

WEB-BASED SYSTEM TO BRIDGE THE DIGITAL DIVIDE AMONG MSMES AND PROMOTE AN INCLUSIVE ECONOMY: THE CASE OF DULART, CUETZALAN, PUEBLA

A WEB-BASED SYSTEM TO BRIDGE THE DIGITAL DIVIDE AMONG MSMES AND PROMOTE AN INCLUSIVE ECONOMY: THE CASE OF DULART, CUETZALAN, PUEBLA

Martínez Ramírez Violeta¹, Véliz Sugasti Blanca Estela², Balandra Aguilar Lorena Elizabeth³,
Gonzalez Fabián Vanesa⁴, Andrade Herran Mariel⁵

¹ National Technological Institute of Mexico/Puebla Technological Institute, violeta.martinez@puebla.tecnm.mx,
<https://orcid.org/0000-0003-1518-786X>

² National Technological Institute of Mexico/Technological Institute of La Laguna, bevelizs@correo.itlalaguna.edu.mx,
<https://orcid.org/0009-0002-3909-705X>

³ National Technological Institute of Mexico/Comitán Technological Institute, lorena.ba@comitan.tecnm.mx, <https://orcid.org/0000-0002-6744-6889>

⁴ National Technological Institute of Mexico/Technological Institute of Puebla, i19221993.19@puebla.tecnm.mx,
<https://orcid.org/0009-0005-1701-2264>

⁵ National Technological Institute of Mexico/Puebla Technological Institute, i19221866.19@puebla.tecnm.mx,
<https://orcid.org/0009-0003-6469-7413>

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Abstract – This paper presents the implementation of a self-managed web application as the digital corporate image of a business unit dedicated to making and selling traditional handmade sweets in the city of Cuetzalan, Puebla. It has been created with free tools and hosted in the cloud to completely eliminate technological costs for the microenterprise, with the aim of contributing to community development and promoting economic inclusion by strengthening the production of local products.

Keywords: web application, self-managed, inclusive economy gap, technology.

Abstract -- This paper presents the implementation of a self-managed web application as a corporate digital image for the business unit dedicated to producing and selling traditional artisanal sweets in the city of Cuetzalán, Puebla. It was created with free tools and hosted in the cloud to eliminate technology costs for the microenterprise. The goal is to contribute development benefits to the community and promote economic inclusion by strengthening the production of locally sourced inputs.

Key words – web application, self-manageable, inclusive economy gap, technology.

INTRODUCTION

Cuetzalán del Progreso has been a magical town since 2002, according to information published on the government website [1]. Located in the northeastern mountains of the

state of Puebla, it is surrounded by forests, coffee plantations, and beautiful waterfalls.

Rainfed agriculture in Cuetzalán includes the cultivation of corn, beans, and perennial crops such as apples, avocados, bananas, pears, shade-grown coffee, citrus fruits, nuts, and wild pepper [2].

According to data from the Ministry of Economy [3], more than 33,000 inhabitants speak an indigenous language, the most widely spoken being Nahuatl. In terms of connectivity, almost 80% of the population has a cell phone and only 10% has internet at home. More than 60% of the population is economically active. There are five entities that lead the total number of MSMEs in Mexico, with Puebla ranked fourth. According to the national context, 99.8% of companies are classified as MSMEs. These family businesses represent ancestral trades, with women playing a prominent role.

The Aspen Institute [4] defines an inclusive economy as an economic system that includes everyone. It promotes the free and fair exchange of goods and services while enabling all people to earn a decent wage to start or grow a business that benefits their family and community. Improving their income is everyone's responsibility, both the government and citizens. From public schools, the Technological Institute of Puebla, through its Systems and Computing Department, seeks social alliances that boost the region's economy by creating computational solutions that digitally highlight micro-enterprises through projects based on free development environments and enthusiastic students who program these applications tailored to the needs of single-family business units.

In a globalized scenario, it is important for micro-enterprises to be connected to the use of ICTs and to promote technological innovation in their business [5] in order to be digitally visible to their closest competitors.

Where the inclusive economy is a tool for greater justice and "technology for good" [6]. According to a recent study by the National Polytechnic Institute entitled "Towards an inclusive economy: indicators of inclusive growth for MSMEs in Mexico" [7], it concludes that all micro-enterprises require digital inclusion to increase their competitiveness and the success of also adding digital marketing in the promotion of their products.

Problem

The artisanal candy company DULART, established in the city of Cuetzalán, produces traditional sweets for sale in its facilities, handmade with locally sourced ingredients, including coffee. However, being located in a magical town in the state of Puebla, there is a need to begin a technological immersion, incorporating, in the first stage, a website that allows the main administrator to easily manage the updating of published content and be located as a family micro-business using the geolocation applications most commonly used by regular internet users, thereby gaining the best commercial references over its closest competitors.

Justification.

When digitizing a single-family business unit, companies face various challenges, among which one of the highest technological infrastructure investments is the initial cost of investing in hardware, software, and connectivity.

Seven out of ten people have internet access through their mobile devices.

Although ICT skills have been included in education in the region, they are slowing down the robust implementation of computer applications within businesses.

Even the recording of quantities in the manufacture of artisanal sweets, as well as their sale, is still done manually.

General objective

To create a web-based application that easily manages content and promotes economic inclusion in the DULART business unit, which produces artisanal sweets in the city of Cuetzalán.

Specific objectives

- Analyze requirements.
- Select the development tools.
- Front-end programming.
- Back-end programming
- Implementation on the free server

State of the art

The work in Colombia entitled "Implementation of a digital marketing strategy for family-owned SMEs selling food products", and artisanal sweets."

Colombianos is a project implemented in a candy store that not only involves advertising its products for sale on a website, but also on social media and blogs, significantly increasing its advertising reach and confirming that web applications have a positive impact on placing items for sale to the masses in real time with low financial investment. However, it does not have a self-management system, which would add independence to the technical support that involves extra payment to the microenterprise. [8]

Another study published in Colombia in 2018, entitled "Design and development of a web application to project the corporate image and control inventory management of Palmeros Asociados del Pacifico PALMAPAC," accurately concludes that the implementation of a PHP-based website positively favored the company's national and international presence. [9]

Based on the user-centered design methodology, the work published from Ecuador, "Web design as a tool for positioning the corporate image of Emprande Riobamba's ventures," [10] manages to achieve a solid online presence, influencing consumers' perceptions and purchasing decisions through a website created for this purpose.

A final work worth mentioning for its differentiating perspective found on the web is "Happing: digital natives at the service of Coca-Cola's corporate image" Spain, which studies success based on the "consumer creativity-centered" methodology, no longer of the products or services of these brands, where the user enriches the brand itself with their experiences to break into the Spanish market and, therefore, the gateway to the European market; and thus indirectly positioning itself as a brand image [11].

DEVELOPMENT

Architecture and Design

The following tools and methods were used to develop the website. See image 1.

Image 1. DULART home page.



Source: Own work (2025).

Tools used:

Dreamweaver: to design the website with all the required features, guided by the website manual.

- Working with programming languages such as HTML, CSS, JavaScript, and PHP
- Creating communication channels on the server side
- Load testing to evaluate the server's response time server.
- Manually inspecting page architecture and navigation.
- Review of source code to detect common accessibility errors

common accessibility errors.

MySQL: for managing the store's product database

- Install an Apache server with MySQL as the database manager

Includes PHP as a server-side scripting language

- Includes PHP as the server-side scripting language server.

- Define, manipulate, control, and query data with the Structured Query Language (SQL). See image 2.

Image 2. Page about DULART's mission and vision.



Source. Own elaboration (2025).

Creation of the self-managed system

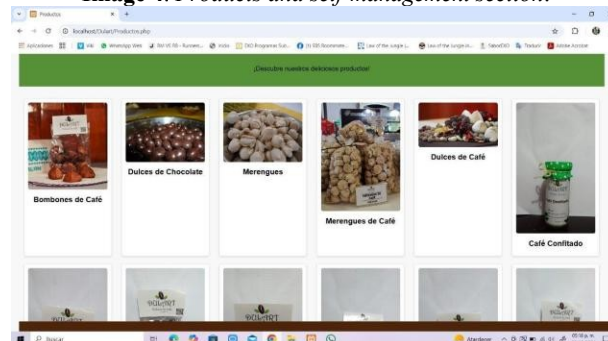
A self-managed system was created to allow owners to update the site without having to resort to the developer. Whenever they want to add or remove products, they can do so. It also has a section where they can manage their product inventory. See images 3 and 4.

Image 3. Hierarchical section of the administrator for the management of DULART.



Source: Own work (2025).

Image 4. Products and self-management section.



Source: Own creation (2025).

DISCUSSION AND ANALYSIS OF RESULTS

Aimed at a target market.

The aim is to focus on the commercial concept, which is to communicate specific needs to customers regarding the products they manufacture. Our graphic skills and technical knowledge will be geared towards meeting these specific requirements.

Visual design:

The design always respects the colors that distinguish the company and is attractive and modern, showing us important information about it. See image 5.

Image 5. Page about DULART's mission and vision.



Source: Own work (2025).

Functionality

Functionality tests:

All links work correctly, and no significant JavaScript errors were detected. See images 6 and 7.

Image 6. Administrator access window.

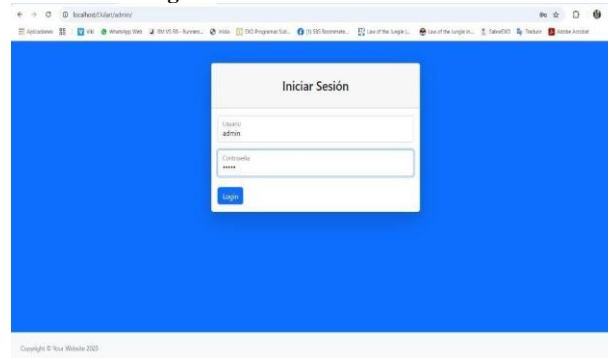
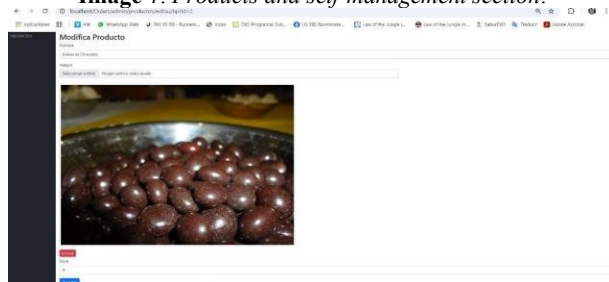


Image 7. Products and self-management section.



Source: Own work (2025).

Site structure:

The page structure is clear, with a well-defined hierarchy on the home page, adding important elements about the candy store, as well as content that will help customers learn about all the products offered, the location, and contact information. See image 8.

Visual design:

The design respects the colors that distinguish the company and is attractive and modern, displaying important information about it.

Image 8. Navigation page to DULART's background information.



Source: Own elaboration (2025).

Navigation:

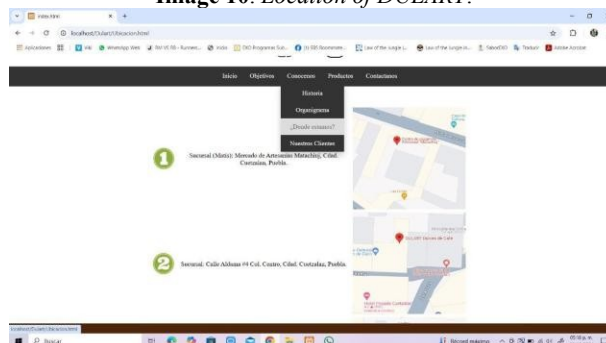
The page has a clear and accessible navigation structure. However, when searching on a cell phone, it is slightly distorted, but it is recommended to use a computer to get a better view of the entire page. See images 9 and 10.

Image 9. DULART contact information.



Source: Own work (2025).

Image 10. Location of DULART.



Source: Own work (2025).

Comparative table of the previous process and the process obtained after the implementation of the project (see Table 1 below).

Table 1. Comparative table.

Indicator	Before	After
Business dissemination	Manual advertising by loudspeaker	Digital publication of products for sale
Consumer experience of the consumer	in-person	digital
Number of potential customers	Attention only to visitors to the business	Wide coverage through the customer website

commercial strategy through the adoption of memorable experiences each time it is accessed from a web application [12].

The microenterprise already has a business page defined as "the best digital showcase for your company," and it is better to adapt to current digital technologies [13].

A corporate website keeps the business open and available 24/7 for the 104 million web users in Mexico, exponentially increasing the microenterprise's coverage [14].

CONCLUSIONS

The DULART website performs well overall and has a solid structure. We aim to showcase everything about the company and what it is best known for. However, there may be some areas for improvement, especially in terms of mobile phone display.

The goal is for the client to be satisfied with the work done, which is essential for the company to become better known and successful online.

Future work

As a line of future work, we propose to continue with the digitization of the micro-enterprise DULART through

a second stage of technological intervention aimed at automated inventory control. This phase will consider the implementation of a database connected to a graphical interface developed with Excel macros, which will function as a secure desktop application, guaranteeing the integrity of the information and restricting access to unauthorized users [16]. The technical feasibility is high and the investment required is minimal compared to the expected benefits.

Likewise, the development of an integrated computer suite is proposed that brings together various customized tools, such as a notification calendar for urgent processes, information centralization modules, and automated report generators. This system would optimize operational management and strengthen strategic decision-making within the microenterprise.

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Contribution Roles Table

Role	Author(s)
Conceptualization	Mariel Andrade Herran
Data curation	Vanesa Gonzalez Fabián
Methodology	Lorena Elizabeth Balandra Aguilar
Project management	Violeta Martínez Ramírez
Resources	Blanca Estela Véliz Sugasti
Software	Vanesa Gonzalez Fabián
Supervision	Violeta Martínez Ramírez
Validation	Mariel Andrade Herran
Visualization	Vanesa Gonzalez Fabián
Editorial	Original draft – Violeta Martínez Ramírez
Editorial	Revision and editing – Violeta Martínez Ramírez



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