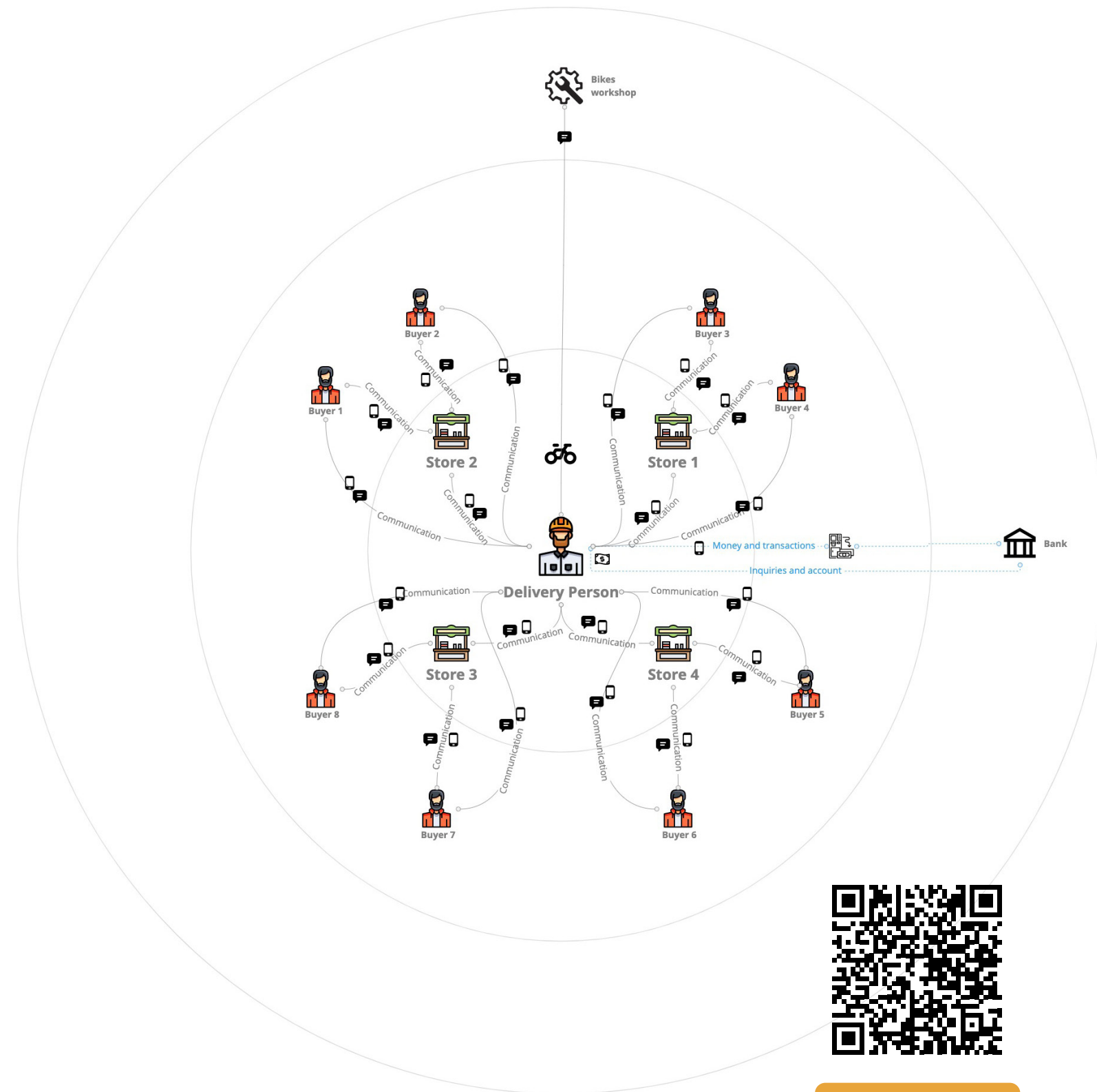
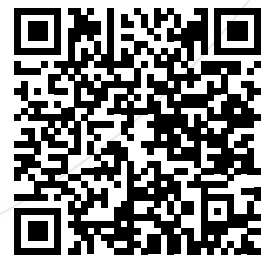


Fig. 10
Ecosystem map: delivery



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Note: The process and methodology indicated in section "7. Additional Resources. Tool for preparing maps of tenants, services and products". The implementation of the said methodology is suggested so that each local market can map the key elements of its environment.

Market manager: public servants

User description

Public servants are any person who provides physical or intellectual subordinate work for public entities. Therefore, they have attributions, rights, and obligations established by the Federal Law of Administrative Responsibilities of Public Servants. For the local jurisdiction, each federal entity has a Law for their Public Servants of the State² -to which they belong- and their Municipalities³, where the working conditions are established by the appointment that corresponds to their legally authorized position. Except in the cases of advice, consultancy, and those that provide services to the Government, which will not be governed by law, nor will they be considered public servants.

The public servants involved in monitoring the implementation and development of the Digital Solution will probably hold state and municipal attributions. Such attributions would allow them to perform functions of direction, coordination, supervision, inspection, surveillance, management of funds or values, and control of acquisitions, warehouses and inventories, advice, consultancy, and scientific research.

The public servants' work is public order and general observance activities. It is critical that once the implementation processes of the Digital Solution have started, there is a public servant responsible for the project with clear and delimited attributions before all parties are involved in the project since the purpose of the Digital Solution is to solve urban development processes focused on citizens.

In the case of the piloting of "Mi Mercado AMG", the public servants involved are the ones who carry out all the processes in the implementation and operation. This is part of the meaningful work of the officers, which is to offer practical and innovative solutions to its citizens, both to market tenants (sellers) and its customers.

MARKET MANAGER



Maria Zaldivar

Public Servant

Cities and their governments must facilitate digitization processes in their commerce and commercial areas.

Demographics

- Guadalajara, JAL
- 39 years old
- Director
- Bachelor Degree
- Monthly income \$40K MXN

Apps and Devices

- High end laptop
- High end cell phone
- Social media
- Everyday use of email
- Task management software
- Digital office tools

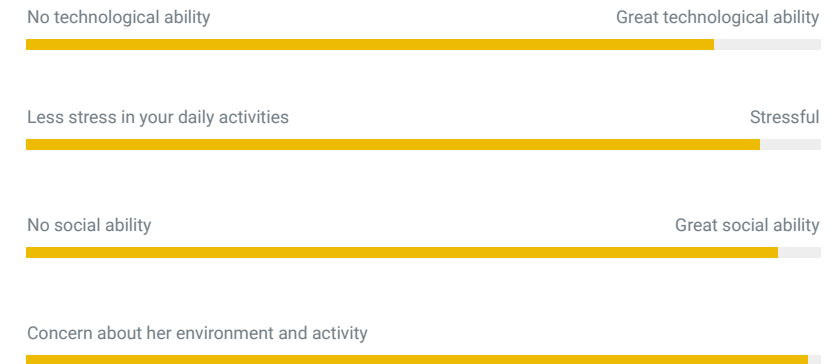
Fig.11
User persona: Market manager / public servants

About

Maria is divorced with two minor children who are under her support. She has developed a professional career in public service.

Throughout her career, she has held different positions that have made her aware of the operation of various areas, so her profile is operational, resolves conflicts, conciliator, and leader.

She believes in innovative projects that offer you results and recognition in her daily work. At the same time, she trusts that carrying out these solutions will bring social and economic benefits to the community.



Rational needs

- Professional Growth
- Labor and economic stability
- Labor benefits
- Tools and people to collaborate and get the job done

Emotional needs

- Recognition of their work, both internally and externally

Identified problems

- She and her team have many projects in the developing process
- Attrition with the union.
- Lack of staff
- Lack of appropriate work supplies
- High job competition
- Temporary job / position
- On many occasions, they must respond to a political logic

What do we need to provide?

- Technical monitoring with her and her team
- Respond to government timelines (long and bureaucratic processes)
- Extensive timeline in the application of this type of project

²
https://www.oas.org/juridico/spanish/mesicic3_mex_anexo5.pdf

³
<https://www.jalisco.gob.mx/sites/default/files/ley-servidores-jalisco.pdf>

Ecosystem map: public servants

It is relevant to mention that in the case of “Mi Mercado AMG”, it was detected through the collaboration with different representatives of the participating entities, that there are a significant number of stakeholders (public servants) involved. These are at all levels: strategic, tactical, and operational.

All entities involved should communicate clearly to understand the role, scope, and functions of all stakeholders. It will simplify the operation processes. It will elude the double efforts that a project with these scopes could detonate. Also, it will evade confusion and unclear information provided to tenants and citizens.

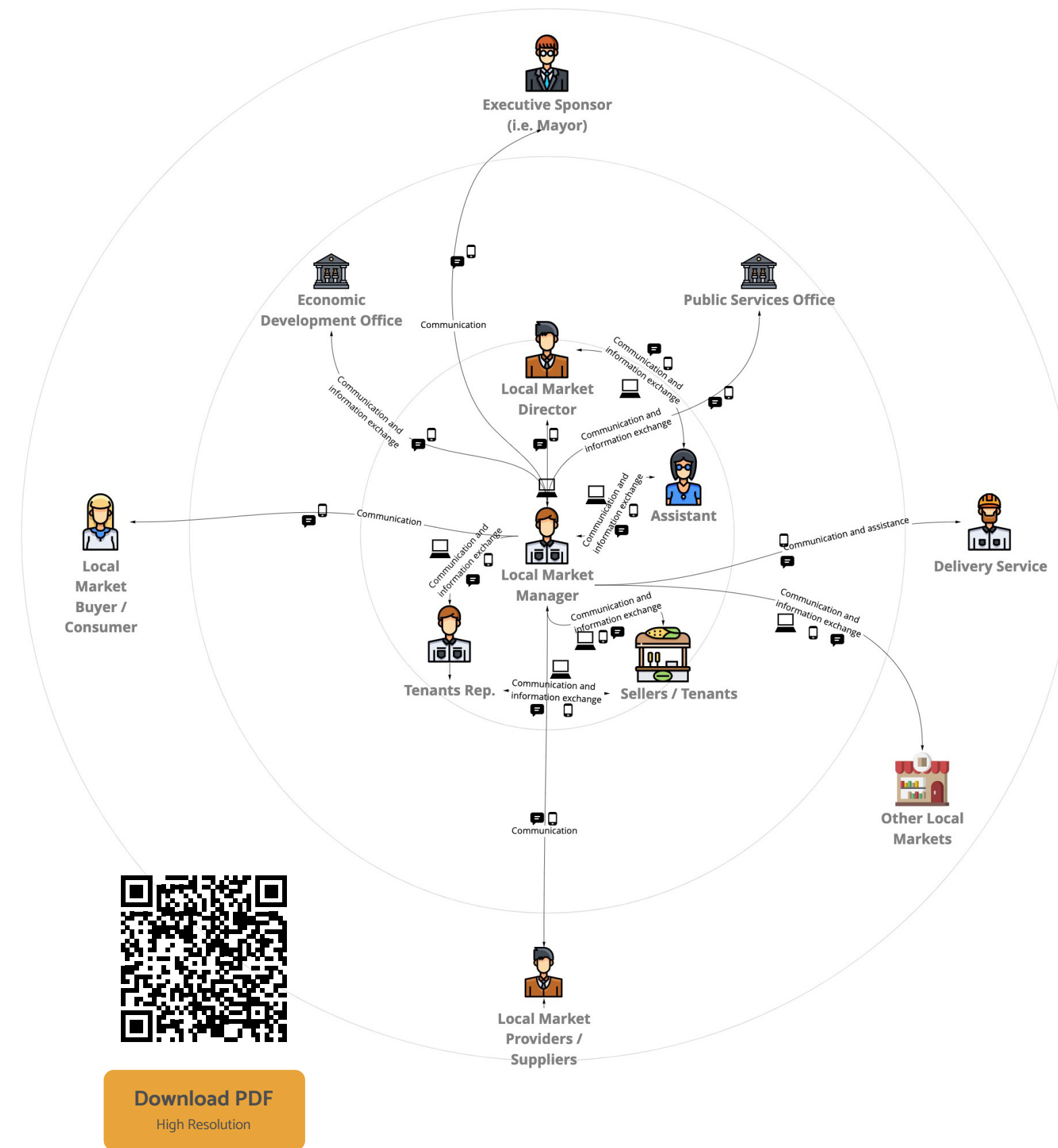
The sociodemographic detail of the civil servants for the Digital Solution is presented. As well, as the ecosystem of users and elements that interact and communicate with them.

In the case of the ecosystem map, in its closest zone are the tenants, their form of organization and representation, from which communication is established and the work of integration into the adoption and training process begins. At this first level, there are also other civil servants or public officials involved in the project whose experience and decision-making capacity are key to facilitating the deployment of the solution.

On a second level, there are the different institutions and organizations with which it interacts and to which the objectives of deploying the solution in terms of public policy responses.

Finally, at the last level, they engage with other actors, such as consumers and suppliers in the local market.

The Digital Solution is a tool for reactivating the economy and the urban environment, allowing citizens (consumers) new forms of interaction and consumption with local markets.



Note: The process and methodology indicated in section “7. Additional Resources. Tool for preparing maps of tenants, services and products”. The implementation of the said methodology is suggested so that each local market can map the key elements of its environment.

Fig. 12
Ecosystem map: Market’s manager (Public servant)

Feasibility analysis pre-implementation assessment checklist

Before the deployment of the Digital Solution, it is suggested to carry out a first feasibility analysis, in which the hypothesis of the intervention (implementation of the Digital Solution) is considered.

This first feasibility analysis aims to concentrate the assessment work in the earliest stage, considering the possible limitations in resources and time within the local government structures.

To this end, the following evaluation matrix is proposed as a guide. It is composed of the following elements:

1. Evaluation questions and sub-questions:

These questions seek to investigate different aspects of public or inter-organizational intervention within the municipality. These questions structure the scope and lead to the Roadmap (chapter 3). The purpose of this element is to articulate and focus on the issues, concerns, and interests of those responsible for the coordination and deployment of the Digital Solution, as well as identifying the capacities of each actor involved.

2. Criteria:

These elements are linked to the evaluation questions and are the valuation elements that allow a subjective valorization of the different phases of the Digital Solution deployment. The assessment is generated by experts within the municipalities and those responsible for the implementation of public policies related to the Digital Solution.

3. Indicators / Methodology:

These elements allow obtaining evidence about the asked questions.

4. Verification sources:

They are the sources of information, tools, or data that enable the construction of indicators or the per-

formance of analyzes derived from them.

The matrix is a guide that can be adapted according to the context of each city and market, intending to be able to deepen the analysis of the earliest stage of adoption of the Digital Solution.

The description of the most frequent traditional criteria is presented below:

1. Pertinence:

It is the degree to which the set of measures that make up the intervention (deployment of the Digital Solution) resolves the existing need or problem.

2. Relevance:

It refers to the importance of the measures in the broader policy framework. Interest is central in the set of measures as intervention criteria.

3. Coherence (internal or external):

It refers to the relationship between the objectives set, and the measures designed and implemented.

4. Complementarity:

It refers to the degree of coordination and alignment between two or more policies that intervene in the resolution of a problem, thus seeking a better result.

5. Implementation:

It refers to the form of implementing one or several policies or programs. It considers structures, processes, results, etc.

6. Coverage:

It refers to the scope and degree of inclusion of tenants that are part of the project.

7. Efficacy:

It is the degree to which the problem or demand, which motivated the deployment of the Digital Solution, was resolved. It is the degree of objective fulfillment.

8. Efficiency:

It refers to the results or effects obtained with the minimum resources possible.

9. Sustainability:

It refers to whether the benefits obtained continue after implementation.

10. Equity:

It refers to equitable and non-discriminatory distribution criteria, with special attention to gender equality.

11. Participation:

It refers to the role of stakeholders, both in the design process and in its implementation and monitoring.

12. Transparency:

It refers to the perception, knowledge, and accessibility of the public regarding the measures and/or policies.

The public servant is not considered an end-user. Therefore, this profile does not present a journey map analysis within the Digital Solution (app). Their needs and interests have been considered from the perspective of the design and implementation of public policies. As well, as their concerns for the implementation and proper functioning of the application within the municipal markets.

Evaluation questions	Sub-questions	Criteria	Indicators / Methodology	Verification Sources
Is there a sponsor to promote the project?	Is the sponsor a public servant with decision-making capacity at the local level?	Pertinence	Project formalization instrument	Mayor Councilman/woman (Executive Sponsor)
Is there a clear and long-term vision of the implementation of the Digital Solution as a public policy?	Is this vision built with a gender and non-discrimination perspective?	Relevance Equality	Project executive summary / Project charter	Executive Sponsor Responsible for strategic areas within the municipality (i.e. Information Technologies, Promotion or Economic Development, Social Communication, Markets, among others)
Are there other public policies that are linked to and strengthen municipal markets?	In the area responsible for local markets, are public policies being deployed that may be linked to the Digital Solution implementation?	Relevance Complementarity	Identification of current public policies that could be linked to the deployment of the Digital Solution, positively impacting one or another policy among themselves.	Executive Sponsor Area Directors: <ul style="list-style-type: none"> Information Technology Economic Development / Economic Promotion Local Markets

Fig. 13
Evaluation matrix

Evaluation questions	Sub-questions	Criteria	Indicators / Methodology	Verification Sources
Is there budget availability or sufficient resources for the deployment of the solution?	Are there enough public servants/officers in the areas of 1. IT 2. Local Markets 3. Entrepreneurship / Economic Development that will be involved in the processes of: 1. Design 2. Deployment 3. Monitoring of the Digital Solution?	Efficiency	Budget availability - Committed budget	Treasury office Innovation / Technology Information Office Economic Development Office Etc.
	Are resources available for hiring a cloud storage service that meets the minimum characteristics specified in section "04. Developer Guide"?			Efficiency
Is there the necessary human talent for the technical deployment of the solution?	What are the characteristics of the profile and experience of the available talent?	Implementation	Available staff (public servants) and/or Budget availability for hiring them	Responsible for Human Resources Management within the municipality or directors from the involved areas.
Is there a clear relationship and involvement on the part of the tenants?	Are the tenants organized in any way? (i.e. Association, collective, etc.)	Pertinence	Articles of incorporation and/or documentation proving the degree of organization of the tenants.	Tenants representative

Fig. 13
Evaluation matrix

Evaluation questions	Sub-questions	Criteria	Indicators / Methodology	Verification Sources
Are there experts for the socialization of the project and subsequent deployment of the marketing strategy?	Are there human resources or financial resources available to execute the socialization strategy of the project?	Efficacy	Available staff (public servants) and/or Budget availability for hiring them	Area responsible for Social Communication
Is there a team assigned to monitor the application once the project has been deployed?	Is there a support team for tenants after the deployment phase?	Participation	Available staff (public servants) and/or Budget availability for hiring them	Area responsible for entrepreneurship / Economic Development / Citizen participation
	Is there a help desk and/or support and maintenance team for the application?	Participation	Available staff (public servants) and/or Budget availability for hiring them	Area responsible for Information Technology and/or Innovation
Is there an area that works specifically for the social and economic development of markets?	Is there any leadership that can articulate the different areas of government that would be part of the deployment of the solution?	Implementation	Identification of actors that should be involved in the implementation and continuity of the Digital Solution	Executive Sponsor Responsible for strategic areas within the municipality (i.e. Information Technologies, Promotion or Economic Development, Social Communication, Markets, among others)
Are there enough resources for the promotion of the Digital Solution?	Is there a communication strategy at the local government level?	Efficacy	Available staff (public servants) and/or Budget availability	Area responsible for Social Communication

Fig. 13
Evaluation matrix

3

Roadmap

**Roadmap:
How to implement
the Digital
Solution?**

What is the transfer package?

A technology transfer package is a set of innovative scientific or technological knowledge, empirical and commercial, processed and systematized. Its purpose is the implementation, operation, production, and distribution of a new or improved good or service (CEGESTI, 2005).

The adoption of the Digital Solution, through the transfer package, aims to establish the Roadmap that allows its implementation. To do this, the Roadmap considers 4 phases:

1. Diagnosis
2. Planning
3. Configuration and Pilot
4. Launching

Level	Stakeholder / Area	Role Description
Strategic	Executive Sponsor	The sponsor or executive sponsor is generally the highest-ranking team member within the project. This person establishes leadership in the vision of the project. He is the main interested in the success of the project, its promotion, and its results. Usually, is the one who manages the necessary resources for its execution.
Tactical	Project Manager	This person is responsible for the activities during the tactical and operational deployment. From the initial phase to the last activity of the project. This person coordinates people and processes and manages risks and resources. Their purpose is an optimal implementation and deployment of the Digital Solution.
Tactical	Information Technology / Innovation	The person in charge of this area is responsible for and understanding the technical requirements. As well, as ensuring the resources that allow the deployment of the solution.
Tactical	Economic Development / Economic Promotion	The person in charge of this area is responsible for integrating the Digital Solution strategy into public policy efforts for economic development for the tenants who use the Digital Solution.
Tactical	Social Communication	The person in charge of this area is responsible for the public launch of the solution. As well, as the constant promotion for the citizens to adopt and use the app.
Tactical	Legal Area	The person in charge of this area is responsible for following up on the implementation requirements of the Digital Solution. As well as the legal aspects that its jurisdictional regulations dictate in the different topics that affect the implementation of the Digital Solution (i.e. personal data protection)

The Roadmap of the transfer package allows to establish the basic criteria of each phase, the actors involved in its execution, and the activities and tools suggested for its execution.

Key Stakeholders

Throughout the entire Solution deployment process, there are different key stakeholders. These actors need to be mapped to involve them at each level of the deployment, as suggested in the following table.

Nivel	Actor / Area	Rol description
Tactical	Tenant Representative(s)	Is the person responsible for facilitating the communication processes with the tenants, ensuring the viability and participation of the people who are part of the market. This person ensures that the vision and needs of their colleagues are reflected in all phases of the project.
Tactical	Local Markets	Is the person responsible for coordinating and supervising the daily actions and operations within the local markets.
Tactical	Private initiative	Private sector companies or organizations interested in strategically promoting the development, public launch, and support for the continuous improvement of the Digital Solution in the market.
Tactical	Technical Support	It is the area responsible for the technical implementation. As well, as generating the subsequent technical support strategy to provide continuity to the solution.
Operational	Product Manager	Is the person responsible for promoting the adoption, implementation, public launch, and support for the continuous improvement of the Digital Solution in the market. As well, as the socialization and inclusion strategy for the tenants.
Operational	Software Development (DevOps) Full Stack	Is the person responsible for managing the necessary tools for the deployment of the web and mobile platform. He analyzes the technical requirements to generate the correct environment for the solution. He also plans and tests the operation of the software, including the solution of possible problems with the system. As well, as gives support and maintenance to all the software and hardware functionalities of infrastructure.
Operational	Local Markets	Is the person responsible for supervising the daily operation of the market. He or she is also involved in the operation of the Digital Solution as an extension of the market.
Operational	Tenant Representative(s)	Is the person who communicates with his colleagues, and the other tenants in the market. He or she is involved in the proper operation of the Digital Solution from the experience with the tenants.
Operational	Technical Support	It is the area or person responsible for providing technical assistance that guarantees the optimization and operation of the digital solution, after its implementation.

Fig. 14
Stakeholders

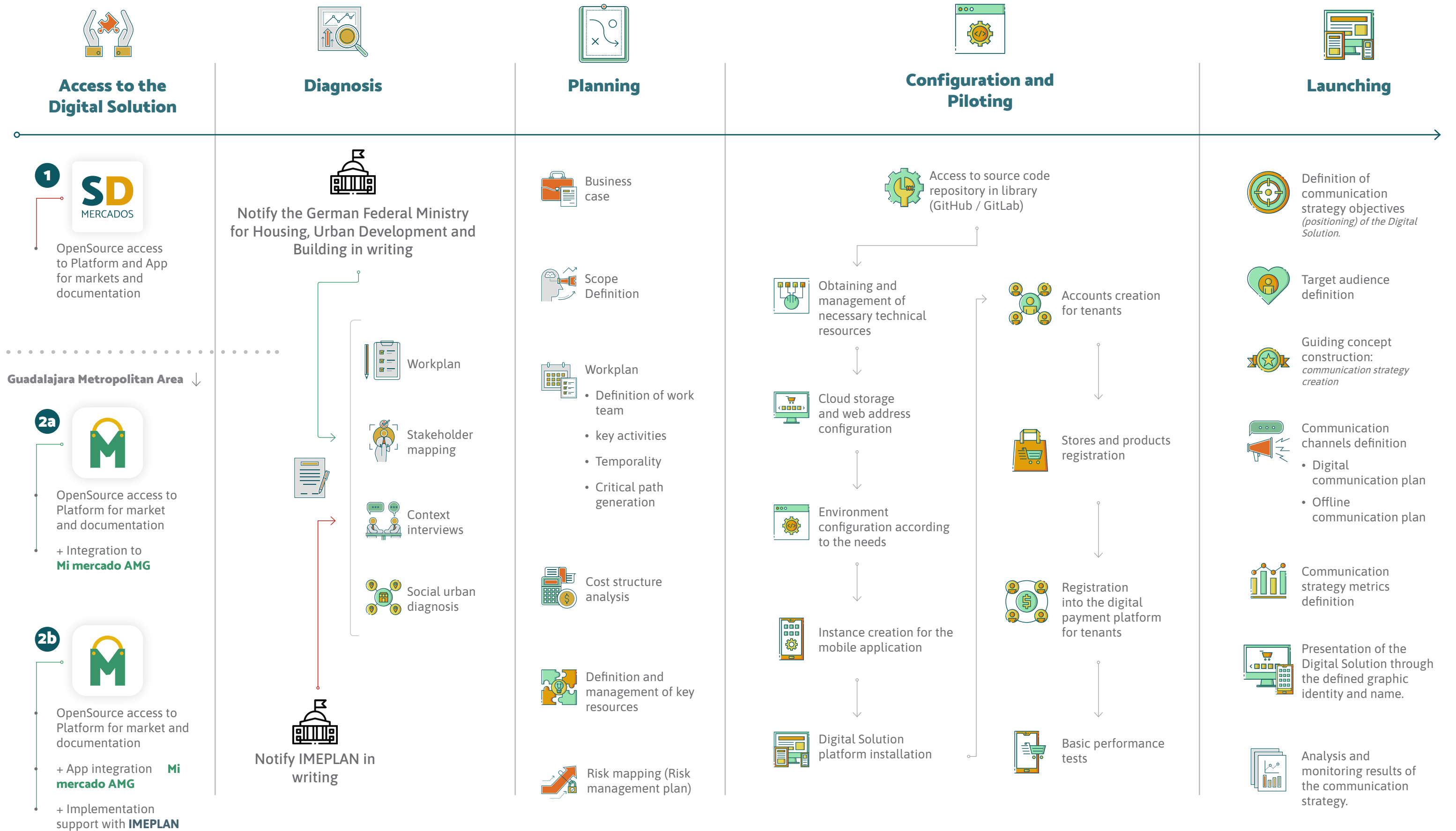


Fig.15
Digital solution roadmap

Diagnosis

The diagnosis phase is composed of the processes that allow mapping the characteristics and context of the market and its users. In addition, it allows understanding and defining stakeholders that will intervene in the four phases of implementation of the Digital Solution (app).

Stakeholders

As a project activation team, the stakeholders must select the appropriate processes for the fulfillment of objectives. In this sense, the coordination of actors executes two levels of processes:

1. **Project administration processes:** Those that correspond to the documentation, monitoring, and control of the deployment of the Solution.
2. **Processes oriented to the Digital Solution:** Those that are specific for each city and/or market and respond to unique characteristics, for example, the vocation of each market, its geographic location, or sociodemographic factors, among others.

At the diagnostic level, the key stakeholders are those with the capacity to make decisions and define the vision of the project in the short, medium, and long term. In this sense, it is suggested to integrate the actors defined as “strategic and tactical” in the previous section.

Key Activities

It is essential to consider that there could be three ways to obtain access to and implement the Digital Solution.

1. Implementation and customization of the Digital Solution in an independent project

The first of these options corresponds to the free and full use of the tool. This option is aimed at any city or market that is going to adopt the Digital Solution.

For this option, it is necessary to notify the interest in using the solution to:

Federal Ministry for Housing, Urban Development and Building, to the following e-mail: smart-city-dialog@bmi.bund.de

Once the interest has been communicated, access to the library (GitHub or GitLab) that hosts the source code will be authorized.

2. (A) Adoption and implementation of the Digital Solution within the framework of the “Mi Mercado AMG” project

The second option provides access to use the adapted digital solution such as “Mi Mercado AMG” (pilot platform). If so, it is necessary to point out that the intellectual property rights over the logo and the name in its phonetic, graphic, and conceptual aspects belong exclusively to IMEPLAN.

In addition, the use and exploitation of the logo and name will be regulated exclusively by IMEPLAN.

To access this version of the Digital Solution, please notify in writing to IMEPLAN which cities will be implementing the Digital Solution under the “Mi Mercado AMG” brand. The notification must be addressed to:

Direction of Management & Metropolitan Development
E-mail: info@imeplan.mx

2. (B) Adoption, implementation, and know-how transfer of the Digital Solution

In addition to accessing the repository of the Digital Solution, adapted to “Mi Mercado AMGt”, there is a third option that would allow the transfer of knowledge and best practices acquired through the pilot. To do so, besides notifying IMEPLAN, the interested city must express their intention to join the “Mi Mercado AMG” project and their interest in obtaining the support of IMEPLAN for the deployment of the solution.

Unlike the previous option, this process requires more than a notification (for example, the signing of a collaboration agreement or the use of other instruments). However, this process will be defined by IMEPLAN after receiving the expressed notification.

If so, the following strategic activities are suggested:

- Preparation of Work Plan: Estimation of timeline and objectives
- Stakeholders map
- Implementation of Context Interviews
- Social urban diagnosis

Tools

- Setting the project name (Digital Solution)
- Goal setting
- Social Communication Best Practices Manual
- Guide of social and urban analysis

- Tool to elaborate maps of tenants, services, and products
- Geographic and statistical information analysis platforms
- Context interviews (semi-structured)

Planning

The planning phase consists of those processes that allow establishing the total scope of the effort, the definition of objectives, and the development of strategic activities that allow the implementation and adoption of the Digital Solution.

The planning stage of the Roadmap must be understood as the sum of efforts that are used temporarily and whose objectives are to launch and obtain the first data and scope of the piloting.

Stakeholders

Strategic

- Executive Sponsor

Tactic

- Project Manager
- IT / Innovation
- Economic Development / Economic Promotion
- Social Communication
- Local Markets
- Tenants Representative

Operacional

- Product Manager
- Software Development (DevOps) - Full Stack

Key Activities

- Business Case
- Scope Definition
- Workplan
 - Definition of work team
 - Key activities
 - Temporality
 - Critical route
- Cost structure analysis
- Definition and management of key resources
- Risk plan management development

Tools

- Business Plan
- Project Chart
- Gantt
- Risk Plan Management

- Transference Package:
 - Social Communication Best Practices Guide
 - Guide of social and urban analysis
 - Feasibility analysis (Assessment prior to implementation)
- Developer Guide: Technical Requirements

Configuration and Pilot

This phase consists of the management of the installation, adjustment, configuration, and technical programming of the Digital Solution, for the perfect deployment, use, and application of the mobile application, as well as the web system.

During this phase, coordination with tenants is implemented to access and configure the Digital Solution according to their needs, create their digital catalog and publish it for consumers.

Then the changes, monitoring, and control are executed until the initial needs of the users are met. The intention is to adapt the Digital Solution so that it is functional in accordance with the objectives of the project and the needs of the users.

Stakeholders

Tactic

- Project Manager
- IT / Innovation
- Economic Development / Economic Promotion
- Social Communication
- Local Markets
- Tenants

Operacional

- Product Manager
- Software Development (DevOps). Full Stack

Key Activities

- Management and obtaining of necessary technical resources
- Configuration of the Digital Solution (Web application)
- Installation of the Digital Solution platform
- Instance creation for the mobile application
- Register of tenants
- Registration of stores and products
- Registration of tenants in the digital payment platform
- Basic performance tests

Tools

- Technical requirements
- Cost approximation: Deployment of the Digital Solution
- Identification of management processes of the

- Digital Solution
- DNS configuration for domain resolution
- Installation of the Digital Solution
- Creation of instance for the Digital Solution
- General diagrams of management processes of the Digital Solution (Flow maps)
- Final User's Guide
- Social Communication Best Practices Guide

Launching

The launch phase, as a stage of communication and socialization of the project towards citizens, has to be seen as a conversation process. Therefore, it does not have to be unidirectional, but rather a mutual interaction. It has to be something that enriches both, the one who communicates and the one who is receiving the communication.

Stakeholders

Tactical

- Executive Sponsor
- Local Markets
- Economic Development / Economic Promotion
- Tenants
- Citizens

Key Activities

- Definition of communication strategy objectives (positioning) of the Digital Solution
- Definition of target audience
- Construction of the guiding concept: the creation of a communication strategy
- Definition of communication channels:
 - Digital communication plan
 - Offline communication plan

- Definition of communication strategy metrics.
- Presentation of the Digital Solution through the graphic identity and name defined
- Analysis and monitoring of results of the communication strategy

Tools

- User's Guide:
 - 2. About the Digital Solution
 - 3. Roadmap: How to implement the Digital Solution?
 - 5. Administrator Guide (a public servant)
- Social Communication Best Practices Guide
- Social Media
 - Advertising tools
 - Data analysis
- Data Analysis
 - Data Analysis: Application Download (Digital Solution)

After a period of adoption by the public, it is suggested to look for feedback mechanisms that allow the continuous improvement of the solution, in order to continue to adapt to the needs of its users and that number grows.

4

Technical development guide

Technical development guide

The Digital Solution, in its web format, currently does not contemplate versioning. Its current version is 1.0, the launch version.

The mobile applications (apps) version is 2.2, for both iOS and Android versions and is fully compatible.

Technical requirements

Minimum technical requirements

The requirements for installing the solution in a production environment are listed below. However, due to the nature of the solution, they are cited as a recommendation and may be replaced by technologies with similar capabilities or characteristics.

The Digital Solution for Markets works with Ubuntu 20.04 LTS x64. This documentation describes the process for installing Digital Solution for Markets on this specific version of the operating system.

Server

Operating system: Ubuntu / 20.04 LTS.

RAM Memory: 16 GB

Hard Drive: 160 GB minimum

SSH account: With root privileges for the installation of libraries, dependencies, and applications

Processor: 4 cores

Ports: 80, 443

Initially, it is proposed for a single server to host the various components of the solution. It is marked as an entry point to facilitate its adoption, the subsequent segmentation of services in independent servers depends on the maturity of the receiving area and its technical criteria.

Domain

The definition of a domain is required to access the web platform.

HTTPS Certificate

The generation of an HTTPS certificate for the delivered server is required. It is a fundamental requirement for providing services from mobile applications safely.

SMTP Account

The application notifies users of various events via email. The service requires an SMTP account to output them.

Third-party services

Google Play Store and Apple App Store developer account

This service requires a registration and a membership: Cost as of 04/01/21 (Play Store): \$25.00 US dollars / one-time payment

Cost as of 04/01/21 (App Store): \$99.00 or \$299 (Enterprise version) US dollars / annual payment

<https://play.google.com/console/u/O/signup>

<https://developer.apple.com/en/support/enrollment/>

Google (Firebase Cloud Messaging)

Firebase Cloud Messaging (FCM) is a cross-platform messaging solution that allows the user to send messages securely and free. FCM is used in the project to notify a client app that a new email or other data is available for synchronization. (Google free service) | An API key is required for use.

reCAPTCHA V3

reCAPTCHA v3 returns a score for each user request. It is used in the solution to identify risky transactions (Optional service, can be turned off and on), (Google free service) | An API key is required for use.

Third Party Login (SSO)

Includes login features with Google and Apple Sign, (Optional service, which can be turned on and off), (Free service from Google and Apple) | An API key is required for use.

Tools used for development and deployment

JDK 1.11+

Java Development Kit (JDK) is software that provides development tools for creating Java programs. It can be installed on a local computer or a network drive.

Tomcat 9+

Tomcat (also called Jakarta Tomcat or Apache Tomcat) works as a servlet container developed under the Jakarta project at the Apache Software Foundation. Tomcat implements Sun Microsystems' JavaServer Pages (JSP) and servlet specifications.

Minio

Minio is a file and object storage server.

Elasticsearch

Elasticsearch is a distributed analytics and analytics engine, free and open for all types of data, including textual, numerical, geospatial, structured, and non-structured structured.

Postgresql 12+

PostgreSQL is a database management system object-relational, distributed under the BSD license and with its code freely available source.

Postgis

PostGIS converts the database management system PostgreSQL data in a spatial database using the addition of three features: spatial data types, spatial indices, and functions that operate on them.

Nginx

Nginx is a lightweight, high-performance web server/reverse proxy and proxy for email protocols.

It is free and open-source software, licensed under the Simplified BSD License.

Spring Boot / JHipster

Spring Boot is a subproject of Spring. It aims to facilitate the creation of projects with the framework Spring eliminating the need to create long files XML configuration. Spring Boot provides configurations by default for Spring and a large number of other libraries. JHipster is an open-source application generator that is used to rapidly develop web applications modern using Angular and Spring Framework. The use of Spring Framework makes it easy to document in code and provides a development framework that is easy to understand and extend thanks to the use of proven design patterns through time. The technological stack of the project is detailed below:

- Jhipster generator
- Spring Boot
- Maven
- SpringSecurity
- Spring MVC REST + Jackson

- Spring Data JPA + Bean Validation
- Spring State Machine
- Liquibase
- Angular 10
- Bootstrap 4

Ionic

IONIC is an open-source front-end SDK for developing hybrid applications based on web technologies (HTML, CSS, and JS). It is a framework that allows the application development for native iOS, Android, and the web, from a single code base.

IntelliJ IDEA

IntelliJ IDEA is an integrated development environment (IDE) for the development of programs in Java and Java Web.

Android studio

Android Studio is the official integrated development environment for the Android platform. It was announced on May 16, 2013, at the Google I/O conference, and replaced Eclipse as the official IDE for Android application development. The first stable version was published in December 2014.

XCode

Xcode is a comprehensive set of developer tools for creat-

ing apps for Mac, iPhone, iPad, Apple Watch, and Apple TV. Xcode combines the capabilities of UI design, programming, testing, debugging, and submitting to the App Store in a unified workflow.

Solution architecture

The following diagram details the architecture of the technological solution through its deployment diagram.

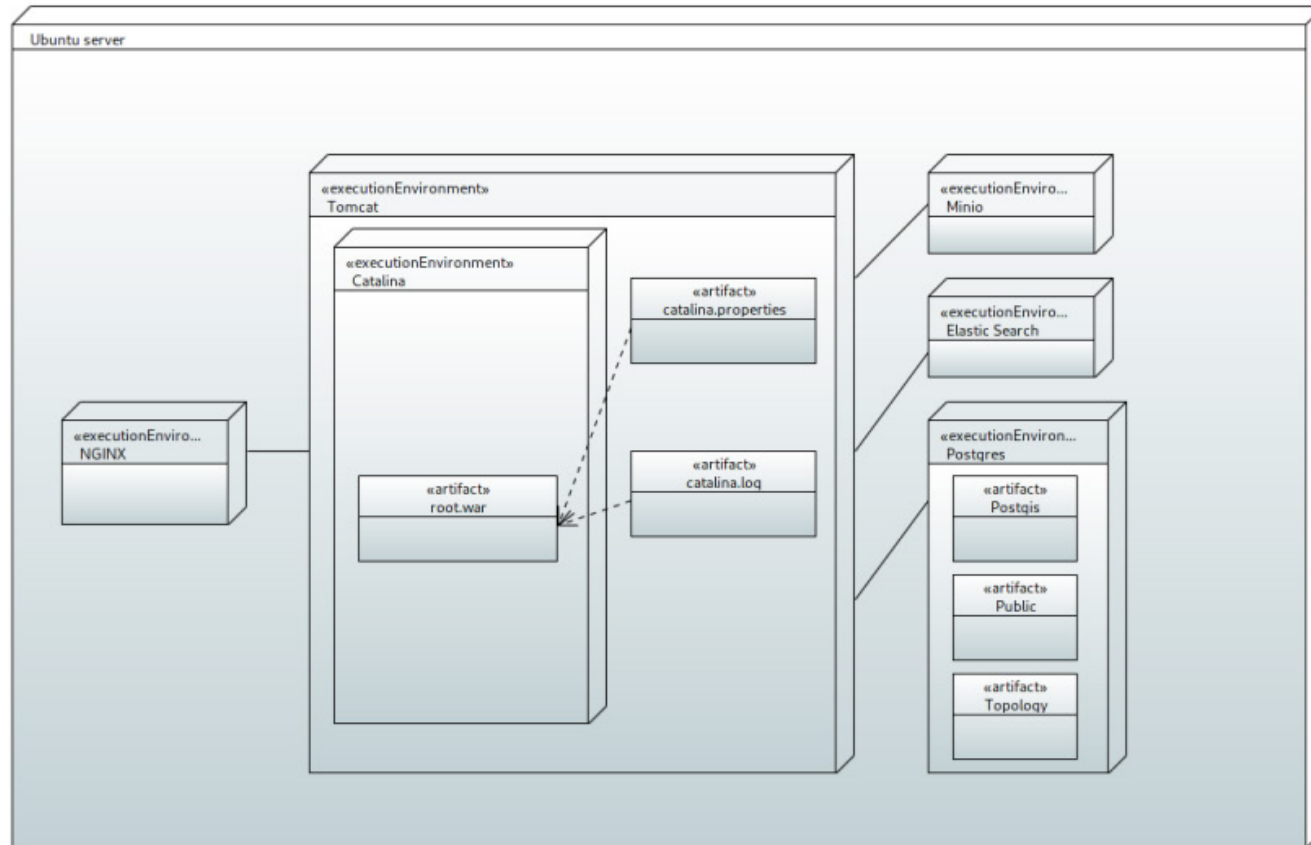


Fig. 16
Architecture diagram of the digital solution (technological solution)

Identification of the Digital Solution management process

Section scope

This guide is intended for technical personnel in charge of implementing and configuring the Digital Solution and will provide an overview of the steps to follow for the correct platform implementation.

Process identification general description

1. CAs a first step is to execute the "Development Environment Preparation Guide" this will allow you to have a development environment in which the source code of the platform and mobile applications will be available.

2. Configuration and customization of the 3 applications web, iOS, and Android according to the "Preparation Guide development environment" if applicable.
3. Compilation of the source code of the 3 software applications.
4. Acquisition and configuration of the necessary infrastructure according to the "technological requirements".
5. Domain purchase and monitoring of the "DNS configuration for domain resolution".
6. Configuration and settings of the server according to the "Installation of the Digital Solution".
7. Testing and troubleshooting.

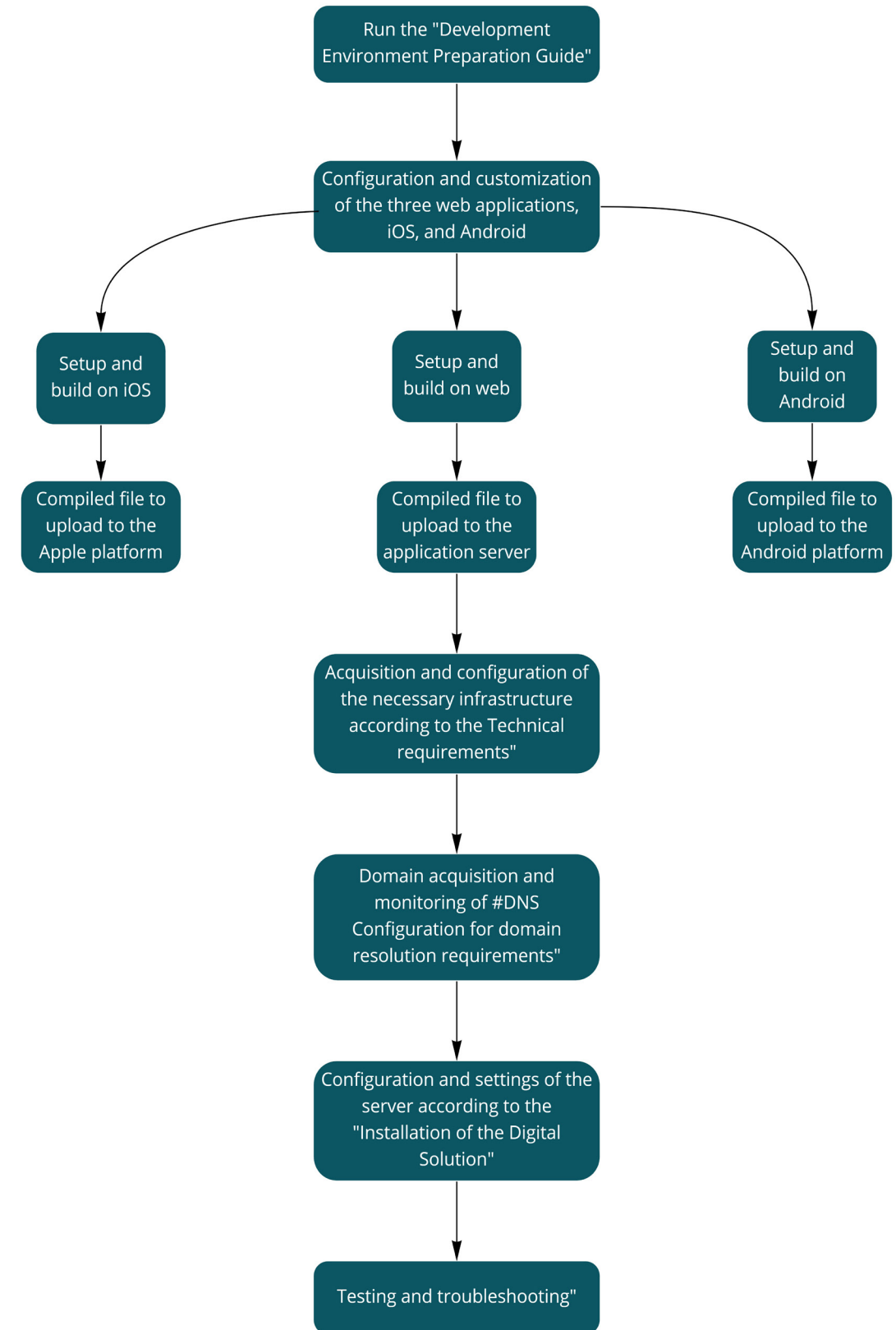
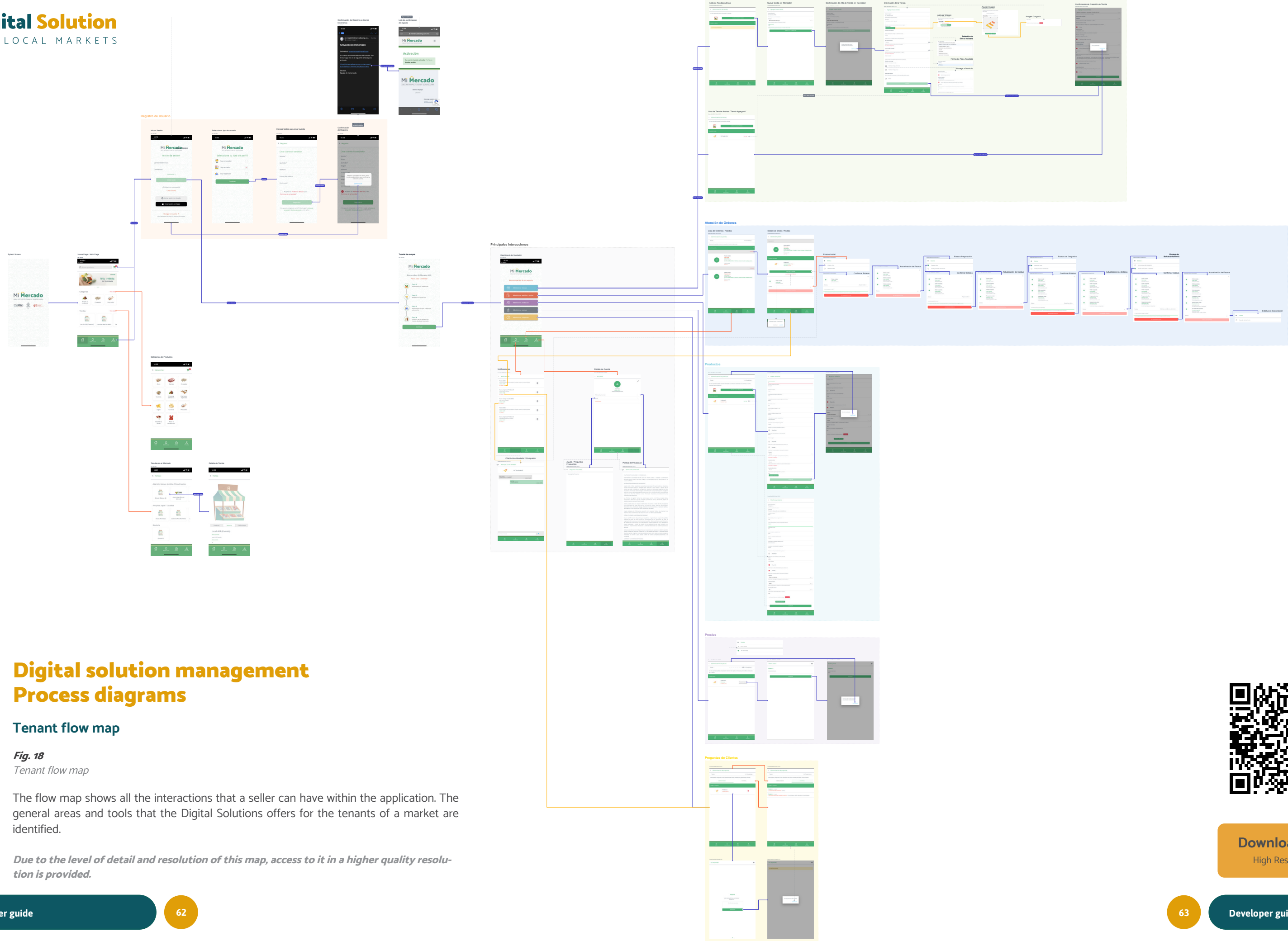


Fig. 17
Process diagram of the digital solution



Digital solution management Process diagrams

Tenant flow map

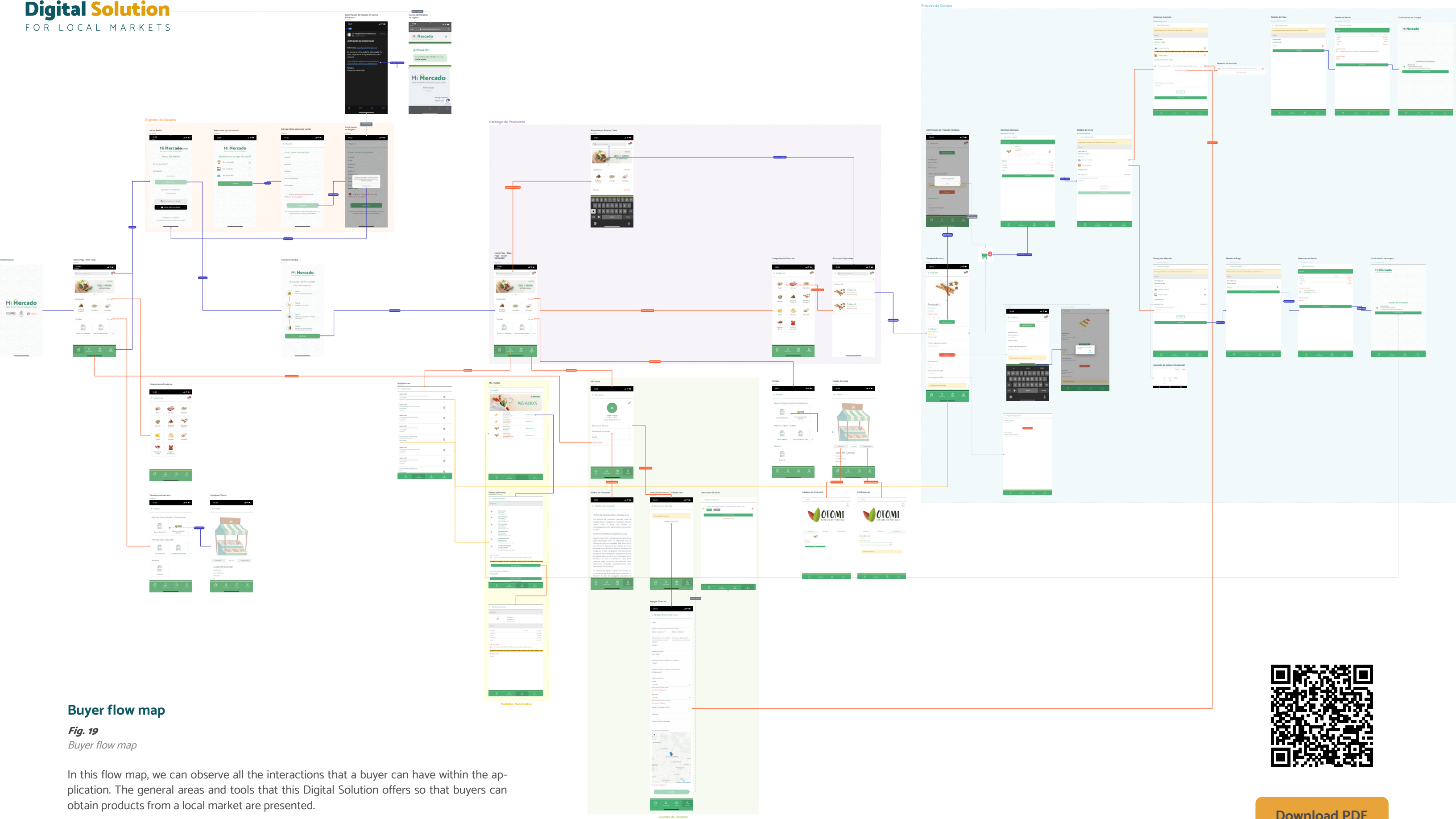
Fig. 18
Tenant flow map

The flow map shows all the interactions that a seller can have within the application. The general areas and tools that the Digital Solutions offers for the tenants of a market are identified.

Due to the level of detail and resolution of this map, access to it in a higher quality resolution is provided.



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High Resolution

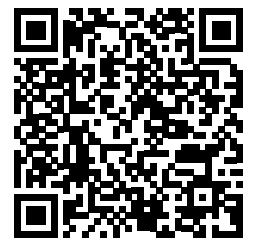


Buyer flow map

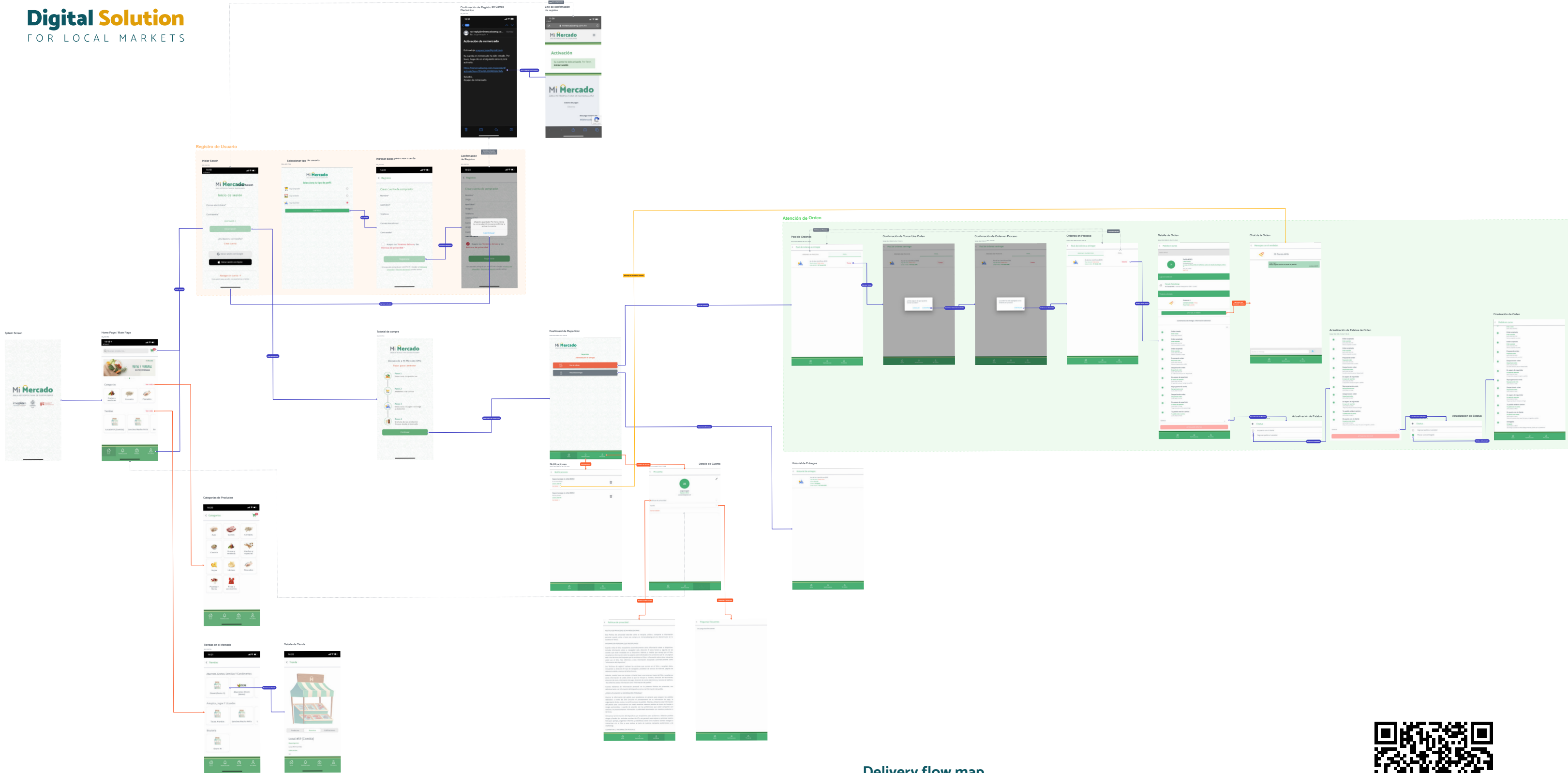
Fig. 19
Buyer flow map

In this flow map, we can observe all the interactions that a buyer can have within the application. The general areas and tools that this Digital Solution offers so that buyers can obtain products from a local market are presented.

Due to the level of detail and resolution of this map, access to it in a higher quality resolution is provided.



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Delivery flow map

Fig. 20
Delivery flow map

In this flow map, we can see all the interactions that a delivery person can have within the application. The general areas and tools that this Digital Solution offers so that couriers (delivery service) can make deliveries effectively are presented.

Due to the level of detail and resolution of this map, access to it in a higher quality resolution is provided.



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DNS configuration for domain resolution

Scope of the document

This guide is for the technical staff responsible for implementing and configuring the Digital Solution.

Additional information about the principal domain providers and vendors in Mexico is included, to demonstrate the possible domain configuration based on practical examples.

User Guide

This guide is a reference document for those technically responsible for implementing the Digital Solution. The following content is informative, and it is for the technical staff responsible for the Digital Solution. It presents the procedures that must be followed correctly to configure a domain.

What is a DNS, and what do they have to do with the domain?

The domain name system or Domain Name System (DNS) is a decentralized hierarchical naming system that allows thousands of interconnected computers to communicate with each other. Computers use sequences of numbers called Internet Protocols, also known as IP addresses.

These numbers (like a home address) guide Internet users to information on websites or apps that live on their IP address.

However, it would be difficult for people to remember those number strings every time they want to use them, which is why internet domains were invented to replace them. An example is that of this same page: www.misoluciondigital.com.

Description of the domain configuration process

Below is the general procedure to follow for domain configuration, regardless of the selected domain provider:

DNS configuration steps:

1. Make sure that the platform is installed and configured, that it is capable of being viewed through the IP address, for example: 23.343.34.5
2. Select a domain name provider, a configuration guide with some providers is presented later in this document.
3. Settings according to the provider so that the DNS type A record points to the main server with the IP address from step one.
4. Check that it resolves the DNS type A record (This process can take up to 72 hours).

Domain configuration with common providers

The steps for configuring the domain will be shown next. The following providers were selected for demonstration purposes due to their technical support and coverage in Mexico.

How can DNS be changed on GoDaddy?

At GoDaddy, some users may have a domain registered with that provider, but a hosting or mail service with a different provider.

Therefore, if you need to modify, create or delete any DNS record of your own domain, you must follow the following steps:

1. Sign in to your GoDaddy account.
2. In your list of products and services, go to Domains and click on the “DNS” button.
3. The next screen – called DNS Administration – shows the DNS records associated with the selected domain. To modify any, you must click on the pencil

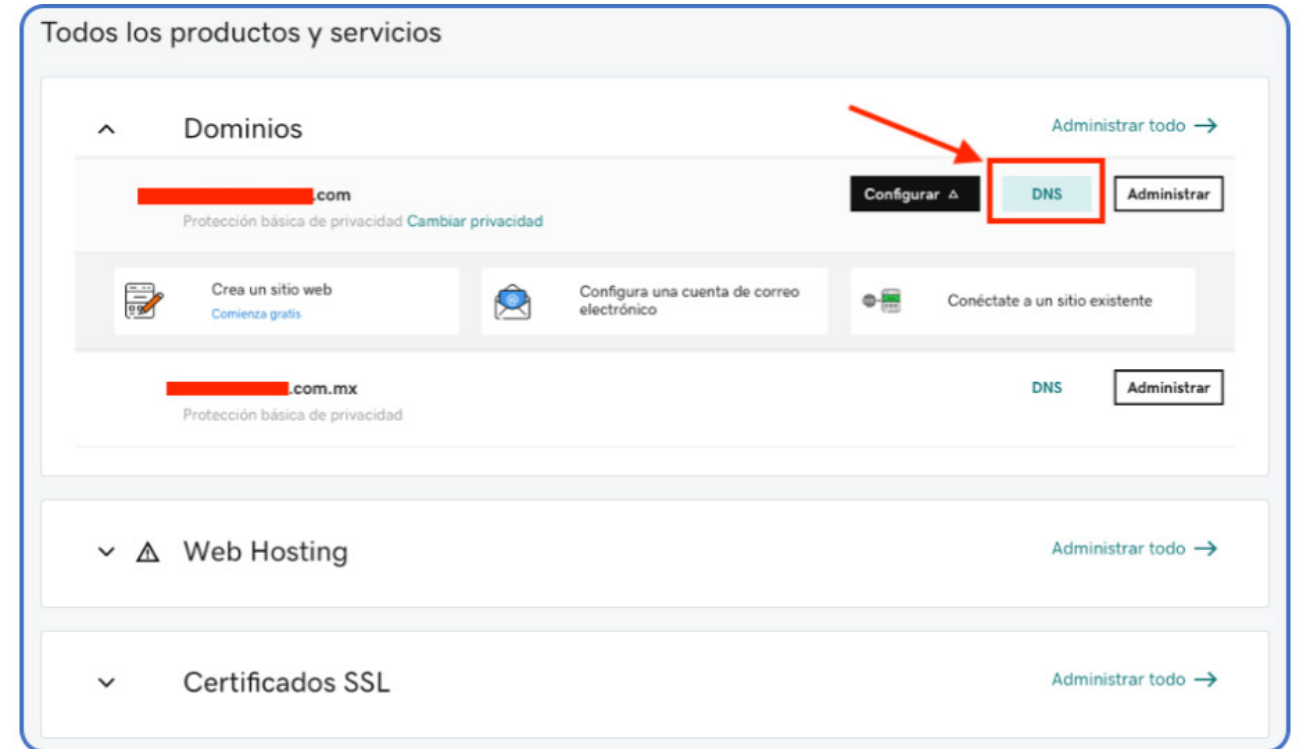


Fig. 21
GoDaddy domains screen example

icon.

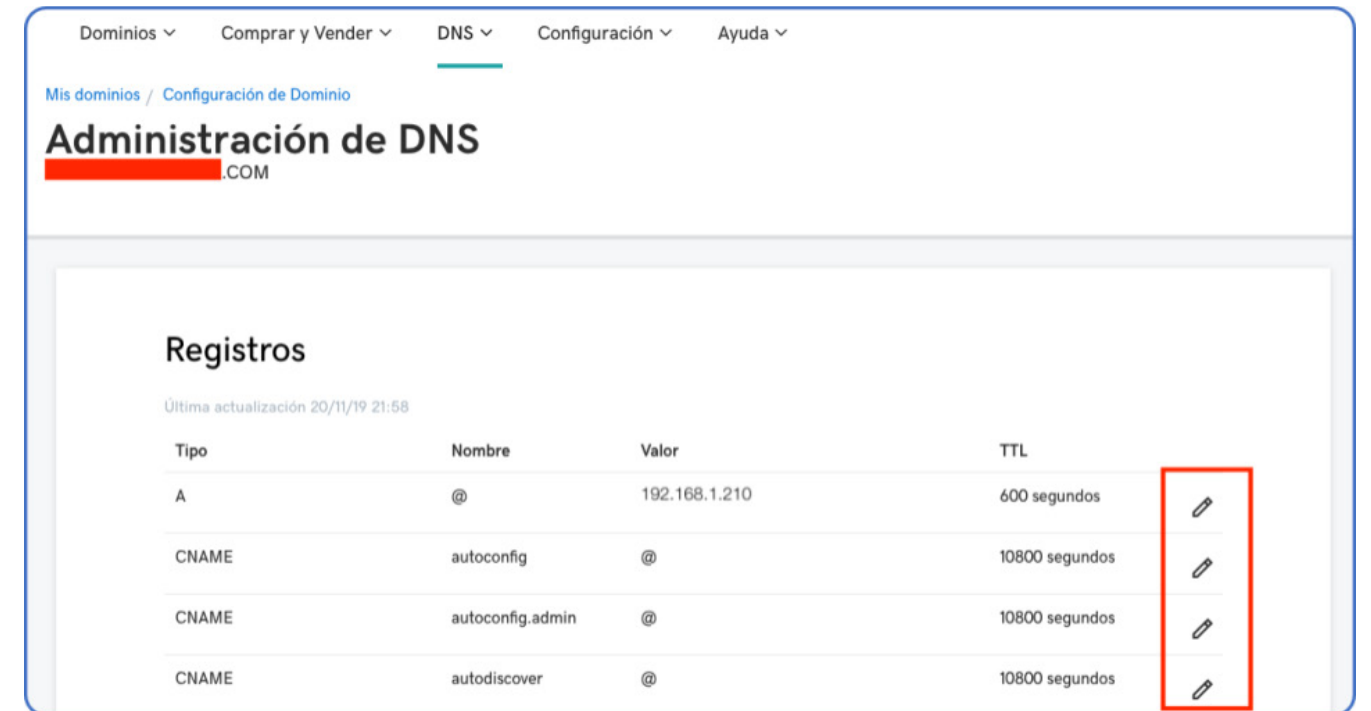


Fig. 22
GoDaddy domains screen example

4. Immediately, a form will be displayed with the following spaces: (fig. 23)

Fig.23
GoDaddy DNS screen example

- Host. It is the name, word, or phrase that will identify the record. It will depend on the type of record you add/modify. For example, www or any other subdomain will allow users to find the web page when they type the domain with that prefix. You can also use @ as the default value.
- Enter the IP address you want DNS to point to.
- TTL (Time-to-live). It shows the options for the time intervals it will take for the changes to take effect. You can also customize it (the value is expressed in seconds, and the minimum allowed by the system is 600s).

5. When you finish the changes, you must click on “Save” and allow the specified time for the changes to be made.



How can DNS be modified on Bluehost?

Follow the next steps to generate DNS modifications in Bluehost:

1. Go to the “Domains” page in the Bluehost control panel and click the Manage button next to the domain you want to add an A record for. (fig. 24)

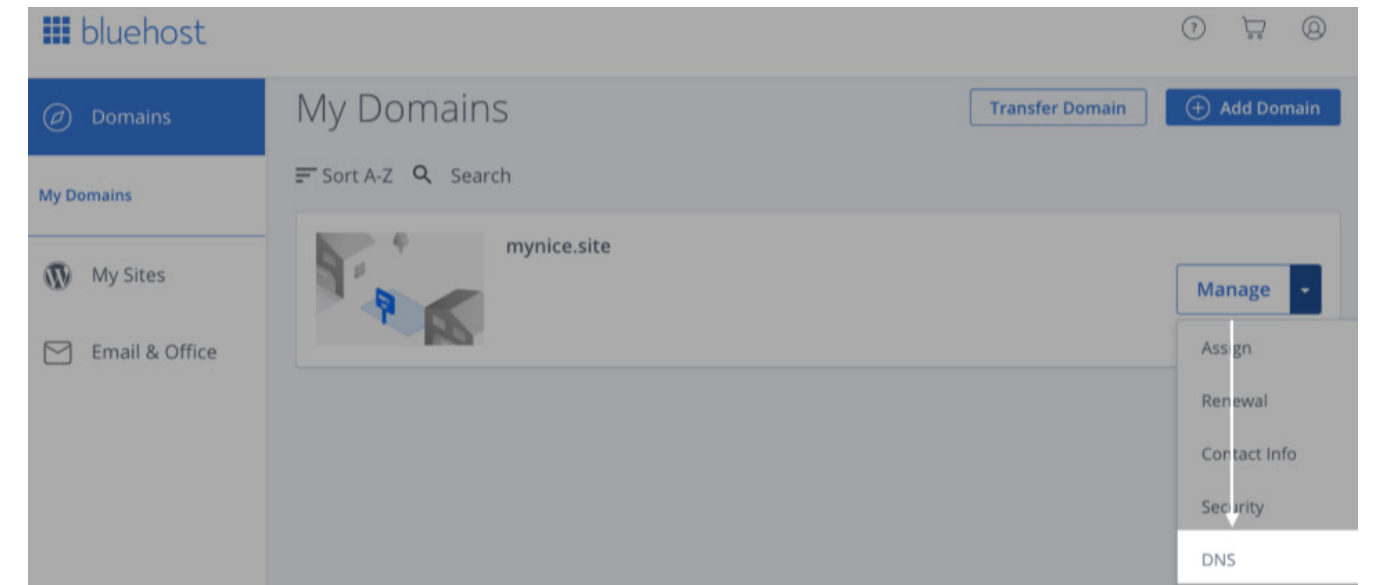


Fig. 24
Bluehost domains screen example

1. Click on the domain in Bluehost.
2. Click the DNS tab to go to the DNS management interface. (fig. 25)

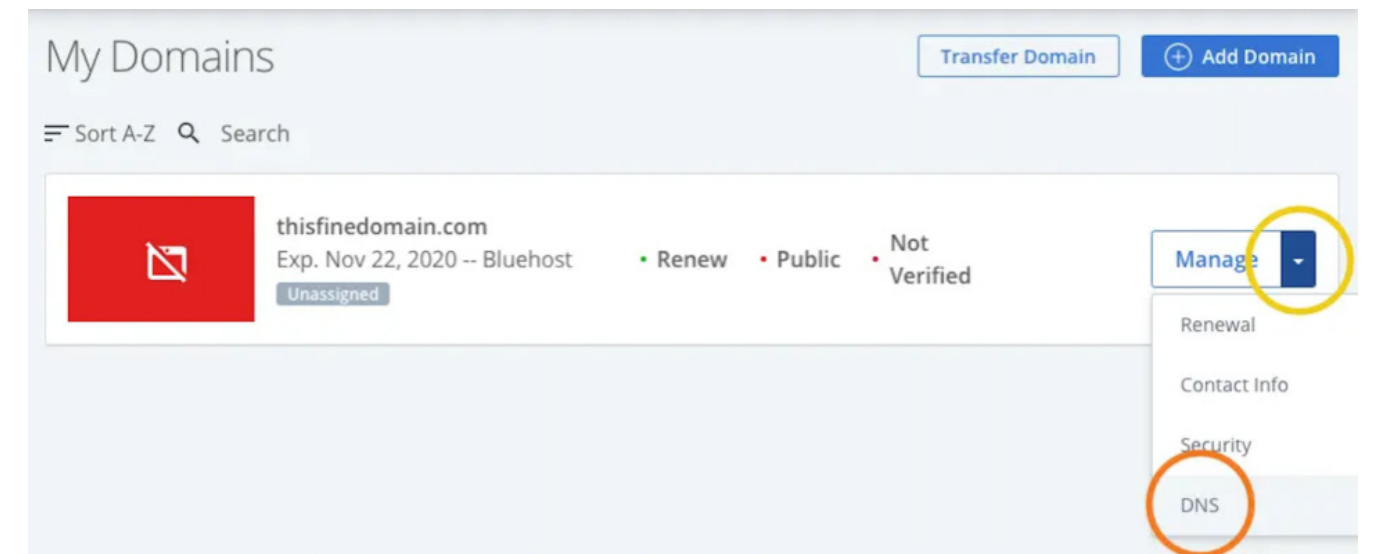


Fig. 25
Bluehost DNS screen example

Add an A record to Bluehost

Next, you will need to configure the host record, the destination (dots a), and the TTL for the Bluehost A record.

Go to the DNS management page in your Bluehost dashboard.

1. Host registration

If you are setting up an A record for your root domain (for example, mydigitalsolution.com), you will need to use “@” for the “Host Record” field in Bluehost’s DNS manager. If you’re setting up an A record for a subdomain (for example, awesome.mydigitalsolution.com), use the subdomain for the host record.

2. Point to

In the «Apunta a» field, add the IP address of your server where the Digital Solution is set up.

3. TTL (Time to Live)

Leave the TTL setting at the default minimum duration of 4 hours. (fig. 30)

Finish your Bluehost A registration. Finally, click Save to finish the setup. After the A record creation on Bluehost, it can take 24 - 48 hours to propagate.

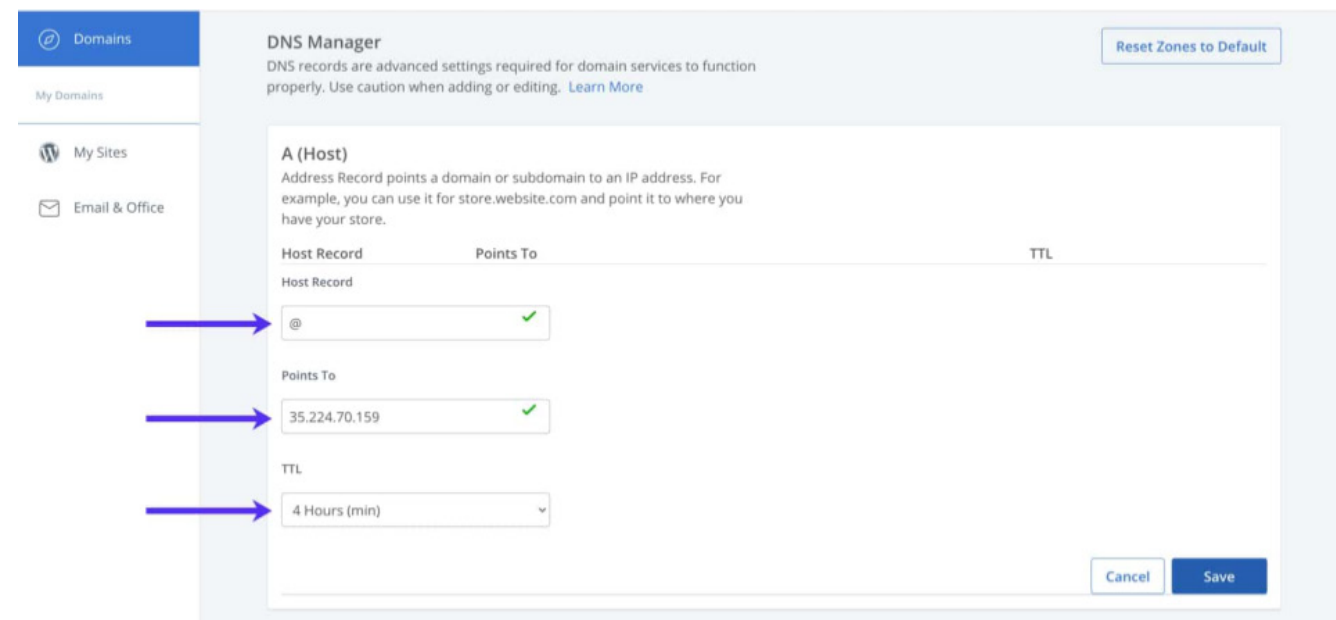
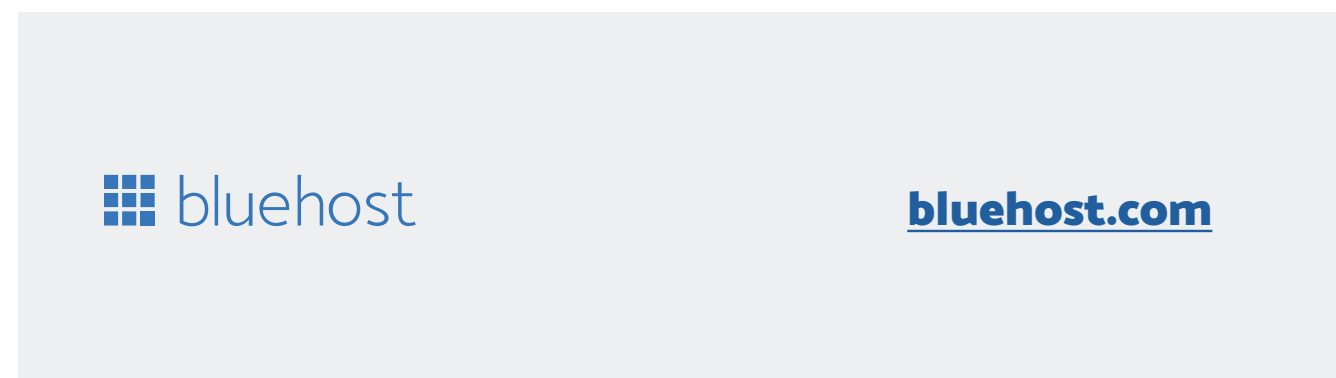


Fig. 26
Bluehost DNS screen example



Installation of the Digital Solution

Installation process

This section details the steps necessary to carry out the deployment or installation of the Digital Solution.

Minio Installation and configuration process

Login with root privileges

```
sudobash
```

Update ubuntu repositories and install base libraries

```
aptupdate
```

```
aptinstallapt-transport-httpsca-certificateswgetgnupgcurlgit
```

Enter user directory

```
cd
```

Enter user directory

```
wgethttps://dlminio.io/server/minio/release/linux-amd64/minio
```

Grant execute permissions to binary

```
chmod+xminio
```

Move the file to the /usr/local/bin directory, where Minio’s systemd startup script expects to find it

```
mvminio/usr/local/bin
```

For security reasons, add a specific user for the minio execution

```
useradd-rminio-user-s/sbin/nologin
```

Update the minio executable by marking minio-user as the new owner

```
chownminio-userminio-user/usr/local/bin/minio
```

Next, create a directory where Minio will store the files

```
mkdir/usr/local/share/minio
```

Give ownership of that directory to minio-user

```
chownminio-userminio-user/usr/local/share/minio
```

Prepare configuration file storage folder

```
mkdir/etc/minio
```

Give ownership of that directory to minio-user

```
chownminio-userminio-user/etc/minio
```

Use nano to create a new configuration file

```
nano/etc/default/minio
```


With the following content

```
MINIO_ACCESS_KEY="solucion-digital-random-key"  
MINIO_SECRET_KEY="solucion-digital-random-secret-key"  
MINIO_VOLUMES="/usr/local/share/minio"  
MINIO_OPTS="-C/etc/minio-address.0.0.0.9000"
```

Use nano to create a new Minio startup script

```
nano/etc/systemd/system/minioservice
```

With the following content

```
[Unit]  
Description=MinIO  
Documentation=https://docs.minio  
Wants=network-online.target  
After=network-online.target  
AssertFileIsExecutable=/usr/local/bin/minio
```

```
[Service]
```

```
WorkingDirectory=/usr/local/
```

```
User=minio-user
```

```
Group=minio-user
```

```
EnvironmentFile=/etc/default/minio
```

```
ExecStartPre=/bin/bash -c "if [ -z "${MINIO_VOLUMES}" ]; then echo \"Variable MINIO_  
VOLUMES not set in /etc/default/minio\"; exit 1; fi"
```

```
ExecStart=/usr/local/bin/minio server $MINIO_OPTS $MINIO_VOLUMES
```

```
# Let systemd restart this service always
```

```
Restart=always
```

```
# Specifies the maximum file descriptor number that can be opened by this process
```

```
LimitNOFILE=65536
```

```
# Disable timeout logic and wait until process is stopped
```

```
TimeoutStopSec=infinity
```

```
SendSIGKILL=no
```

```
[Install]
```

```
WantedBy=multi-user.target
```

```
# Built for ${projectname}-${projectversion} (${projectname})
```

Then run the following command to load all the systemd units

```
systemctl daemon-reload
```

Finally, enable Minio to start on boot

```
systemctl enable minio
```

```
systemctl start minio
```

Use the following commands to start, stop or restart the new service

```
systemctl start minio
```

```
systemctl stop minio
```

```
systemctl restart minio
```

Installation and configuration of ElasticSearch

Import GPG repository key

```
wget -qO- https://artifacts.elastic.co/GPG-KEY-elasticsearch | sudo apt-key add -
```

Add the Elasticsearch repository to the system via the following command

```
sudo sh -c echo "deb https://artifacts.elastic.co/packages/7.x/apt/stable/main" > /etc/  
apt/sources.list.d/elastic-7.x.list
```

Once the repository is added, install elasticsearch through the following command

```
sudo apt update
```

```
sudo apt install elasticsearch
```

Finally, enable Elasticsearch to start on boot:

```
systemctl enable elasticsearch
```

```
systemctl start elasticsearch
```

Use the following commands to start, stop or restart the new service

```
systemctl start elasticsearch
```

```
systemctl stop elasticsearch
```

```
systemctl restart elasticsearch
```

Postgresql + Postgis instalation and configuration

Add postgresql repository to our server

```
wget -quiet -O- https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
```

```
RELEASE=$(lsb_release -cs)
```

```
echo "deb http://apt.postgresql.org/pub/repos/apt/${RELEASE}-pgdg-main | sudo tee  
/etc/apt/sources.list.d/pgdg.list
```

Update ubuntu repositories

```
apt update
```

Install postgresql package via the following command

```
apt -y install postgresql-12
```

Verify that the service is running

```
ss -tunelp | grep 5432
```

Create password for default user

```
su postgres
```

```
psql -c "alter user postgres with password 'NewPassword'"
```

```
exit
```

Install postgres select version

```
apt install postgres postgresql-12-postgis-3
```

Try postgis installation

```
sudo -i -u postgres
```

```
createuser postgis_test
```

```
createdb postgis_db -O postgis_test
```

```
psql -d postgis_db
```

```
CREATE EXTENSION postgis;
```

```
SELECT PostGIS_version(); 2.5 USE_GEOS=1 USE_PROJ=1 USE_STATS=1
```

Service commands

```
sudo systemctl restart|start|stop postgresql
```

Tomcat installation and configuration

Install OpenJDK package via the following command

```
apt install openjdk-11-jdk
```

```
apt install default-jdk
```

Tomcat user creation, for security reasons, tomcat should not be run under root user. Create a new system user and group with the /opt/tomcat home directory that will run the service:

```
useradd -r -m -U -d /opt/tomcat -s /bin/false tomcat
```

Download the latest version of Tomcat 9. Before proceeding to the next step, check the download page for a new version. If there is a new version, copy the link to the core tar.gz file, found in the binary distributions section

```
wget wget https://downloads.apache.org/tomcat/tomcat-9/v9.0.58/bin/apache-tomcat-9.0.58.
```

```
tar.gz -P /tmp
```

Once the download is complete, extract the Tomcat archive and move it to the /opt/tomcat directory:

```
tar xf /tmp/apache-tomcat-9*.tar.gz -C /opt/tomcat
```

For more control over tomcat versions and updates, create a symlink pointing to the tomcat installation director:

```
ln -s /opt/tomcat/apache-tomcat-9.0.58 /opt/tomcat/latest
```

Change the ownership of the tomcat directory to the user and groups created above

```
chown -R tomcat:tomcat /opt/tomcat/latest/*
```

Assign execute permissions to installation binaries

```
sh -c chmod +x /opt/tomcat/latest/bin/*sh
```

To run tomcat as a service, create a new file 'unit file'

```
nano /etc/systemd/system/tomcat.service
```

Paste the following configuration:

```
[Unit]
```

```
Description=Tomcat 9 servlet container
```

```
After=network.target
```

```
[Service]
```

```
Type=forking
```

```
User=tomcat
```

```
Group=tomcat
```

```
Environment="JAVA_HOME=/usr/lib/jvm/default-java"
```

```
Environment="JAVA_OPTS=-Djava.security.egd=file:///dev/urandom -Djava.awt.headless=true"
```

```
Environment="CATALINA_BASE=/opt/tomcat/latest"
```

```
Environment="CATALINA_HOME=/opt/tomcat/latest"
```

```
Environment="CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid"
```

```
Environment="CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC"
```

```
ExecStart=/opt/tomcat/latest/bin/startup.sh
```

```
ExecStop=/opt/tomcat/latest/bin/shutdown.sh
```

```
[Install]
```

```
WantedBy=multi-user.target
```

* Modify the value of JAVA_HOME if the path to your Java installation is different.

Save, close the file, and notify systemd that we've created a new unit file

```
systemctl daemon-reload
```

Start the tomcat service by running

```
systemctl start tomcat
```

Check the status of the service with the following command

```
sudo systemctl status tomcat
```

If there are no errors, enable the Tomcat service to start automatically at boot time

```
sudo systemctl enable tomcat
```

Test installation of tomcat, for this, access via the browser to the IP of our server through port 8080, you will have to view the apache tomcat welcome page as shown below.(fig. 31)

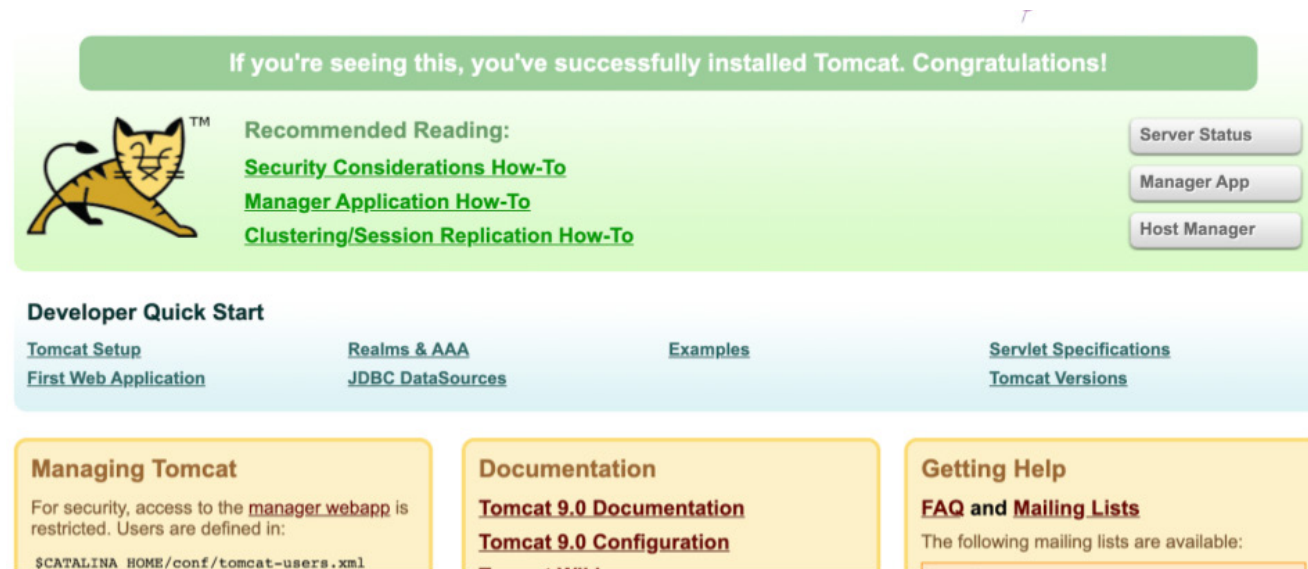


Fig. 27
Apache tomcat view

Service commands

```
sudo systemctl restart|start|stop tomcat
```

Installation and configuration of Digital Web Solution

Create Digital Solution database and its access credentials:

```
sudo su postgres
createuser soluciondigital_user
createdb soluciondigital_db -O soluciondigital_user
psql -d soluciondigital_db
alter user soluciondigital_user with password 'soluciondigital_pass';
CREATE EXTENSION postgres;
CREATE EXTENSION postgres_topology;
exit
exit
```

Assign application environment variables in the catalina.properties file within the tomcat installation:

Step 1 - access configuration file

```
sudo nano /opt/tomcat/apache-tomcat-10.0.16/conf/catalina.properties
```

Step 2 - paste the following configuration variables at the end of the file

```
#Spring-General
spring.profilesactive=prod,swagger
server.use-forward-headers=true
spring.http.multipart.max-file-size=50MB
spring.http.multipart.max-request-size=50MB
#This token must be encoded using Base64 and be at least 256 bits long (you can type#
`openssl rand -base64 64` on your command line to generate a 512 bits one)
jhipster.security.authentication.jwt.base64-secret=secret-hash
```

```
#Database configuration
spring.datasource.url=jdbc:postgresql://localhost:5432/soluciondigital_db
spring.datasource.username=soluciondigital_user
spring.datasource.password=soluciondigital_pass
```

```
#Minio configuration
minio.url=http://127.0.0.1:9001
minio.accessroot-user=soluciondigital-random-key
minio.accessroot-password=soluciondigital-random-secret-key
```

```
#ElasticSearch configuration
spring.elasticsearch.rest.url=http://localhost:9200
```

```
#Application configurations
application.base-url=https://midominio.com.mx
application.tmp-file-directory=/tmp
application.enabled-cart=true
application.geo-delivery-validation=true
application.mobile-app-version=1.8
application_mobile-redirect=soluciondigital/login
```

```
#Third-party authentication / Refer to Third-party authentication manual
application.client-social-login-facebook-enabled=false
application.client-social-login-google-enabled=false
application.client-social-login-apple-enabled=false
spring.security.oauth2.client.registration.apple.client-id=client
spring.security.oauth2.client.registration.apple.client-secret=secret
spring.security.oauth2.client.registration.google.client-id=client
spring.security.oauth2.client.registration.google.client-secret=secret
spring.security.oauth2.client.registration.facebook.client-id=client
spring.security.oauth2.client.registration.facebook.client-secret=secret
```

```
#Notification push / Firebase
```

Digital Solution uses Google Firebase Cloud Messaging to send push notifications, to obtain the access API Key it is necessary to create a firebase project from the following link:



console.firebase.google.com

Once created, execute the following steps:

1. Access the project configuration section.
2. Access the service accounts section.
3. Access the Manage service account permissions section.

(fig. 28)

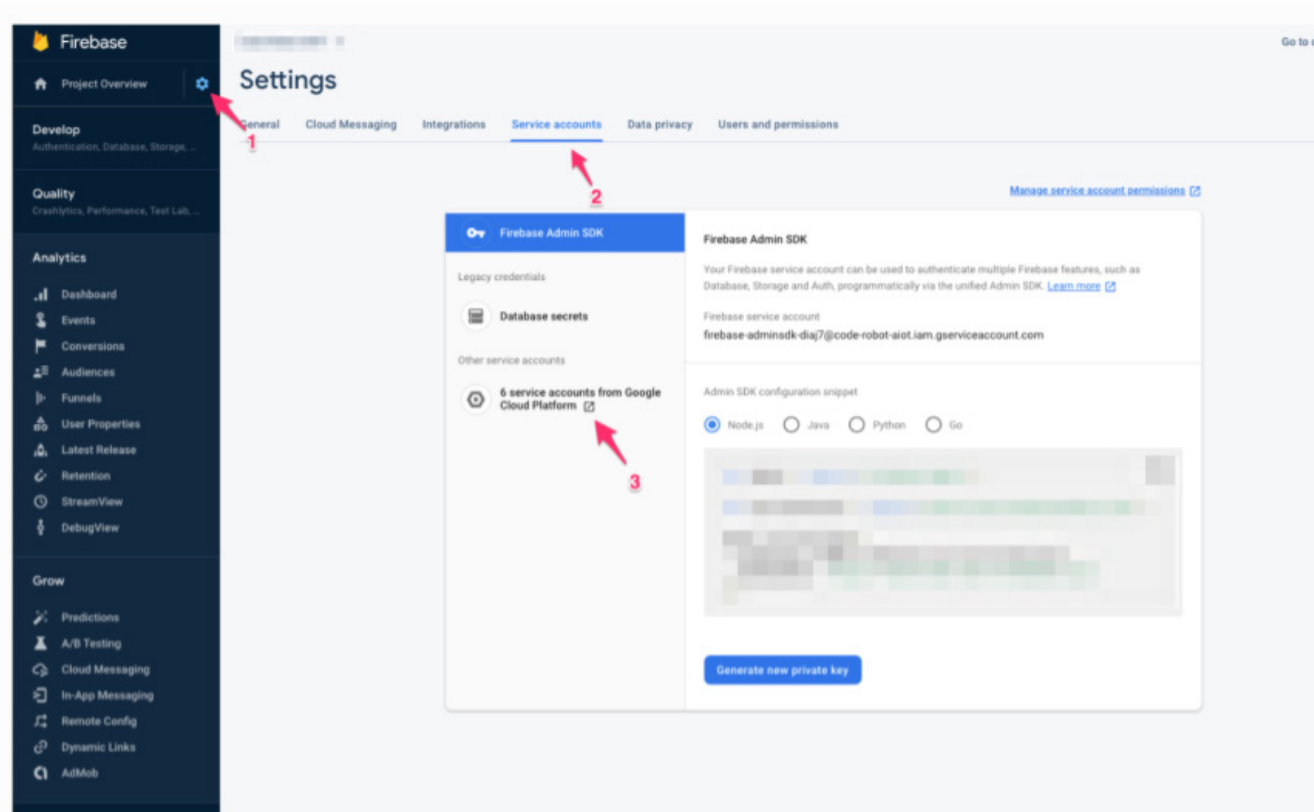


Fig. 28
Firebase reference

In the other service accounts section, you will find the following content distribution:
(fig.29)

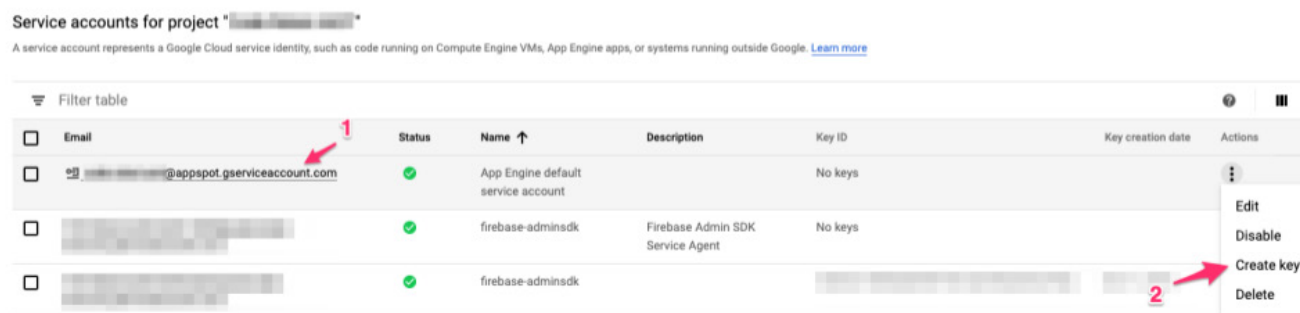


Fig. 29
Account references

1. Pay attention to the account with domain @appspot.gserviceaccount.com
2. Access the 'Create key' option.
(fig. 30)

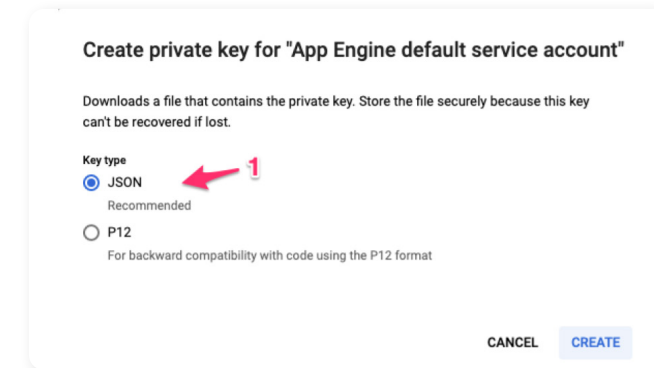


Fig. 30
Reference to create a private key

Select the option to create a new key of type JSON.

This last step will generate a JSON type file, open it in any text editor and retrieve the configuration variables from it.
(fig. 31)



Fig. 31
Reference to create a private key

Assign the attributes as detailed below:

1. The PROJECT_ID value for the environment variable application.firebase.app-id (a)
2. The CLIENT_EMAIL value in the environment variable application.firebase.account-id (b)
3. The PRIVATE_KEY value in the environment variable application.firebase.private-key (c)
4. Add the following configuration to the next file at the end where the Notification push / Firebase comment is:

```
sudo nano /opt/tomcat/apache-tomcat-10.0.16/conf/catalina.properties
application.firebase.app-id=
application.firebase.account-id=firebase-adminsdk-aduk@solucion-digital...
application.firebase.private-key=
```

Recaptcha V3

The Digital Solution uses Recaptcha V3 to detect bots, to obtain the access API Key it is necessary to create a project from the following link:

(fig. 32)

<https://www.google.com/recaptcha/admin/create>

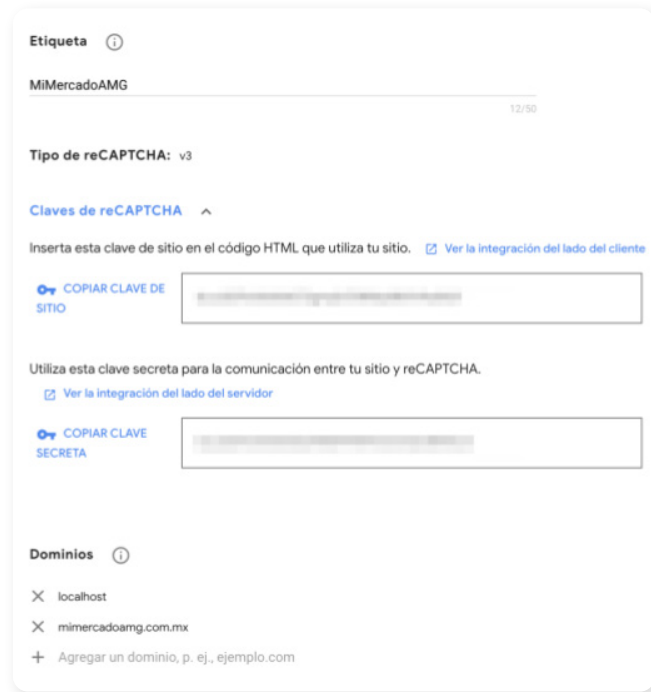


Fig.32
Reference for Recaptcha V3

```
application.recaptcha.v3.secret-key=
application.recaptcha.v3.pass-score=0.7
application.recaptcha.v3.enabled=true
```

Mail output configuration

```
jhipster.mail.from=mail@mail.com
jhipster.mail.base.url=https://midominio.com.mx
spring.mail.host=smtpgmail.com
spring.mail.port=587
spring.mail.username=
spring.mail.password=
spring.mail.protocol=smtps
spring.mail.tls=true
spring.mail.properties.mail.smtp.auth=true
spring.mail.properties.mail.smtp.starttls.enable=true
spring.mail.properties.mail.smtp.ssl.trust=smtpgmail.com
```

Step 3, restart tomcat for the changes to take effect:

```
sudo systemctl restart tomcat

Source code repository:
Clone binary repository
cd /tmp
git clone (public URL)
cd soluciondigital-webapp-binaries
```

Deposit the latest version of binary in tomcat webapps directory:

```
rm -R /opt/tomcat/latest/webapps/*
cp soluciondigital-latest-war/opt/tomcat/latest/webapps/ROOT.war
```

Check tomcat logs to determine installation status:

```
tail -f /opt/tomcat/latest/logs/catalina.out
(Ver fig. 33)
```

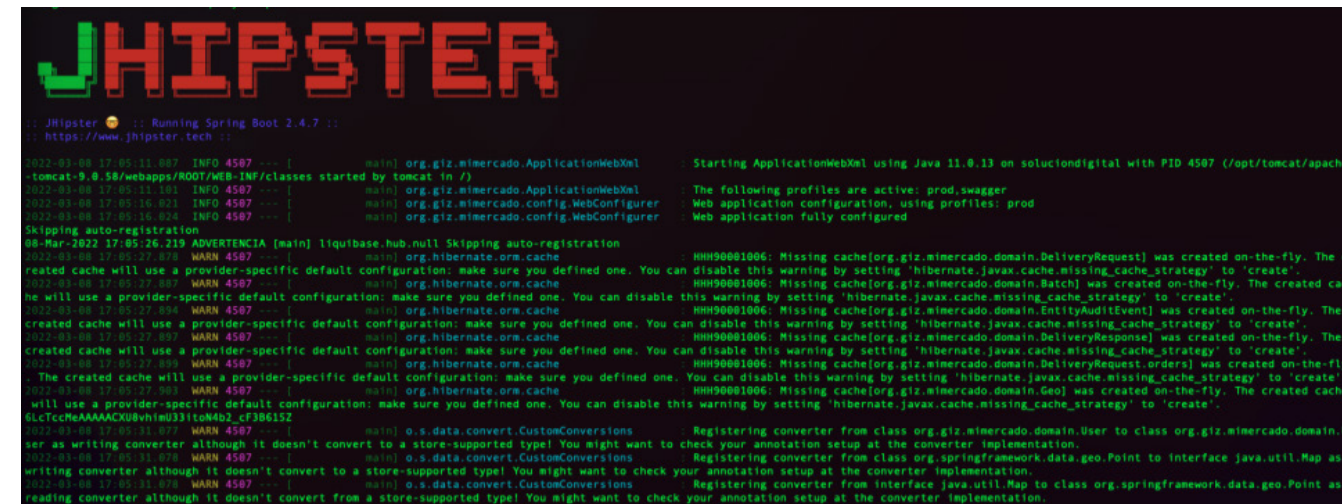


Fig. 33
Tomcat log verification reference

¹ **Note:** Currently (April 2022), the Digital Solution is in the pilot phase. For this reason, as well as for traceability reasons, the source code repository is currently not available in open-source libraries. To access the source code, please follow the steps outlined in the “3. Roadmap” section of this document. The German Federal Ministry for Housing, Urban Development and Building and IMEPLAN are the institutions responsible for managing the source code, prior to its publication in an open-source library.

Test installation of Digital Solution, for this, access via the browser to the IP of our server through port 8080, it will have to display the welcome page of Digital Solution.

To enter test username and default passwords:

```
user:admin
password:password
```

(fig. 34)



Fig. 34
Login screen reference

Installation and configuration of NGINX Proxy

Install nginx from the ubuntu repositories

```
apt install nginx
```

Check installation status

```
service nginx status
```

- Generation of HTTPS certificates

```
Local o pruebas:
mkdir -p /etc/nginx/certs
cd /etc/nginx/certs
openssl req -x509 -sha256 -nodes -newkey rsa:2048 -days 365 -subj /C=US/ST=Oregon/L=Portland/O=CompanyName/OU=Org/CN=localhost -keyout ./privkey.pem -out ./fullchain.pem
```

- Productive environment

```
# Generar certificado con proveedor de certificados y depositar
# archivos privkey.pem y fullchain.pem en la ruta /etc/nginx/certs
```

- NGINX Configuration

```
sudo unlink /etc/nginx/sites-enabled/default
cd /etc/nginx/sites-available/
nano solucion_digital.conf
```

Paste the following configuration in the msedmetro.conf file and save

```
server {
listen 80;
location / {
proxy_set_header Host $host;
proxy_pass http://localhost:8080;
}
}

server {
listen 443;
ssl on;
ssl_certificate /etc/nginx/certs/fullchain.pem;
ssl_certificate_key /etc/nginx/certs/privkey.pem;
location / {
proxy_set_header Host $host;
proxy_pass http://localhost:8080;
}
}
```

Continue with the NGINX configuration:

```
ln -s /etc/nginx/sites-available/solucion_digital.conf /etc/nginx/sites-enabled/solucion_digital.conf
```

```
sudo service nginx restart
```

Test installation, for this, access via the browser to the IP of our server through port 80 or 443, it should deploy the welcome page of the Digital Solution.

Mobile Application Preparation

To compile and publish the iOS application and the Android application, an OSX machine with xCode, Android Studio and NodeJS 16 LTS installed are required, once the previous dependencies are satisfied, proceed as follows:

Mobile application configuration

Check nodejs and npm versions

```
node -v
npm -v
```

² **Note:** Currently (April 2022), the Digital Solution is in the pilot phase. For this reason, as well as for traceability reasons, the source code repository is currently not available in open-source libraries. To access the source code, please follow the steps outlined in the “3. Roadmap” section of this document. The German Federal Ministry for Housing, Urban Development and Building and IMEPLAN are the institutions responsible for managing the source code, prior to its publication in an open-source library.

Install environment dependencies

```
npm install -g @ionic/cli
```

Get repository source code

```
git clone (public URL)
```

Install app dependencies

```
cd solution\digital-ionic
```

```
npm install
```

Update mobile app environment variables

```
nano src/environments/environment.prod.ts
```

```
nano src/environments/environments
```

(fig. 35)

```
export const environment = {
  production: true,
  versionCode: 2.0,
  apiUrl: 'https://mimercadoamg.com.mx/api',
  socialLoginUrl: 'https://mimercadoamg.com.mx/oauth2/authorization/{provider}?mobile=true',
  recaptchaV3PublicKey: ''
};
```

Fig. 35
Tomcat log verification reference

Add Firebase Cloud Messaging credentials, from the Firebase application defined in the previous section, enter it and add a new Android application as shown below: (Fig. 36)

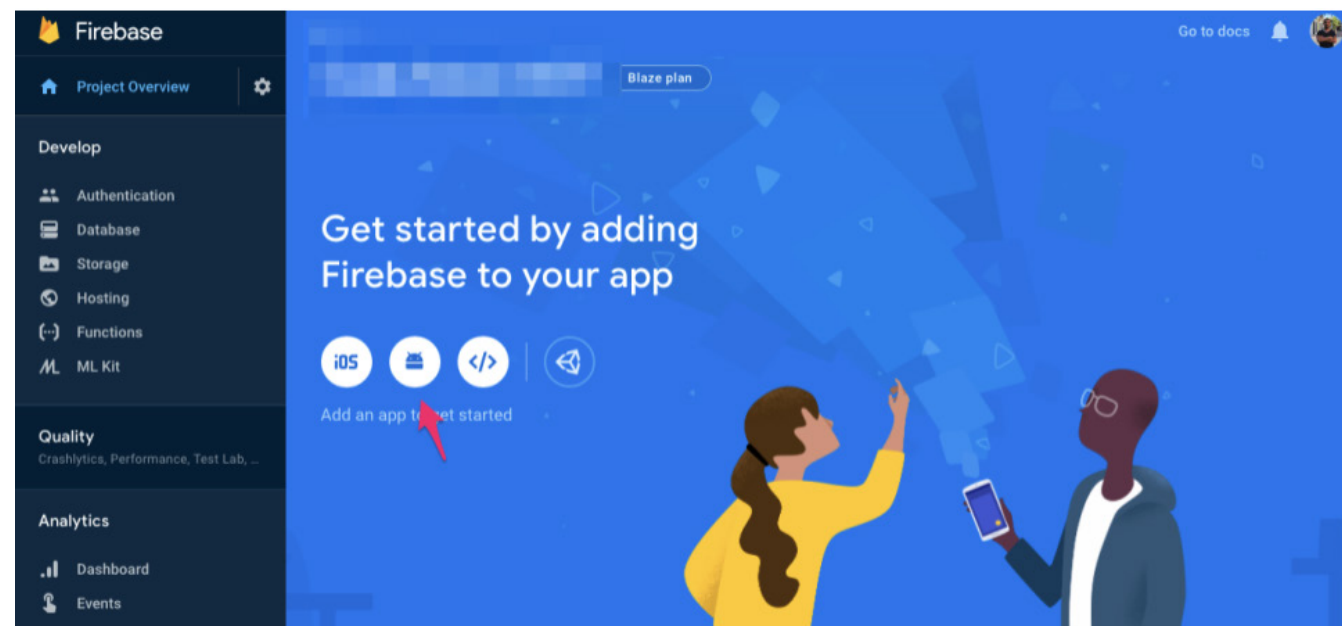


Fig.36
Reference for adding a new Android app

Set the package name and information consistent with the mentioned settings. (Fig. 37)

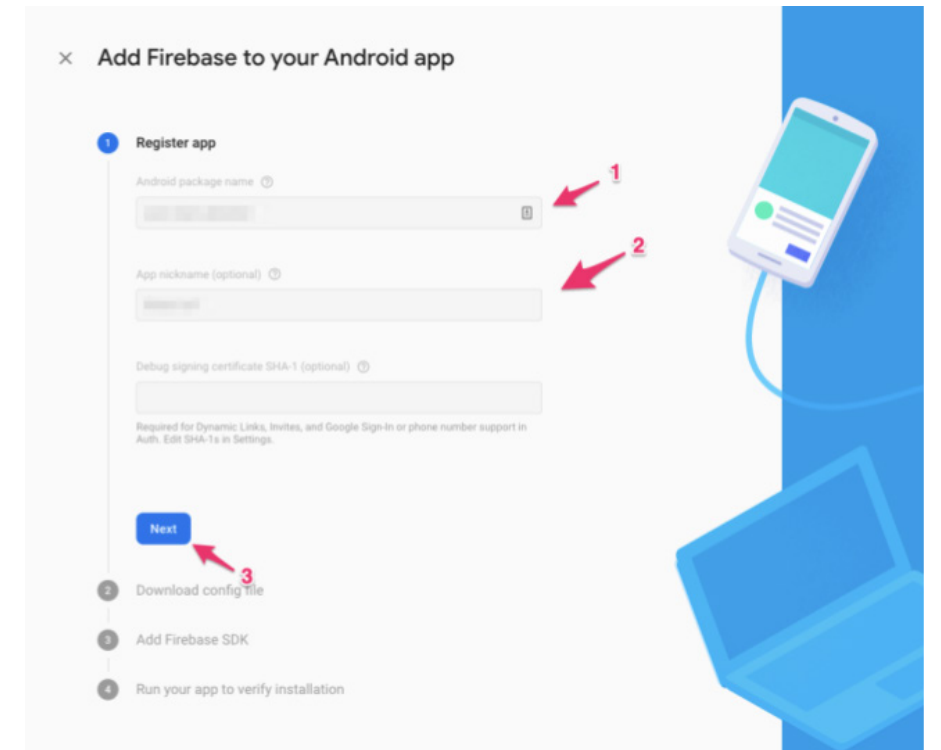


Fig. 37
Package Configuration Reference

Download the google-services.json configuration file and store it in the following directory:

```
android/app/google-services.json
```

Once this file is obtained, it is not necessary to continue with the following steps within the Firebase wizard.

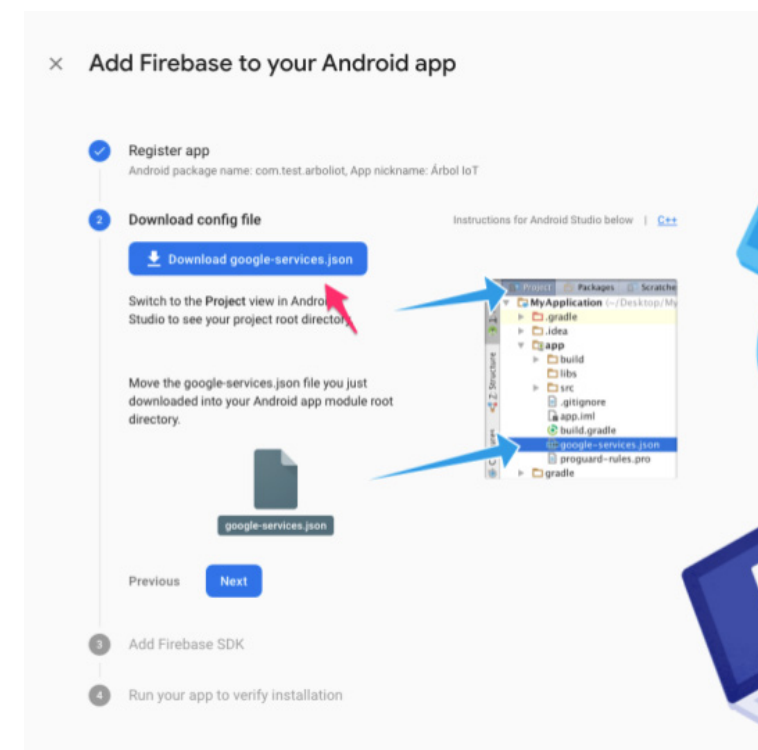


Fig. 38
JSON file download reference

For the iOS version, add a new iOS app as shown below:
(Fig. 39)

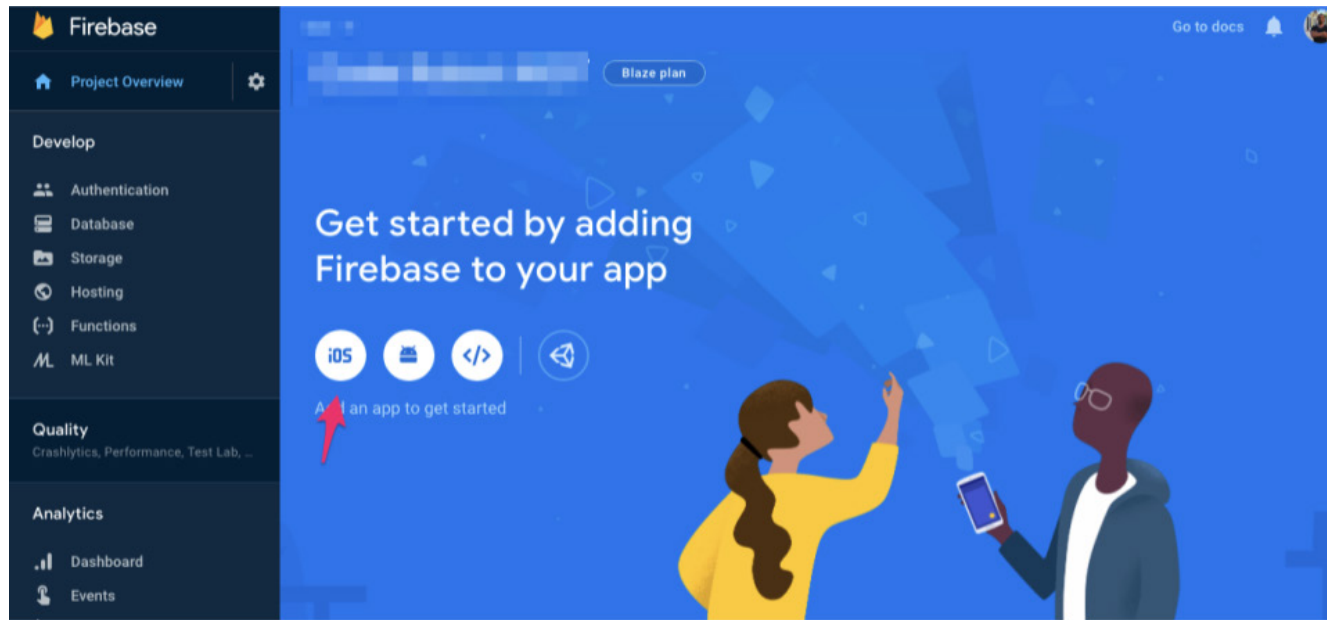


Fig. 39
Reference for adding a new Android app

Set the package name and information consistent with the mentioned settings

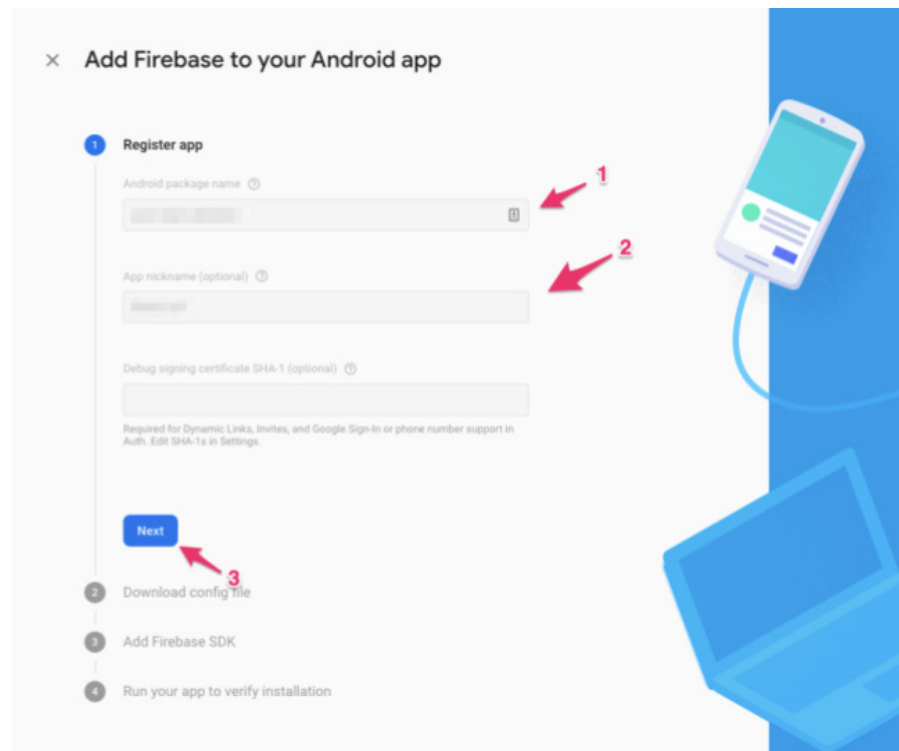


Fig. 40
Package Configuration Reference

Download the GoogleService-Info.plist configuration file and store it in the following directory:

(Fig. 41)

```
ios/App/App/  
GoogleService-Info.plist
```

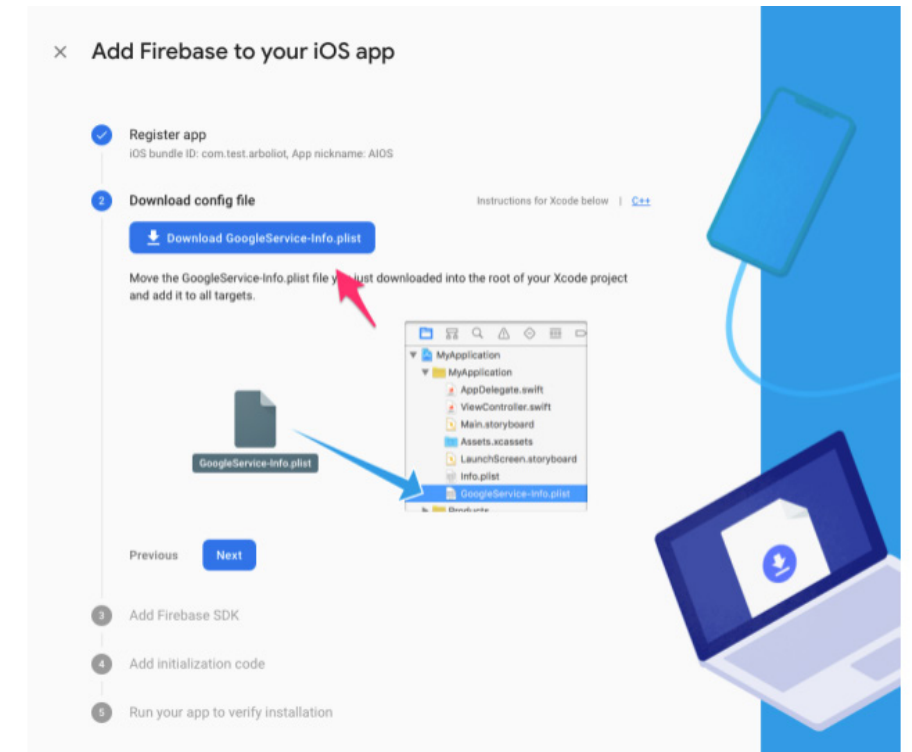


Fig. 41
JSON file download reference

Run the app on Android

To run the application, use the following command:

```
ionic capacitor build android --prod
```

This will launch android studio with the project loaded, so the app can run using the official android studio documentation.

<https://developer.android.com/training/basics/firstapp/running-app>

Run the app on iOS

To run the application, use the following command:

```
ionic capacitor build ios --prod
```

This will launch XCode with the project loaded, allowing you to run the application using the official XCode documentation.

<https://developer.apple.com/documentation/xcode/running-your-app-in-the-simulator-or-on-a-device>

Publish app

Refer to the official documentation of the respective stores:

Android:

<https://developer.android.com/studio/publish>

iOS:

<https://developer.apple.com/documentation/xcode/preparing-your-app-for-distribution>

Creation of instance for the Digital Solution

Introduction

Scope of this section

This section is to facilitate technical users in the platform development environment setup.

How to use this guide section?

This guide is a reference document for the technical managers of the app. The information presented here is aimed at informing the technical user about the procedures to deploy the development environment on an OSX computer.

For its use, consult the table of contents above and follow the instructions carefully.

General overview

Minimum hardware and software requirements

The requirements for the development environment are cited below, however, due to the nature of the solution, they are cited as a recommendation and may be replaced by technologies with similar or superior capabilities or characteristics.

Operating System: OS X

Note: The guide discusses the OS X development environment as it's dependency for building iOS applications.

RAM Memory: 8GB
Hard drive: 160GB (Minimum)
Processor: 4 cores

Tools used for development

Docker

Docker is an open-source project that automates the deployment of applications within software containers, providing an additional layer of abstraction and automation of application virtualization across multiple operating systems. For the deployment of the development environment, this tool is required. It may help to simplify the related services, such as:

- **Minio:** It is a file and object storage server.
- **Elasticsearch:** It is a free, open, and distributed an-

alytics and analytics engine for all types of data, including textual, numeric, geospatial, structured, and unstructured.

- **Postgresql 12+ / Postgis:** It is an object-relational database management system, distributed under the BSD license and with its source code freely available..

JDK 11

Java Development Kit (JDK) is software that provides development tools for creating Java programs. It can be installed on a local computer or a network drive.

Spring Boot / JHipster CLI

Spring Boot is a subproject of Spring, which aims to make it easier to create projects with the Spring framework by eliminating the need to create long XML configuration files. Spring Boot provides default configurations for Spring and a large number of other libraries.

JHipster is an open-source application builder used to rapidly develop modern web applications using Angular and the Spring Framework. Using the Spring Framework facilitates documentation in code and provides a development framework easy understandable and extendable thanks to the use of time-tested design patterns.

The technological stack of the project is detailed below:

- Jhipster generator
- Spring Boot
- Maven
- Spring Security
- Spring MVC REST + Jackson
- Spring Data JPA + Bean Validation
- Spring State Machine
- Liquibase
- Angular 10
- Bootstrap 4

Ionic / Ionic CLI

IONIC is an open-source front-end SDK for developing hybrid applications based on web technologies (HTML, CSS, and JS). This framework allows the development of applications for native iOS, Android, and the web, from a single code base.

IntelliJ IDEA

IntelliJ IDEA is an integrated development environment (IDE) for developing Java and Java Web programs.

Android studio

Android Studio is the official integrated development en-

vironment for the Android platform. It was announced on May 16, 2013, at the Google I/O conference, and replaced Eclipse as the official IDE for Android application development. The first stable version was published in December 2014.

XCode

Xcode is a comprehensive set of developer tools for creating apps for Mac, iPhone, iPad, Apple Watch, and Apple TV. Xcode combines the capabilities of UI design, programming, testing, debugging, and submitting to the App Store in a unified workflow.

Development environment preparation

This section details the steps required to set up the development environment.

Dependency installation

Docker installation

1. Download and install Docker. It is recommended to use the stable version. You must enter the following link and select the model and operating system of the computer you use to download and install:

<https://docs.docker.com/desktop/mac/install>

2. After the installation is complete, double-click docker in the "Applications" folder to run it.
3. Once docker is running, its icon will appear in the OSX status bar.
4. The Docker for Mac installation package contains Docker Engine, Docker command-line client, Docker Compose, Docker Machine, and Kitematic. Use the following command to check your version number: (Fig. 42)

GIT Installation

Install the latest version of Git via the official installer:

```
bash-3.2# docker --version
Docker version 20.10.12, build e91ed57
bash-3.2# docker-compose --version
docker-compose version 1.29.2, build 5becea4c
bash-3.2#
```

Fig. 42

Docker version reference

<https://sourceforge.net/projects/git-osx-installer/>

(Fig. 43)

You will need to open terminal and run git command to check git availability. (Fig. 44)

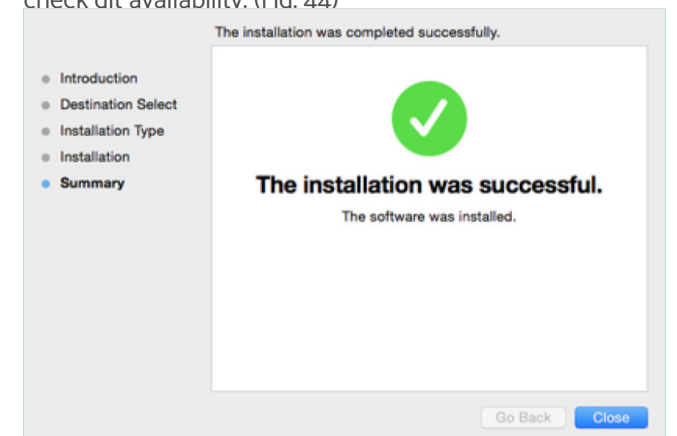


Fig.43

Git installation

```
bash-3.2# git
usage: git [--version] [--help] [-C <path>] [-c <name>=<value>]
  [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
  [-p | --paginate | -P | --no-pager] [--no-replace-objects] [--bare]
  [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
  <command> [<args>]

These are common Git commands used in various situations:

start a working area (see also: git help tutorial)
  clone Clone a repository into a new directory
  init Create an empty Git repository or reinitialize an existing one

work on the current change (see also: git help everyday)
  add Add file contents to the index
  mv Move or rename a file, a directory, or a symlink
  restore Restore working tree files
  rm Remove files from the working tree and from the index

examine the history and state (see also: git help revisions)
  bisect Use binary search to find the commit that introduced a bug
  diff Show changes between commits, commit and working tree, etc
  grep Print lines matching a pattern
  log Show commit logs
  show Show various types of objects
  status Show the working tree status
```

Fig. 44

Git command review

Node.js Installation

Install Node.js from the Node.js website (remember to use the 64-bit LTS version, as non-LTS versions are not supported). (Fig. 45)

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

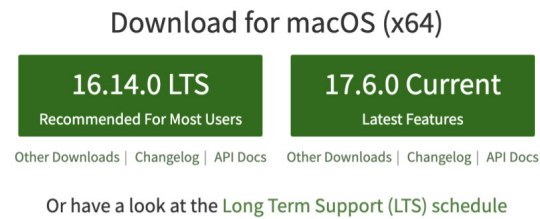


Fig. 45
node JS download

Once the installation is finished, check it by opening the OSX terminal and executing the following command:

```
node--version
npm--version
```

JDK 11 (Java) Installation

Additionally, it is necessary to install the JDK from the JDK website: <https://adoptium.net>

(Fig. 46)

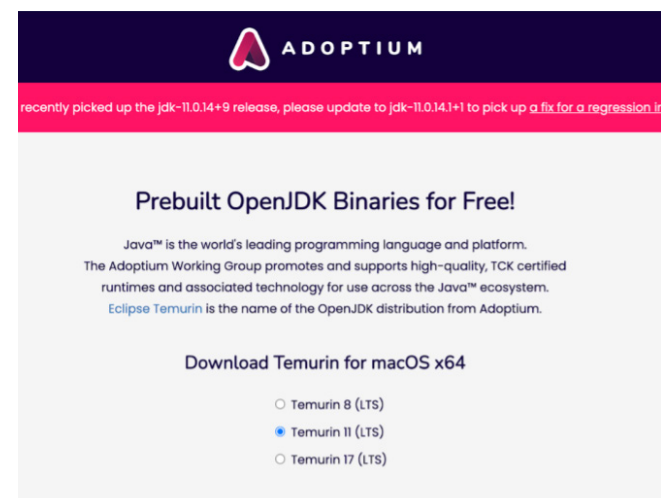


Fig. 46
JDK Installation.

Once the installation is finished, check it by opening the OSX terminal and executing the following command:

```
java--version
```

IntelliJ IDEA Installation

Download IntelliJ IDEA Community and run the install with defaults:

<https://www.jetbrains.com/es-es/idea>

(Fig. 47)

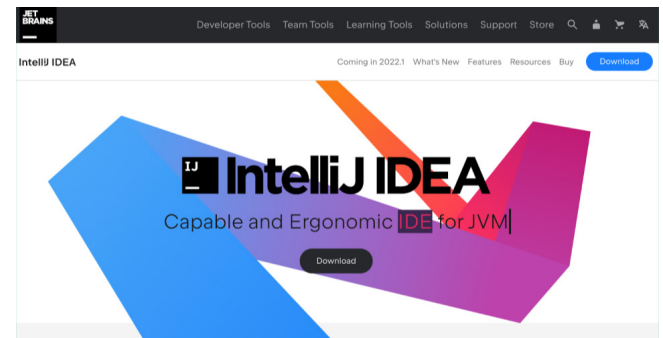


Fig. 47
Download and installation.

Android studio installation

To install Android Studio, it is suggested to do it from the official page, and keep the default installation:

<https://developer.android.com/studio/index.html>

(Fig. 48)

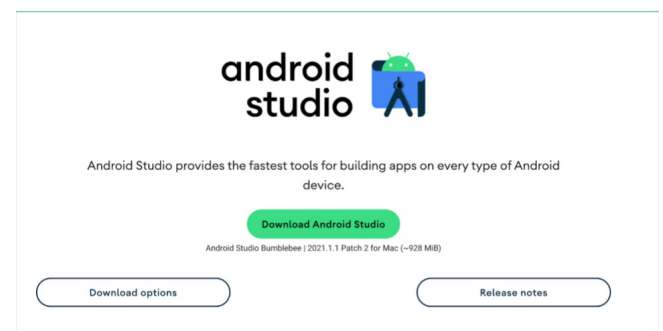


Fig. 48
Android studio installation

XCode Installation

It is suggested to install XCode from the Apple Store: <https://apps.apple.com/us/app/xcode> (Fig. 49)



Fig. 49
Download and install Xcode

Using backend of Digital Solution in development

Get source code

The sequence of steps that will allow obtaining the source code of the Digital Solution is described below:

1. Login to OSX terminal.
2. Generate work folder.
3. Clone repository:
 - Git clone (Public URL)³
4. Once cloned, you will be able to access the source code in the folder mi-mercado-webapp

```
cd mi-mercado-webapp
```

Start services required by the project

To start the services required by the project, you must follow the next steps:

1. Enter the folder my-market-webapp/src/main/resources/docker through the OSX terminal:

```
cd src/main/docker
```



Fig. 50
Docker containers

Run backend component

1. Enter the folder my-market-webapp through the OSX terminal:

```
cd mi-mercado-webapp
```

2. Run mvnw command to run the backend (this command only runs the backend):

```
./mvnw-P-webapp
```

³ **Note:** Currently (April 2022), the Digital Solution is in the pilot phase. For this reason, as well as for traceability reasons, the source code repository is currently not available in open-source libraries. To access the source code, please follow the steps outlined in the "3. Roadmap" section of this document. The German Federal Ministry for Housing, Urban Development and Building and IMEPLAN are the institutions responsible for managing the source code, prior to its publication in an open-source library.

3. Once the service is loaded, a message like the following should be displayed in the log: (Fig. 51)

```

2022-04-05 10:40:43.643 DEBUG 17823 --- [mercado-task-1] o.g.m.s.OrderReviewExtendedService Exit: getReviewAverage() with result = null
2022-04-05 10:40:43.643 DEBUG 17823 --- [mercado-task-1] o.g.m.s.ProductExtendedService SERVICE-V2 request to elasticSearchIndex : Optional.empty, org.giz.mimercado.service.elastic.dto.ProductIndex@194c240
2022-04-05 10:40:43.743 DEBUG 17823 --- [mercado-task-1] o.g.m.s.ProductExtendedService Exit: indexStoreProducts() with result = null
2022-04-05 10:40:43.775 DEBUG 17823 --- [mercado-task-2] o.g.m.s.PriceVersionExtendedService Enter: getLastProductPrice() with argument(s) = [9]
2022-04-05 10:40:43.777 DEBUG 17823 --- [mercado-task-2] org.hibernate.SQL select priceversio_id as id1_35_, priceversio_created_by as created_2_35_, priceversio_created_date as created_3_35_, priceversio_last_modified_by as last_mod_35_, priceversio_last_modified_date as last_mod_35_, priceversio_price as price_6_35_, priceversio_product_id as product_7_35_, priceversio_store_id as store_10_35_ from price_version priceversio inner join product product1 on priceversio_product_id=product1_id where product1_id=9 order by priceversio_id desc limit 7
2022-04-05 10:40:43.784 DEBUG 17823 --- [mercado-task-1] o.g.m.s.PriceVersionExtendedService Exit: getLastProductPrice() with result = 19.0
2022-04-05 10:40:43.783 DEBUG 17823 --- [mercado-task-2] o.g.m.s.OrderReviewExtendedService Enter: getReviewAverage() with argument(s) = [9]
2022-04-05 10:40:43.783 DEBUG 17823 --- [mercado-task-2] o.g.m.s.Service.OrderReviewService SERVICE-V2 request to get review average Optional.empty, 9
2022-04-05 10:40:43.783 DEBUG 17823 --- [mercado-task-2] org.hibernate.SQL select avg(orderreview_seller_rate) as col_0_0_ from order_review orderreview0 inner join jhi_order_order1 on orderreview_order_id=order1_id inner join store store2 on order1_store_id=store2_id where store2_id=9
2022-04-05 10:40:43.800 DEBUG 17823 --- [mercado-task-1] o.g.m.s.ProductExtendedService Exit: getReviewAverage() with result = null
2022-04-05 10:40:43.800 DEBUG 17823 --- [mercado-task-2] o.g.m.s.ProductExtendedService SERVICE-V2 request to elasticSearchIndex : Optional.empty, org.giz.mimercado.service.elastic.dto.ProductIndex@1d013a36
2022-04-05 10:40:43.904 DEBUG 17823 --- [mercado-task-2] o.g.m.s.ProductExtendedService Exit: indexStoreProducts() with result = null
2022-04-05 10:40:44.027 INFO 17823 --- [reactor-http-epoll-3] org.giz.mimercado.MimercadoApp Started MimercadoApp in 43.954 seconds (JVM running for 44.703)
2022-04-05 10:40:45.043 DEBUG 17823 --- [reactor-http-epoll-3] o.g.m.s.Service.BatchProductService Enter: initializeModule() with argument(s) = []
2022-04-05 10:40:45.050 DEBUG 17823 --- [reactor-http-epoll-3] org.hibernate.SQL select batch0_id as id1_19_, batch0_created_by as created_2_19_, batch0_created_date as create_d_3_19_, batch0_last_modified_by as last_mod_19_, batch0_last_modified_date as last_mod_19_, batch0_charset as charset_6_19_, batch0_jhi_file as jhi_file7_19_, batch0_jhi_file_content_type as jhi_file8_19_, batch0_name as name_19_, batch0_status as status10_19_, batch0_jhi_type as jhi_type11_19_ from jhi_batch batch0 where batch0_status=? and batch0_jhi_type=?
2022-04-05 10:40:45.074 INFO 17823 --- [reactor-http-epoll-3] org.giz.mimercado.MimercadoApp Exit: initializeModule() with result = null
Application 'mimercado' is running! Access URLs:
Local: http://localhost:8080/
External: http://192.168.3.4:8080/
Profile(s): [dev, api-docs]

```

Fig. 51 Listening port 8080 **Note:** The database schema is automatically generated when the service starts for the first time.

Run frontend component

To run the frontend component(s), you must follow these steps:

1. Enter the folder my-market-webapp through the OSX terminal:

```
cdmi-mercado-webapp
```

2. Install Angular dependencies:

```
npminstall
```

Note: EThis step only needs to be done the first time or when dependencies change.

3. Run the following command to launch the web client:

```
npmstart
```

(Fig. 52)

```

** Angular Live Development Server is listening on localhost:4200, open your browser on http://localhost:4200/ **

✓ Compiled successfully.
[Browsersync] Proxying: http://localhost:4200
[Browsersync] Access URLs:
-----
    Local: http://localhost:9000
    External: http://192.168.3.4:9000
-----
    UI: http://localhost:3001
    UI External: http://localhost:3001
-----

```

Fig. 52 Web client listening ports

Note: It is required to keep both this terminal and the one executed in the backend section open during the development process.

4. In a browser, enter the solution through the url <http://localhost:9000> with the default username and password.

Project import in IDE

To import the project through IDEA, you must continue with the following steps:

1. Enter the IntelliJ IDEA application previously installed through the IntelliJ IDEA installation package, in case of requesting additional configurations opt for default options.
2. Once the welcome screen is open, select the option to open or import project:

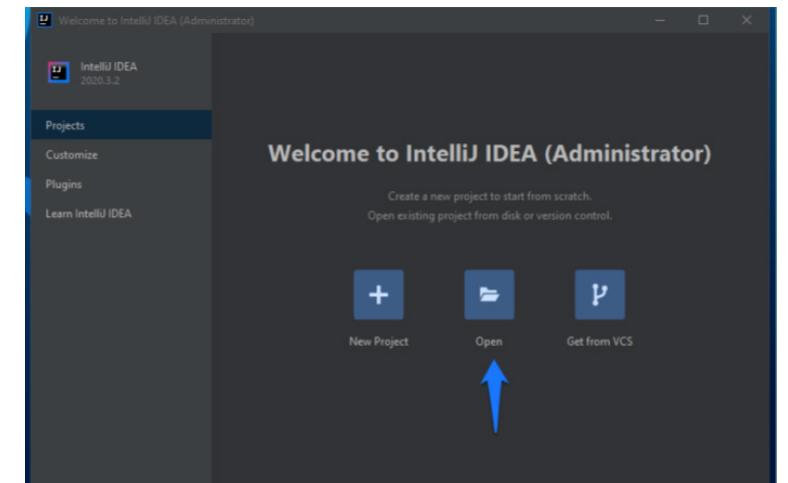


Fig. 53 Project import

(Fig. 53)

3. Navigate to the project folder, select it and press ok.
4. Once opened, wait for IntelliJ Idea to resolve the project dependencies (This may take a while for the first time).
5. Edit or extend the solution based on requirements.

Compile application for productive mode

To compile the application in production mode, it is necessary to follow these steps:

1. Enter the folder my-market-webapp through the OSX terminal:

```
cdmi-mercado-webapp
```

2. Compile in productive mode:

```
/m/mwcleanverify-Pprod/war
```

3. Locate compiled file in target folder:

```
target/*-0.0.1-SNAPSHOT.war
```

Note: To use the generated war, check the installation manual.

⁴**Note:** Currently (April 2022), the Digital Solution is in the pilot phase. For this reason, as well as for traceability reasons, the source code repository is currently not available in open-source libraries. To access the source code, please follow the steps outlined in the “3. Roadmap” section of this document. The German Federal Ministry for Housing, Urban Development and Building and IMEPLAN are the institutions responsible for managing the source code, prior to its publication in an open-source library.

Using mobile app in development

Source code access

The sequence of steps that will allow obtaining the source code of the Digital Solution is described belows:

1. Login to OSX terminal.
2. Clone repository:
Git clone (Public URL)⁴

Once cloned, you will be able to access the source code in the folder mi-mercado-webapp

```
cd mi-mercado-ionic
```

Run mobile app component

To run the mobile app component, it is necessary to follow these steps:

1. Enter the folder my-market-webapp through the OSX terminal:

```
cd mi-mercado-ionic
```

2. Install ionic cli globally:

```
npm install -g @ionic/cli
```

3. Install project dependencies:

```
npm install
```

Note: This step only needs to be done the first time or when dependencies change.

4. Run the following command to launch the application

```
npm start
```

Note: It is required to keep both this terminal and the one executed in the backend section open during the development process.

5. Enter the solution through the url <http://localhost:8100> in your browser, with the default username and password (Fig. 54)



Fig. 54
Execution mobile development environment

Project import in IDE

To import the project in IDE it is necessary to follow these steps:

1. Enter the IntelliJ IDEA application previously installed through the IntelliJ IDEA installation package. In case of requesting additional configurations, opt for default options.

2. Once the welcome screen is open, select the option to open or import project: (Fig. 55)

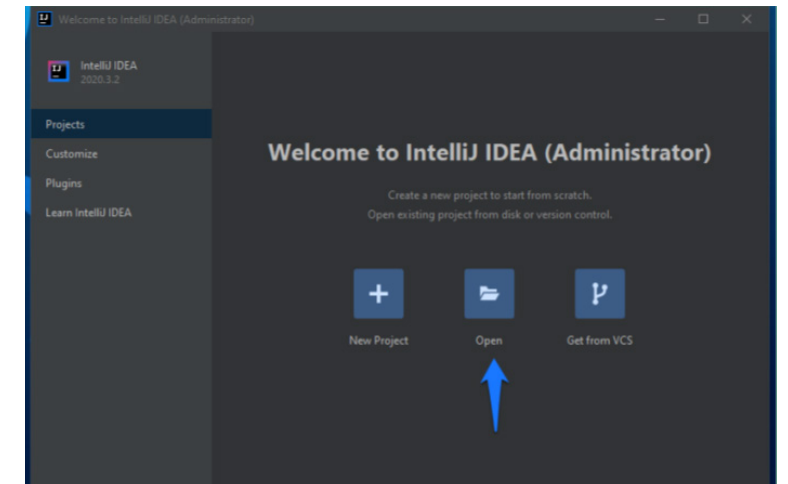


Fig. 55
Project Import

3. Navigate to the project folder, select it and press OK.

4. Once opened, wait for IntelliJ Idea to resolve the project dependencies (this may take a while for the first time).

5. Edit or extend the solution based on requirements.

Compile application for productive mode

To compile the android app, run the following command:

```
ionic capacitor build android --prod
```

Nota: This will launch android studio with the project loaded. It runs the app using the official android studio documentation <https://developer.android.com/training/basics/firstapp/running-app>

To compile the iOS app, run the following command:

```
ionic capacitor build ios --prod
```

This will launch XCode with the project loaded, allowing to run the application using the official XCode documentation: <https://developer.apple.com/documentation/xcode/running-your-app-in-the-simulator-or-on-a-device>

Publish application

To publish the application in the iOS and Android stores, please review the requirements and official documentation of the respective stores:

Android:

<https://developer.android.com/studio/publish>

IOS:

<https://developer.apple.com/documentation/xcode/preparing-your-app-for-distribution>

Payment gateway implementation | Payment methods

Impact on web: API configuration, generation of res services, frontend interfaces.
Impact on mobile: the services to be consumed from the backend are added.

Key configuration

```
src/main/resources/config/application-dev.yml
```

```
src/main/resources/config/application-prod.yml
```

Billpocket backend

```
src/main/java/web/rest/BillpocketResource.java
```

```
src/main/java/service/BillPocketPaymentService.java
```

Billpocket frontend

Related entities:

- **Payment methods:** Add new payment method.
- **Stores:** Select the created payment method as available.
- **Payment keys:** Link users, payment keys and payment method.

Other interfaces:

- **Payment gateway registration**
 - Integrate related entities in an admin user interface, exclusive to Billpocket.
- **Shopping cart**
 - Payment behavior when selecting the new addition.

Personalization

Website

Developed with Jhipster

The SBS methodology is implemented. To locate which files of the frontend web solution are shown, it is recommended to consult the file “entity-routin.module.ts”

```
src/main/webapp/app/entities/entity-routing.module.ts
```

Resources

```
src/main/webapp/content/images
```

```
src/main/webapp/content/scss
```

Note: Each of the pages and components in turn contains a file to define specific styles.

Translations

```
src/main/webapp/i18n/es
```

Mobile

Developed with IONIC v5

Resources

```
src/assets/fonts
```

```
src/assets/img
```

```
src/assets/icons
```

Styles

```
src/theme/variables.scss
```

```
src/global.scss
```

Note: Each of the pages and components in turn contains a file to define specific styles.

Translations

```
src/assets/i18n/es.json
```

Additional documentation

Solution Architecture

<https://docs.google.com/document/d/1d6NzWXPddefKPaYAiH8dd3IHuG3VU2ADGVbheisJDO/edit>

Angular

<https://angular.io/guide/styleguide>

[Ionic](#)

<https://ionicframework.com/docs/intro/cli>

Spring + JHipster + JAVA

<https://www.jhipster.tech/>

<https://google.github.io/styleguide/javaguide.html>

Cost estimate: deployment of the Digital Solution

The Digital Solution is a platform developed under the principles of Open Source (or open code), which means that the cost of accessing it is zero cost (\$0.00). Usually, this cost is only about the cost of accessing the technology license.

Although the Digital Solution does not entail a cost for access, it is essential to emphasize that the technical deployment of the Digital Solution implies unavoidable costs for its proper functioning. On the one hand, human talent is necessary for its implementation, support, and maintenance over time; and on the other, there are technical inputs necessary for its deployment.

A first approximation of the costs that could mean (1) the necessary human talent and (2) the technical costs of the additional inputs for the deployment of the Digital Solution is presented.

Cost Estimate: Human Talent

Calculating the cost of deploying human talent is considered a variable cost that will be affected by socio-demographic factors, such as the cost of recruiting, hiring, retaining, and developing talent, etc.

The implementation and operational sustainability of the Digital Solution viable may be affected over time depending on internal and/or external factors. Such as the availability of financial resources or the current legislation of each country and/or city, among others.

In addition to the following considerations in the cost approach of the solution, it is suggested to consider a salary benchmarking¹, which should fully break down the salary package of the talent.

In Mexico, the labor rights and obligations are determined by the Official Mexican Standards in force, having as guide those determined in the Federal Labor Law, where two types of benefits prevail:

1. **Legal benefits:** These are compensations that must be granted to employees without distinction and that are part of the labor rights of all workers. These cannot be suspended or modified.

2. **Benefit packages:** These are additional compensations that are granted and are not considered mandatory.

In general, the 11 labor benefits considered in the Mexican Federal Labor Law are:

1. Aguinaldo (annual bonus)
2. Holiday period
3. Vacation bonus
4. Social Security
5. Weekly rest day
6. Sunday rate payment
7. Seniority bonus
8. Profit payment
9. Maternity / Paternity leave
10. Adoption leave

In addition to the previous considerations, the salary benchmarking must contain the specification of:

- **Geographic location.** It refers to the place or places where the human talent is being hired.
- **Profile.** It refers to the characteristics, skills, and aptitudes of the collaborator.
- **Education.** It refers to the academic credentials necessary to execute key activities.
- **Definition of activities (responsibilities).** It refers to the main activities and how to measure their success (KPI²s, OKR³s, etc.).
- **Breakdown of considerations.** It refers to the breakdown of costs for the recruitment, compensation, retention, and development of integrated talent. Among other parameters.

¹Benchmarking: Evaluation or revision of something in comparison with the standard.

²KPI = Key Performance Indicator

³OKR = Objective and Key Results.

Through benchmarking, it will be possible to compare the profile(s) between different geographical sites, so that the cost of integrating the required human talent can be parameterized and approximated.

Human talent recruitment

The hiring of the necessary talent for the deployment of the Digital Solution is part of the internal costs for its implementation.

Formula:

(Internal recruiting costs + External recruiting costs) / Total number of hires = Hiring cost

Human talent: required profiles

Below is a brief description of the profiles considered for adequate deployment of the Digital Solution. As well, as a simulation of the estimated cost per profile, having as reference the approximate cost in the city of Guadalajara (January 2022).

Administrative coordinator

Job description: Responsible to follow up on the sustainability strategy of the market, following up on what is established with the different stakeholders involved in the project, and monitoring the user's needs. As well, as the administration of the market(s). It is responsible for defining the product categories, and commercial lines of the stores, capturing advertising banners. In addition to activating or deactivating user accounts that will play the role of delivery people. It will be the link between the tenants and the technical and design area.

Role objective: Maintain the vision of the Market or Markets that he or she manages, as well as maintain communication with all the users and actors involved in the maintenance of the solution. Integrate, channel, and/or follow up on the interests and concerns of users.

Concept	Gross Income (Monthly)	ISR (6.4% Monthly estimate.)	IMSS (6.5% Monthly estimate.)	INFONAVIT (5% Monthly estimate)	Net Income (Monthly)	2% ISN (Monthly estimate.)
Administrative coordinator	\$24,361.00	- \$1,559.10	- \$1,583.47	- \$1,218.05	\$20,000.38	\$487.22

Fig. 56

Estimated salary calculation for Administrative Coordinator (2022).

⁴ISN = Payroll Tax. It is a local tax and must be covered by the employer. In Mexico, its collection is generated by the state and varies according to each federal entity. In the case of the state of Jalisco, this cost is 2%.

Responsibilities:

- Maintain constant communication with all the involved stakeholders
- Follow up on the sustainability strategy of the Market following what is established with the different stakeholders involved in the project.
- Report advanced progress with established objectives and goals.
- Execute and follow up on proposals for improvement.

Professional experience: More than 5 years in similar positions.

Academic experience: Bachelor's Degree in Business Administration. A MBA is preferred.

Skills:

- Interpersonal communication
- Negotiation skills
- Proactivity
- Leadership
- Creative thinking
- Knowledge of business model development
- Presentation of financial balance
- Budget generation

Estimated cost: The approximate estimate of the employee's monthly cost, according to the profile described, is presented below:

Aguinaldo (annual bonus):

To access this benefit, in its entirety, the collaborator must have completed (at least) the year of contracting. However, the proportional amount must be paid following the provisions of the law. The following is a projection that considers the calculation after the employee's first year of hire.

To estimate the calculation, the following formula was implemented:

$$(\text{Salary per day}) (15 \text{ days}) = \text{Bonus payment}$$

The estimate considered for the previous example is:
 $(\$812.03) (15) = \$12,180.45^6$

Vacation bonus

It is the extra amount paid to the worker to enjoy their vacations. Same as calculated using the following formula:

$$(\text{Salary per day}) (\text{Holidays}) \times 0.25\% = \text{Vacation bonus}$$

In the case of the example above, the estimated would be:
 $(\$880.55) (6) \times 0.25\% = \$1,218.45$

This amount is not considered in the global calculation estimate because the vacation premium is a benefit that is accessed after the first year of the job contract.

Operational coordinator

Job description: He/she is the person responsible for managing and monitoring tenant users. He/she is responsible for keeping the register of tenants up to date. He/she is the link with the managerial, technical, and design areas.

Role objective: Guarantee the operability of the Digital Solution, with a special focus on the software and hardware elements and market environment. As well, as attention to the needs, requirements, and suggestions of the different types of users.

Responsibilities:

- Coordinate, together with the Management, the necessary resources to guarantee the operation and maintenance of the Digital Solution.

essary resources to guarantee the operation and maintenance of the Digital Solution.

- Optimize the processes of ascription to the platform.
- Establish and monitor the relationship with providers of the Digital Solution.

Academic experience: Bachelor Degree in Industrial Engineering or Business Administration

Professional experience: More than 2 years in similar positions.

Skills:

- Problem resolution
- Conflict management
- Customer service
- Teamwork
- Responsibility
- Supplier management
- Budget Implementation
- Documentation and continuous improvement of operational processes.

Estimated cost: The approximate estimate of the employee's monthly cost, according to the profile described, is presented below:

Aguinaldo (annual bonus):

To access this benefit, in its entirety, the collaborator must have completed (at least) the year of contracting. However, the proportional amount must be paid following the provisions of the law. The following is a projection that considers the calculation after the employee's first year of hire.

To estimate the calculation, the following formula was implemented:

Concept	Gross Income (Monthly)	ISR (6.4% Monthly estimate.)	IMSS (6.5% Monthly estimate.)	INFONAVIT (5% Monthly estimate)	Net Income (Monthly)	2% ISN (Monthly estimate.)
Operational coordinator	\$18,271.00	- \$1,169.34	- \$1,187.62	- \$913.55	\$15,000.49	\$365.42

Fig. 57
Estimated salary calculation for Operational Coordinator (2022).

⁵ On a monthly basis, consider 30 days
⁶ Bonus gross estimate.

$$(\text{Salary per day}) (15 \text{ days}) = \text{Bonus payment}$$

In the case of the example above, the estimated would be:
 $(\$609.03) (15) = \$9,135.45^{10}$

Vacation bonus:

It is the extra amount paid to the worker to enjoy their vacations. Same as calculated using the following formula:

$$(\text{Salary per day}) (\text{Holidays}) \times 0.25\% = \text{Vacation bonus}$$

In the case of the example above, the estimated would be:
 $(\$609.03) (6) \times 0.25\% = \913.54

This amount is not considered in the global calculation estimate because the vacation premium is a benefit that is accessed after the first year of the job contract.

Engineering coordinator (Full stack developer)

Job description: It is the person in charge of managing the software project. He/she is dedicated to the planning, programming, allocation of resources, execution, monitoring, and delivery of support and maintenance operations, improvement, and updating of the Digital Solution.

He/she will be responsible for reporting if he/she has generated updates that could be useful to other users.

Role objective: Maintain the proper functioning of the Digital Solution for all users.

Responsibilities:

- Installation and deployment of source code.

- Documentation and planning of updates and changes to the environment.
- Support and maintenance of the Digital Solution.
- Technical documentation of the implementation and use of the Digital Solution.
- Promotion of the best technical practices for the proper use of the application.
- Monitoring, backups, administration, and server updates.

Professional experience: More than 5 years in similar positions.

Academic experience: Bachelor Degree in Computer Systems Engineering / Information Technology. A Master's degree is preferred in Computer Systems..

Skills:

- Analytics
- Interpersonal and communication skills
- Teamwork
- organization capacity
- Innovation
- Experience in database design and queries
- Management of different programming languages: Java + Spring, Angular + Ionic, Postgre SQL.
- Experience working with application architectures and cloud solutions.
- Experience in managing databases.

Estimated cost: The approximate estimate of the employee's monthly cost, according to the profile described, is presented below:

Aguinaldo (annual bonus)

To access this benefit, in its entirety, the collaborator must

Concept	Gross Income (Monthly)	ISR (6.4% Monthly estimate.)	IMSS (6.5% Monthly estimate.)	INFONAVIT (5% Monthly estimate)	Net Income (Monthly)	2% ISN (Monthly estimate.)
Full stack developer	\$48,722.00	- \$3,118.21	- \$3,166.93	- \$2,436.10	\$40,000.76	\$974.44

Fig. 58
Estimated salary calculation for Engineering Coordinator (Full Stack Developer) (2022).

⁸ ISN = Payroll Tax. It is a local tax and must be covered by the employer. In Mexico, its collection is generated by the state and varies according to each federal entity. In the case of the state of Jalisco, this cost is 2%.
⁹ On a monthly basis, consider 30 days
¹⁰ Bonus gross estimate.

have completed (at least) the year of contract. However, the proportional amount must be paid following the provisions of the law. The following is a projection that considers the calculation after the employee's first year of hire. To estimate the calculation, the following formula was implemented:

$$(\text{Salary per day}) (15 \text{ days}) = \text{Bonus payment}$$

In the case of the example above, the estimated would be: $(\$1,624.06) (15) = \$24,360.90^{13}$

Vacation bonus:

It is the extra amount paid to the worker to enjoy their vacations. Same as calculated using the following formula:

$$(\text{Salary per day}) (\text{Holidays}) \times 0.25\% = \text{Vacation bonus}$$

In the case of the example above, the estimated would be: $(\$1,853.67) (6) \times 0.25\% = \$2,436.09$

This amount is not considered in the global calculation estimate because the vacation premium is a benefit that is accessed after the first year of the job contract.

Design Coordinator

Job description: It is the person responsible for integrating the image of the market and assisting and guiding tenant users in the graphic projection of their products or services marketed through the solution. This person will be in constant communication with the Engineering Coordinator to improve the identity and image of the market, as well as the graphic visualization of the tool.

Role objective: Adapt and implement the identity and image of the market to the Digital Solution. As well, as optimizing the design of existing interfaces. Provide support to users concerning the display of their store and/or products.

Responsibilities:

- Understand the graphic requirements of the Engineering Coordination.
- Employ human-centered design methodologies to improve the user experience of the application.

Professional experience: More than 5 years in similar positions.

Academic experience: Bachelor of Arts in Graphic Design / Bachelor Degree in Communication

Skills:

- Detail oriented
- Proactive
- Empathic
- Creative thinking
- Effective communication
- Management of the Adobe Creative Cloud suite
- Management of prototyping tools such as Figma, Sketch, Adobe XD or similar
- Knowledge of agile methodologies.

Estimated cost: The approximate estimate of the employee's monthly cost, according to the profile described, is presented below:

Aguinaldo (annual bonus):

To access this benefit, in its entirety, the collaborator must have completed (at least) the year of contracting. However,

Concept	Gross Income (Monthly)	ISR (6.4% Monthly estimate.)	IMSS (6.5% Monthly estimate.)	INFONAVIT (5% Monthly estimate)	Net Income (Monthly)	2% ISN (Monthly estimate.)
Design Coordinator	\$24,361.00	- \$1,559.10	- \$1,559.10	- \$1,218.05	\$20,000.38	\$487.22

Fig. 59
Estimated salary calculation for Design Coordinator (2022).

¹¹ ISN = Payroll Tax. It is a local tax and must be covered by the employer. In Mexico, its collection is generated by the state and varies according to each federal entity. In the case of the state of Jalisco, this cost is 2%.

¹² On a monthly basis, consider 30 days

¹³ Bonus gross estimate.

the proportional amount must be paid following the provisions of the law. The following is a projection that considers the calculation after the employee's first year of hire. To estimate the calculation, the following formula was implemented:

$$(\text{Salary per day}) (15 \text{ days}) = \text{Bonus payment}$$

The estimate considered for the previous example is: $(\$812.03) (15) = \$12,180.45^{16}$

Vacation bonus

It is the extra amount paid to the worker to enjoy their vacations. Same as calculated using the following formula:

$$(\text{Salary per day}) (\text{Holidays}) \times 0.25\% = \text{Vacation bonus}$$

In the case of the example above, the estimated would be: $(\$880.55) (6) \times 0.25\% = \$1,218.45$

This amount is not considered in the global calculation es-

Human Talent Cost Structure

Position	1st Month	2nd Mont	3rd Month	4th Mont	5th Mont	6th Mont
Administrative coordinator	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22
Operational coordinator	\$18,636.42	\$18,636.42	\$18,636.42	\$18,636.42	\$18,636.42	\$18,636.42
Full Stack Developer	\$49,696.44	\$49,696.44	\$49,696.44	\$49,696.44	\$49,696.44	\$49,696.44
Design Coordinator	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22

Fig. 60
Human Talent cost structure in the first 6 months of the year (Guadalajara 2022).

¹⁵ On a monthly basis, consider 30 days.

¹⁶ Bonus gross estimate.

Position	7th Month	8th Month	9th Month	10th Mont	11th Month	12th Month ¹⁷
Administrative coordinator	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$38,246.71
Operational coordinator	\$18,636.42	\$18,636.42	\$18,636.42	\$18,636.42	\$18,636.42	\$28,685.41
Full Stack Developer	\$49,696.44	\$49,696.44	\$49,696.44	\$49,696.44	\$49,696.44	\$76,493.43
Design Coordinator	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$24,848.22	\$38,246.71

Fig. 61
Human Talent cost structure for the second 6 months of the 1st year (Guadalajara 2022).

Summary Payroll of Human Talent required for the deployment of the solution:

Position	Yearly Estimated Amount (Mexican pesos)
Administrative coordinator	\$311,577.13 (mexican pesos)
Operational coordinator	\$233,686.03 (mexican pesos)
Full Stack Developer	\$623,154.27 (mexican pesos)
Design Coordinator	\$311,577.13 (mexican pesos)
Total	\$1,479,994.56 m.n. (mexican pesos)

Fig. 62
Annual talent cost (GDL 2022)

¹⁷This amount considers the payment of the Christmas bonus in full after 12 months of collaboration and the payment of the vacation bonus.

The previous projection does not consider variations (i.e. recruitment cost, payment of utilities, overtime, or higher). It is an approximation of the costs of the human talent necessary for the first year of deployment of the solution.

Different fiscal or human resource management strategies within the current legal framework could result in lower costs than those projected. The previous model does not consider any financial strategy and is only a projection of the real approximate cost without this type of mechanism.

Cost Estimate: Technical requirements

The following technical proposal is addressed to IT professionals or technical leaders with the required knowledge attached to the Technological Coordinator profile.

In addition, this proposal is based on the initial and infrastructure requirements essential for the correct execution and operation of the Digital Solution.

It is suggested to execute a benchmarking of the various providers to determine the best service and quality-price options. The estimated costs consider the main infrastructure providers (in Mexico), both cloud and traditional.

Infrastructure

Server with Ubuntu operating system / The Latest version available
Processor: 4 cores
RAM Memory: 16 GB
Hard drive: 160 GB (Minimum)

Third-party services

Google Play and Apple App Store development account
Google Firebase Cloud Messaging¹⁸
Domain and Public IP
HTTPS Certificate

Approximate cost structure with different providers

Below is a table with the approximate costs (in Mexican pesos) for the installation of the platform in cloud services and on premise:

Provider	Infrastructure	Third-party services	Costs (mexican pesos)
Amazon Web Services	\$18,511.56 (mexican pesos).	\$3,754.27 (mexican pesos)	\$22,265.83 (mexican pesos)
OVH	\$19,473.24 (mexican pesos)	\$3,754.27 (mexican pesos)	\$23,227.51 (mexican pesos)
On-premise	\$63,198.00 (mexican pesos)	\$3,754.27 (mexican pesos)	\$66,952.27 (mexican pesos)

Fig. 63
Approximate cost of infrastructure.

¹⁸ Multi-platform messaging service for safe and free sending of notifications, more information <https://firebase.google.com/>

5

Management Guide: Public servant

Management for the implementation of the Digital Solution

Infrastructure requirements (Hardware and software)

Below is a list of the hardware and software requirements necessary to implement the solution:

Hardware

- The server either in the cloud or physical with the minimum requirements presented within this document, in the “Installation Guide section 2.1.1 - Server” section.
- Computer equipment preferably MacOS for the technological tasks of the developer with the specifications mentioned in the “Development environment preparation guide section 2.1”.
- Computer equipment with Internet access is needed to carry out administrative tasks and manage the web platform.

There is complementary equipment that may or may not be provided by the Public Servants in charge of deploying the solution, as a task or accompanying process.

- Digital photographic equipment for documentation and management in the process of deploying the Digital Solution in different tasks. For Example, registration of tenant products, photographic and video reports of the deployment process, and participation of tenants, among others.
- The minimum suggested characteristics are:
 - Snapdragon 662 Octacore Processor
 - 4GB RAM
 - 128 GB Management
 - Battery 500 mAh

Software

- Creation of development accounts of the various tools necessary for the execution of the platform, such as:
 - Android developer
 - iOS developer
 - Firebase,
 - Etc., more information in the “Installation Guide section 3.5”

Analysis of the social and urban environment of the market

It is crucial to define an area of immediate action for the deployment of the Digital Solution. It is recommended that this polygon have a buffer of 4 km, with the market to be intervened as the central point, since this distance is suitable for deliveries made by bicycle or other non-motorized transportation modes.

For deeper information on the social and urban analysis of the market, see “Chapter 7, section B. Social and urban analysis guide”.

Meeting the tenants, the services and products of the market

To deploy a project with the characteristics of the Digital Solution, it is important to have continuous communication with the tenants of the market. In addition to being the people who keep the shops alive, they are the ones who will be the direct point of encounter and communication with the solution and the users/buyers.

Each market will have its very particular characteristics, as well as its tenants, for this and to achieve the expected approach and response, it is necessary to take into consideration the following:

- Detect who is the market leader.
- Generate a first meeting with the leader.
 - To explain and motivate to be part, and from this to expand the call to the rest of the tenants.
- Generate a first meeting with the other tenants.
 - From this moment, generate periodic meetings with the tenants.

Once the key stakeholders and interested tenants have been identified in the market in adopting the solution, it is essential to consider the following:

- The Digital Solution must be seen as a tool.
- Normally, there is resistance to change and adopting the technologies.
- It is necessary to communicate with tenants and help them understand how it will benefit them: it is a tool that will boost their sales.

- Hold regular meetings with tenants to contextualize each of the processes and progress.
- The periodic approaches with the tenants must be one on one.

In the piloting of “Mi Mercado AMG”, different meetings were held with the tenants of the market to know their experiences from using the solution. From these interviews and conversations, as follows the highlights:

- The tenants consider it accessible to those who are not familiar with the technology.
- It is a sales opportunity: “we reach more customers”.
- It is a functional tool for improving their economy.
- Advertising is a must. Either online and on social networks or with a card so that tenants can promote their business.
- The new generations are the ones who are open to using them, so targeting digital natives initially will be key.
- Implementing card payment has helped them recover other face-to-face customers who only brought cash.

It is relevant to mention that the processes in the piloting have been constant through direct and personalized communication, although the objective is to digitize the market trade, the target audience; both tenants and consumers are people who enjoy face-to-face interaction, so gaining the trust of tenants will be imperative.

Digital Solution operation

The integration of users has different moments. In the case of the tenants, it could be summarized in two phases.

The first phase has a specific timeframe, which corresponds to the piloting phase, with the onboarding process of the tenants. During this phase, the Digital Solution is adjusted, under an optic that allows pivoting and improving the solution in the short term (by test-error).

Once the initial phase of the Digital Solution (pilot phase) has been deployed, there is a second moment that is not finite, in which its objective is to open the solution to more tenants to achieve its scalability and a higher level of adoption. This process of invitation and integration must be supported by different elements to achieve a successful onboarding process.

As mentioned in the previous section, the integration of users will largely depend on understanding the tenant’s doubts and questions, and offering them answers with accurate communication, as well as direct solutions in each process they encounter, for example:

- Consider making one-minute explanatory videos that introduce the app and how to use it.
- People are visual. Therefore, providing a step-by-step guide on how to use the solution is strategic

It will help make the appropriation of the Digital Solution more feasible and more manageable.

Invitation of new tenants

The proposed model is presented below (Bauer & Erdogan, 2011):

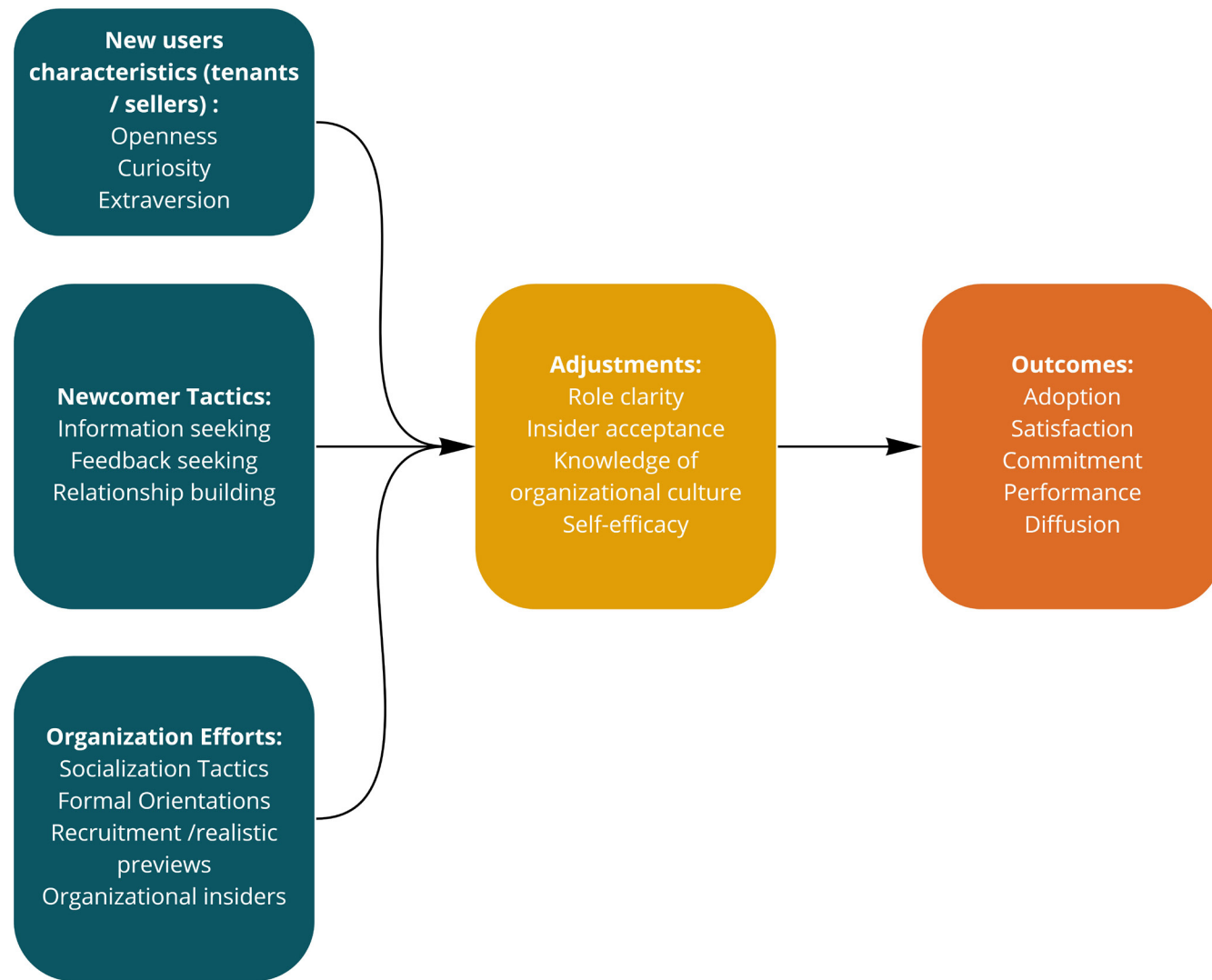


Fig. 64
Proposed model (Bauer & Erdogan, 2011)

New users characteristics (tenants /sellers) Attitudes

This first phase is linked to emotional elements, which allow less friction or resistance from potential new users. The most common emotional elements are:

Openness: This attitude usually occurs in the earliest stage of the integration process (onboarding), it is the result of considering the Digital Solution as a practical tool within the current context of digitization and after the changes generated by the COVID-19 pandemic.

Curiosity: This attitude arises as a response to the interest in learning about the tool, its scope, and its potential. Maintaining their interest is crucial in the process of training and adoption of the app.

Extroversion: Communication attitude benefits the invitation and user addition process, as it is the tenants themselves who could promote the Digital Solution as an option for digitizing the market and their businesses.

Newcomer Tactics - Early Actions

Information search / seeking: This action, usually, corresponds to the tenants. It is the outcome of the aforementioned attitudes. Its purpose is to identify the scope and benefits of the app.

Feedback: This action corresponds to those responsible for the deployment of the app (the municipality) to identify areas for improvement, based on the context of the deployment of the app and the current context of its users (tenants).

Relationship building: Not all tenants have the same level of involvement at a collective level, with the different initiatives or local authorities. Therefore, it should be considered to implement strategic action(s) in the short, medium, and long term; as a process of building confidence with the tenants in the deployment of strategic projects such as the Digital Solution.

Organization efforts (City Hall - Municipality)

Socialization tactics: It is the group of actions or strategies that seek to promote the Digital Solution among new users (tenants), to facilitate the adoption process.

Formal orientation: They are the available and official resources that guide and integrate new users. These resources are various processes and mechanisms –e.g. membership letters or required documentation–, or information resources –video tutorials, promotional videos, among others–.

Recruitment /Previous visits: The socialization process is a sum of efforts that goes from the social urban environment of the market to the Solution itself, but it is the knowledge of this environment and the familiarity between the different stakeholders that will facilitate the integration process of new users. Therefore, previous visits will allow for identifying strategic factors for the integration and adoption process.

Organizational insiders: It corresponds to the information obtained from the tenant’s environment and their day-to-day life. Throughout the Digital Solution Transfer Package, there are presented references to different methodologies that could be used to obtain such information. For example, context interviews, and focus groups, among others.

The sum of these actions allows the development of a continuous improvement model when reaching an adjustment phase.

Role clarity: It will allow new users to identify who is the contact if they have any difficulties or questions during the integration process.

Insider acceptance: It refers to the degree of acceptance of the Digital Solution by new users.

Knowledge of organizational culture / Self-efficacy: It is not enough to be the local authority to know the details of the social urban environment of the market or markets in which the Digital Solution is deployed. It is imperative to understand the needs and interests of the tenants and how these interests are generated from the current context in which they are immersed.

Outcomes

The outcomes are a set of strategic actions and attitudes that generate a cycle of iteration and improvement in the platform, and whose objective is to permeate a high degree of adoption of the Digital Solution.

Adoption: It constitutes the first of the objectives of the invitation phase for new tenants. However, this does not guarantee their permanence. That is why the process is iterative and constantly improving.

Satisfaction: It is the degree to which users (tenants) identify the level of functionality and experience in the solution.

Commitment: It is the degree of interest and continuity of the tenants towards the subsequent phases of the deployment of the Digital Solution.

Performance: It is the degree of functionality of the platform for the different users. However, at this stage, it focuses specifically on the tenants.

Diffusion: The scaling and adoption of users entail a process of promotion and dissemination. It is in the key actions that the scaling of other types of users is also sought, for example, buyers.

Monitoring and growth of the Digital Solution

The Digital Solution, in its web format, currently does not contemplate versioning. Its current version is 1.0, the launch version.

The mobile applications (apps) version is 2.2, for both iOS and Android versions and is fully compatible.

New updates

As part of the improvements or updates on the platform, the following nomenclature can be used for its versioning:

It is handled by 3 numbers: X.Y.Z and each one indicates different information:

- The first (X) is known as the major version and indicates the main version of the software. Example: 1.0.0, 3.0.0
- The second (Y) is known as a minor version and indicates new features. Example: 1.2.0, 3.3.0
- The third (Z) is known as a review and indicates that a code review was made due to a bug. Example: 1.2.2, 3.3.4

Versions of the Digital Solution at the launch of the "Mi Mercado AMG" pilot:

- Web version 1.0
- Android version 2.2
- iOS version 2.2

New features and continuous improvement

At present, and under the "Mi Mercado AMG" pilot model, the Digital Solution only integrates the "Mi Mercado AMG" brand. To be able to customize according to the implementation needs, it is necessary to follow the steps of the guide **Development environment preparation guide - Sections 4 and 5.**

Payment methods - Section 4:

- In this section, you can customize the web and mobile application.

Personalization - Section 5:

- In this section, you can customize the web and mo-

bile application.

Internal and external couriers (delivery)

Currently, and under the "Mi Mercado AMG" pilot model, the Digital Solution only integrates internal distributors of the market with a direct contract with the implementing municipality.

It is from this experience that the Digital Solution could be susceptible to improvement, specifically in the following functionalities and integrations:

1. Registration option for external users through a distributor validation system within the same market.
2. Delivery service qualification.
3. Add extra payment (tip) for the delivery service.
4. API integration of cycle logistics companies.

Functions for sale of services

The Digital Solution is a platform that integrates different tools that allow the approach of local markets to digital users. Among these tools, the use of eCommerce or electronic commerce stands out, which is used mainly for the commercialization of products. However, within the functionalities susceptible to continuous improvement, there is the implementation of eCommerce as a marketing platform for those tenants and tenants that provide a service.

In the current version –Mi Mercado AMG pilot– this option is considered a digital showroom, whose purpose is to present the market's services. Under this modality, the Digital Solution allows access to the following information:

5. Store description
6. Location
7. Business hours
8. Services
9. Payment methods
10. Phone

Additionally, it gives the option of adding services that could maintain a standardized cost.

In this model, the option to use the Digital Solution (app) as a marketing tool for digital services is at the discretion of each tenant.

However, there could be different ways to improve communication, scope, and functionalities for the commercialization of services, for example, the tool could develop functionalities oriented towards:

- **Quote requests.** In addition to exhibiting the range of services, the Digital Solution could integrate a contact form that allows tenants that provide services to obtain more detailed information to offer solutions and quotes for those services that are not subject to standardization.
- **Services packages.** This option could be used as a sales tool that allows offering complete or complementary services within the current version.
- **Utility payment.** The Digital Solution could be capable of integrating public windows for the payment of public services, for example, property tax, and vehicle verification, among others. This integration could be carried out through the use of APIs of available public platforms or services. In this way, the platform could take advantage of the various digital payment methods implemented either in the piloting of Mi Mercado AMG or with the payment methods implemented within the framework of continuous improvement as a complementary tool in the collection process.

Payment methods

Currently, the piloting of "Mi Mercado AMG" contemplates the use of the Billpocket platform to process electronic payments, however, as mentioned in previous points, it is possible to implement other payment providers, either directly with banks or with third parties, this is possible thanks to the use of API's which can be integrated with other payment methods such as Conekta, OpenPay, Paypal, etc.

A key factor to understand before the selection and implementation of the final selected payment gateway are:

1. User management (tenants): What are the requirements and integration process of new users to the given platform? As it is a process of banking and digitization, the different gateways may require supporting personal information about the economic activities of the tenants to conclude their registration period and be able to transfer the income they generate through these platforms.
2. Payment Processing: Knowing the details of the process, scope, and limitations of the selected payment

gateway will allow building the integration strategy of other users, for example, internal or external distributors and whether or not payments can be centralized and how their dispersions are generated.

For further details of the technical integration process, please visit the **Development Environment Preparation Guide - Section 4.**

Service polygon definition

Local markets are the epicenter of the Digital Solution, as they are the starting point of the strategy within this tool. However, the Digital Solution is not limited to its implementation being solely and exclusively within local markets. This strategy will be defined by the conditions of the social urban environment of the market.

Although there are recommendations throughout the Transfer Package, such as the application of a 4 km diameter buffer as a best practice, there are elements that could extend or modify this range.

For example, the communication of offers and events, which would aim to expand the promotion and seek to bring consumers closer to the market. In other words, the area is not necessarily expanded, but communication with consumers (citizens) is.

Communication of offers and events

The Digital Solution must be seen as an "extra" tool that will add to the improvement of the market, but above all to the community. Therefore, it is not only essential to publicize the Digital Solution (app), but also to promote it through events and offers so that more customers and people know about it.

It is decisive to be clear about the market's identity, what they call it or how the public recognizes it. Comprehending its identity will allow to generate proper strategies that contemplate different encounters with the population¹.

To successfully communicate offers, it is recommended to standardize the message of all the tenants as a collective effort. As well as the offers that each of them has individually. It is essential to consider the previous schemes (collectively and individually) so that they do not feel at a disadvantage from each other.

¹ As it is a Digital Solution, it is important to consider that these activities can range from face-to-face to digital.

At the same time, communicating events must be organized and planned together with the tenants and based on their needs. Therefore, implementing dialogue tables to agree on their scope can be a good strategy for their proper organization.

For greater depth on offers and events, see *Chapter 7, Section A. Social Communication Best Practices*, where it could be consulted on how to build a communication strategy that includes key messages for citizens.

Incentives for new tenants

There are different ways to encourage tenants to join the use of the digital solution, the strategy should be built based on the objectives of each public administration. For example, in the case of the “Mi Mercado AMG” pilot, efforts were sought to be linked in the implementation process, as well as to trigger and reinforce them in different areas, among which stand out:

1. Digitization and banking process of entrepreneurs.
2. Training for entrepreneurs and family businesses.
3. The intervention of public infrastructure (specifically remodeling of the Mexicaltzingo market, the place where the pilot was promoted).

In addition to the above, different motivations could be used as incentives to attract new users (tenants), among which the following stand out:

1. Opening a new marketing and communication channel with their customers.
2. Generate additional income through a new sales channel.
3. Greater scope in the distribution of its products. Inside the final defined polygon.
4. Participate in a local value supply chain. It refers to being part of a local ecosystem that allows the generation of considerable added value, and therefore, greater wealth for the market, its environment, and its tenants.
5. Lower cost in commissions, unlike private platforms. As it is an open-source technology and innovation tool, the cost of the commission may be set in common agreement with the tenants, aiming to generate a tool oriented towards its development and evolution as an economically sustainable tool.

6. It refers to the presentation of their business on the platform. As well, as through the promotion campaign to be developed to publicize the Digital Solution. This campaign can include publications on the social media of the official accounts of the participating governments, as well as promotional videos, etc.

Section 7. Additional Resources - Section A. Social Communication Best Practices Guide presents the suggestions and/or best practices for the socialization process of the incentives for new tenants.

6

End user guide

Introduction

Digital Solution

Scope

This manual or guide aims to model the general use of the mobile application (App). The different uses are shown here depending on the role or access permissions. The user roles for the application are:

- Buyer
- Seller / Tenant
- Delivery

Using the guide

This document is a guide for the use of the application by each of the different users.

App overview

The Digital Solution for Markets is a web and mobile application that seeks to bring the customer service and purchase experience to a traditional market. It was generated in a participatory way, always seeking to satisfy the needs of tenants and buyers.

The Digital Solution (App) allows local merchants in any market to make all their products and services available to any citizen for purchase through a digital channel. It adds one more channel of purchase to the traditional one and allows any buyer to consume without physically going to the place.

General characteristics

Mobile and web access

The Digital Solution can be consulted and used through a website and mobile devices.

Availability

The application is optimized to work on both IOS and ANDROID devices. In addition, it provides web access from any device.

Ease of buying and selling

It brings the consumer closer to any product or service in a local market at affordable prices.

Lower commissions

Lower commission for marketplace sellers.

Adaptation to new markets

- The amplitude of the consumer market adapting to the next generations.
- Available for any type of product, food, and service.
- Security and data protection of all users.

Application and interface

Description of the general areas

Description of the general areas

The interface is designed to access all the general areas where each tenant can create, make adjustments and delete information necessary for the proper functioning of their store within the digital application.

User registration

This area is intended to obtain all the necessary information to be able to register as a seller and to be able to access the general tools to create a store within the digital application.

Store registration

This area is intended to configure and adjust a store. The buyer can access its information, its products, and the services that he/she offers.

Products

The area where products can be created, defined and configured for purchase through the digital application.

Orders and shipping area

It is the most active area of the application, intended for the purchase process in response to orders made by a buyer.

The details of each purchase are shown in this area and the complete process of customer service is monitored, specifically in the service of providing the ordered products and making them reach their recipient.

Prices

It is the area for updating product prices. It is to make quick adjustments to the prices of each product, without having to access the product itself in the product's area.

Frequently Asked Questions (FAQs)

This area is intended for effective communication with buyers, responding to questions arising in purchasing products from each store.

Notification

It is the area where each vendor receives messages notifying any interaction in the purchase process. It can be used by both the buyer (more frequently) and the tenant. It can also access real-time communication (chat) with the tenant and the delivery person.

My account

It is the sign in / login area on the platform. This user is usually the owner or manager of each store. Both the personal name and the default contact email can be edited in the registration area. The user can also access the privacy policy and the platform's help service. Also, the user can log out of your account from this area.

Cancellation

The detail of the product cancellation process is specified in the segments:

1. Product selling ("Vendiendo mi producto")

Since it is within this flow that the cancellation of the order could be generated throughout the following processes:

- Attending an order

- Preparing order
- Deliver order
- Request delivery service

If the order is canceled, the request will return the order to the previous status.

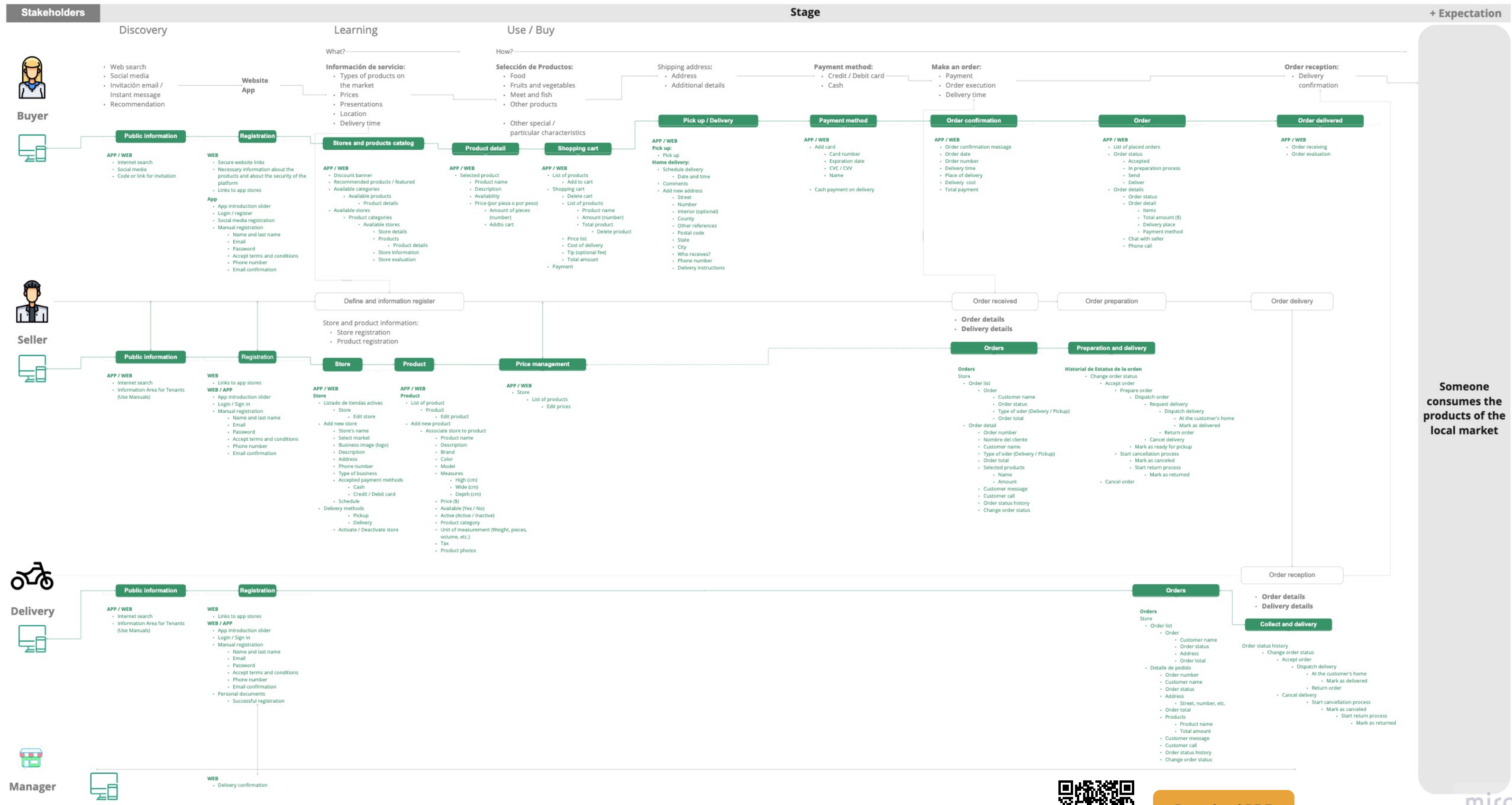
By rejecting the order and canceling the order, the customer will be informed and if the payment was made by credit or debit card, the seller must enter his payment account configured in his store to make the return of the payment. (Billpocket, Stripe, OpenPay, etc.)

Journey map - Product centered

The following map shows all the specific interactions within the digital solution.

This type of Journey shows how the experience of all stakeholders within the digital solution. It also shows how the digital solution streamlines and automates processes or activities in a more agile and efficient way.

It exposes the interactions and the entire flow of information that happens within the application by each stakeholder; These data and interactions are necessary for its correct function and to achieve the objective of the required service in a digital way.



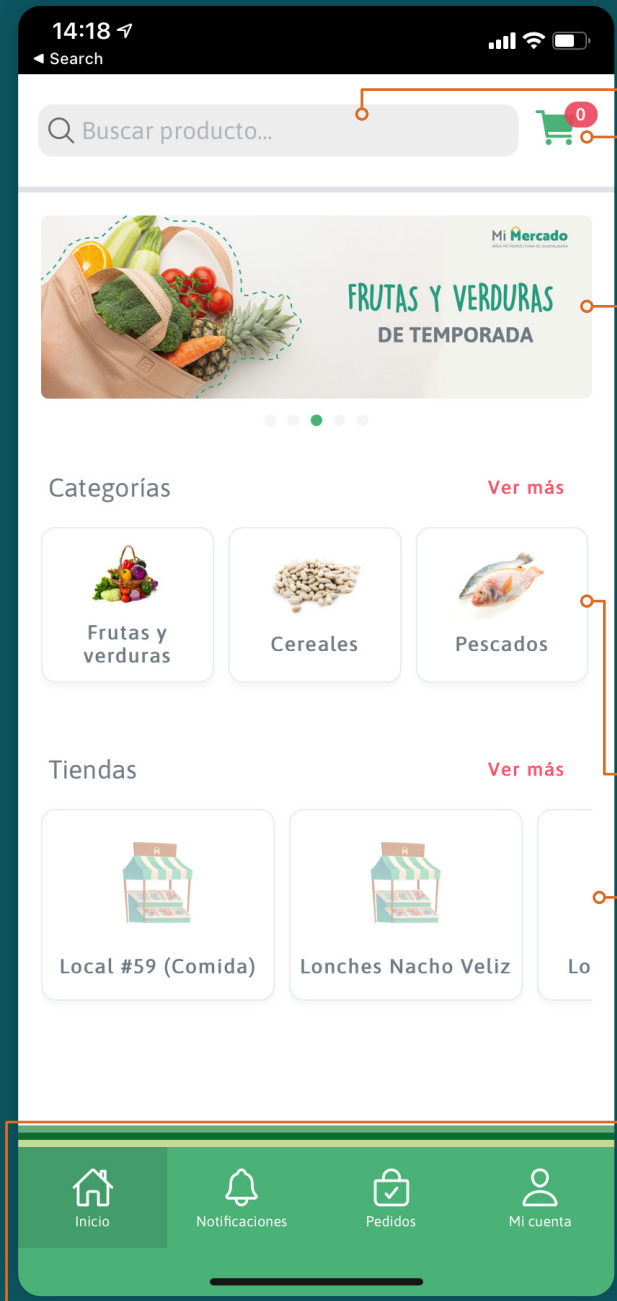
Note: You can also view the complete map with the application screens for each of the users in section "4. Technical development guide. Digital solution management Process diagrams".

Fig. 65
Journey Map - Product Centered



Download PDF
High Resolution

Home screen navigation



General home screen navigation

By entering the app any user can navigate without logging in. The screen displays the following home screen sections:

1. **Search bar**
It allows the user to search for products using keywords, throughout the entire application.
2. **Shopping cart**
Is the button that works to display the number of products added to the shopping list. It accesses the list of products added to the shopping cart screen.
3. **Banners**
Allows the user to consult notices made by administrators.
4. **Category**
List of available products categories created in the application.
5. **Stores**
List of stores registered in the app.
6. **Menu**
It allows the user to manage and access different areas when using the application.

Fig. 66
Home screen navigation

You do not need to log in to view this screen.



Fig. 67
Login

The registration of any user is necessary to fully use the application and its features.

Login

The user does not need to log in to view the next screen. It shows the general access of the users, with the necessary elements to access an account within the application. The users can access it in different ways. Either with their email and password or with their Google account or Apple ID.

This area presents the possibility of registration for any type of user.

1. **Access by email and password**
Area to enter account access using an email and a password.
2. **Change user type**
A button that provides access to the screen to select another type of user.
3. **Access account button**
The button activates sending the email and password access data to validate the user's account.
4. **Restore password**
Allows the user to enter the section to recover their login access to their account.
5. **Create account**
Allows any user to create an account on the platform. The button acts according to the previously selected user.
6. **Sign in using Google ID**
A button that accesses the login process using Google ID.
7. **Sign in using Apple ID**
A button that accesses the login process using Apple ID.
8. **Browse without an account**
A button that allows you to return to the home screen of the product catalog.

My account

Once the session is logged in, any user will be able to enter the application and start buying – if they are a consumer– or start selling –if they are a tenant– or deliver an order –if they are a delivery person .

The users have a section for their profile accounts. It can be accessed through the lower menu, by clicking on the “My Account” option.

1. My account home screen

The first display that the user will have is his name and his email; in addition to having three possible options:

- **Privacy policies**
It shows the privacy policy for the use of the data within the application.
- **Help**
It shows the frequently asked questions that other users ask about the use of the application. The user can also ask a question himself, by writing to the contact box he will find at the end of the list of questions.
- **Logout**
This option is to log out of the user’s account.

2. Profile editing

In the upper-right part of the “My Account” screen, there is a button that will access to edit the profile data. Personal data entered at the time of registration can be changed in this area.

- Name
- Last Name
- Phone
- e-Mail

To save any changes made to the information, click on the “Save” button to update the profile information. In this area, it can also be changed to the previously entered password, by clicking on the “Change password” button. It will take the user to the corresponding area to update the account password.

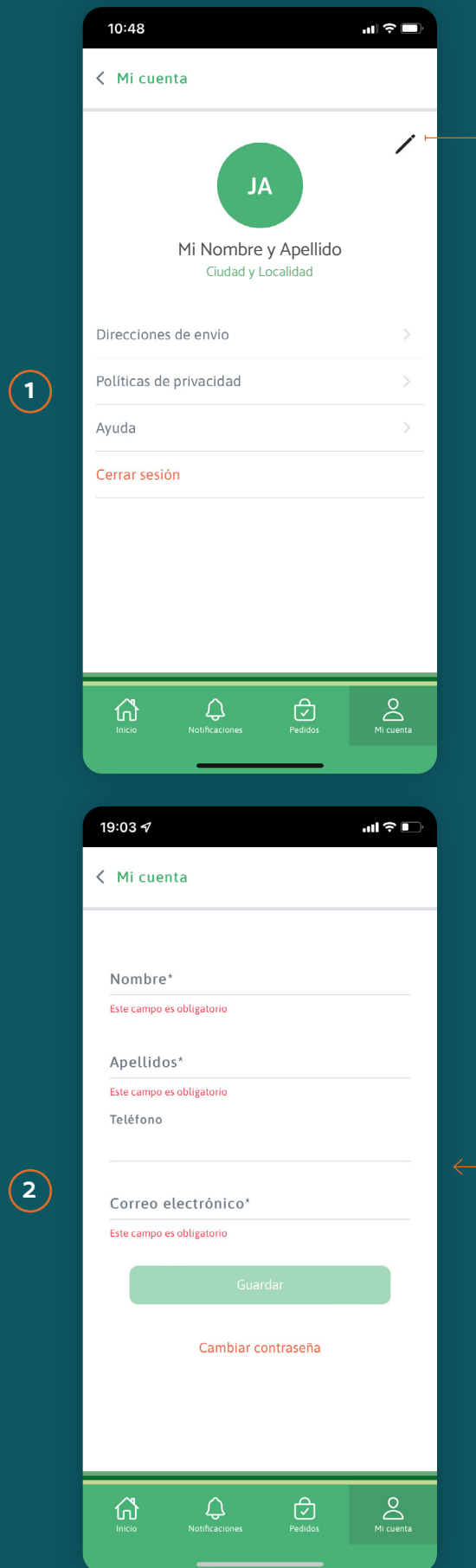


Fig. 68
Profile editing flow

Restore password

If the user does not have his password. On the login screen of the account, there is the option “Forgot your password?” This option will take the user to the corresponding area to restore the access account.

1. Recover password / Restore password

By clicking on the question “Forgot your password?” that appears on the login screen of the application, the user will access a screen to enter the email linked to the account. The user must click on “Reset the password”. He will receive a confirmation email with temporary access.

2. Enter your email

The user must have an **email from the market administrator**. The email will contain a **link to enter to change the password**.

By entering the link in the email, the areas for registering a new password for the account are displayed. The user must enter the new password and click on “Validate the new password”.

The user will receive a confirmation that the password was changed successfully.

Now the user can access the application with the new registered password.

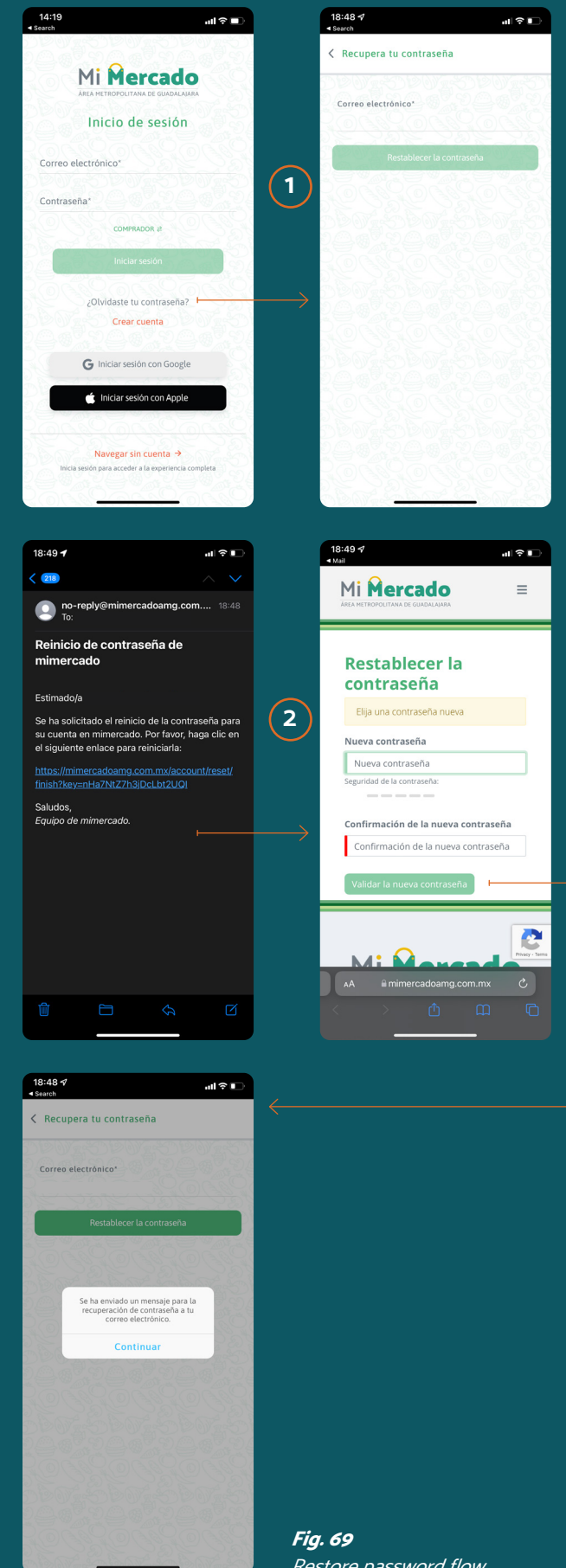
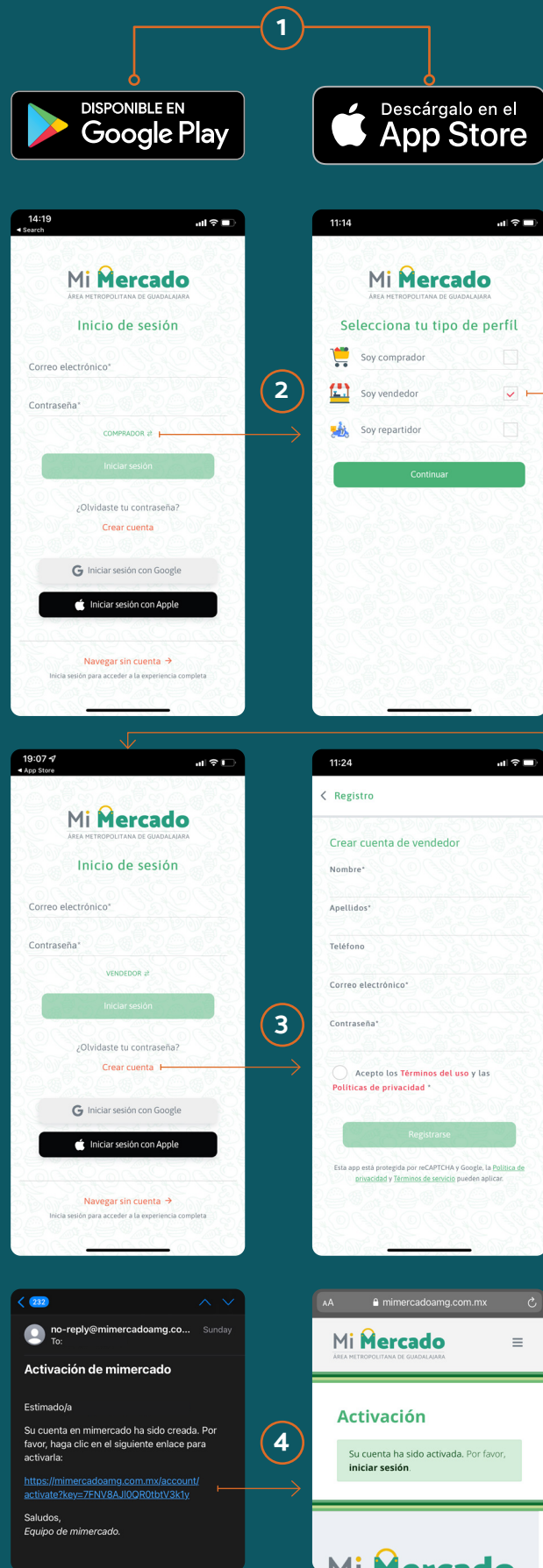


Fig. 69
Restore password flow



Tenants / Sellers

Tenant registration

To register the tenants, it is necessary to register one person per business. The process is simple and can be done by following the next steps:

- 1. Download the app**
On the smartphone or tablet. The user must search for the Digital Solution app (Mi Mercado AMG, for the pilot) in the App Store or Google Play.
- 2. Within the app**
The user must open the app, click on “Buyer”, select your “I am a seller” profile and click on continue. Then click on “Create account”.
- 3. Registration**
The user must fill out the registration page with their data, read, and accept the terms and conditions.
- 4. Active registration**
The user must enter their email, look for the registration activation message and confirm their registration using the link provided in the message.

Registration on the website

- 1. Access the website**
The user must enter the website defined for the market. Click on “Account” and select the “Create an account” option.
- 2. Registration**
The user must select the “I am a seller” option, fill out the registration page with their data, and read and accept the terms and conditions.
- 3. Active registration**
The user must enter their email, look for the registration activation email and confirm their registration using the link that comes in the message.

Fig. 70
Tenant Registration flow



Fig. 71
Tenants home screen

Home screen

Tenants

The next screen shows the seller’s initial options. Each of their areas of interaction is explained below.

- 1. Manage stores**
It access the section to add or edit the business information.
- 2. Manage orders and shipments**
Section to view buyer orders, give them attention, and follow up.
- 3. Manage Products**
Section to add or edit business products or services.
- 4. Manage prices**
This section allows updating the prices of existing products.
- 5. Manage FAQs**
This is the section to access the questions of the buyers and to be able to answer them.

Bottom menu

Access to general sections of the app

- 6. My account**
Access to the section for account management, password modification, consult privacy policies, help, and logout.
- 7. Orders**
Access the section to view buyer orders and track them. Quick access to the order and shipping section.
- 8. Notifications**
Access to the notification section sent by the system. These can be requested orders, messages from buyers, or opinions.
- 9. Home**
Quick access to the home screen.

It is necessary to register as a seller (user) to be able to access this screen and use these sections.

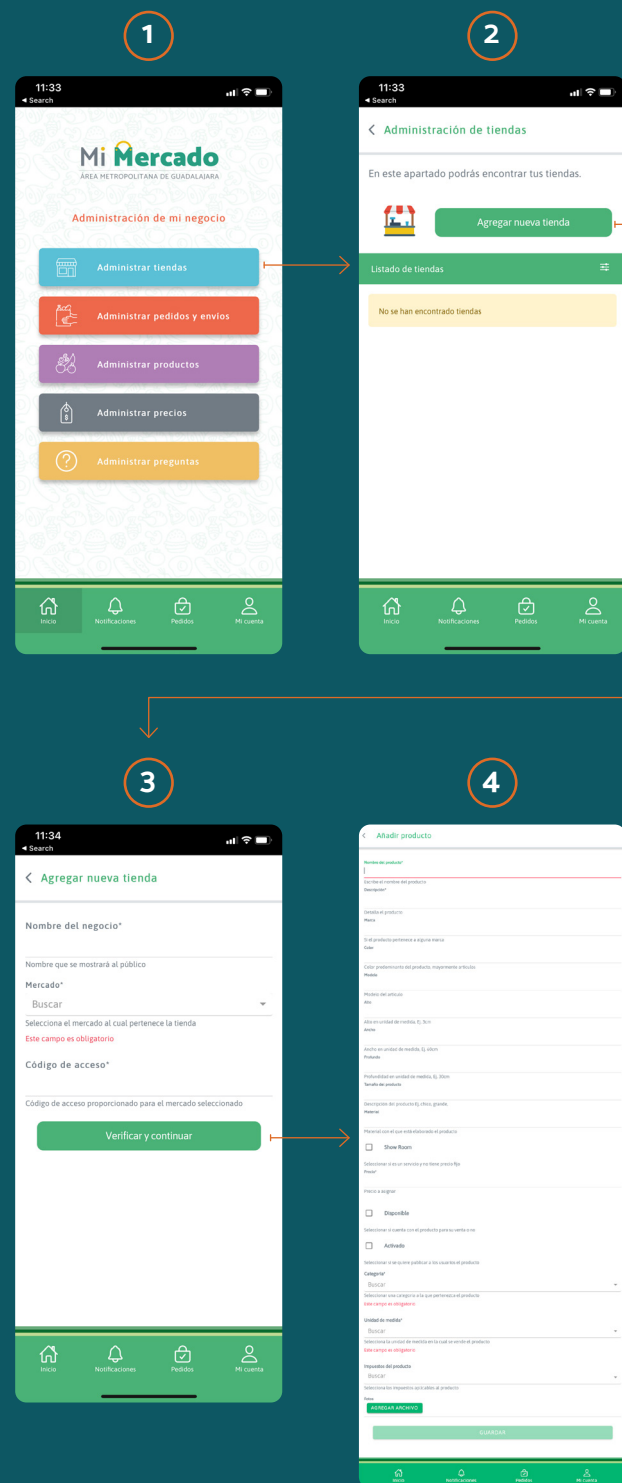


Fig. 72
Store creation flow

Manage stores

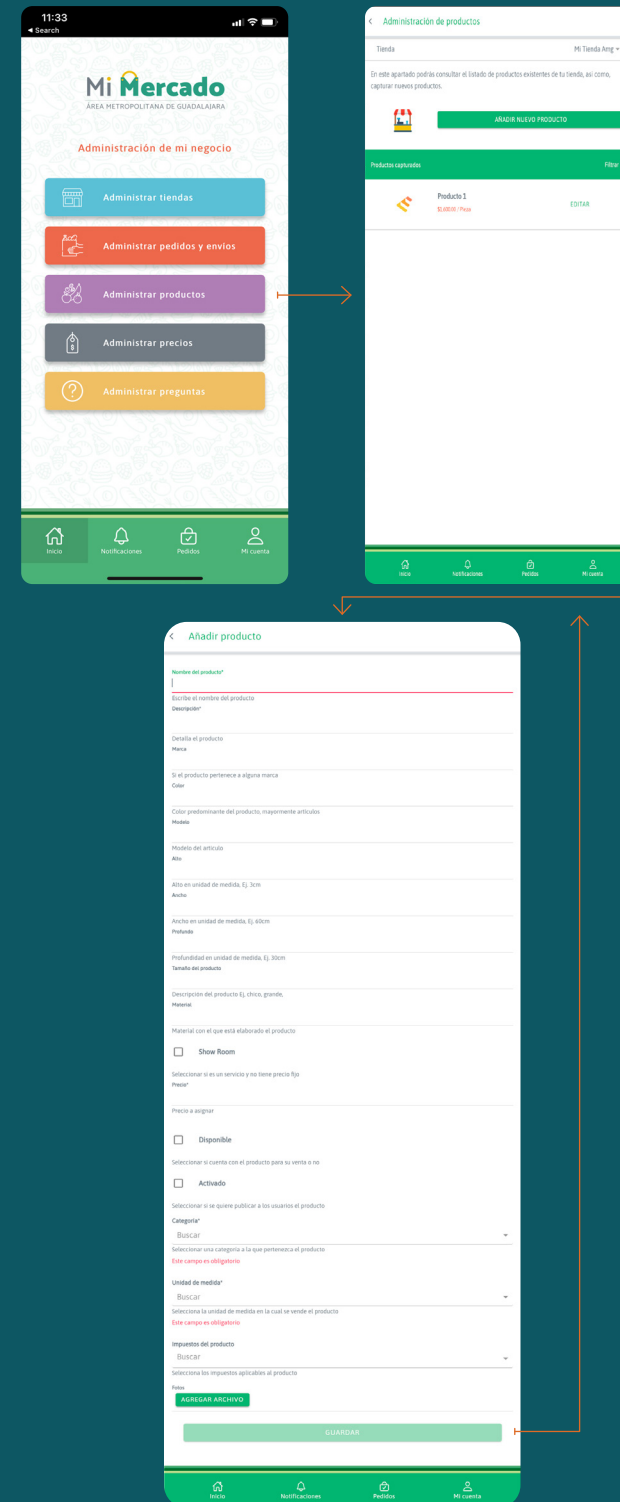
This section allows tenants to add the full name of the store(s) on the platform, and add the correct information about the location, its hours, and days of operation. As well, as being able to edit them if they already exist.

Store creation

- 1. Seller account**
The user must enter their seller account and click on “Manage stores”.
- 2. Store managers**
In the list of entered stores, you can edit any of them. On the contrary, if a store has not been created, it can be added in “Add new store”.
- 3. Create store**
Enter the information required to locate the store:
 - Business name
 - Select the market to which the business belongs.
 - Access code (provided by the administrator)
- 4. General business data**
The user must register the general information of the store and detail of their service:
 - Business name
 - General description
 - Business image and logo
 - Address and interior within the market
 - Phone
 - Line of business
 - Payment methods
 - Cash
 - Credit and Debit Card
 - Business hours
 - Delivery methods
 - Pick up
 - Delivery
 - Store Activate / Deactivate status

The user must click on “Save” and all the data entered will be saved, and the store will be created.

Product sale



Product registration

This section allows tenants to add, edit and delete products and services within their store so that buyers can purchase them.

Before the user starts adding products, they must have created at least one store.

Add products

- 1. Seller account**
The user must enter the account through the vendor profile and click on “Manage products”.
- 2. Product management**
The user will be able to edit any product or service added to the list of products. If he has not created one, he will be able to do so by selecting “Add new product”.
- 3. Create a product in store**
Enter the general information and characteristics of your product or service:
 - Name of the product/service
 - General description
 - Brand
 - Color
 - Model
 - Dimensions
 - Size
 - Material
 - Active / Inactive Showroom (for services)
 - Price
 - Activate / Deactivate product availability
 - Activate / Deactivate the product in the catalog
 - Select a category for the product
 - Unit of measure (if sold by quantity)
 - Product tax
 - Photos of the product

To save the information, the user must click on “Save” and all the data entered will be saved, creating the product or service.

Fig. 73
Add products flow

Best practices for introducing products

The following content is intended for sellers.

Remember that your products are of the best quality and that your buyer has to realize.

Please follow the following best practices to enter the products with enough information for your customers to prefer them.

1. Product list

Consider a list of products first, then detail most of the features mentioned in step 3.

Consider that the more information your buyer has to make his purchase, it will be much easier for him to decide on your product.

2. Product photos

Square final photographs

- Remember, the photos within the application will be displayed square, so you must leave some free space around your product.

White background

- Use this color to make your product stand out. It can be accompanied by other elements to complement the functionality or detail of the product. Consider, these elements must be subtle. They must not overshadow the main article. This background color is used to simplify later editing.

Good lighting

- Try to have good lighting for your product. You can illuminate the product frontally, posteriorly, or laterally.
- You must consider the shadow position projected in the opposite direction from where the light reaches it.
- The simplest option is to use a window to access natural lighting. But you have to be aware that the lighting could change while you take the photos.

*It is recommended not to use the front camera of your cell phone since the quality of the photo obtained by this mode is low.

ID	Product	Description	Price \$	Category
1				
2				
3				
4				
5				
6				
7				

Fig. 74

Example table for list of products

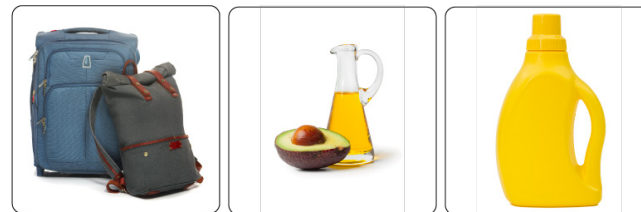


Fig. 75

Example Product Images

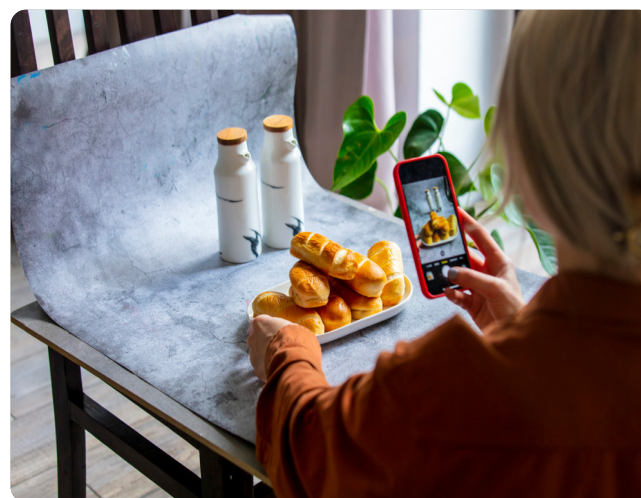


Fig. 76

Example image of taking product photos

You can find more information in this link:

[Sacar fotos de productos para tu tienda online con tu celular](#)

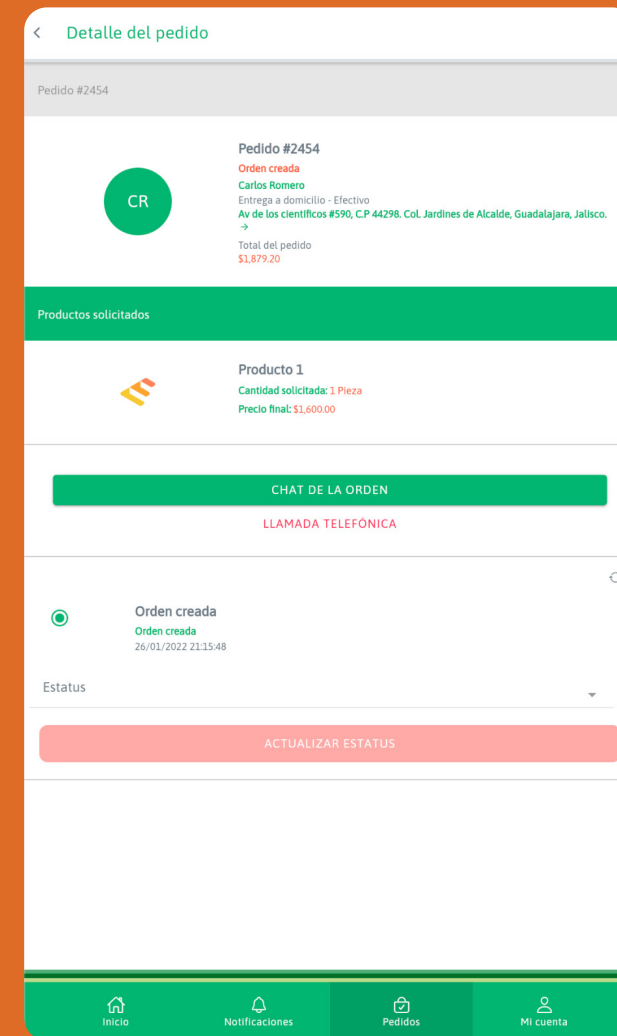
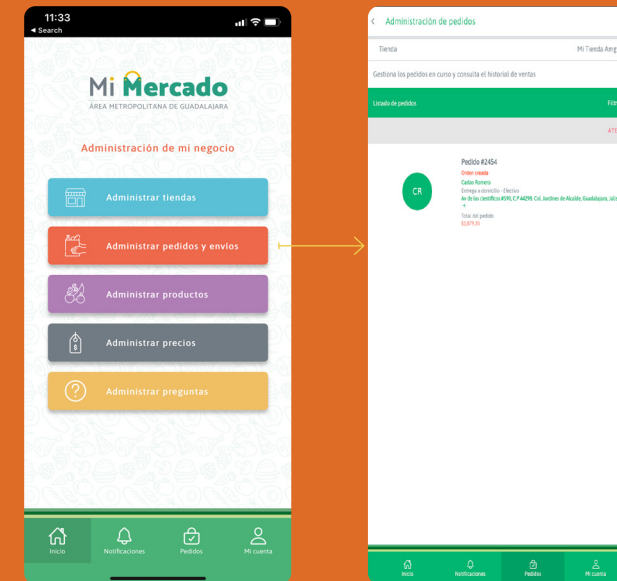


Fig. 77

Manage orders and delivery flow

Product selling

This area allows the tenant to manage the orders that arrive at their store, giving them the possibility of attending to them and supervising the service to deliver the ordered products.

Orders

1. Manage orders and delivery

Log in to your seller account and click on “**Manage Orders and Delivery**”. You can also access the same area by selecting the “**Orders**” option in the lower menu.

2. Select a store

Upon entering, the orders of the default store will be displayed. If the user has more than one store and would like to see the orders of another, the user will have to select the store whose information wants to see.

3. Order detail

By clicking on any order on the list, the details are displayed. It presents the following areas of information:

General order information

- Order number
- Order status
- Customer name
- Delivery
- Address
- Price (\$)

Purchased products

The user will be able to see the list of products purchased in this order and the specific characteristics of each one.

Contact and messages

This function allows the user to contact the client directly by phone, in addition to being able to access an instant messaging channel. All this is to give them the possibility to clarify any detail.

Order status

In this section of the screen, the user will be able to observe the order status and will be able to update the status, leaving a history of attention to it.

Product selling

In the status section of a selected order, you can take care of your customers' orders through the application and tell them what stage their order is at.

Attending an order

1. Select an order

The user must enter their orders and click on “**Manage orders and delivery**”. The user can also access the same area by selecting the “Orders” option in the lower menu.

2. Order created

In the status section of a selected order, the seller can attend their customers' orders through the application and communicate the current status of the order.

3. Attending an order

By clicking on the “**Status**” option, the application will display two options:

• Accept order

By selecting this option, the user will be able to communicate to his client that his order was accepted and the attention to the order will begin. *The seller can also add a custom message for his customer after selecting the status.*

• Decline order

By selecting this option, the user can reject the order and cancel it. It will be reported to the customer, and if the payment was processed by credit or debit card, the seller has to enter his payment account configured in the app to request the payment return. (Billpocket, Stripe, OpenPay, etc.)

Note: This return is NOT generated from the app.

Accepted order

Clicking on “**Update Status**” will change to the accepted order. This order status will give the user a moment to make the order and enter to prepare the order within the store. This would already be the normal process that users would follow to serve any customer in their store.

After placing the order, this order could change its status to preparation.

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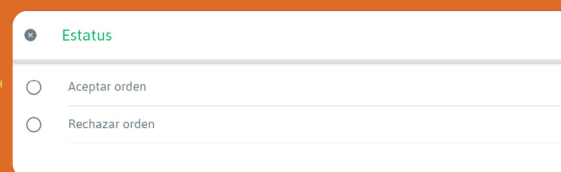
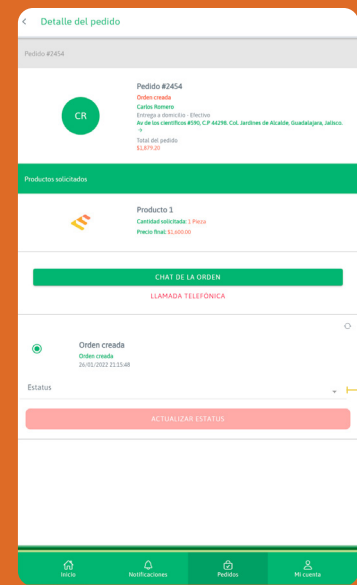
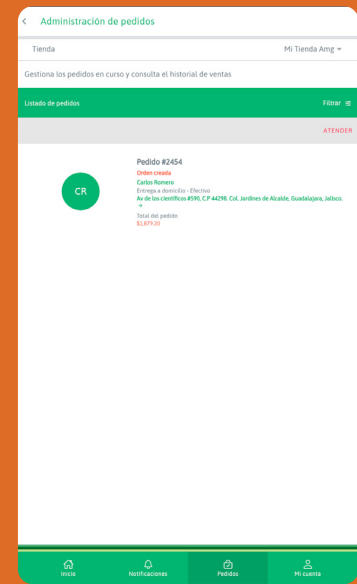


Fig. 78
Attending an order flow

Product selling

In the status section of a selected order, the seller can trace his customer's order through the application and notify them at what stage their order is.

Attending an order

4. Preparing order

By clicking on the “**Status**” option, the application will display two options:

• Preparing order

Selecting this option allows the seller to notify his customer that their order is being prepared. *It can add a custom message for the customer after selecting the status.*

• Start cancellation process

Selecting this option allows the seller to reject the order and cancel it.

It will be notified to the customer. If the payment was processed by credit or debit card, the seller must enter their payment account configured in the store to request the return payment. (i.e. Billpocket, Stripe, OpenPay, etc...)

Preparing order

Clicking on “**Update Status**” will change to preparing the order. This order status will return the time to place the customer's order, pack it, and get it ready for delivery.

When the order is ready to be delivered, it is time to move on to the next order status:

5. Deliver order

By clicking on the “**Status**” option, the application will display two options:

• Deliver order

By selecting this option it will be able to communicate to the customer that their order is ready for delivery or shipment.

• Start cancellation process

By selecting this option, the seller can reject the order and cancel it.

This will be reported to the customer. If the payment was processed by credit or debit card, the seller will have to enter your payment account configured in your store to request the return payment. (Billpocket, Stripe, OpenPay, etc.)

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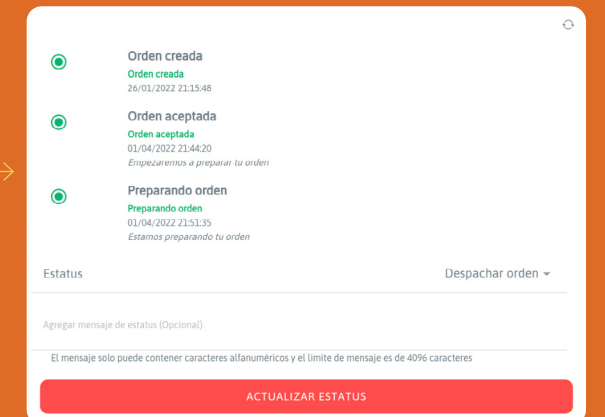
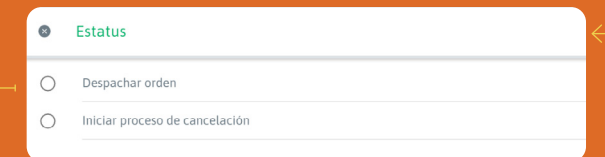
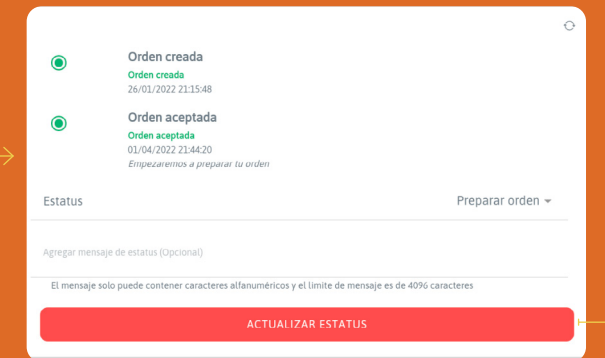
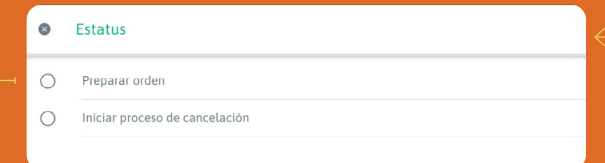


Fig. 79
Attending an order flow

Product selling

In the status section of a selected order, the user can attend to their customers' order through the application and tell them what stage their order is.

Attending an order

6. Request delivery service

This status will appear only if the order is configured by the customer as home delivery. By clicking on the "Status" option, the application will display two options:

- Request delivery

By selecting this option, the seller will be able to notify the customer that their order is ready for delivery. *The deliver can also add a custom message for his customer after selecting the status.*

- Start cancellation process

By selecting this option, the seller can reject the order and cancel it.

This will be reported to the customer. If the payment was processed by credit or debit card, the seller will have to enter your payment account configured in your store to request the return payment. (Billpocket, Stripe, OpenPay, etc.)

Request delivery

Clicking on "Update Status" will change to request delivery. This order status will alert an available courier to pick up the order at your store and transport it to its destination.

When the delivery person collects the order, it will be his responsibility to change the status of the order. The seller will no longer have to perform any status updates. The seller can cancel the shipping request if needed. Which will take the order to the previous status (Delivery order).

Although the practice of ordering and fulfilling the order is digital, it is still a service activity, where customer service is paramount so that the shopping experience is great. Thus, it will be possible to retain customers who buy through this mode.

The section below presents more tools within this application that may improve customer service by striving to perform excellent service.

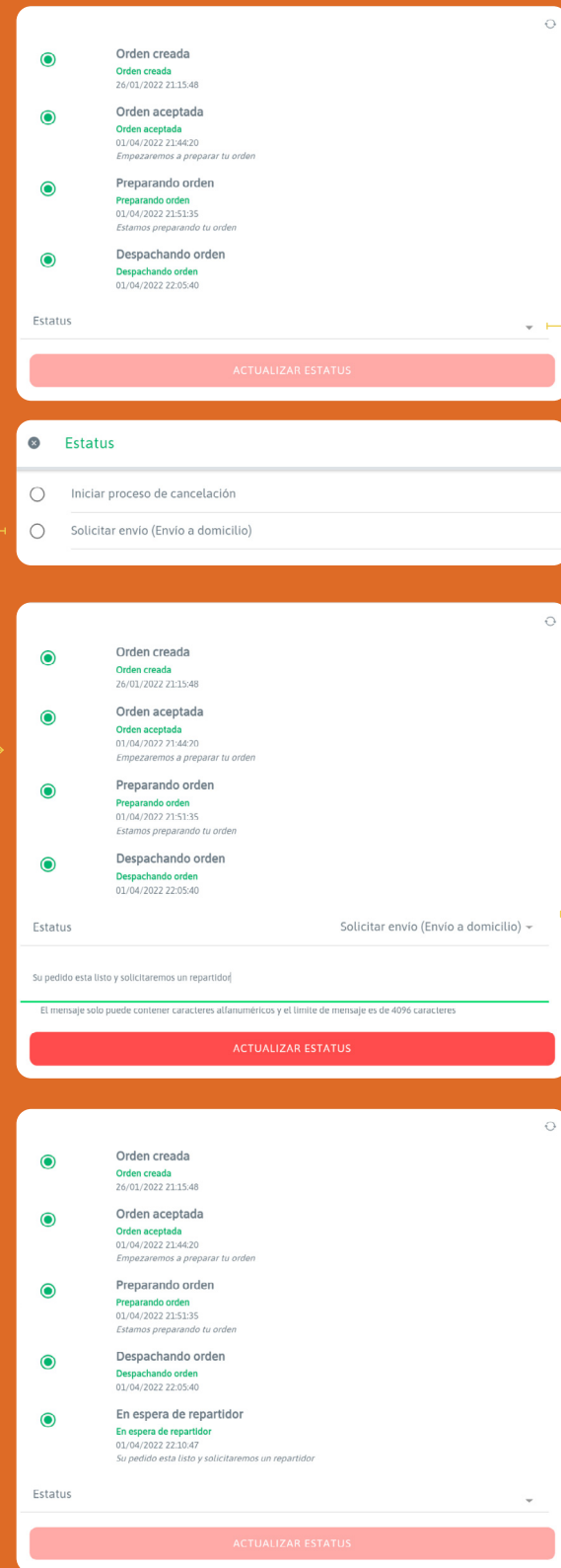


Fig. 80
Attending an order flow



Product selling

The following section will help sellers carry a highly effective customer service as a competitive advantage of the mobile application.

1. Best customer service practices

These best customer care practices will help the seller to provide a complete service to their customers. The goal is to help them decide on the products the seller is offering.

Order details

When entering an order, just after the list of products, the seller will be able to find the tools for instant and direct communication with the client:

- Chat

The chat functionality works like any messaging application. It allows users to communicate through instant messages with the client. It allows them to solve any doubt or consult any detail related to the order, ensuring that the client will receive what they were expecting.

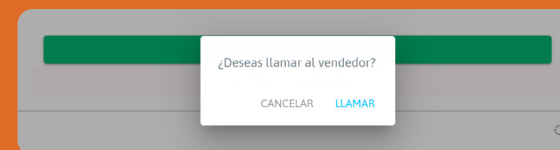


Fig. 82
Call display image

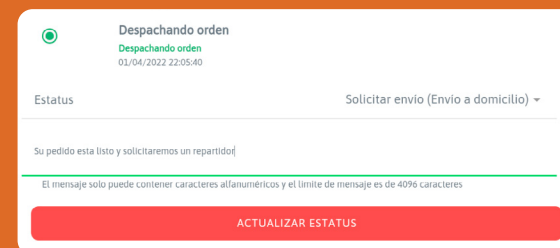


Fig. 83
Picture of message display on order

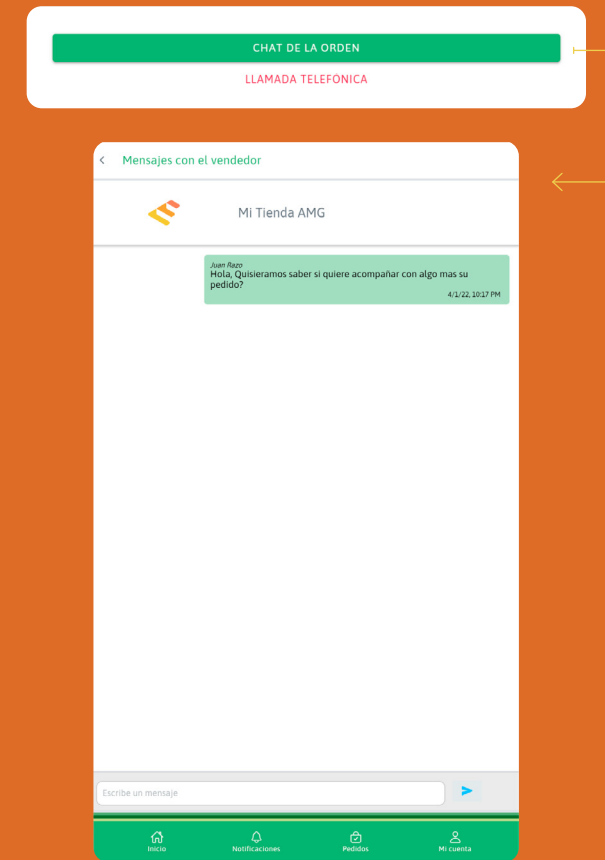


Fig. 81
Image of the app's chat display

- Phone call

The best form of contact at all times is a phone call. The user can talk to the client directly and quickly. This will help give them much closer attention, leaving aside the wait, and making a direct connection with the client.

- Personalized order status message

When updating each "Status" of an order, it is possible to add a message that the customer will receive. This makes the attention more direct and personalized. The following practices seek to provide the advantage of the use of the entire application. As well, it aims to provide a high-quality service.

The goal is to make the client feel that he or she is physically buying in the market, by offering the greatest confidence and closeness. Below are presented, other tools and best practices for customer service outside an order to help potential customers to decide on the seller's products and services.

Product selling

The following section will help sellers carry a highly effective customer service as a competitive advantage of the mobile application.

2. Best customer service practices

These best practices will provide a complete service to the customer, to help them decide on the market products and to prefer them.

General customer service

Within the app there will be many people searching for different products and services every day. Normally, the customer may have certain doubts before buying a product or want to obtain them quickly and easily. These tools and best practices will help potential customers decide to consume the seller's products/services.

Product questions

This tool is at the end of the initial screen "Manage questions". The user will also receive notifications of questions in the lower menu by accessing them by clicking on "Notifications".



Fig. 85
Notification screen

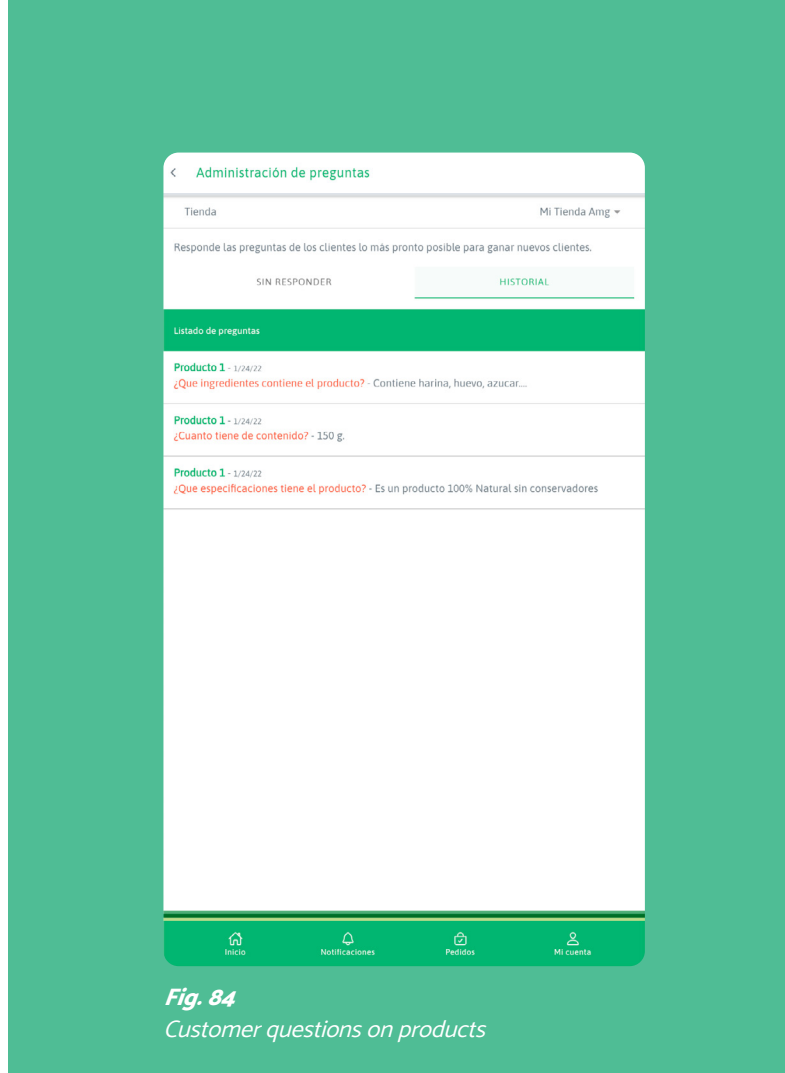


Fig. 84
Customer questions on products

Product questions aim to inform all customers of different details of a specific product or service. The customer can access a product or service and ask you a question about a particular feature of the product. The question remains as information within the product so that other visitors can see the questions and answers provided, helping to visualize a product or service in more detail.

Notifications

This section is located on the main screen, in the lower menu, and it is accessed by clicking on the "Notifications" button.

This section accumulates the different interactions between clients interested in the products or services. The notifications received in this section are:

- New orders
- Question about the product
- Customer message in an order

The fastness of attention will make the client feel good about the service or product the seller is providing.

Product update

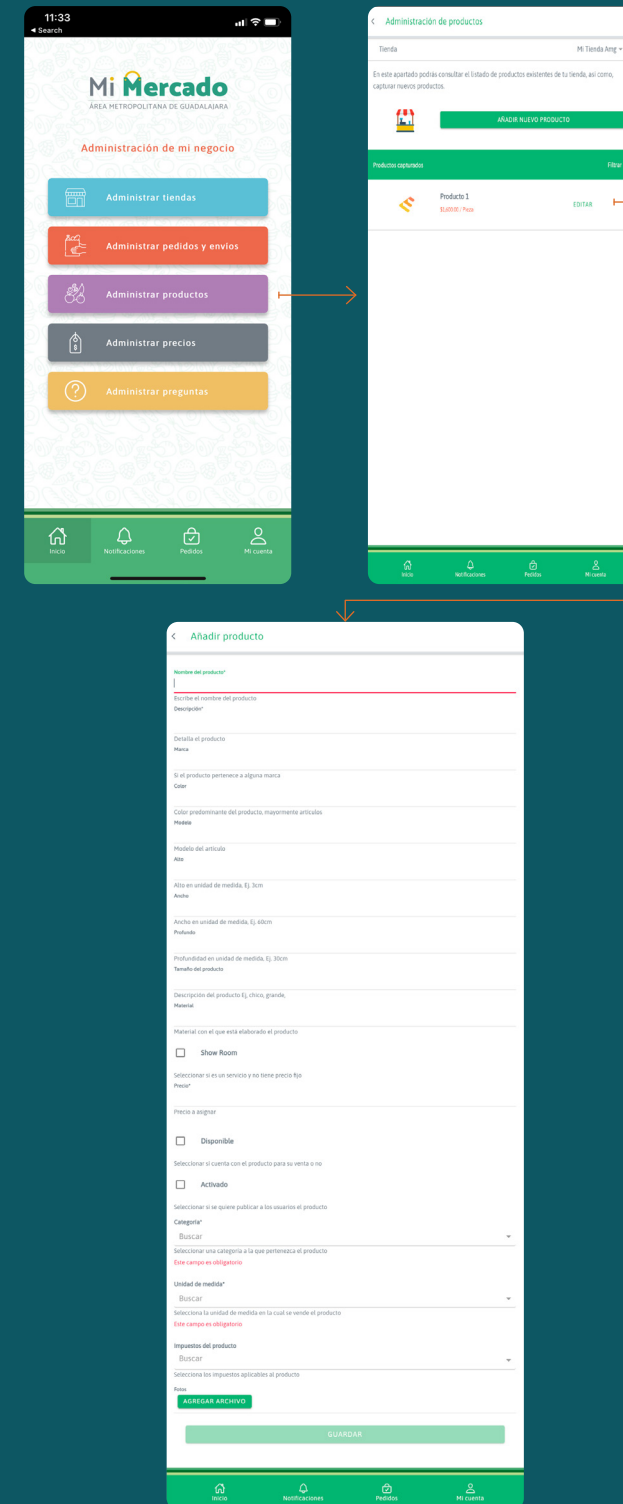


Fig. 86
Product Detail Flow

Information and product status

This interaction will help the seller to have products available in their store. It allows the customers to buy from the store at any time.

Information and product status

1. Manage products

Log in to the seller account and click on "Manage products".

2. Product in store

Upon entering, the orders of the default store will be displayed.

If the user has more than one store and would like to see the orders of another, he will have to select the store whose information wants to see.

3. Update product detail

By clicking on any product on the list, the user will be able to see its details. They can change any preloaded information:

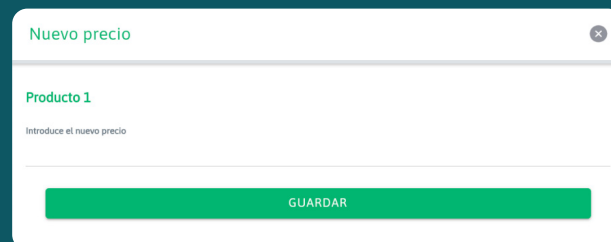
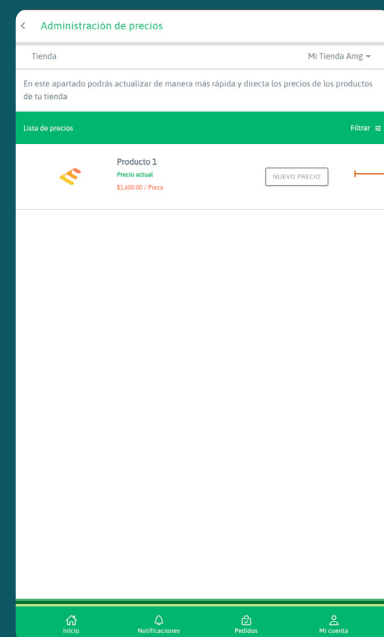
- Product / Service name
- General description
- Brand
- Color
- Model
- Dimensions
- Size
- Material
- Activate / Inactivate Showroom (for services)
- Price
- Category
- Unit of measure (if sold by quantity)
- Product tax
- Add/delete product photos

Product status

- Activate / Deactivate product availability
- Activate / Deactivate the product in the catalog

Finally, the user must click on "Save" and all the changes made will be saved, and the new information will be published for the buyers.

Product update



Price update

This section allows tenants to edit the prices of products and/or services within their store quickly and without having to edit the entire product/service.

Before editing the prices, the products must exist in the store catalog.

- 1. Seller account**
Log in to the seller's account and click on **"Manage prices"**
- 2. Select a store**
Upon entering, the orders of the default store will be displayed.

If the user has more than one store and would like to see the orders of another, he will have to select the store whose information wants to see.
- 3. Manage prices**
The list of products/services added to the selected store is displayed. On this screen, the user can edit each price by clicking on the **"New price"** button corresponding to each product.
- 4. New prices**
The user should enter the new price in the field that appears.

Then click on **"Save"**, so the new price will be saved and will be shown to the public from that moment.

The seller will receive an updated confirmation.

Fig. 87
Price update flow

Delivery

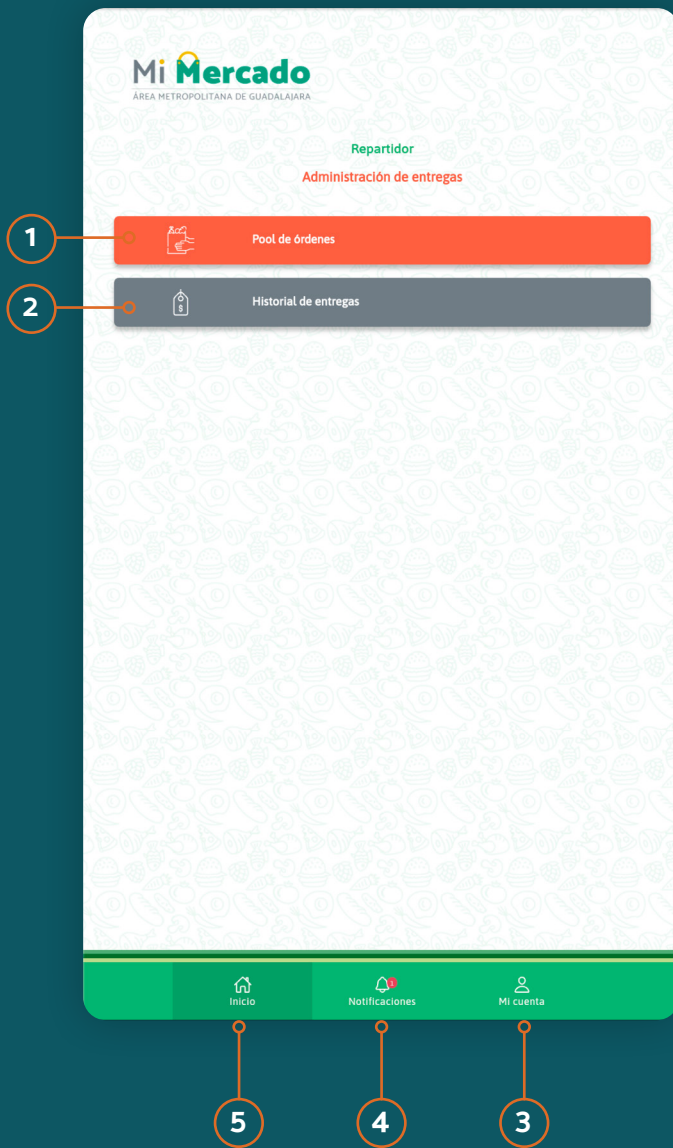


Fig. 88
Delivery person home screen

Navigation

Delivery user home screen

The next screen shows the initial options for a seller. Each of their areas of interaction is explained.

1. **Order pool**
Access to the section for visualizing both, new orders and those in process.
 2. **Delivery history**
It is a section to visualize the list of delivered orders.
- Bottom menu**
Access to general sections of the application..
3. **My account**
Section for account management, password modification, consult privacy policies, help, and logout.
 4. **Notifications**
Access to the notification section sent by the system. These can be new orders, and messages from sellers and buyers.
 5. **Home**
Quick access to the home screen.



Delivery registration

To register delivery people, users must create a user account as a “delivery person”, which must be activated by the application administrator.

Follow the next steps to create a delivery person user:

1. **Download the app**
Search for the Digital Solution app (Mi Mercado AMG) in the App Store or Google Play on the user’s device and download the app.
2. **Register in the app**
To create an account as a delivery person, open the app, click on “Delivery”, select the “I’m a courier” profile, and click continue. Now click on “Create account”.
3. **Complete registration**
The user must fill out the registration page with their data, and read and accept the terms and conditions.
4. **Activate registration**
The user must enter their email, look for the registration activation message and confirm their registration using the link provided in the message.

Registration on the website

1. **Access the website**
The user must enter the website defined for the market. Click on “Account” and select the “Create an account” option.
2. **Registration**
The user must select the “I am a delivery person” option, fill out the registration page with their data, and read and accept the terms and conditions.
3. **Active Registration**
The user must enter their email, look for the registration activation email and confirm their registration using the link that comes in the message.

Fig. 89
Delivery driver registration flow

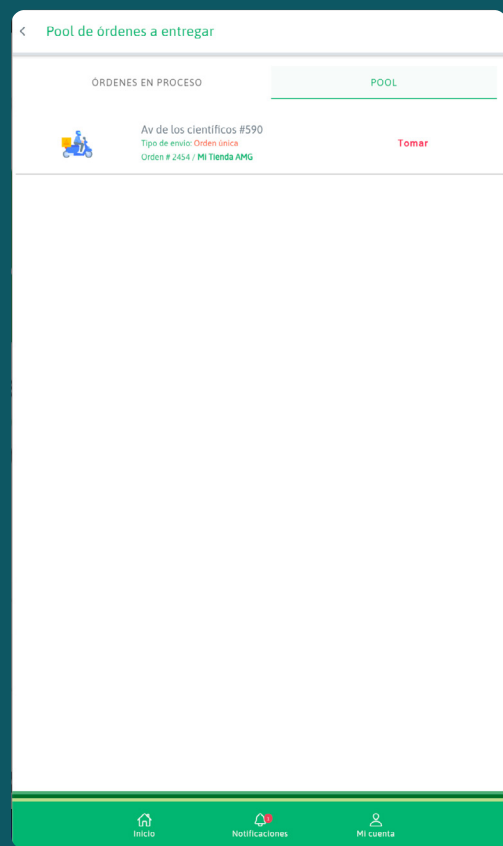
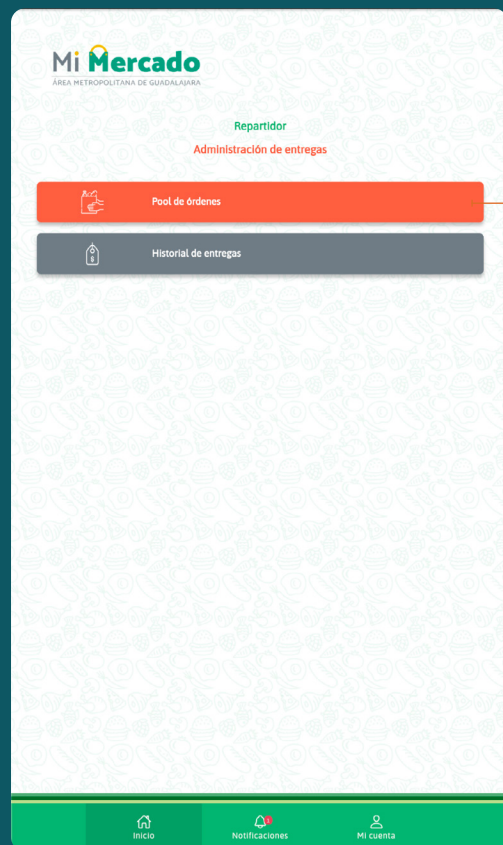


Fig. 90
Order list display flow

Order display

This area allows the delivery person to view orders assigned to him, giving him the possibility of attending to them and managing the service to deliver the products ordered from a certain store.

Orders

- 1. Order pool**
The user must log in to his delivery account and click on "Order pool".
- 2. Select an order**
When entering, the assigned orders will be displayed. The user will be able to review each order's destination address, the type of shipment, the order number, and the store where you will pick up the order.
- 3. Order details**
By clicking on any order on the list, the details will be displayed.

The section is integrated with the following areas of information:

General order information

- Order number
- Customer name
- Address
- Total order amount (\$)

Pickup location

- Market
- Store where the order is located

Purchased products

This section shows the list of products purchased in order and the specific characteristics of each one.

Contact and messages

In this area, the user has the possibility of accessing an instant messaging channel to contact the seller or client by message. All this is to allow them to clarify any detail.

He will also be able to see comments or additional information added to the order.

Order status

In this section of the screen, the status order detail is presented, and it can be updated according to the delivery process.

Order delivery

This area allows the courier to view orders assigned to him, giving him the possibility of attending to them and managing the service to deliver the products ordered from a certain store.

Attending an order

- 1. Select an order**
The user must sign in to the delivery profile account. Click on "Order Pool" and select or click "Take" an order from the list of orders.

The user will see a message on the screen to confirm that he is available to take and deliver the order. If so, click on the "Confirm" button. The order will be added to his list of orders in process.

- 2. "Order on the way"**
The status changed to "Order on the way" when the delivery person brought the order to the client. The delivery person can go to the customer's address.

- 3. At the delivery address with the client**
By clicking on the "Status" option found at the bottom of the screen, the application will display two options:

- **At the delivery address with the client**
By selecting this option, the user will be able to communicate to the customer that he is away from their home and ready to deliver their products.
- **Return order to the seller**
By selecting this option, the user will be able to return the order to the seller for any issue related to the product or order.

At the delivery address with the client

Clicking on "Update Status" will change to order "At the delivery address with the client". It will notify both the seller and the customer that the delivery person is outside the indicated address and ready to deliver the product or products purchased.

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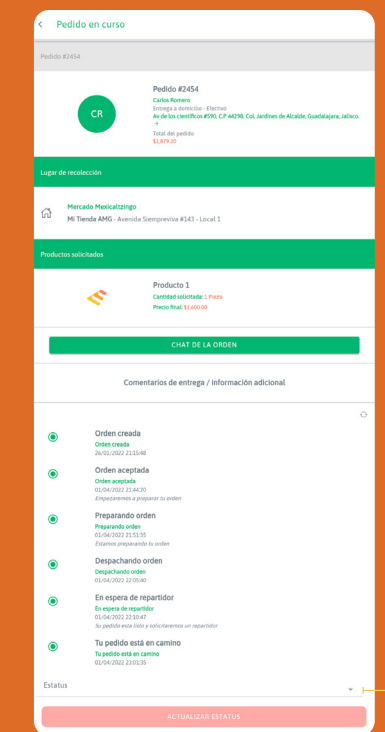
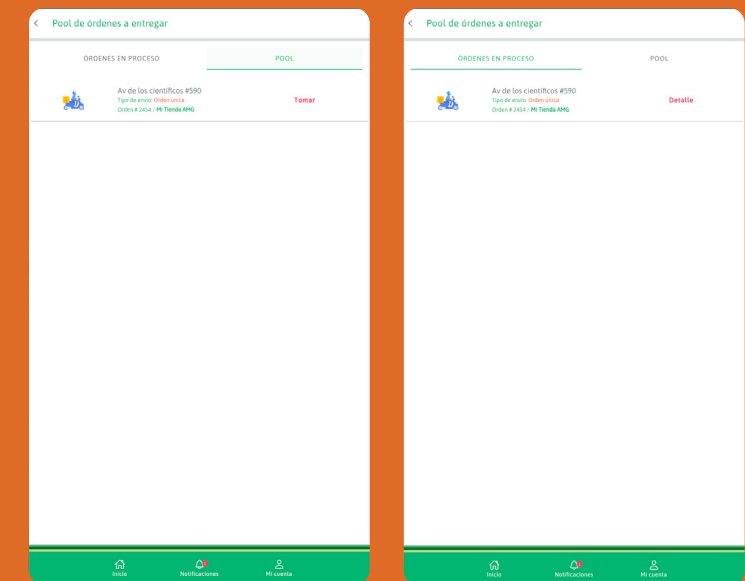


Fig. 91
Order service flow

Delivery orders

This area allows the delivery person to review orders assigned to him or her, giving them the possibility of attending to them and managing the service to deliver the products ordered from a certain store.

Attending an order

1. Mark as delivered

By clicking on the “**Status**” option found at the bottom of the screen, the application will display two options:

- **Mark as delivered**
By selecting this option, the user will be able to inform the seller that the order was delivered correctly.
- **Return order to the seller**
By selecting this option, the user will be able to return the order to the seller for any issue related to the product or order.

At the delivery address with the client

Clicking “**Update Status**” will change the status to “**Delivered Product**”. This will finalize the order for everyone and notify the seller that the courier has successfully delivered.

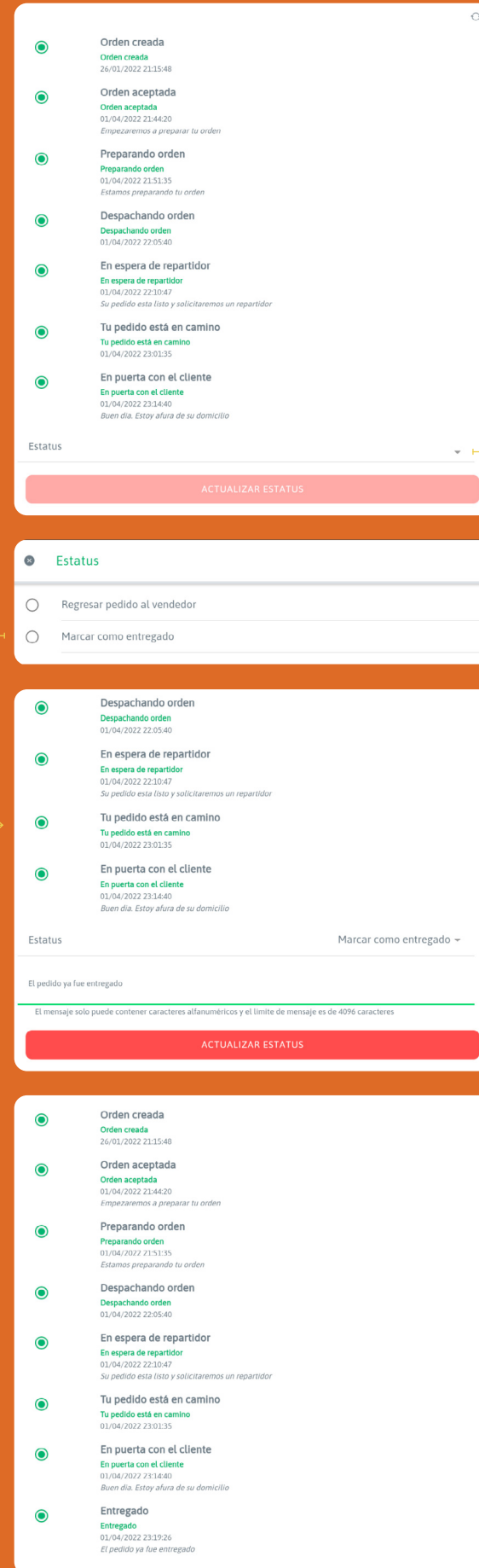


Fig. 92
Order service flow

Logistics

Best practices are understood as those events, experiences, theories, and ideas implemented through agreed procedures or regulations that have been considered appropriate for a specific purpose. After their implementation, they proved to be effective.

Not all best practices are equally applicable to all organizations. It is necessary to detect which ones could be useful and adapt them to each case.

1. Local delivery

Local delivery persons are key users in the successful use and growth of the platform. There are different options and schemes to integrate them into the Digital Solution. Below are the two initial groups considered during the “Mi Mercado AMG” pilot phase:

General delivery persons: They provide attention to the market as a whole business. This delivery figure intends to provide coverage to all those tenants who lack staff or vehicles to expand their distribution area.

Particular delivery persons: They provide exclusive service to one or a certain number of businesses within the market. They do not provide service to all tenants.

Usually, they are part of the operational and administrative structure of a specific business.

The learning or model of “Mi Mercado AMG” does not mean that other possible models should be excluded in future efforts. In reality, this will depend on the conditions of each city and market.

Independent delivery persons: They provide the service with their resources (time, equipment, etc.) and they are not part of the structures of the tenants or the market. They work regularly but independently, which does not guarantee the delivery person’s time availability.

Among the best practices learned from the “Mi Mercado AMG” pilot, the bike logistics distribution stands out, whose purpose is to add to the search for sustainability in the short, medium, and long term.

Logistics management best practices

Currently, version 2.2 of the Digital Solution (used in the “Mi Mercado AMG” pilot) does not integrate GPS (Global Positioning System) navigation tools. For this reason, the best logistics practices that allow the optimization of time and resources (such as the number of available delivery persons) are presented below.

Incentivize the collection service (Pick up)

It is suggested as an alternative to the delivery service. This option allows the buyer to collect directly in the market and/or local the products purchased. Among the advantages that encourage this practice is the reduction of the delivery cost of the order and the strengthening of the link of the consumer with the market when visiting it physically.

Logistics distribution by node

The purpose of this practice is to generate the distribution of two or more orders during the same shipping process. For example, between 2:00 p.m. - and 4:00 p.m., two or more users are likely to place food orders.

One way to distribute them would be to group those that enter within a limited time frame (for example, within a period of between 10 - 20 minutes) so that their orders are fulfilled and sent in the same time frame. Thus, two or more orders could be delivered together, as long as they are within the same route and whose sequence is logical.

Within the pilot, this practice is executed manually, since, as previously mentioned, the Digital Solution does not yet integrate GPS functionalities.

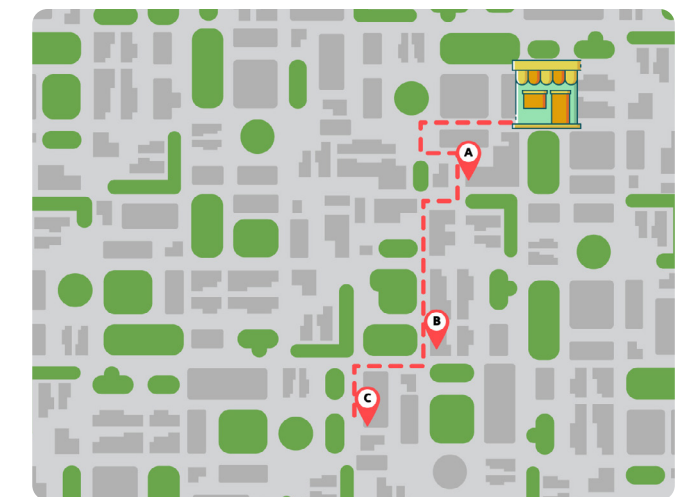


Imagen 93
Example of logistics distribution by nodes

Logistics

Use of the “Chat” functionality within the Digital Solution

This functionality allows interaction between the following users: (1) the buyer, (2) the seller, and (3) the delivery person. Its purpose is to enable a transparent communication channel that allows knowing the status of the order or any difficulty that may arise in the course of its preparation or delivery.

Different practices transcend the Digital Solution in a complementary way. For example, the use of instant-messaging tools outside the app, such as WhatsApp. The selection and use of this type of tool will depend on the context of each project and user.

2. Subcontracting bike-logistics services

A parallel option to the solutions presented above is subcontracting or partnering with local bike logistics service companies. Bike logistics services are those that deliver or distribute products with bicycles with or without a trailer, and with or without electric assistance, which allows an efficient and sustainable distribution with a zero-carbon vehicle, which is an adapted form of active urban mobility.

One of the key elements to evaluate for the association or subcontracting of the bike-logistics service is the working conditions between the companies and their workers. A socially responsible and equitable bike-logistics model must be guaranteed.

It is important that by using local bicycle logistics services, added value is included in the product. The bicycle is not the most competitive, efficient, and sustainable means of transportation, but it also provides that human component within the sales and delivery experience.

Important note: In all the distribution modalities mentioned above, it is necessary to guarantee safe circulation conditions for bicycle delivery persons. Therefore, during the development of the Social Urban Environment Analysis, it is important to understand the context and the existing cycling infrastructure and speed limits of vehicles in the service area of the Digital Solution.

Observatorio de Logística y Sustentabilidad. Instituto Tecnológico de Buenos Aires, “Guía de buenas prácticas para la logística y la sustentabilidad”. Septiembre, 2016. Recovered March 31st, 2022 from: <https://www.itba.edu.ar/intranet/ols/wp-content/uploads/sites/4/2016/10/Gu%C3%ADa-de-Buenas-Pr%C3%A1cticas-para-la-Log%C3%ADstica-y-la-Sustentabilidad.pdf>

3. Bike-logistics best practices

Two companies with the best local cycle logistics practices are listed below:



Fig. 94

Mission Spaces & Logistic - <https://www.instagram.com/mission-bicimensajeros/>

MiSSiOn Bicimensajeros GDL

Place: Guadalajara, Mexico.

It is a cycle logistics company committed to its network of businesses and customers. In addition to caring for its environment and promoting cycling culture.

Its delivery process is simple and is summarized in the following steps:

Through its rate map, the place where the package must be collected is located.

It determines at what time the delivery needs to be shipped. Based on the rate map and time, the quote is generated and approved.

La Güerta Ciclista

Place: Madrid, Spain.

This company promotes a clean energy distribution model, by bicycle and adapts them to the needs of its customers. This company is the merger of two projects, Cosecha and Ciclos Jelca.

La Güerta Ciclista is a project that believes in close ties through environmental sustainability and mobility, offering quality ecological products and distributing them in a sustainable means of transport, the bicycle. Its mission as a company is to facilitate access to quality food at a fair price.

The process of this company is through a web platform and has the following steps:

1. Customers sign up.
2. Customers generate their orders with a minimum purchase. Payment can be made in cash, by credit or debit card.
3. They coordinate delivery dates and times with the assigned delivery person.

7

Additional resources

Social communication guide best practices

Starting point

Traditional markets are spaces that articulate the social fabric. At the same time, they are supply spaces for large sectors dedicated to the exchange between people, products, or services, so implementing digital solutions in these exchange centers within the framework of the current pandemic has a fundamental role in caring for the public health of the population and local economies.

Successfully deploying the digital solution in local markets in other cities depends on the communication and socialization processes. As well, as the strategies, objectives, scope and digital tools used for it.

To be clear, this Guide of Best Communication Practices develops the key points to using communication efficiently. It is a general outline of how we can implement public and digital communication in a better way in spaces with so much culture and tradition, such as markets.

Although transferring a Digital Solution to other cities will have its complications, this document seeks to be a guide, both for tenants and public servants, so that markets become institutional strengths.

The process of communication and positioning of a local market not only responds to the positioning of the offer of the tenants, but these activities are also part of the socialization process of the project. The traditional and online communication tools and methods selected for this process should add to the construction of collective identity and the sense of belonging to the community.

Strategic communication

What is it?

Reducing the concept of communication to a simple means of transmitting information is limiting it to an act that cannot necessarily be effective. It is different if it is seen as an experi-

ential process, key to the proper functioning of the institution or market.

Communication is a cultural fact. There is no culture without communication. Without it, there would be no way to transmit or share it. From this point of view, communication has great potential to generate social change. Why? It can generate new meanings and new views of the world, different from those recognized until now.

Executing a communication based on a clear objective of what it wants to achieve and the audience's address is to start working under a strategic communication scheme. It is getting to put yourself in the place of the other by analyzing the messages and understanding communication as a meeting of sociocultural diversity that is constantly in motion, defining and redefining itself.

Communication has to be related to the conversation. It doesn't have to be unidirectional but mutual; it has to be something that enriches both the one who communicates and the one who is receiving the communication. It translates into the desire to respond, to converse, to speak.

What is it for?

Strategic communication represents numerous benefits for several reasons:

1. It enables the Digital Solution as a system.
2. It is approached with a vision in which the Digital Solution is analyzed from the relationship with its environment and not as an entity isolated from the society it must serve.
3. Avoid falling into a short-term strategy.
4. It allows showing articulated policies by integrating its actions into a longer cycle. The government enunciates its discourse around a narrative idea.

In this form of communication, political, cultural, and economic variables converge which is necessary to generate a

Communication has to be related to the conversation, it doesn't have to be unidirectional but mutual; it has to be something that enriches both the one who communicates and the one who is receiving the communication. It translates into the desire to respond, to converse, to speak.

permanent participatory construction, which leads to discussions and involves people much more in the fulfillment of government programs; in this case, the Digital Solution.

Elements

1. It must identify the favorable elements of The Digital Solution and the environment.
2. It must be consistent with the reality of the social and economic context.
3. It must set social and economic objectives to pursue.
4. It must establish clear actions for the fulfillment of those objectives.

These elements will give rise to the construction of a communication strategy, which is formulated with the following:

- Guiding message
- Discursive lines
- Image
- Strategic actions
- Content production
- Communication tools
- Press

- Communication channels

This communication strategy will give rise to the construction of a communication campaign, which aims to:

- Publicize or increase awareness of the program (the Digital Solution).
- Project the desired image.
- Disseminate actions, benefits, and scope.

Elements of a communication campaign

1. Starting point / Context

It allows identifying:

- Where are we?
- Where are we going?
- What do we have?
 - Resources
 - Programs
 - Allies
 - Etc.

2. Communication objectives

It allows identifying:

- What do we seek to achieve through the communication strategy?
- How are we going to present the Digital Solution?
- What should the Digital Solution represent?
- How are we going to position the brand or the project?
- What will we do with the people who are not in favor?

3. Stages

1st Stage – Kick-off or presentation:

- Presentation of the Digital Solution: name / graphic identity.
- Start telling the story (storytelling).

2nd Stage – Benefits:

- Match the story with the identified needs.
- As a best practice, to build the narrative, consider no more than five specific benefits.

3rd Stage – Follow up/ Share:

- Continue communicating the uses and scope of the Digital Solution.
- At this stage, the adoption process has reached the citizens. Therefore, it is pertinent to show them the benefits from it. Even more relevant is to collect their feedback, this allows the Digital Solution to adapt to their needs.

4. Brand / Stamp

- It provides visual identity to the name of the Digital Solution.
- It is the basis for building positioning and recognition by citizens.
- Align the visual communication of all communication.
- In some cases, it is aligned with a local government identity manual.

5. Speech / Narrative: story

It aims to generate empathy for all spectrums of citizenship: VALUES.

- It must have a meaning and coherence with reality.
- It must be exciting.
- It should be easy to share.

6. Guiding concept (Slogan)

It is the result of the creation of the narrative.

- MESSAGE: It is the whole set of attitudes, behaviors, ideas, and proposals aimed at citizens.
- It is what is said and also what is not said.
- Sounds, silences, images, photographs: everything communicates.
- How is it perceived by the public?

7. Communication tools

The communication tools are the tangible pieces in which we are going to execute the strategy, for example:

Printed tools:

- Posters
- Banners
- Pamphlet
- Etc.

Audiovisual tools:

- Images
- Multimedia
- Sounds

- Etc.

Digital tools:

- GIF
- Infographics
- Postcards
- Etc.

8. Communication channels

They are the channels by which we are going to transmit the strategy or campaign:

- Social media: Facebook, Twitter, Instagram, etc.
- Traditional media: Press, radio, TV, etc.
- Digital media: Website, newsletter, etc.

For the construction of the guiding message, do not forget the VIPS:

VISUALIZE

Use words and examples that illustrate the message

INTERNALIZE

Make the speech your own.

PERSONALIZE

Humanize the speech and the slogan. The citizens should feel understood and represented in their problems.

SIMPLIFY

It is clear, direct, without technicalities, etc.

A government that communicates well and works well, TRANSCENDS.

Public communication

Public communication seeks to reach citizens comprehensively. In other words, it is the democratizing practice and content that educates, sensitizes, and provides benefits for the social change of the audiences.

It is decisive to have it as the basis of public institutions since it sustains the social and political life of the people we speak to.

To ensure that public communication makes good use of the population's time and resources, it is important to consider the following guide on Good Communication Practices for local governments.

Best practices inside and outside local governments

A government that does not communicate is a government that does not exist.

Communication is the principal tool used by municipalities to get closer to citizens with the intention of / to:

- Inform
- Explain
- Anticipate
- Answer / Reply
- Interact
- Consult
- Defend

Therefore, the communication of local governments faces:

- The apathy and disinterest of citizens.
- Widespread discontent with governments.
- Little credibility and fed up with governments and politics.
- Entertainment content that is more attractive to people.

Institutional communication that follows a communication strategy:

- Can achieve governance.
- It will give credibility to the government.
- It generates the conditions to call for co-responsibility so that citizens and government work hand in hand and build.

Institutional communication works as follows, depending on the level of importance for citizens:

1. Services, procedures, and general information.
2. Everyday communication and general government programs.
3. Situations and crises.
4. Mayor's agenda and relevant programs of his or her government.

The four dimensions are significant to generate a perception of Good Governance. That is why there must be a balance between them. The government goals and its style of governing it reflect in all dimensions.

Strategic communication is NOT about personal preferences, nor what the institutional team or the closest collaborators prefers.

Strategic communication IS defining a story that will be told to the public:

- On the actions that will be the legacy of a government.
- Through an idea or concept that will be repeated.
- With tangible evidence that will support the concept and the story.
- It is knowing who you talk to and how to talk to them.
- It is speaking with attachment to the reality that people live in.
- It is telling believable stories.
- It is speaking from the people and for the people.

A good communication is a strategic tool used by municipalities to get closer to citizens.

Good communication generates conditions of co-responsibility so that citizens and the government build solutions.

To achieve this, it is essential to:

Assemble a small communication team:

- Professional photographer
- Content manager
- Social media manager
- Graphic designer
- Community Manager
- PR

Properly select communication tools and channels:

- Digital media: Website, blog, newsletter.
- Social media: Facebook / Twitter / Instagram
- Traditional media: Press / radio / TV
- Printed: pamphlets, flyers, posters

REMEMBER

INFORM: Communication must be useful to people.

EXPLAIN: The reason for the actions and decisions of the government.

SHOW: A government that is constantly working. *trabajando*

Best practices for local market tenants

It is necessary to understand the local market as the workspace of the tenants, so the social and communication approach should emphasize the economic benefit that all the tenants will have.

The developed communication must make the local market offer visible and, at the same time, show closeness to its clients. It will be the basis to create clear communication for the tenants, as well, as for the clients.

It is important to remember that you should only use the channels and tools that are more familiar to both circles: (tenants - customers). It will allow both parties to appropriate The Solution and adopt it.

The socialization of the project within the local market is decisive before the official launch. It means having the approval of the name and message, this will avoid possible crises. We are addressing people, so the representation of tenants with their aspirations, benefits, and desires, will be essential to a successful communication strategy.

Communication for the Digital Solution

It is essential to mention that the communication strategy of The Digital Solution must contemplate a strong marketing strategy in the digital world due to its nature.

Therefore, it is imperative to use digital platforms. Every day, there are more people connected to the internet.

To be successful, it is necessary:

- Advertise.
- Use of geolocation tools.
- Do not saturate digital channels with content, but do not stop communicating either.

Depending on the defined strategy and the response messages, consider the following options:

- Answer questions privately (email).
- Post messages on the website and social media.
- Create a blog for the audiences of interest.

The credibility that any public institution brings with it is a more consistent, solid tone that must be maintained.

All documents, facts, and publications need to have an of-

ficial character.

In other words, everything that appears in the official profiles should be considered irrefutable truth.

Best practices

Proximity

By nature, a social network should bring people together and not make them afraid to participate. The content of each one of the government profiles must be made for the common user, avoiding terms inherent to harsh legal language.

Publication by network type

Each social network, by nature, carries intrinsic characteristics to the citizen's motivation to use it. In this way, it is impossible to define a single rule for the publication with the sum of different social media platforms.

In any case, it is worth pointing out some good practices for the main social networks:

Facebook

- 1 to 3 posts per business day maximum.
- Written in the first person. Informal but direct tone with emotion that involves the user and invites interaction.
- It must include at least one image per post.

Twitter

- 1-3 posts per business day minimum.
- In first-person. It is an informal but direct communication tone. With emotion that involves the user and invites interaction.
- Synthesized hypertext using a maximum of 280 characters allowed by the application, or less if possible.
- Include links if necessary to deepen the information.



Fig. 95
Example of digital advertising image used in the cover section of the "Mercado 47" Facebook account (Madrid, Spain).

Fig. 96
Example of digital advertising image used in the Facebook account of "Mercado 47" (Madrid, Spain).



Fig. 97
Example of advertising GIF format used in the Twitter account of "Mercado 47" (Madrid, Spain).



Moderation

These are social media, open by default, moderation is used only in extreme cases. In general, the content must be kept free and under the control of the user and the community. However, when a case draws attention in the sense of concentrating on illegal content that hurts, openly, or shows violence and discrimination, it must be suspended from the digital channel on social media.

In this sense, any moderation must always be explained to users, and it must also avoid transmitting an image of arbitrariness in editorial control. It must be emphasized that the role of the government is to ensure that the content, whether generated by it or by third parties, aims to broaden the knowledge base of citizens.

When to use each type of content?

- Videos or infographics (multimedia): It is oriented towards complex and supportive content. Using infographics should be the first step, as they cost less to produce than videos and have a higher engagement drive than plain text. When the content is too complex to describe in an infographic, videos should come into the picture.
- Meta-sites: Meta-site should be understood as an independent navigation structure, which includes hierarchical pages under its menu, but is subordinated to a macrostructure. When the content is very complex and relevant, it should be added to its meta-site, with internal navigation that allows the user to go deeper into the topics.
- Text: It is a resource used for simple, linear content that works as a support for navigation as a whole.
- Images or infographics: Most of the content on the networks fall under this point, made up of relevant but easy-to-understand information. This includes everything from relationship posts to illustrations to show results.

Conclusions

Communicating will make governments closer to people, but strategic communication will make your government stand out from the rest and transcend.

It's necessary to prepare a communication strategy that includes the different stakeholders of the institution, both internal and external. To communicate information clearly and conveniently, thus avoiding any misinformation and/or crisis inside and outside the institution.

The Digital Solution must be close and clear. But above all, it must offer a solution for citizens and tenants, and that must be projected in the development of communication strategy.

Social urban analysis guide

Introduction

Public markets are one of the fundamental elements of social urban dynamics. The social, cultural, economic, and political life of the territory practices is reflected in these spaces. In addition, these spaces were and are conceived as one of the spaces where the distribution of food (fresh, non-perishable, and processed) to the population is guaranteed. Markets as public spaces convene a significant number of people on a daily basis, where the largest groups of attendees are merchants and consumers. However, due to its social nature, other actors attend, such as neighborhood residents, city dwellers, tourists, etc.

Public markets are spaces for the encounter and articulation of the social fabric and the local memory of the territory. The market space, “is much closer to the ordinary experience and refers to the place where the exchange occurs” (Callon 1998, p: 11). It is a space where not only product exchanges are concentrated, but also any exchange or daily social encounters. Over time and as part of urban growth, public markets have evolved, adapting to new needs and social dynamics.

A social urban analysis of the market and its immediate context is suggested as part of the activities prior to the execution of the project. Each market has different characteristics. Therefore, the analysis should consider the built environment through its historical, cultural, and social context.

What is a social urban analysis?

A social urban analysis aims to understand the spatial elements and their assembly with demographic, social, cultural, and economic processes. These assemblies characterize and give identity to the territory, for which it is considered relevant to develop a social urban analysis prior to the planning and execution of the Digital Solution to qualitatively and quantitatively recognize the market to intervene, as well as its immediate built environment.

The objective of this analysis is to understand the socio-spatial and economic situation of the city with the market to intervene. It seeks to identify the role of the market

in the urban territory, its connections and disconnections with the immediate environment and the city, as well as the access to other services, mobility, jobs, infrastructure, and public spaces, among others.

The social urban analysis of the market environment will help identify synergies at different scales, which, in a collaborative and coordinated way, might help the execution of the project, achieving coordination between the stakeholders involved and having an effective deployment of the Digital Solution in the target territory.

It is relevant to highlight that this analysis will have to be designed and executed with a transversal gender approach. A social urban analysis with a gender approach focuses on understanding the experiences of women, in this case, the tenants in the market. In addition to understanding these experiences, the analysis will provide possible solutions, which should be addressed within the execution of the Digital Solution.

Who is responsible for facilitating social urban analysis?

The *project leader*¹ should be responsible for planning and coordinating the social urban analysis. The person in charge will have to rely on the relevant Urban Development and Planning agencies for the collection and analysis of information. As well, as the representative of the tenants for the execution of participatory workshops with tenants.

Some tasks of the person in charge would be:

- Prepare a work plan for the preparation of analyses;
- Define the responsibilities, roles, and/or strategies of other actors involved in the social urban analysis process;
- Convene meetings and possible participatory workshops;
- Collect, process, and validate the information collected with the relevant actors;
- Coordinate preparation of the final document.

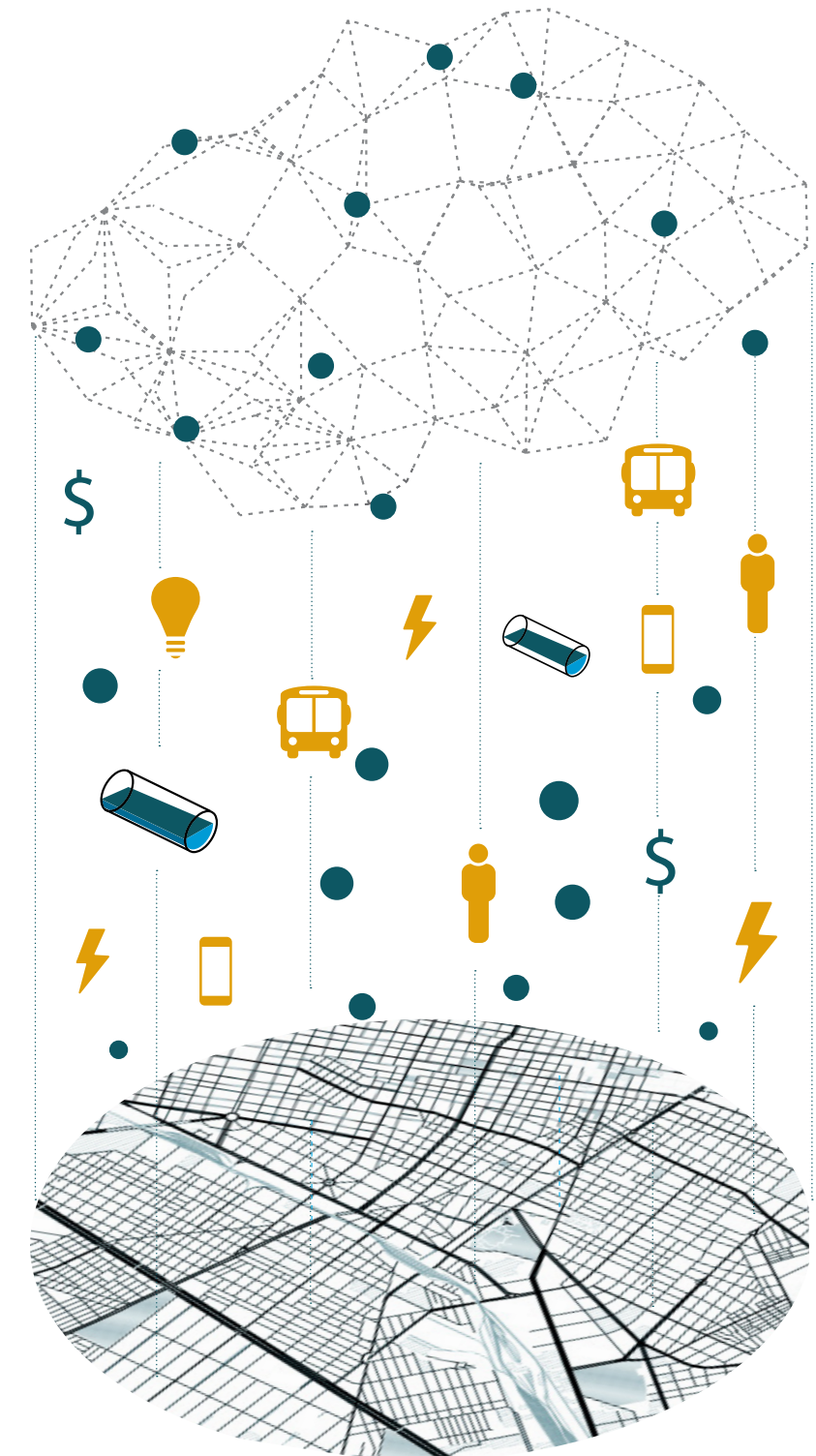


Fig. 98
Territory and layers of analysis

¹
See section Roles and responsibilities.

Layers and scales of analysis

The social-urban analysis is composed of different layers of information, which may be represented in different formats, for example, plans, maps, narrative summaries of interviews and participatory workshops, diagrams, tables, timelines, photographs, videos, etc.

The final document and the formats of the different layers of information are left to the consideration of the person in charge and the rest of the team executing the analysis.

Layers and scales of analysis

The social urban analysis is composed of different layers of information. These layers can be represented in different formats, for example, plans, maps, narrative summaries of interviews and participatory workshops, diagrams, tables, timelines, photographs, and videos, among others.

In the final document, the formats of the different layers of information are left to the consideration of the person in charge and the rest of the team executing the analysis.

Analysis layers

It is recommended, to include, at least the following layers of information:

Politics-administrative

Incidence capacities, urban governance mechanisms for municipal markets, as well as forms of organization and participation of tenants in the market and their immediate environment, are identified and analyzed. To generate analysis and mapping of resources and inputs for efficient execution of the Digital Solution allows the participation of authorities, organizations, and tenants effectively and assertively.

Sociocultural

The demographic composition and population growth of the context close to the market (neighborhood) are identified and analyzed; social characteristics and tenant profiles;

issues of insecurity and violence inside and outside the market; in addition to current forms of organization among them.

Normative

Elaborate on the result of the analysis of current regulations in its different strata; federal, state, metropolitan, and local. As well, as council agreements and administrative acts that contribute to the execution and management of the Digital Solution.

Economics

Production systems (formal and informal) and production chains within the market are identified; their relationship with the labor market, with the city, and the immediate context; the different typologies of economic activities and their dynamics in space are identified; potentialities and limitations of economic activities within the market; current and potential customers are identified.

Historic

Historical analysis helps to identify interventions and projects previously carried out in the market and the neighborhood. The historical details of the market and the neighborhood are investigated; lifestyles, key actors over time, and the change in the morphology of space over time.

Architectural

A photographic survey of the current state of the market to be intervened is prepared. The general conditions of coverage of basic services in the market (water, electricity, gas, and telecommunications) are analyzed.

Urban Systems

It refers to mapping and analyzing the different urban systems that provide services to the market to intervene and their relationship, both with the immediate environment and with the city. Some urban systems that can be analyzed are education, culture, recreation and sports, transport and mobility, health, public space, other businesses, religion, and cemeteries.

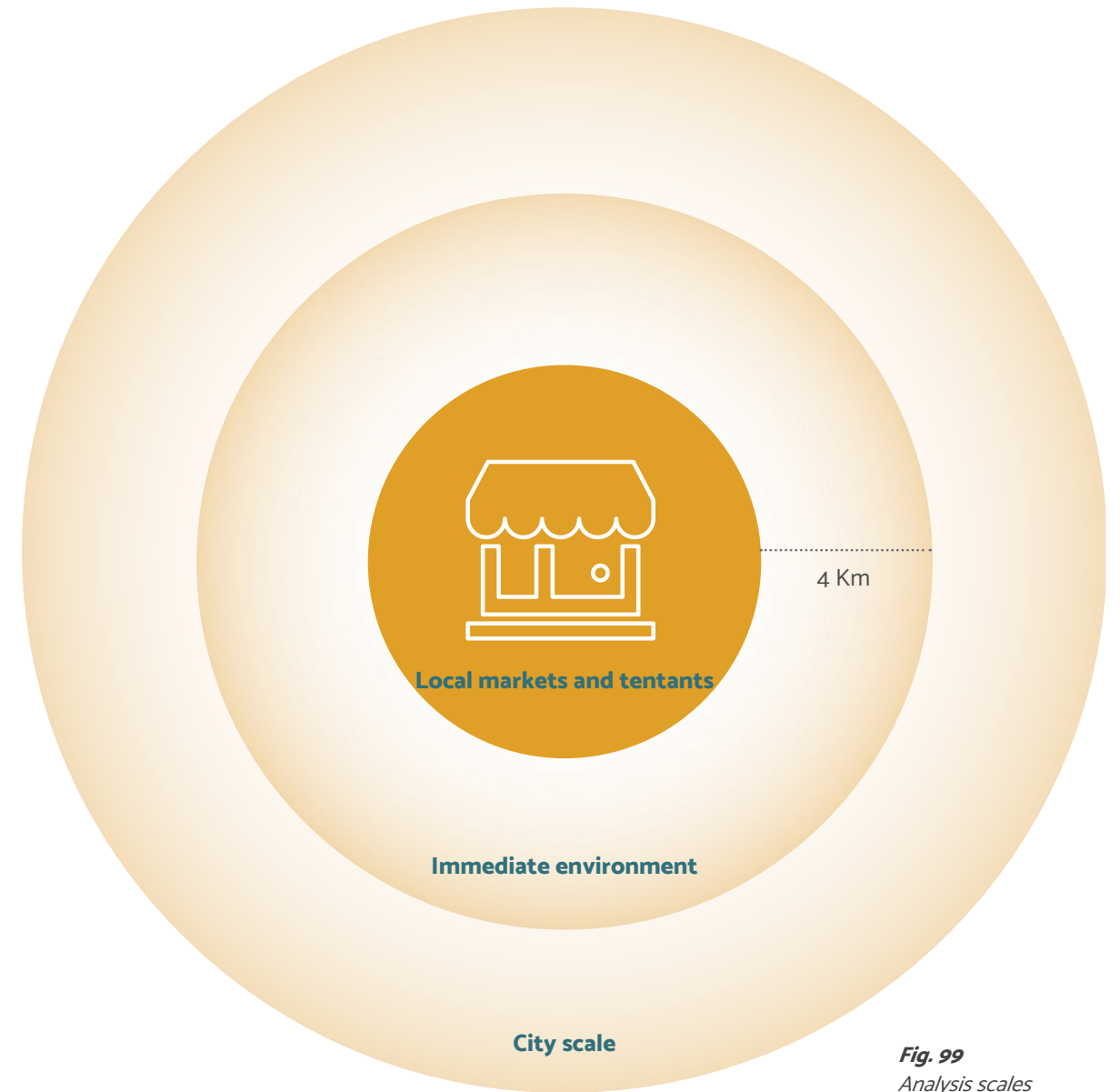


Fig. 99
Analysis scales

Analysis scales

Analyzing at different scales allows us to understand the relationship between the tenants, the market, the neighborhood, and the city.

City scale:

A scale at the city level is the resolution that the market and its immediate surroundings have with the rest of the city, and the socio-spatial dynamics between both scales.

Immediate context (neighborhood):

It is the neighborhood scale where the relationships between the market and the urban systems that provide services to the market (tenants and clients) are analyzed. It is critical to define an area of immediate action for the deployment of the Digital Solution.

*It is recommended that this polygon have a buffer of 4 km, with the market to be intervened as the central point, since this distance is suitable for deliveries made by bicycle or other non-motorized ways of transportation.

Market and tenants:

It is the scale where the internal socio-spatial dynamics of the market are analyzed.

Analysis tools

It is recommended to use creative, innovative, and ethical tools that privilege the appropriation and equitable use of knowledge between those responsible for generating the social urban analysis and the tenants. Social urban analysis tools are divided in two broad fields:

1. Desk research

The research will guide the documentation process on the site (market) and will be complemented by the findings obtained from it.

The research is based on the support of academic research and the compilation of statistical and geographic information bases. It implies the search and systematization of documentary information, previous social, statistical, and geographic analyzes of official data and existing sources from governmental and academic institutions.

2. Qualitative field

Based on qualitative tools such as interviews, ethnographies, focus groups, workshops with tenants, and others that are proposed. These tools aim to include the perspective of tenants, relevant government agencies, and other stakeholders.

It is important to note that these tools are focused on a psychosocial and cultural analysis to understand the meanings that compose the daily life and needs of tenants and market customers. As well as obtaining strategic information from key actors or stakeholders.

Listed below, but not limited to, are some suggested tools:

Urban explorations and field notes: It supports building an approximation to the activities of the markets and their immediate context. In addition, with these explorations, it is possible to identify how different infrastructures and urban systems are related to the market.

Stakeholders map: It is one of the fundamental activities for effective execution, not only of the social urban analysis but of the project in general. It defines the actors involved, the power relations, and the impact they have on the project. The actors may be differentiated according to the sector to which they belong; public, private, tenants, non-profit organizations, civil organizations, opinion and neighborhood leaders, as well as the community in general.

Interviews with stakeholder: Stakeholders' interviews are a strategic qualitative method of data collection by developing a relationship with the people you are interviewing and gaining meaningful information. It is recommended to use semi-structured interviews to have greater flexibility during the interview process.

Co-creation workshop with key stakeholders: It will support the co-creation of the project vision. The workshop activities reflect the current context and the adoption level of the Digital Solution. This workshop is an interactive and dynamic exercise that promotes the participation of stakeholders.

Graphic representation: Is made up of plans, maps, diagrams, visualizations, and other graphic elements, which facilitate communication to represent the different layers of analysis.

Geographic information system database: maps with different layers of information are displayed to be readable and easily understood by the stakeholders involved.

Market database: the database of tenants in the market is registered and updated. The database may have information such as name, age, gender, line of business, types of payments accepted, type of technology used, among others.

Photographic and video documentation: support the visual record of the research and contextual elements of the market and the tenants.

Conclusions and results

The final report will accompany the results with graphic representations in the form of plans and any other necessary to complement the visualization of the results.

Additionally, the adopted methodology, all the materials implemented, the support of the results, and the evidence of the activities conducted may be included in the annexes. The social urban analysis will correspond to the final document that results from the analysis conducted based on these technical specifications. It is recommended to include at least the listed layers of information.

Roadmap

Open-Source policies and creative Commons (CC) licensing

Use policies based on open technologies and standards

The Digital Solution's use policies are subject to the legal framework of the site where the tool is used. In the case of technological contracts and for the Transfer Package, these are considered atypical since it is complex to establish a standardized model, given the unique characteristics of the IT goods and services contracted by the user of the Solution.

Technological contracts protect goods and services related to information technologies. Unlike an IT contract, a technology contract works with different technology resources and could span different platforms or disciplines. The usage and licensing policies are considered technology contracts.

Elements of technology contracts in Mexico

These use and licensing policies, such as technology contracts, must have the following elements:

- Elements of existence. According to article 1794 of the Federal Civil Code (Mexico), the existence of a contract requires two main elements: consent and the object.
- Personal elements. The following are established as part of the consent:
 1. Name of the person or organization that intends to hire or use one or more goods derived from the computer services.
 2. Name of the person or organization that grants the use of one or more goods derived from the computer services.

It is feasible that the parties' consent is granted through electronic or technological means. For example, through clicks, electronic signatures, continued use, and/or downloads of the Digital Solution software.

- Technological object. It is the computer system or application that is the subject of the technological contract. In this case, the use of the Digital Solution. It must be specified:

- Objective
- Functionality
- Operability
- Transmission forms
- Legal nature
- Maintenance
- Particular system specifications (software or hardware).

In the case of legislation and/or legal frameworks other than those of Mexico, the implementation of the Digital Solution will be subject to the current legal framework of the site where the solution is implemented.

Technological contracts via websites

In the case of usage guidelines and/or privacy policies, this type of contract is the one that transfers rights and obligations via the Internet. Different characteristics must be considered when formulating the guidelines or use policies for the Digital Solution, among which the following stand out:

- The user should be aware of the existence of these contracts, and of the rights and obligations these contracts generate.
- They establish limitations and/or transfer responsibility in case of inappropriate use of the product.
- Once the user has accepted the usage guidelines, access to the solution is provided. In case of not accepting these guidelines, access may be null or partial.

Personal elements

In contracts via the web or internet, the personal elements are:

- The name of the supplier of the technological good or service that provides the solution by some means or interface, based on the use of the Internet.
- Name of the web application or system (also known as a technology object).
- Final user. It refers to who uses web applications through Internet access.

Technological elements

In the contracts (guidelines and/or use policies) through the internet, the technological elements are:

- Good or service offered via Internet / web.
- Software interface (browser and/or mobile applications used).
- Consent.

In this last element: Consent. There are different modalities for the transmission of the license to use content protected by copyright or other guidelines such as open source. Currently, the most widely used are browsewrap and clickwrap.

Browsewrap

Through this modality, this type of license of use is granted through continued use of the interface (app or web page and its contents).

The end-user agrees to the terms and conditions of use of the Digital Solution.

Through this modality, the moment in which the user agrees to the terms and conditions can be diffused, usually, they are only notified that they must search and read them. The user may or may not give a reading and, in general, not doing so does not inhibit access to the good or service on the web.

Clickwrap

It is the most used format on the web and has gained great popularity due to its implementation in electronic commerce services (eCommerce) or social networks such as Facebook or WhatsApp.

In this format, users accept the conditions of use by clicking. The contract then takes effect immediately. The mere acceptance through the click generates rights and obligations to both parties: user and service provider.

Among the main uses of this format, through the internet, the following stand out:

3. Purchase and sale of goods and services (material or digitally).

4. Leasing of software use licenses. Commonly referred to as Software as a Service (SaaS).
5. Terms of service to access a web page, mobile application or web content.
6. Transfer of web content.
7. Use of web content.

Technological rights of users

The technological rights of users will be protected by the legal framework where the Digital Solution is deployed.

In Mexico, these rights are protected by different laws and organizations.

The Federal Institute for Access to Information (IFAI) is a decentralized, non-sectorized organization of the Mexican federal government created through the Federal Law of Transparency and Access to Public Government Information. The IFAI was the first government institution created to regulate the administration of personal data held by it and by individuals.

This legal framework continued its development at the beginning of the 2010s with the Federal Law on Protection of Data Held by Individuals, which establishes rights and obligations for companies or organizations that process personal data. This law allows end-users to assert their ARCO rights (access, rectification, cancellation, and opposition) about their data.

Collectivity through Open-Source & Creative Commons

The 'Roadmap' is an efficient tool that allows planning the upcoming actions in an organized way within the framework of a strategy. To replicate the use of the Digital Solution and provide access to the target users of a market or city, the Roadmap presented below is to build and define the policies and content licensing.

The use policies of the Digital Solution are based on Open Source Software - OSS (or open-source) licensing. The purpose of this code is that any user can view and modify the code in the way they see fit.

The principle of open licensing is the sense of community, in initiatives such as the Open Source Initiative or Creative Commons, this has evolved over more than 20 years, with users at the center.

Generating or executing an adequate roadmap around Open Source & Creative Commons licensing requires, in addition to knowing the guidelines of each of these movements and forms of licensing, a clear understanding of the methodology on which a 'Leaf Route'. Next, there are presented the elements that must be considered.

The best practices and recommendations for the implementation and adoption of Open Source & Creative Commons guidelines are established under the principles of reciprocity and acknowledgment of authorship. A user can implement a license or content as long as the result of their work is reciprocal and can be made available to the community.

Although there are different formats or guidelines, their limitations and rights change based on the interests of each project. The principle of collectivity prevails.

Roadmap: methodology

The replicability of the electronic commerce tool –the Digital Solution– depends on different factors, not only on technology. It is important to emphasize that each market and community have different challenges and requirements than other markets and users. Therefore, the purpose of the 'Road Map' is to generate the guidelines and traceability of the licensing of the platform and its contents after its replicability or modification.

The elements of the 'Road Map' methodology are suggested below, which could help define and record the transformation of the tool and its subsequent use.

1. Introduction: This element must consider the presentation of the general panorama of the local market, at the local level, considering the social, political, logistical, and neighborhood (urban) elements in which it is immersed.

The introduction focuses on the current state and panorama of the market, its environment, its users: consumers (neighbors), tenants, and other stakeholders interested in it.

2. Objectives: This element focuses on the future state. Where does the project go with the 'Roadmap' and specifically with the replicability of the Digital Solution?

The objectives must be formulated collectively and should involve all stakeholders. The implementation of methodologies such as the objective definition under the SMART approach is recommended:

These objectives should consider the form of accessibility

Objetivos	Meaning	Definition
S	Specific	What?
M	Measurable	How much?
A	Attainable	How?
R	Realistic	With what (resources)?
T	Time	When?

Fig. 100
SMART objectives

and/or licensing of the platform.

3. Expected results: It is the element that describes the strategy and trajectory agreed upon between the stakeholders involved and the work plan. Its correct formulation will facilitate the integration of new actors.

4. Context: This element should present the current contextual framework of the market. For example, whether or not it has any socio-urban diagnosis, if its tenants have some form of organization, or if it currently implements some type of technology (or infrastructure) for the marketing and distribution of the goods or services it sells, among others.

5. Stakeholders: Drafting the 'Road Map' of a market requires exhaustive knowledge of the community in which it is immersed, and from different angles. The integration and participation of the different users and stakeholders are essential, especially:

- Consumers: They are the primary digital clients of the

markets through the tool. Customers are an essential part of the sustainability process of the platform and the markets through its adoption and consumption.

- Tenants: These are the users who, through their offer, form part of the identity of the markets. Along with consumers and delivery
- Local public servants: Considered the facilitators and enablers in local public policy, they could act as promoters of the solution.
- Distributors or Delivery person: Responsible for the logistics operation and delivery of the products marketed through the solution, they play a crucial role in the formulation of a B2C (Business-to-consumer) solution, which allows the tool to increase its competitiveness..

The participation of women in creating and validating the 'Roadmap' is imperative since they are the main element of the local economy in Mexico.

In other words, it should be designed, through an inclusive,

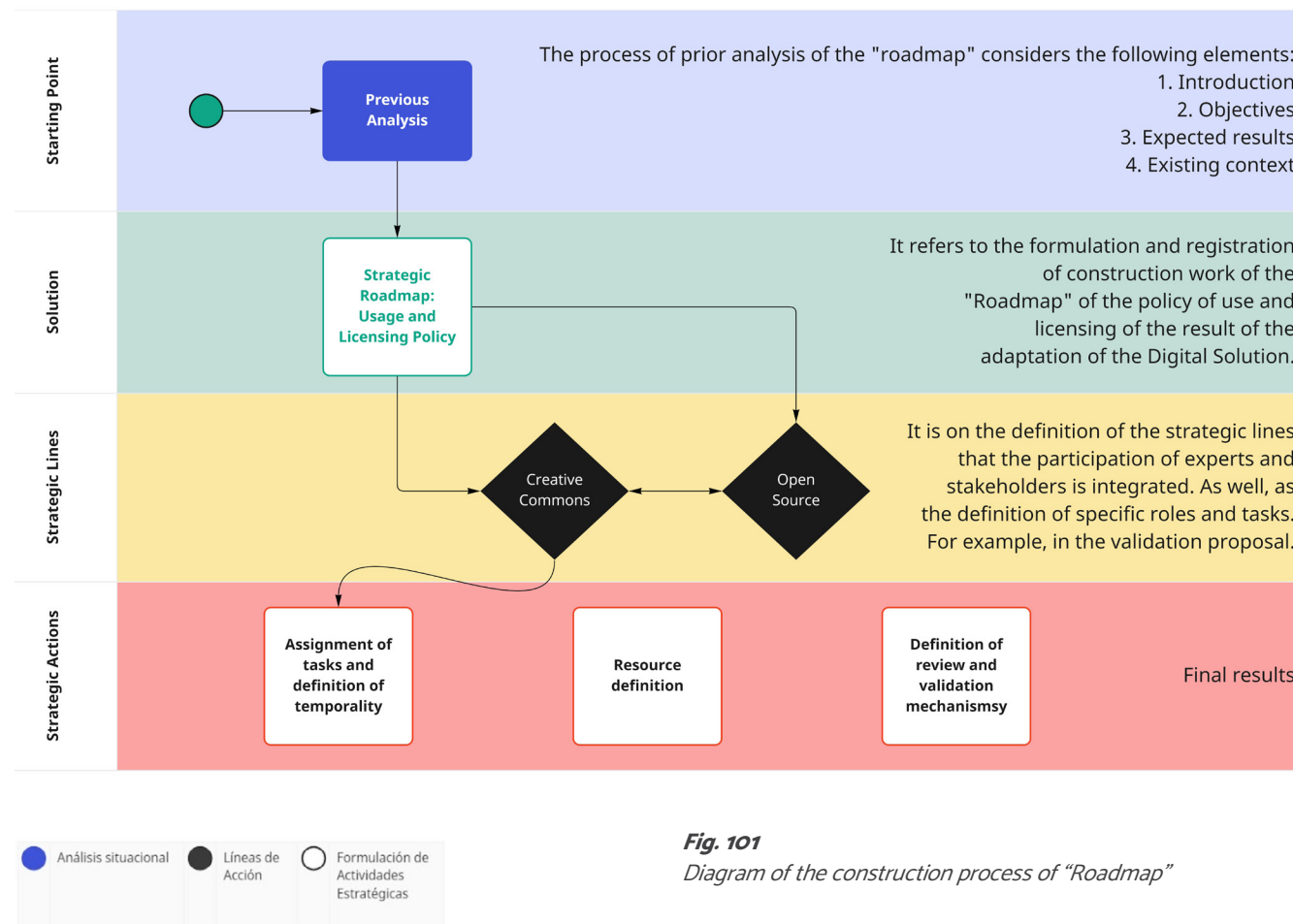


Fig. 101
Diagram of the construction process of "Roadmap"

participatory, and gender equality approach, specifically in the inclusion of strategic actors and technical and financial partners of the solution.

6. Work plan (tasks and schedule of activities): Corresponds to the activities necessary to define the strategy for formulating and adopting the platform's use and licensing policy. It must have the description, time, and estimated and/or assigned resources.

7. Budget and/or resources for the design of guidelines/policies of use: They are the necessary estimated and identified resources to design the use and licensing policy.

8. Review and monitoring mechanisms: This section establishes the form of review and monitoring of the use of the license. It also establishes the periodicity.

9. Annexes: It consists of those graphic or visual ele-

ments that could facilitate the understanding of the construction process of the "Roadmap".

For example, below is a diagram showing how the integration of each of the steps and the lines of action on which it is built could be visualized.

Open Source: Identification, guidelines, and registration process

The definition of OSS transcends access to the source code. Therefore, the Open Source Initiative (OSI), is an organization formed in 1998 in Palo Alto, California, shortly after the announcement of the public release of the Netscape source code. This release had created an opportunity to educate and train around the superiority of the open development process.

Currently, the OSI is the most widely accepted international organization regarding the standards, requirements, and registration process for Open Source developments.

The process of registering and reviewing licenses through OSI ensures that licenses and software labeled as "Open Source" conform to the standards and expectations of the existing global communities. Therefore, there is the registration process and support through OSI so that the license can be improved throughout the process.

Open source has transcended from a form of production to a social movement with decentralized production values that grant advantages such as accessibility, flexibility, the durability of development, and collectivity. In this last aspect, the revision between colleagues and experts stands out, as well as the subsequent evolution and community production. In addition to the above, there are benefits such as the long-term possibility of surviving the different teams of developers, thanks to the supportive communities that are encouraged to introduce innovations continuously, open-source software remains at the forefront of the advancement of the technology as a whole and meets the needs of users and their communities as they evolve in the future.

The most important or accepted Open Source Software licenses have one aspect in common. All have been ap-

proved by the Open Source Initiative (OSI).

The OSI establishes the objective of the "Open Source" licensing registration process as:

1. Approved licenses should meet the definition of open source and provide software freedom.
2. The license should identify the appropriate distribution category.
3. Discourage the use of duplicate licenses.
4. Ensure a complete, transparent, and timely review (having a review framework of 60 days). Discourage the use of duplicate licenses.

Open Source Software definition criteria:

It has been developed ten criteria to guarantee compliance with the objective of the registration process of development under the "Open Source" perspective:

- 1. Free distribution:** The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from different sources. The license shall not require a royalty or other fee for such sale.
- 2. Source code:** The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost, preferably downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.
- 3. Derivative works:** The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of

the original software.

4. Integrity of the author's source code: The license may restrict source code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit the distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

5. Non-discrimination against individuals or groups: The license must not discriminate against any person or group of persons.

6. Prohibition of discrimination against areas or groups of study: The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

7. License distribution: The rights attached to the program must apply to all to whom the program is redistributed, without the need for execution of an additional license by those parties.

8. The license must not be specific to a product: The rights attached to the program must not depend on the program's being part of particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

9. The license must not restrict other software: The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be

open-source software.

10. The license must be technology-neutral: No provision of the license may be predicated on any individual technology or style of interface.²

In other words, the licensing of the "Mi Mercado AMG" platform seeks to be aligned with these ten principles, at the first level of adoption of the best international practices. In addition, it must comply with the following criteria, with the intention of not discriminating (under the OSI principles) against developers or users who decide to use the platform:

1. No international secrets: As a standard, licenses should not contain any details necessary for implementation and interoperability.

2. Because flaws are unavoidable: the standard should define a process for correcting errors identified during implementation and interoperability testing and incorporating those changes into a revised or superseded version of the normative that will be published under terms that do not violate Open Source requirements.

3. Availability: The open-source standard must be free and publicly available (for example, through an accessible and unrestricted website).

4. Patents: All patents that are essential for the implementation of the standard must consider:

- Have a royalty-free license for use without restrictions.
- Be covered by a non-assertion promise when practicing with open-source software.

5. No Agreements: There should be no requirement to execute a license agreement, NDA, grant, click-through, or any other form of paperwork for open software implementations conforming to the OSS standard.

6. No incompatibility dependencies OSR (Open Software Requirements): The implementation of the standard should not require any other technology that does not meet the aforementioned criteria.

The development process of piloting the Digital Solution "Mi Mercado AMG" is under development. Once completed, the generation of the patent registration and its publication is suggested to give continuity to the standards suggested by the OSI and, if possible, the registration process of the platform before this body.

Open-Source license registration process

The process of sending the license registration and supporting data contemplates the following modalities:

1. For approval: It is necessary to have the (legal) administration of the license.

It refers to the approval of completely new licenses or licenses previously used by a single entity.

This process should consider:

- Justification: clearly state the reason for a new license.
- Distinguish: Compare and contrast with the most similar OSI-approved licenses.
- Legal review: Describe any legal reviews the license has undergone and provide the results of any legal analysis, if available.
- Proliferation category: Recommend which license proliferation category is appropriate.

2. For withdrawal of the license: For this request, it must be submitted through the legal administrator of the license.

- Request to withdraw the license. This request can only be made by the license administrator.

Please note that successor licenses must be ap-

proved through the new license approval process.

- Version: specify exactly which version is being retired.
- Successor: Identify successor licenses, if any.

3. For Inherited Approval: Has the proper reputation; license administrator and license holders.

- Retroactive approval of historical/legacy licenses that have already been widely used by an existing community, but have not been previously approved.

- Justification: Describe the nature and history of existing use.

- Proliferation category: Recommend which category of license proliferation is appropriate.

²

OSI, "Definición OSS" Versión 1.9, last modification 22/03/2007.

Licenses by typology

Throughout the history of OSI, there have been just over 110 types of licenses registered with that body. As a best practice, the selection of the type of license must be by its purpose and the scope in which it is developed.

Below is an index of them and a brief description by typology. The detail of each license is found through each indexation (the detail is in the original language of OSI publication in English).

Licenses that are popular and widely used or with strong communities:

Through statistics and data analysis from public sources, OSI determines which licenses are widely used.

Licenses that are popular and widely used or with strong communities
Apache License 2.0 (Apache-2.0)
3-clause BSD license (BSD-3-Clause)
2-clause BSD license (BSD-2-Clause)
GNU General Public License (GPL)
GNU Lesser General Public License (LGPL)
MIT license (MIT)
Mozilla Public License 2.0 (MPL-2.0)
Common Development and Distribution License 1.0 (CDDL-1.0)
Eclipse Public License 2.0 (EPL-2.0)

International licenses

The purpose of this class of license is for the redistribution of collaborative work globally

International licenses
CeCILL License 2.1
European Union Public License (EUPL-1.2)
Licence Libre du Québec – Permissive (LiLiQ-P) version 1.1 (LiLiQ-P-1.1)
Licence Libre du Québec – Réciprocité (LiLiQ-R) version 1.1 (LiLiQ-R-1.1)
Licence Libre du Québec – Réciprocité forte (LiLiQ-R+) version 1.1 (LiLiQ-Rplus-1.1)
Mulan Permissive Software License v2 (MulanPSL - 2.0)

Special purpose licenses

Certain licensors, such as schools and the US government, have concerns such as specialized rules for government copyright. Licenses identified by the License Proliferation Committee as meeting a special need were placed in this group.

Special purpose licenses
BSD+Patent (BSD-2-Clause-Patent)
CERN Open Hardware Licence Version 2 - Permissive
CERN Open Hardware Licence Version 2 - Weakly Reciprocal
CERN Open Hardware Licence Version 2 - Strongly Reciprocal
Educational Community License, Version 2.0 (ECL-2.0)
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Lawrence Berkeley National Labs BSD Variant License (BSD-3-Clause-LBNL)
NASA Open Source Agreement 1.3 (NASA-1.3)
OSET Public License version 2.1 (OSET-PL-2.1)
SIL Open Font License 1.1 (OFL-1.1)
Unicode License Agreement - Data Files and Software
The Unlicense (Unlicense)
Upstream Compatibility License v1.0 (UCL-1.0)

Other licenses

These licenses do not fall neatly into any category.

Other licenses
0-clause BSD License (0BSD)
1-clause BSD License (BSD-1-Clause)
Adaptive Public License (APL-1.0)
Artistic license 2.0 (Artistic-2.0)
Free Public License 1.0.0 (0BSD)
MIT No Attribution License (MIT-0)
Open Software License (OSL-3.0)
Q Public License (QPL-1.0)
Universal Permissive License (UPL)
Zero-Clause BSD (0BSD)
zlib/libpng license (Zlib)

Licenses that are redundant with more popular or commonly used licenses

Several licenses in this group are excellent licenses and have their following; however, the License Proliferation Committee perceived these licenses as wholly or partially redundant with existing licenses.

Licenses that are redundant with more popular or commonly used licenses
Academic Free License 3.0 (AFL-3.0)
Attribution Assurance License (AAL)
Eiffel Forum License V2.0 (EFL-2.0)
Fair License (Fair)
Historical Permission Notice and Disclaimer (HPND)
Lucent Public License Version 1.02 (LPL-1.02)
OpenLDAP Public License Version 2.8 (OLDAP-2.8)
The PostgreSQL License (PostgreSQL)1
University of Illinois/NCSA Open Source License (NCSA)
X.Net License (Xnet)
Zope Public License 2.1

Non-reusable licenses

The licenses in this group are specific to their authors, and although they meet the OSI criteria, they cannot regularly be reused by others (for this reason their detailed indexing is not presented). Many, but not all, of these licenses fall into the category of custom licenses.

Non-reusable licenses
Apple Public Source License (APSL-2.0)
Computer Associates Trusted Open Source License 1.1 (CATOSL-1.1)
eCos License version 2.0
EU DataGrid Software License (EUDatagrid)
Entessa Public License (Entessa)
Frameworkx License (Frameworkx-1.0)
IBM Public License 1.0 (IPL-1.0)
LaTeX Project Public License 1.3c (LPPL-1.3c)
Motosoto License (Motosoto)
Multics License (Multics)
Naumen Public License (Naumen)
Nethack General Public License (NGPL)

Superseded licenses

The licenses in this category have been superseded by newer versions. For this reason, license details have not been indexed.

Nokia Open Source License (Nokia)
OCLC Research Public License 2.0 (OCLC-2.0)
Python License (Python-2.0)
CNRI Python license (CNRI-Python) (CNRI portion of Python License)
RealNetworks Public Source License V1.0 (RPSL-1.0)
Ricoh Source Code Public License (RSCPL)
Sleepycat License (Sleepycat)
Sun Public License 1.0 (SPL-1.0)
Sybase Open Watcom Public License 1.0 (Watcom-1.0)
Vovida Software License v. 1.0 (VSL-1.0)
W3C License (W3C)
wxWindows Library License (WXwindows)

Superseded licenses
Apache Software License 1.1 (Apache-1.1)
Artistic license 1.0 (Artistic-1.0)
Common Public License 1.0 (CPL-1.0)
Eclipse Public License 1.0 (EPL-1.0)
Educational Community License, Version 1.0 (ECL-1.0)
Eiffel Forum License V1.0 (EFL-1.0)
Lucent Public License ("Plan9"), version 1.0 (LPL-1.0)
Mozilla Public License 1.0 (MPL-1.0)
Mozilla Public License 1.1 (MPL-1.1)
Open Software License 1.0 (OSL-1.0)
Open Software License 2.1 (OSL-2.1)
PHP License 3.0 (PHP-3.0)
PHP License 3.0 (PHP-3.0)
Reciprocal Public License, version 1.1 (RPL-1.1)

Voluntarily withdrawn licenses

Self-defined category. It is suggested that you do not use these licenses in the future, although it is assumed that licensors may or may not choose to continue to use them.

Voluntarily withdrawn licenses
CUA Office Public License Version 1.0 (CUA-OPL-1.0)
Intel Open Source License (Intel)
Jabber Open Source License
MITRE Collaborative Virtual Workspace License (CVW)
Sun Industry Standards Source License (SISSL)

Uncategorized licenses

As their name suggests, the following licenses listed are not specifically categorized. For this reason, license details have not been indexed.

Uncategorized licenses
Boost Software License (BSL-1.0)
Cryptographic Autonomy License v.1.0 (CAL-1.0)
Common Public Attribution License 1.0 (CPAL-1.0)
GNU Affero General Public License version 3 (AGPL-3.0)
ISC License (ISC)
Microsoft Public License (MS-PL)
Microsoft Reciprocal License (MS-RL)
MirOS Licence (MirOS)
Non-Profit Open Software License 3.0 (NPOSL-3.0)
NTP License (NTP)
Open Group Test Suite License (OGTSL)
Reciprocal Public License 1.5 (RPL-1.5)
Simple Public License 2.0 (SimPL-2.0)

Creative Commons guidelines

Creative Commons is a non-profit organization from the United States of America. This organization is dedicated to generating legal and technical tools that allow the licensing and use of works protected by copyright without having to request the permission of the author of the work. Its estimated lifetime is close to that of OSI, with more than 20 years of experience, it is the reference in the best international practices.

This type of license focuses on the protection of creative content that varies from an image, multimedia videos, and music, among others. They provide everyone, from individual creators to large institutions, with a standardized way of granting the public permission to use their creative work under international best practices for global copyright law.

The form of licensing of content under this optics is significantly easier than the selection and registration of an open software license (Open Source).

The purpose of Creative Commons as a content sharing tool in the Digital Solution roadmap seeks to enhance the content generated by a community or a market to grow its consumers, position the content of a community, generate tourist content information or the specific purpose determined by the market. Always having as main optics the generation of collective and collaborative content.

The Creative Commons model and practices have only six types of licenses and the total waiver of rights, listed below from the most permissive to the most restrictive.

CC BY

This license allows re-users to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use.



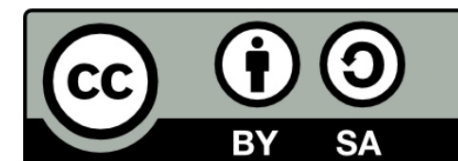
CC BY includes the following elements:

BY – Credit must be given to the creator



CC BY-SA

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CC BY-SA includes the following elements:

BY – Credit must be given to the creator.

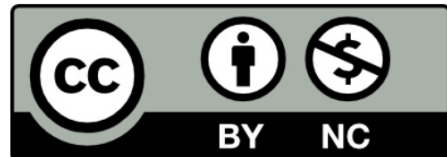


SA – Adaptations must be shared under the same terms.



CC BY-NC

This license allows re-users to distribute, remix, adapt, and build upon the material in any medium or format for non-commercial purposes only, and only so long as attribution is given to the creator.



It includes the following elements:

BY – Credit must be given to the creator



NC – Only noncommercial uses of the work are permitted



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CC BY-NC-SA includes the following elements:

BY – Credit must be given to the creator.



NC – Only noncommercial uses of the work are permitted

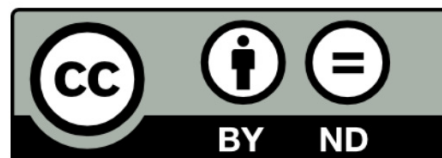


SA – Adaptations must be shared under the same terms



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CC BY-ND includes the following elements:

BY – Credit must be given to the creator



ND – No derivatives or adaptations of the work are permitted.



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CC BY-NC-ND includes the following elements:

BY – Credit must be given to the creator



NC – Only noncommercial uses of the work are permitted



ND – No derivatives or adaptations of the work are permitted



CCO

A.k.a CC Zero is a public dedication tool, which allows creators to give up their copyright and put their works into the worldwide public domain. CCO allows re-users to distribute, remix, adapt, and build upon the material in any medium or format, with no conditions.



The six licenses and public domain dedication tool give creators a variety of options. The best way to decide which one is appropriate for the market or city you represent is to think about why you want to share your work and how you expect others to use that work.

Before applying for a CC or CCO license to work or content, there are a few important things to consider:

1. The licenses and CCO cannot be revoked. This means once you apply a CC license to your material, anyone who receives it may rely on that license for as long as the material is protected by copyright, even if you later stop distributing it.
2. You must own or control the copyright in the work. Only the copyright holder or someone with express permission from the copyright holder can apply a CC license or CCO to a copyrighted work. If you created a work in the scope of your job, you may not be the holder of the copyright.

How to apply for a CC license or CCO for your work?

CC-licensing your work is simple. All you have to do is choose the CC license that suits your needs, and then communicate this choice in a way that will be clear to people who come across your work. As part of this communication, you should include a link to the license you've chosen.

This can be as simple as a bit of text stating and linking to the license in a copyright notice, like this:

© 2019. This work is licensed under a [CC BY 4.0](#).

Annex 1. Roadmap format V 1.0

Format: Roadmap

Introduction

[In this section the preamble of the project should be added. As well as the initial justification for guidelines and use policies following the Open Source and creative commons.]

Objectives

[In this section, the objectives of the platform's use and licensing policies should be established. It is suggested to formulate a maximum of three goals, under the SMART methodology, which allows monitoring and continuity of these objectives.]

Objectives	Meaning	Definition
S	Specific	What?
M	Measurable	How much?
A	Attainable	How?
R	Realistic	With what resources?
T	Time	When?

Fig. 102
SMART Goals

Expected outcome

[In this section, the expected outcomes should be added. It is suggested to consider quantifiable results.]

Context

[In this section, it is suggested to specify the current conditions that will allow the development of guidelines for the use of the platform, based on the best practices of Open Source and Creative Commons.]

Stakeholders

[It is suggested to list and identify the stakeholders involved in the formulation and adaptation of the guidelines of the Digital Solution. As well as the contact information for issues related to the guidelines.]

Work plan

[This section specifies the activities during the development of usage and licensing policies. As well as those responsible and temporality of said activities.]

Actividad	S1	S2	S3	S4	S5	S6	S7	S8	S9
1.									
2.									
3.									
4.									
5.									

Fig. 103
Sample work schedule table

Format: license technical information sheet

Format: License Technical Information Sheet

(Example)

License	Apache License ³
Twitter	Version 2.0 (January, 2014)
Web	http://www.apache.org/licenses/

Terms and conditions

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Tool for preparing maps of tenants, services and products

Introduction

To develop co-creative Journey Maps, it is necessary to invite participants who have a solid knowledge of the mapping experience. If the goal is to create a Journey Map around customer experiences, this might mean inviting customers (yes, real ones!) and/or frontline employees (those responsible for the operation).

Be careful while conducting this type of workshop or exercise, especially if the participants do not have deep knowledge or understanding of the experience. The results may seem convincing, but they could be biased.

For example, if an IT (Information Technology) team without prior qualitative research and in-depth knowledge of customers' daily lives conducts a co-creative workshop on their customer experience journey map, the results tend to represent the idealized process rather than the actual customer experience

Journey Maps

- Experience Centered Map
- Product Centered

Ecosystem Maps

- Tenants / Seller
- Delivery
- Buyer

Journey maps

Visualizing specific experiences of a main actor, often exemplified by a persona, over time.

Duration:	Activity 1 - 6 hrs. (depending on complexity and amount of data)
Researchers / Facilitators	Minimum 1 (a better approach is to have teams of 2-3 researchers)
Participants	2 - 12 with good knowledge of the research data or of the experience the journey map represents (optional)
Physical requirements	Research data, personas, journey map templates (paper-based or digital), paper, pens, masking tape
Expected output	Journey Map

It should be considered...

Journey maps can visualize either existing experiences (current-state journey maps) or new experiences that are planned but do not yet exist (future-state journey maps).⁰¹ Unlike service blueprints or business process maps, journey maps focus on human experiences, illustrating the story of a specific actor as a sequence of steps.

The basic structure of a journey map consists of steps and stages defining the scale of the visualized experience. The scale can range from a high-level journey map that shows the entire end-to-end experience to a very detailed journey map showing only a few minutes.

You can think of the scale of a journey map like the zoom levels of a map: a map of a whole country helps you to navigate on a bigger scale, while a map of a region or a map of a city helps you find a specific destination. You need both if you want to drive from one place to another: you need to navigate on the larger scale and zoom in whenever necessary.

With an increasing scale (i.e., a longer time frame), the level of detail for each step usually decreases: a high-level journey map gives an overview of the entire experience, while a detailed journey map focuses on the details.

In addition to the basic structure of steps and stages, journey maps can be enriched with various additional lanes.

Research-based current-state journey maps are a visualization of existing experiences based on research data.

Another option is to create current-state journey maps that do not use research data, but are rather built on assumptions. Assumption-based journey maps are relatively easy and fast to put together.

Therefore, teams are often tempted to work only in an assumption-based manner. This is risky, as journey maps that are just built on our assumptions can be very misleading.

Sometimes, it makes sense to start with an assumption-based journey map to get an idea of how to structure the research process: who to ask what, when, and where. However, mind the risk of confirmation bias.

If you start with assumption-based journey maps, constantly challenge your assumptions. Over time, assumption-based journey maps should develop into research-based ones with a solid foundation on research data.

Step-by-step guide

1. Prepare and print out data

Journey maps are often created iteratively together with data collection to gain a quick overview of your research data. Prepare the room with the materials you'll need to create your journey map, such as journey map templates, paper, sticky notes, pens, and of course your research data, as well as existing personas, journey maps, or system maps. Decide who should join you to co-create your journey map.

2. Choose the main actor(s) (Persona)

Select the main actor of your journey map – into whose shoes do you want to slip? Alternatively, start without a dedicated persona and use journey mapping to cluster your data and discover different customer experience patterns shown by your customers. These might be a very useful indicator to help segment your customers and then build your personas.

3. Define scale and scope

Define the time frame of your story. Are you talking about an experience of 10 minutes, 2 hours, 5 days, or 10 years? Write down the stages of the customer journey. Stages are the high-level sections of an experience, such as “inspiration, planning, booking, experience, sharing” for a holiday.

Then, cluster your research around these stages and again look to identify gaps in your data. Don't hesitate to go back and do some more research if you find gaps. This is an iterative process!

4. Create steps

Fill up the stages of your customer journey with steps. Root your steps in your data and use indexing to keep track. Sometimes it helps if you start with the most crucial steps and then ask yourself what happens before and what happens after these. Use simple sticky notes for this, so you can easily add or discard steps, but also use the material from your research wall. Photos, sketches, screenshots, and artifacts help visualize the experience and can be added as a storyboard to the journey map.

5. Iterate and refine

Refine the journey by going through it from end to end to check if you missed a step or if you need more/ fewer details in certain parts. You can always break up a step into two or more steps, or condense several steps to one.

Depending on the project, it might make sense to find a consistent level of detail throughout the whole journey map or to highlight a specific part of the journey in more detail. Invite real customers or frontline staff to give feedback and use their feedback to refine it.

6. Add lanes

Depending on the aim of the journey map, add more lanes to visualize specific aspects of the experience, such as a storyboard, an emotional journey, channels, stakeholders, a dramatic arc, backstage processes, “What if?” scenarios, etc.

A storyboard visualization of each step is often considered essential, as it helps people understand the context of this step and get to grips with a journey map much faster. Also, an emotional journey is often considered a main feature of a journey map, as it makes it easy to understand where the pain points are from the persona's point of view. Often, the research data at hand defines which additional lanes you'll need to add to be able to visualize this.

7. Follow-up

Document your progress with photos and write a summary of your journey map. If useful, create a well-visualized journey map that is easy to understand for people outside your team. Choose a format that you can distribute in your organization or to your client (physical or digital) and add enough context information to make your key findings clear.

Method notes

- > A customer journey always experience without mapping if/then decisions, loops, or decision trees and the like. Alternative routes not taken by the main actor can be added as possible options, but these should be mapped out in separate self-consistent journey maps.
- > To increase the rigor of research-based journey maps, they should include real data – in particular, first-level construct data, such as quotes from customers or employees, photos, or screenshots from videos.

Journey map



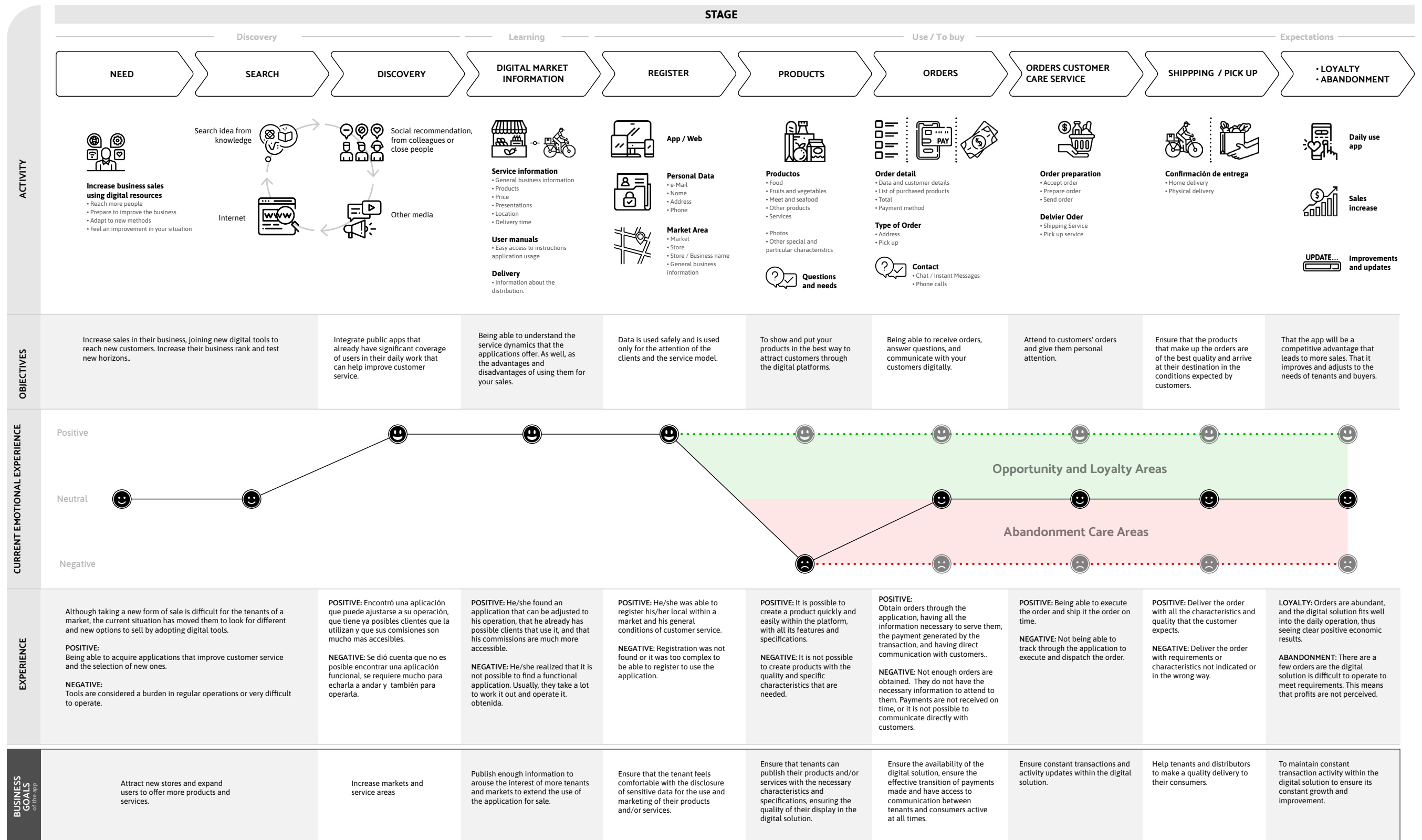
Pepe Flores

STAGE

Pepe is a family man dedicated to his business. He inherited the family business from his father and is the second generation in charge of it. Pepe has experienced the transition to the digital world and for this reason, technology causes him curiosity and interest. He knows the potential and benefits that it could generate, which is why he is interested in transforming the family business.

OBJECTIVES AND EXPECTATIONS

Pepe would like to increase his sales by satisfying the needs of his customers, looking for the possibility of taking his products to his customers' homes.



Descargar PDF
Alta Resolución

Fig. 104
Example of elaborated Journey Map

Ecosystem map

Visualizing the ecosystem around services and physical or digital products.

Duration	Preparation 00:30 min. - 2:00 hrs. (depending on complexity and amount of data) Activity 1 - 6 hrs. (depending on complexity and amount of data)
Researchers / Facilitators	Minimum 1 (a better approach is to have teams of 2-3 researchers)
Participants	2-12 with good knowledge of the research data or of the experience the journey map represents (optional)
Physical requirements	Research data, personas, journey maps, system map templates (paper-based or digital), paper, pens, masking tape, etc.
Expected output	System Map

It should be considered...

“System maps” is an umbrella term for different visualizations of systems: stakeholder maps, value network maps, and ecosystem maps. All of these can be created from various perspectives.

A system can be mapped from a customer’s perspective, including competitors within their consideration set, as well as external players that might not have a direct relationship with the organization.

Alternatively, a system map can focus on the business itself and visualize external stakeholders involved in support processes: as an alternative or addition, it could illustrate various departments and business units.

System maps have obvious relationships to other tools in service design, such as personas and journey maps.

Personas can be integrated as stakeholders within a system map. This becomes particularly interesting when customers have contact with one another or when there are (potential) conflicts between different customer groups. As stakeholders can be part of journey maps (e.g., through a specific lane on the journey map that summarizes which internal and/or external stakeholders are involved at each step), you can use this data as a basis for a system map to understand relationships between the involved players within a particular journey.

As system maps can become very messy, you should maintain a clear focus for a map. Don’t try to visualize every stakeholder you can think of on the same stakeholder map; it’s more useful to make various maps for different purposes. Such maps could, for example, focus on internal stakeholders to visualize the formal and informal internal network, focus on one specific experience (e.g., based on a journey map) to get an overview of the system of actors, or focus on financial transactions between stakeholders to understand financial streams within a system.

System maps are an excellent tool to synthesize your research data and to identify promising interview partners.

Remember that research is iterative, and it makes sense to use these maps to find gaps in your research data which you can investigate in later research iterations.

Step-by-step guide

Prepare and print out data
System maps are often created iteratively together with data collection to gain a quick overview of your research data. Use your research wall or prepare your research data by printing out key pictures, writing out great quotes, visualizing audio recordings or videos as quotes or screenshots, and putting out your collected artifacts and any other data that might contain information about the particular system or network you want to visualize. Prepare the room with the materials you’ll need to create your system maps, such as system map templates, paper, sticky notes, pens, and of course your research data, as well as existing personas, journey maps, or system maps. Also, think about who should join you to create your system maps.

1. List of actors/ Stakeholders

Go through your data and catalog the actors or stakeholders that are (potentially) part of the ecosystem you want to visualize. Use a list or sticky notes to write down or sketch the actors or stakeholders.

2. Prioritize actors/stakeholders

Prioritize the actors/stakeholders based on your research data. Either give participants the criteria, or let each group define their own.

3. Visualize actors / stakeholders on map

Arrange the actors/stakeholders on the map according to the prioritization. If you use one sticky note per stakeholder, you can simply move the sticky notes around.

4. Illustrate relationships between stakeholders (optional)

Sketch relationships between actors/stakeholders to visualize interdependencies within the ecosystem. You can also progress your system map into a value network map that

illustrates what kind of value is exchanged between them. Think about values such as trust and mistrust, any kind of information that is exchanged (and via which channel/medium), any kinds of artifacts that you need to provide a service or that customers use, formal and informal hierarchy levels (who gives support or power to whom), and so on.

5. Find gaps and iterate

Are you missing some data for your system maps? Use these gaps as research questions, and iterate your research to fill the gaps with data.

Depending on the focus of your system map, it might make sense to find a consistent level of detail throughout the whole map or to highlight a specific part of the system in more detail. Invite real customers or employees to give feedback and use their feedback to refine it.

6. Follow-up

Document your progress with photos and write a summary of your system map. If needed, progress the fidelity of your map into a format that you can distribute in your organization or to your client (physical or digital).

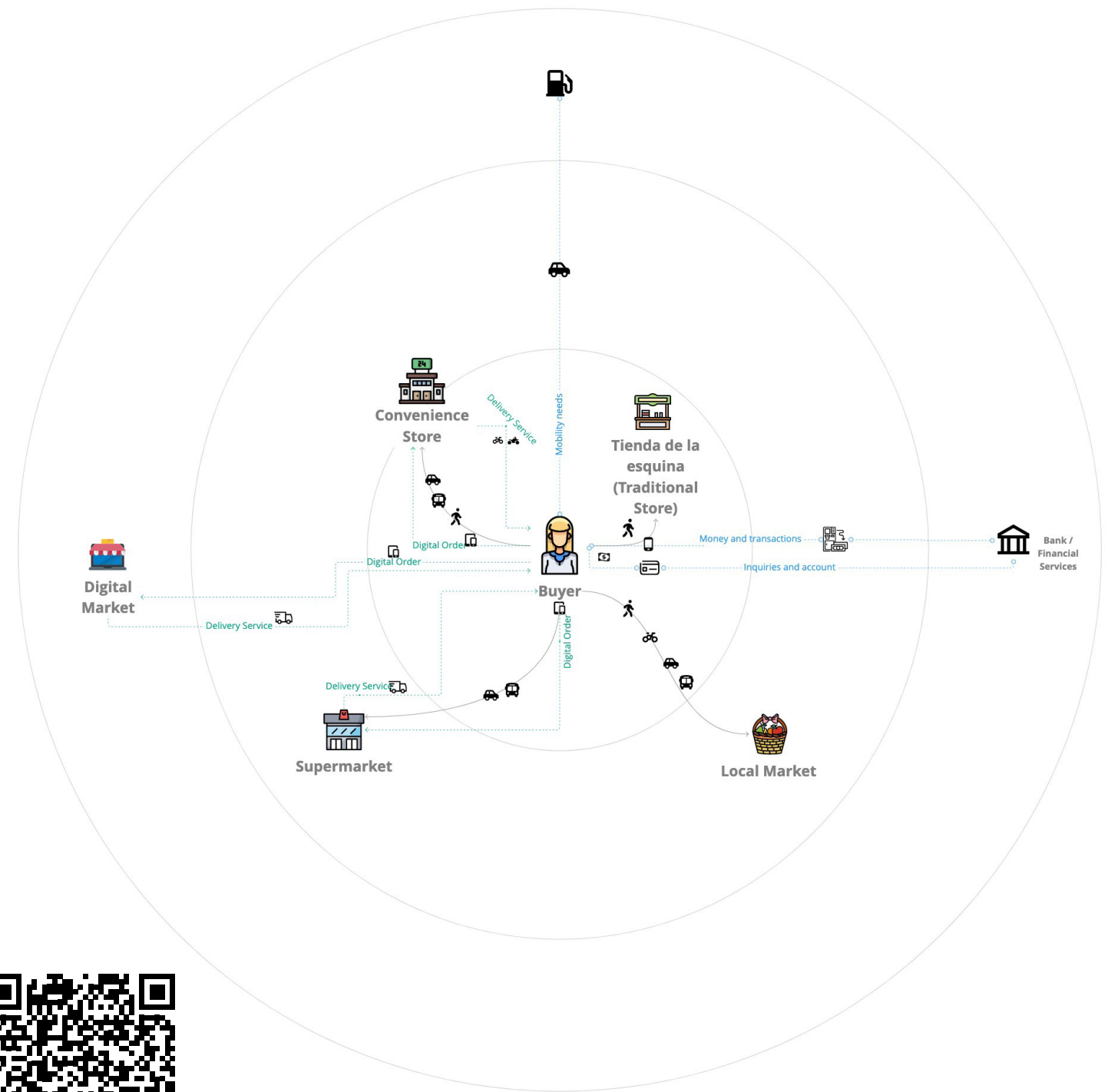
Variants

A **stakeholder map** visualizes stakeholders in a system according to a specific prioritization. One of the simplest ways to prioritize stakeholders is to rate how important each one is from a customer's point of view, from (a) essential, to (b) important, to (c) interesting. In a B2B context, it might make more sense to base your evaluation on the contact level between a stakeholder and your organization, from (a) direct contact/first level, to (b) semi-direct contact/second level, to (c) indirect/third level and more.

A **value network** map builds on a stakeholder map, but additionally visualizes the value streams within an ecosystem of various stakeholders. It might follow the flow of information throughout the network, or visualize financial streams within an ecosystem. You can use this to identify bottlenecks or hidden champions within a network.

Ecosystem maps build on stakeholder maps or value network maps but also add other actors, such as channels, places, (digital) platforms, websites, apps, ticket machines, and so on, besides more typical stakeholders such as people and organizations. This might help you to uncover hidden relationships to other – less obvious – stakeholders. Think of a ticket machine for public transport: Who takes care of maintenance or cleaning? What happens to the information gathered? What infrastructure does it need beyond electricity, and who provides this? Who is responsible for buying or designing the machines? And so on.

Ecosystem map



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High Resolution

Fig. 105
Infographic example of Ecosystem Map

Bibliography

Alfaro, R. M. (n/y). Participation for what? A political approach to participation in popular communication.

Inter-American Development Bank (IADB) (2021, October 26th). The future of food markets in Latin America and the Caribbean. (Video). YouTube. <https://www.youtube.com/watch?v=efcoX2shoq4>

Barranzuela, I. (2021, June 11st). "Mi Caserita", the app that shows the updated prices of food in retail markets. <https://pqs.pe/>. Recovered November 5th, 2021, from <https://pqs.pe/actualidad/tecnologia/mi-caserita-la-app-que-muestra-los-precios-actualizados-de-los-alimentos/>

Bauer, T. N., & Erdogan, B. (2011). Organizational socialization: The effective onboarding of new employees. Chapter 2. Recovered April 9th, 2022, from https://www.researchgate.net/profile/Berrin-Erdogan/publication/285000696_Organizational_socialization_The_effective_onboarding_of_new_employees/links/565f2e9b08aefe619b28561a/Organizational-socialization-The-effective-onboarding-of-new-employees.pdf

Camacho, A. (2018, August 11st). Mexicaltzingo: from a town of Indians to a historic neighborhood. <https://www.milenio.com/>. Recovered November 1st, 2021, from <https://www.milenio.com/cultura/mexicaltzingo-de-pueblo-de-indios-a-barrio-historico>

Camarena, E. F. (1969). Narrativas Tapatías. Guadalajara, Jalisco, México.

Callon, M. (1998). Markets and the performance of economic sciences. Argentina: Saint Martin 's University. Work documents.

CEGESTI. (2005). Transfer and acquisition of sustainable technologies Manual. San Jose of Costa Rica.

Click Abasto - Preguntas frecuentes. (s. f.). Click Abasto. From <https://clickabasto.com/pages/preguntas-frecuentes>

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Cruz Arenas, R. A. y Olivares Díaz, M. (2021, August 18th). Traditional Markets in Mexico City Heading from the New Normal. Arguments. Critical Studies of Society 1, no. 96. Recovered from <https://doi.org/10.24275/uamxoc-dcsh/argumentos/2021961-03>.

Descubre - La plataforma de los mercados municipales. (s. f.). Mercado 47. From <https://www.mercado47.com/info/acerca-de>

García Canclini, N. (1987). What are we talking about when we talk about the popular. In Communication and Popular Cultures in Latin America. FELAFACS. Gustavo Gil. Mexico.

García, O. (2013, September 17th). Project planning process <https://www.proyectum.com/mx/>. Recovered March 26th, 2022, from <https://www.proyectum.com/sistema/blog/proceso-de-planificacion-de-un-proyecto/#:~:text=De%20acuerdo%20al%20PMBOK%2C%20el,requerida%20para%20alcanzar%20dichos%20objetivos>.

Government of Catalonia. (2012, February). Usage and style guide in the social networks of the Government of Catalonia. (N.o 5). LIBRARY OF CATALONIA - DADES CIP. http://bibliotecasocial.pbworks.com/f/quia_usos_xarxa_es.pdf

Government of Spain. (2015). Practical guide for designing and carrying out evaluation of public policies. Evaluation and Quality Agency. Ministry of Finance and Public Administration. Recovered March 30th, 2022, from http://www.aeval.es/export/sites/aeval/comun/pdf/evaluaciones/Guia_Evaluaciones_AEVAL.pdf

Government of Navarra. (2011, December). How to plan communication from a public institution? Methodology for the design of communication plans. Evaluation and Quality. Government of Navarra. <http://www.navarra.es/nr/rdonlyres/5fbd54a1-d7cf-4eaf-9ec3-43ad2fcd3a9e/O/guiaparaelaborarunplandecomunicacion2012x.pdf>

Institute of Statistical and Geographic Information (ISGI). (2021). Survey of home delivery couriers. Guadalajara, MX. Recovered March 29th, 2022, from <https://iieg.gob.mx/ns/wp-content/uploads/2021/06/Encuesta-a-repartidores-20210615.pdf>

Kotler, P., Mager, B., Pine II, B. J., & Schneider, J. (2018). This Is Service Design Methods: A Companion to This Is Service Design Doing. En Data Visualization, Synthesis, And Analysis Mapping Journeys (pp. 43-45). O'Reilly Media. <https://www.thisisservicedesigndoing.com/methods/mapping-journeys>

Mi Caserita. (s. f.). Plataforma digital única del Estado Peruano. From <https://www.gob.pe/554-herramientas-para-consultar-precios-de-alimentos-mi-caserita>

Misión, visión y valores. (s. f.). Mercado Central Zaragoza. From <https://www.mercadocentralzaragoza.com/es/asociacion-mercado-central-zaragoza.php>

NSDS Guidelines. Designing the roadmap: Concept of the roadmap. Recovered from <https://nsdsguidelines.paris21.org/es/node/312>

Open Source Initiative. (2021). Open Standards Requirement for Software. Open Source Initiative. Recovered from <https://opensource.org/osr>

Open Source Initiative. (2021). History of the OSI. Recovered from <https://opensource.org/history>

Open Source Initiative. (2021). Open Source License Initiative. Recovered from <https://opensource.org/licenses/category>

Open Source Initiative. (2021). Apache License, Version 2.0. Recovered from <https://opensource.org/licenses/Apache-2.0>

OXFAM Mexico. (2021). This future doesn't apply. Recovered March 29th, 2022, from https://www.oxfamemexico.org/sites/default/files/Este_futuro_no_aplica_informe_01262022_0.pdf

Project Management Institute. (2017). Guide to the Fundamentals of Project Management, (PMBOK® Guide). Sixth edition. Project Management Institute Inc.

Qué es el Mercado Central? (s. f.). Corporación del Mercado Central de Buenos Aires. From <http://www.mercadocentral.gov.ar/paginas/qu%C3%A9-es-el-mercado-central>

¿Quiénes somos? (s. f.). Compra Local. From <https://compralocal.medellindigital.gov.co/quienes-somos/>

Red Hat. (2021, October 24th). What is Open Source?. Recovered from <https://www.redhat.com/es/topics/open-source/what-is-open-source>

Red Hat. (2021). Enterprise Open Source. Recovered from <https://www.redhat.com/es/enterprise-open-source-report/2020>

RMG. Road map - Strategic consulting. Recovered from <https://www.rmg.es/hoja-de-ruta/>

Sarape Social. (2021). Results report. Mi Mercado AMG.

La Secretaría de Desarrollo apoyará iniciativas que busquen reducir el desperdicio de alimentos de Bogotá. (2022, 22 marzo). Secretaría de Desarrollo Económico Bogotá. From <http://www.desarrolloeconomico.gov.co/noticias/la-secretaria-de-sarrollo-apoyara-iniciativas-busquen-reducir-desperdicio-alimentos-bogota/>

López, P. S. (2021). Trabajadores Repartidores de Mensajería y Mercancías (A Pie y en Bicicleta): Salarios, diversidad, industrias e informalidad laboral. Data México. <https://datamexico.org/es/profile/occupation/trabajadores-repartidores-de-mensajeria-y-mercancias-a-pie-y-en-bicicleta>

