



Reorganization of Local Commerce through Regional Marketplaces to Meet Needs Created by the Pandemic

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ABSTRACT

This article presents the marketplace project as a quick solution to the challenge of merchants in the city of Ivaiporã-PR, Brazil, to continue supplying their products during a pandemic period. It is known that small businesses commonly do not have digital platforms for their online sales and that the access of technological solutions requires substantial investments. Realizing that need, a task force was organized to develop the ACISI WEBSHOP marketplace. The authors are associated to the Federal Institute of Parana - IFPR, Campus Ivaiporã, and develop the extension project entitled: "Technological support to the community of Ivaiporã. Thus, ACISI WEBSHOP is one, among others, of the technological solutions which have been continuously developed with public/private partnerships. This tool aims to contribute, in this critical period of economic recovery, as a support for business continuity, which generates a ripple effect, as it also contributes to the maintenance of jobs and income ultimately leading to a sense of duty fulfilled to all involved.

General Terms

Electronic Commerce, Information Systems, Traders Association

Keywords

IFPR; Marketplace; ACISIWEBSHOP; Ivaiporã-PR. Brazil

1. INTRODUCTION

E-commerce has created immense inequality between retail markets and this has been further intensified at the advent of the COVID-19 pandemic. According to André Dias, coordinator of camara-e.net Metrics Committee and executive director of Neotrust | Compre & Confie, assumed in August 2020:

"Even with part of the reopening of physical stores in Brazil and the seasonality of the July month which traditionally has lower sales volume due to the school vacation period, e-commerce maintained exponential growth levels. The set of new consumers, greater frequency of purchase and acquisition

of high-end products will continue to maintain e-commerce as one of the most promising sectors in Brazil." [1].

This report demonstrates that the consumer has been refrained from physically attending at those retail establishments. The risk of contamination by the new coronavirus has led many consumers to embrace e-commerce, including for basic consumer items. Naturally, many of these segments of consumption of basic products suffered an abrupt interruption in the commercialization of their products, independently of the pandemic ends or not.

In view of the aforementioned, as well as being aware of its role in society, the Federal Institute of Parana - IFPR Campus Ivaiporã, through its human capital, and in partnership with the Commercial, Industrial and Services Association of Ivaiporã (CISAI) – or ACISI, in Portuguese and for further mentioning - made a task force to list merchants who were harshly punished by social isolation and who lacked the conditions, resources and technological tools to resume commerce with their customers online, before they were incorporated by the large e-commerce markets, which are rapidly adapting to further incorporate this slice of the consumer market.

After three months since the beginning of the pandemic, in mid-June 2020, there was a certain trend in Ivaiporã-PR for traditional businesses to permanently close their doors, precisely because they lacked the working capital reserve to keep their businesses low also with a low flow of people, and that resulted in a negative balance in the number of job offering in the city, as shown in Figure 1, which brings the consolidated data of the General Registry of Employed and Unemployed (CAGED, as in Portuguese and for further mentioning) of the Brazilian Economy Ministry [2], referring to the city of Ivaiporã-PR. The quickest possible solution to alleviate the local problem was the creation and implementation of a regional sales marketplace.

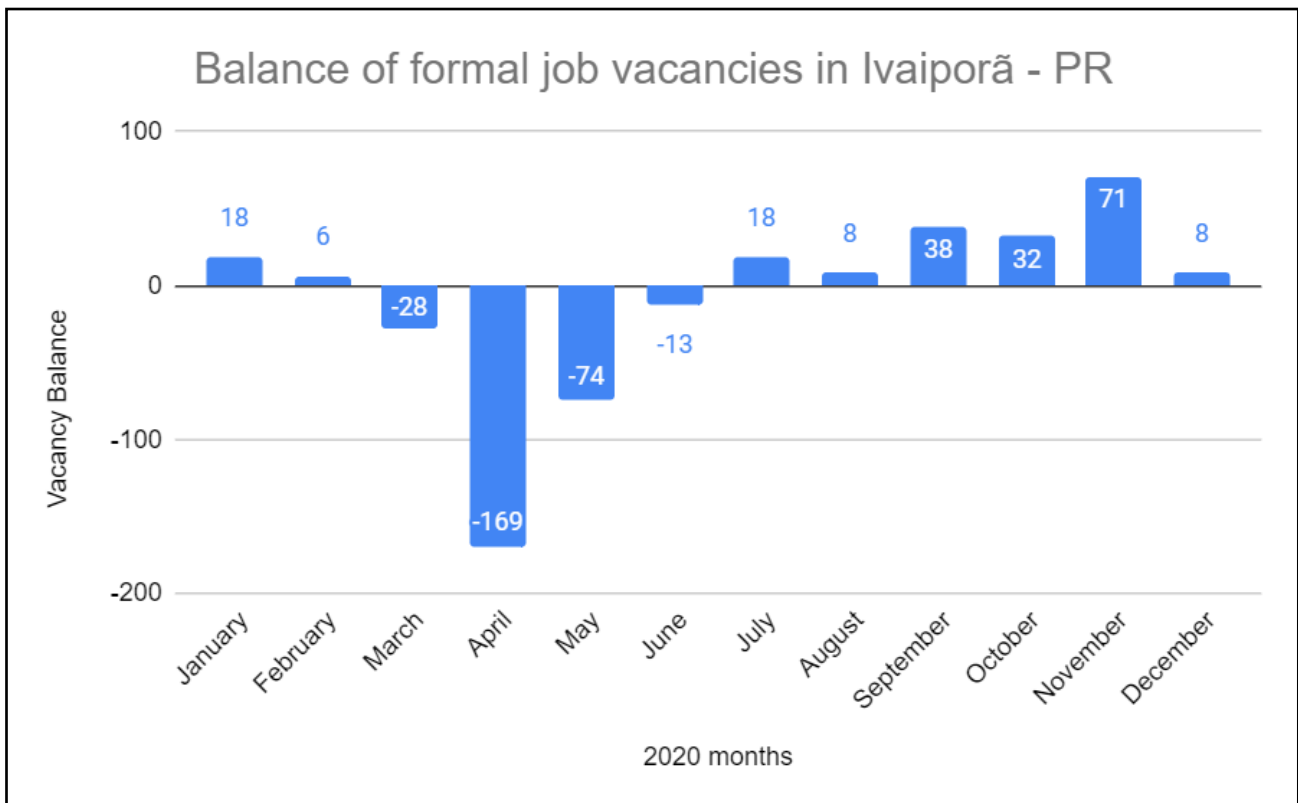


Fig 1: Balance of formal job vacancies in Ivaiporã – PR

Therefore, the theme of this article aims to support small businesses in the city of Ivaiporã-PR, as well as the sustainable promotion of these businesses through the ACISI WEBSHOP marketplace (online) and most importantly: trust based on people who know each other in the locality, thus permeating a favorable environment for technological innovation.

2. THEORETICAL REFERENCIAL

In the 2010s, large e-commerce companies emerged around the world, each as a result of technological changes and the unique characteristics of their regional markets in terms of regulation and consumer preferences. Jindong and Alibaba are giants serving the thriving Chinese market, building as they grew their own distribution capabilities, which were not yet available. Rakuten and B2W Digital are, respectively, the largest e-commerce companies in Japan and Latin America in Brazil [3]. In Europe, the biggest e-commerce companies come from retailers adapting to online sales (e.g. Otto, Sainsbury, Tesco) or from start-ups with a digital focus (e.g. Zalando) able to leverage delivery services of orders already effective. Yet, Amazon symbolized this emerging e-commerce logistics and remained the world's largest e-commerce company with a strong focus on North America and Europe, where it ranked number one in online sales [4]. In 2018, it represented 38% of all online retail sales in the United States and 4% of total retail sales. In its early growth phase, Amazon was able to use the distributional capabilities of third-party postal services and logistics providers.

The new SARS-CoV-2 (severe acute respiratory syndrome) has caused the respiratory infection of thousands of people and has spread rapidly around the world [5]. The recent pandemic crisis of COVID-19 brought great insecurity to consumers who habitually made their purchases in person and

many of them adhered to ways that replace face-to-face purchases, such as online through home delivery or e-commerce. The growth of home deliveries is one of the most tangible impacts of e-commerce, as consumers are replacing a part of their consumption, which was previously carried out physically, with purchases made online [6]. Initially, this demand was mostly discretionary, but the adoption of e-commerce as a consumption paradigm is increasingly involving essential goods such as household utensils and groceries. Although several aspects of e-commerce are perceived as virtual retail, e-commerce can be better understood from a freight distribution point of view, since the distribution and delivery aspects are essential. A successful e-commerce transaction and its value to the consumer depend on the ability to deliver the order within a specified time frame. Thus, distributive consumption is a fundamental feature of e-commerce.

The authors [7] demonstrated that technologies are essentially changing the producer-consumer relationship. The importance of the digital (online) platform is increasing and for that reason one can observe changes in the way people communicate [8] as well as the ways in which companies communicate with their customers. In recent years it has also been seen a dramatic increase in the amount of time and money consumers spend online. Thus, innovation has become an imperative for organizational sustainability and has demonstrated its importance during the current COVID-19 pandemic crisis [9]. However, getting things done quickly and doing them right proved not to be an easy task for small businesses in the interior of Brazil.

According to the Organization for Economic Cooperation and Development - OECD [10], the public policy to support innovation comprises different instruments and political



programs that aim to promote innovation directly; through financial and non-financial support; or indirectly, through regulations and standards. Therefore, the engagement of public/private partnerships is fundamental as mobilization instruments for local businesses that have been harshly punished to do well in the current economic crisis.

There are many definitions about the marketplace. According to Verhagen [11], the marketplace is a meeting point for buyers and sellers in a more specific field. Also, according to Mulyaningsih, marketplace is an e-commerce, but not every e-commerce site is a marketplace. A key difference is that the marketplace has many providers [12].

3. METHODOLOGY

In the development of the present system, the design analysis and system design proposed in the Whitten and Bentley methodology were used. The fundamental understanding of system analysis is talking about how to solve a problem. Furthermore, system analysis is the study of a business problem and then recommending improvements and also establishing the business needs needed to design a solution. Meanwhile, system design consists of several stages, from application architecture design, database design, and interface design [13]. The results of the problem analysis are listed in Table 1.

Table 1. Problem analysis

| No. | Problem or Opportunity | Classification |
|-----|---|----------------|
| 1 | No marketplace to serve local trade, | Problem |
| 2 | No information about demands system should serve, | Problem |
| 3 | No personalized information for segment among local merchants for the system, | Problem |
| 4 | No system for integrated marketing, | Problem |
| 5 | Financial recording is still manual in some cases, | Problem |
| 6 | No automatic control for goods and services produced, | Problem |
| 7 | Customer should buy only bodily at stores, | Problem |
| 8 | Customer cannot order online, | Problem |
| 9 | Customer cannot have clear when orders end, | Problem |
| 10 | Small merchant has a low price even with the same quality of big suppliers. | Opportunity |

Requirements analysis can be divided into functional requirements and non-functional requirements. The developed

system is web-based therefore it has a functional requirement. Details of the functional requirements can be seen in Table 2.

Table 2. Functional requirements

| AWS-ID | Description |
|--------|--|
| AWS-1 | System has a registration mechanism or secure login, |
| AWS-2 | System has a mechanism to logout with security, |
| AWS-3 | System can perform data storage, |
| AWS-4 | System can display information on the web in general and how to shop for, |
| AWS-5 | System has an interface to shop for by category: household appliances, clothes, electronics... |
| AWS-6 | System can display change of the product, model, type and price, |
| AWS-7 | System can provide an order review before goods being paid, |
| AWS-8 | System can display an update request of progress given at "order status" in the header, |
| AWS-9 | System can display a list of all businesses of a determined category, |
| AWS-10 | System can display a merchant's portfolio. |

For the analysis that was done, there are at least three proposed solutions. First, create an online store for each merchant. Second, create a financial records system digitally. Third, create a specific marketplace system for small and medium merchants. Each solution has revised implementation possibilities based on four criteria: economic, technical, operational and schedule.

Based on the feasibility analysis of the matrix performed, it was found that the solution for developing marketplaces systems, specifically for small and medium merchants, are better than the other two solutions. The advantages of this solution are the development of a relatively small implementation cost. In addition, the solution is also able to solve the problem in general, and respond to the needs of small and medium traders. The downside of this solution is that development relatively takes more time and requires extra human resources that understand the IT (Information Technology) field to be able to run the system.

The business process analysis was done based on the analysis done previously. The design of business processes made to modify business processes that already existed in these businesses, only added the application of information technology to it. Details of the business process analysis can be seen in Figure 2.

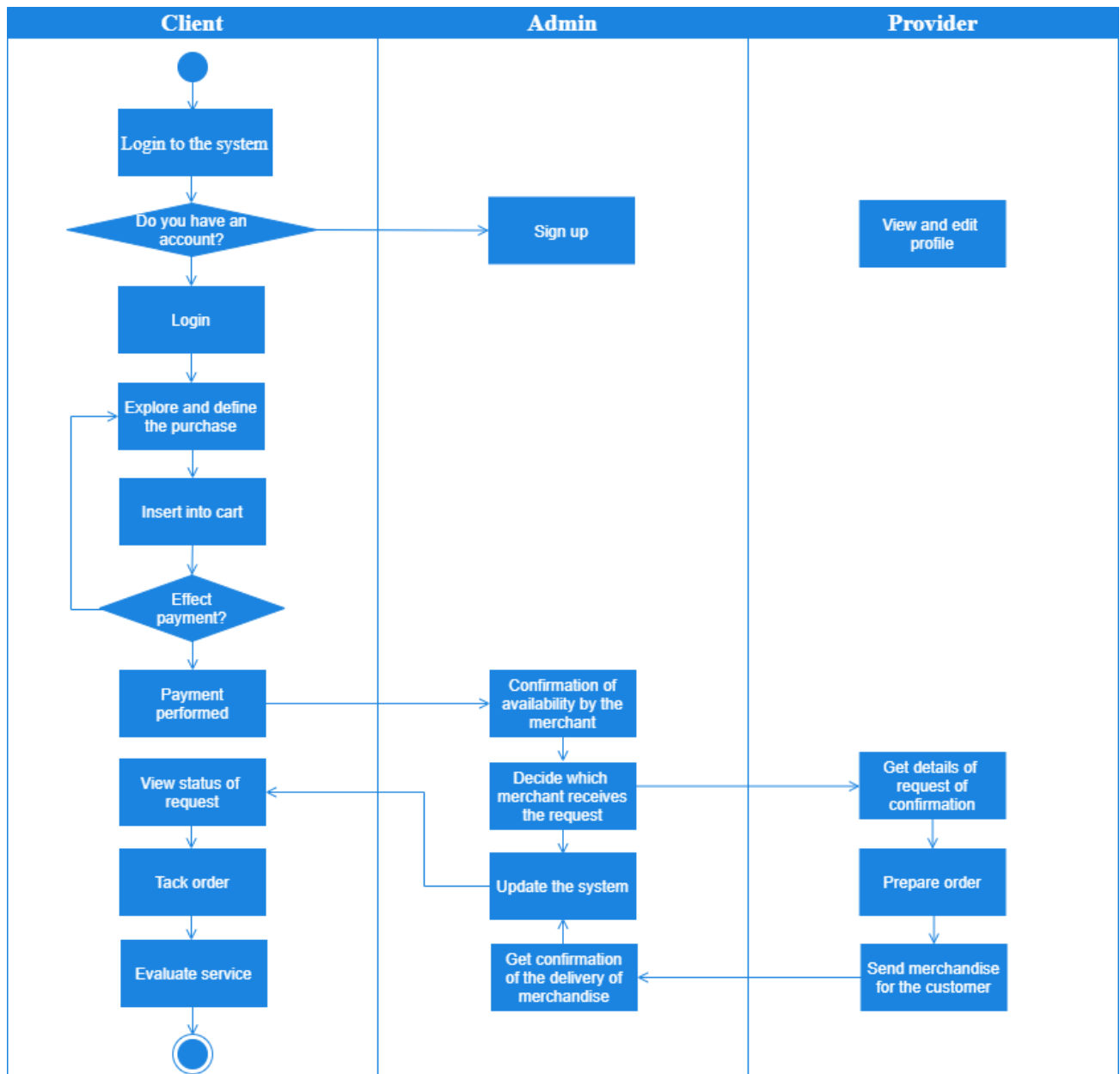


Fig 2: Business Process Analysis

A more unique business process project is the role of an administrator. Therefore, the Admin plays the vital role here and is like a link between the customer and the service provider. The idea arose taking into account that many merchants do not have computers to provide the marketplace for mobile apps, knowing that most of them, although they do not understand much about e-commerce technology, are used

to using smartphones on social networks such as Whatsapp. For example, when the customer completes orders placed online, the merchant will receive an order summary via the smartphone. The system architecture project or the demonstration of the system that was created based on the functional requirements can be seen in Figure 3.

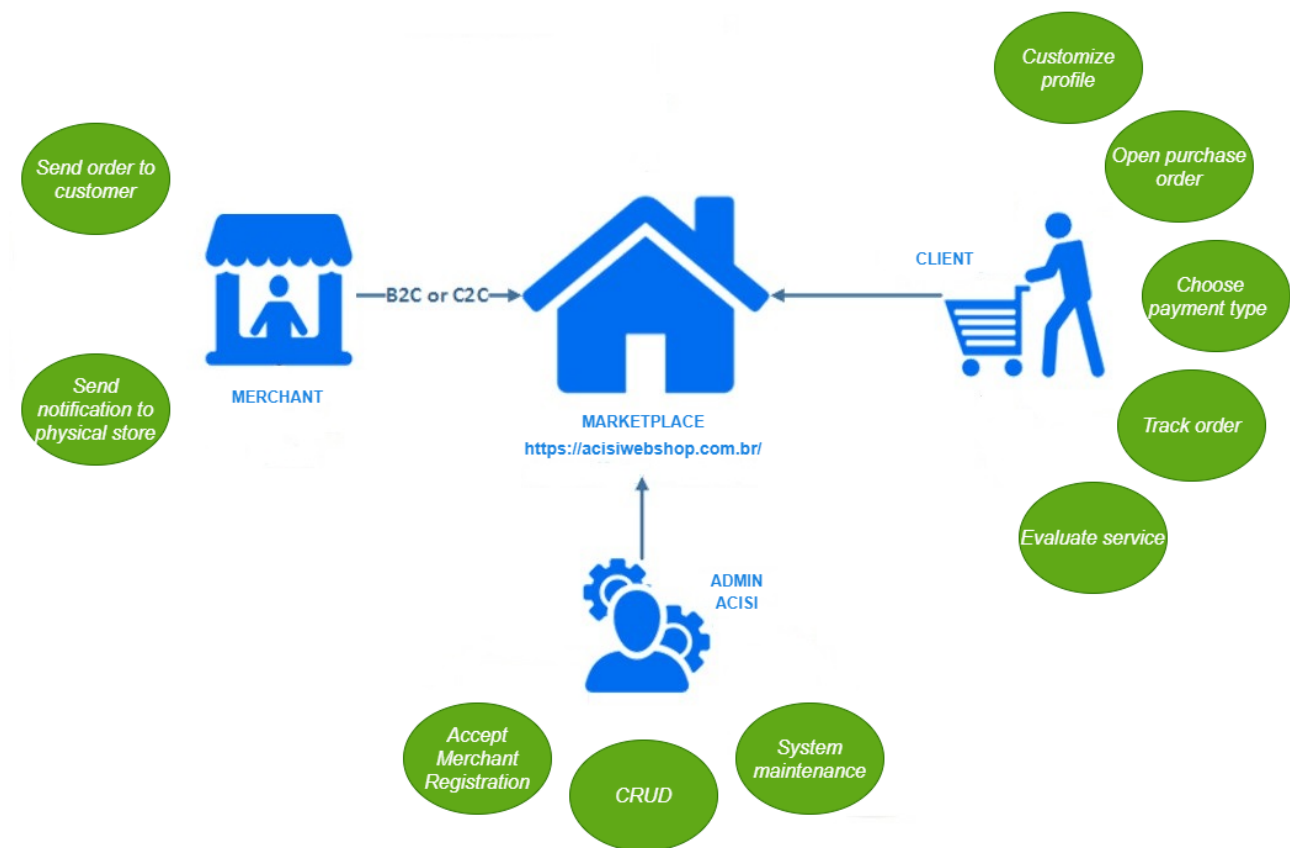


Fig 3: System Design

Testing is done in two ways, namely functional testing to test whether the system has run according to the created AWS-ID, and also through UAT (User Acceptance Test) to get feedback from end users on what was developed.

4. RESULTS AND DISCUSSION

Usability tests were carried out with 10 users, including students of the Bachelor of Information Systems course, IT

professionals, as well as merchants from the city of Ivaiporã-PR. Usability testing is a qualitative test that shows how people interact with the app. During interactions, users report what they were thinking and ask questions about the features of the presented tool. The demonstration of the system that was created based on the functional requirements can be seen on the application's home screen, as shown in Figure 4.

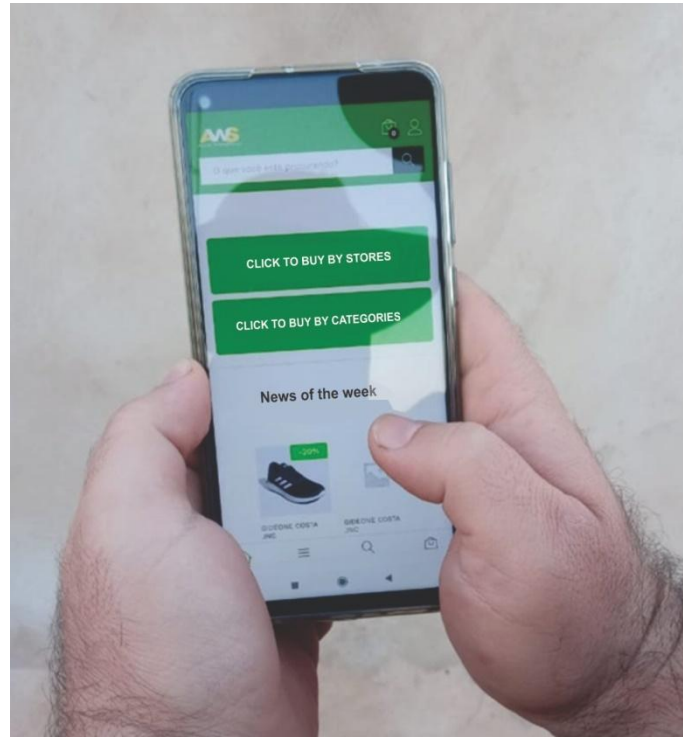


Fig 4: Home page

After loading the web page or application, it is possible to see the overview, log in, register and log out of the system. After the customer selects their product choices and inserts them into the shopping cart, they can complete their order, as shown in Figure 5. An important detail of this order closing

screen is the payment option on product delivery, where it can be done in two ways, with payment in cash or inform in the field “Order notes (optional)” that the delivery person must take the debit/credit card machine upon delivery.



Fig 5: Order closing screen

The supplier profile page is shown in Figure 6. The feedback was very positive. They rated the interfaces as clean and easy

to understand and use, even though it was the first contact with the tool.

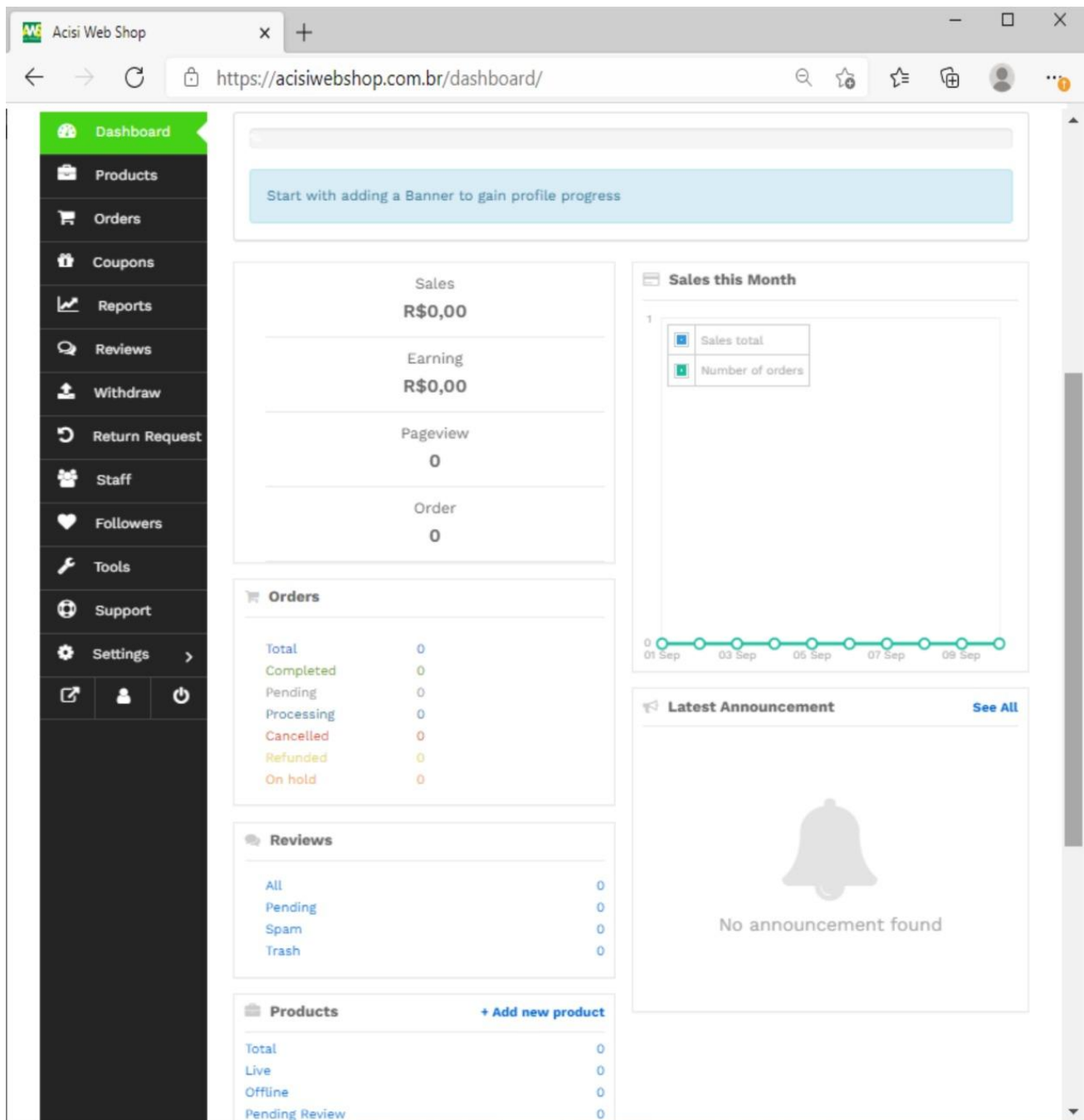


Fig 6: Supplier Profile Screen

As it can be seen, the results of the tests carried out were positive and extremely important for the project, as well as giving tips to complement the platform in order to better meet the users' needs.

5. FINAL CONSIDERATIONS

This article presents the problem of small local businesses in Ivaiporã-PR, highlighting the drop-in sales in the current pandemic period and with a reasonable number of businesses affected by it. Another aspect addressed the lack of a public policy to serve these merchants, lacking both reliable information about online sales, and a tool that provides opportunities for this.

In general terms, the developed marketplace is able to solve the problems mentioned above, also providing benefits to medium and small businesses in Ivaipora-PR. This can be demonstrated by the results of the analysis of the problems that can be solved and the results of the analysis of the needs that can be answered. Test results were also positive.

ACISI WEBSHOP appears as a proposal to solving these problems, giving the buyer the opportunity to get to know the small businesses in the locality better and bringing accurate, easy-to-understand and easily accessible information. In addition, it creates business and market repositioning opportunities in the face of unfair competition, allowing continuity in the supply of the products it proposes. Thus, ACISI WEBSHOP helps both buyers who wish to have a



better experience in their local online shopping, isolated in the comfort of their homes, as well as enabling their sellers to improve their services through buyer feedback.

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