

Local economic development in the microenterprises blacksmiths with technological applications

Desarrollo económico local en las microempresas herreras con aplicaciones Tecnológicas

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Abstract

The forger microenterprises located in Ixmiquilpan have grown up considerably because of housing, stores, educational institutions or any other kind of construction requiring doors and windows to be installed, with the increase of work forgers need to speed up the process on the customer assistance. A software that can help to design the drafts and to register the request will be of great help to the forger microenterprises. To develop the system the scientific method will be used, through observation, introduction, hypothesis, experimentation and conclusions. As a result they will get a software which will help to design the customers' request and it will allow to register them automatically in a database. The system has a catalog that will store the produced designs,

System, Design, Herreria, Deliverys, Software

Resumen

Las microempresas forjadoras ubicadas en Ixmiquilpan han crecido considerablemente debido a las viviendas, comercios, instituciones educativas o cualquier otro tipo de construcción que requiera la instalación de puertas y ventanas, con el aumento de trabajo los forjadores necesitan agilizar el proceso en la atención al cliente. Un software que pueda ayudar a diseñar los borradores y a registrar la solicitud será de gran ayuda para las microempresas de forja. Para desarrollar el sistema se utilizará el método científico, a través de la observación, introducción, hipótesis, experimentación y conclusiones. Como resultado se obtendrá un software que ayudará a diseñar las solicitudes de los clientes y permitirá registrarlas automáticamente en una base de datos. El sistema cuenta con un catálogo que almacenará los diseños producidos

Sistema, Diseño, Herrería, Entregas, Software

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Introduction

The Economic Censuses in Hidalgo offer information on multiple aspects of the economic units, among which manufacturing stands out, being the one that occurs most in the state with 58.0% of men who work in it. (INEGI, 2014).

To transform Mexico through the adoption of Information and Communication technologies, the impacts of Tic on GDP will help local economic development, a 10% increase in digitization in Mexico would have an impact of 59% on GDP. The transversal presence of the ICT industry in the rest of the industry makes it a strategic industry to boost competitiveness in the country. (Mexican Association of the Information Technology Industry, 2013).

On the other hand, we have that labor is a niche of opportunity in different industrial sectors such as manufacturing. (Republic, 2014). In the State of Hgo. There are 2,713 students who are enrolled in engineering, manufacturing and construction, occupying the fifth place within the professions of the state.

This data indicates that there will be a considerable number of people dedicated to manufacturing in the coming years in the state of Hidalgo (Statistical and Geographical Yearbook of Hidalgo 2014 / Instituto Nacional de, 2015).

Therefore, it is necessary to integrate policies that promote local economic development, that materialize the promotion of entrepreneurship and the creation of manufacturing companies, as well as business grouping. (Competitiveness, 2014).

The Technological Ranckin 2013 was found, shows the policies of science and technology and innovation PCTI and indicators of improvement to the states of the republic, finding indicators that in Hidalgo the training of human resources, improving scientific and innovative productivity, business infrastructure, and the economic and social environments, among others, with Hidalgo ranking 22nd out of the 32 entities, reason for carrying out technological applications that support science and technology and PCTI innovation policies and the indicators to create a state with greater technological coverage. (Technological, 2014).

On the other hand we have that in Ixmiquilpan Hidalgo it has 86,366 inhabitants (INEGI, 2014), the number of people who are dedicated to economic activity in manufacturing is considerable. It has a gross domestic product of 21, 153,634, the Manufacture of metal products is 609 on a monthly average. That is equivalent to 1, 417 hours worked.

Manufacturing is a prominent economic unit that represents a significant opportunity niche in Hidalgo. The interactive system for the design of doors and windows for micro-enterprises Herreras is a technological tool for micro-enterprises that will contribute to making the work of manufacturing more efficient,

It is of the utmost importance to support the processes in the Herrera microenterprises so that they fulfill their objective and contribute to economic development. The basic elements of local development initiatives are 1.- Mobilization and participation. The proactive attitude of the local government, the existence of local leadership teams, public-private cooperation,

Preparation of a territorial strategy for development, promotion of microenterprises and SMEs and training of human resources 7.- coordination of programs and instruments for promotion, institutionality for local economic development. (Repositorio.cepal.org, 2015) For technological application, the existence of local leadership teams, public-private cooperation, elaboration of a territorial development strategy, promotion of microenterprises and SMEs, and training of human resources was counted, as shown to be lacking. The proactive attitude of the government 7.- Coordination of programs and development instruments, institutions for local economic development.

The development of the system contributes to the innovative line of applied research and technological development of the educational program of Information and Communication Technologies of the Technological University of the Valle del Mezquital called —Development, application and innovation through ICTs as a driving force for the progress of the region", allows the development of systems that contribute to the growth of the region, derived from this the "Technological application for the design of doors and windows for herrera microenterprises in the ixmquilpan area.

Which is aimed at the population dedicated to blacksmithing who require a tool.

An investigation was carried out finding systems to make designs but their characteristics are not adaptable to micro-enterprises, the interfaces are not user-friendly, they do not consider new door and window designs, they do not contain catalogs showing the designs already made, they do not have the customer registration. The system offers window and door designs, customer registration and a catalogue.

Methodology (development)

The research was carried out with the scientific method since it is supported by two fundamental pillars, which is reproducibility, which is the ability to repeat an experiment based on the communication and publicity of the results. And reusability, (Descartes, 2013). The development of the work was considered a scientific method by carrying out the following:

Observation where an investigation was carried out to analyze what could be the best options to solve this problem of the blacksmiths.

In the study of art, applications that make designs and register them were analyzed, taking into account that most of the micro-enterprises found in the region do not have sufficient technology to make their products (EMIM, 2014).

Formulating the Hypothesis, the technological application for doors and windows will support the design of the products and the administration of orders and clients to improve their processes.

The experimentation was carried out testing the application with the blacksmith microentrepreneurs who requested a series of changes such as the product catalog, and

State of the art: an investigation of the systems that handle similar characteristics that are shown in the

Sistemas similares	Servicios	Características	Gratis	Página web
Ra Workshop	Cálculo para la industria de ventanas y puertas.	Flexibilidad y tiene una interfaz amigable.	No	No
Archimed	Diseño y fabricación de puertas y ventanas.	Flexibilidad	No	No
KitchenDraw	Diseño y fabricación de interiores del hogar	Flexibilidad interfaz amigable	No	No

Table 1 Services and characteristics of the analyzed systems

For this it was necessary to apply a mathematical algorithm that helped determine the number of people to survey.

$$\% = \frac{x * 50}{N}$$

A survey and an interview were carried out with a sample of approximately 50 microentrepreneurs between the ages of 30 and 40, from the Ixmiquilpan region in order to identify the need for technological tools to support blacksmithing.

This project was developed in 2012 as an initiative to contribute technologically in the Region and in the Herrera micro-enterprises.

Information from the state yearbook of Hidalgo and the case of a blacksmith from El Roble located in Ixmiquilpan Hgo were considered.

It is important to mention that a methodology in software development was also considered for this case, it is the life cycle of a software that consists of the following stages.

Analysis of a software As a result we have in analysis of the surveys applied to the 50 blacksmiths enchanting the following.

How long does it take to design your products?

1. Analysis de un software
2. Software design
3. Software development
4. Testing
5. Implementation

In the Analysis of a software, the administration of the clients was analyzed, how the following attributes were stored: name, surname, address, telephone, description of the requested design, advance payment, remaining and total cost of the blacksmithing to be carried out as well as the order date and the delivery date. In the design stage, the use case diagrams and activity diagram were made.

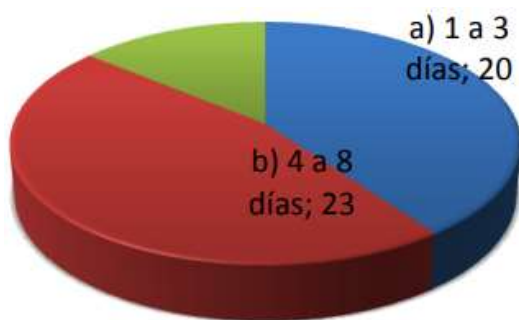
In the development phase, the development tools to be used are Java, NetBeans, MSQl, Photoshop Paint.

With the tests are desktop tests.

In the implementation, the application to the Ixmiquilpan Hgo oak blacksmith shop was presented. And the application delivery letter was made to the oak blacksmith shop.

Results

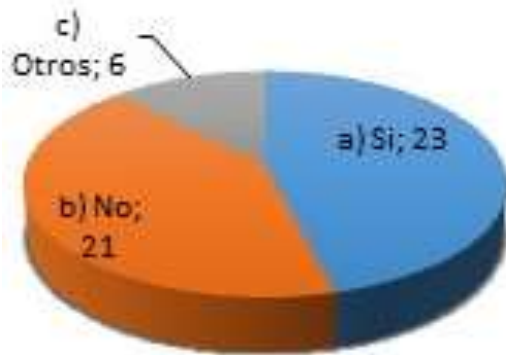
A mathematical algorithm that allows us to delimit the size of the target population.



Graphic 1

According to the questionnaire applied, most blacksmiths take 4 to 8 days to design what their product is.

Another question was: Do you have a catalog where the designed doors and windows are found?

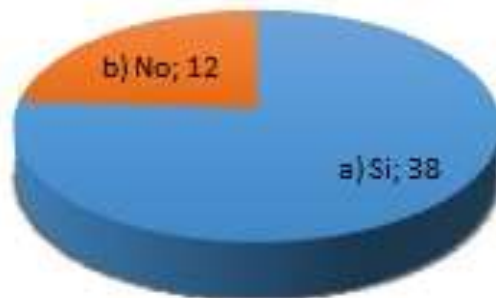


Graphic 2

They have a catalog but it is not divided into sections which would help you better explain your work. The application classifies them the types of jobs.

The majority of microentrepreneurs in the region are not so much into technology, but they agree to acquire software that supports them in their daily work and with this they can learn more about technology.

Another question is If there was a software that allowed you to design your products, would you use it?



Graphic 3

They do not have a technological application but would like to have training and a technological tool that allows them to make their work mechanism more efficient.

Another result is the modeling of the system shown in Figure 1.

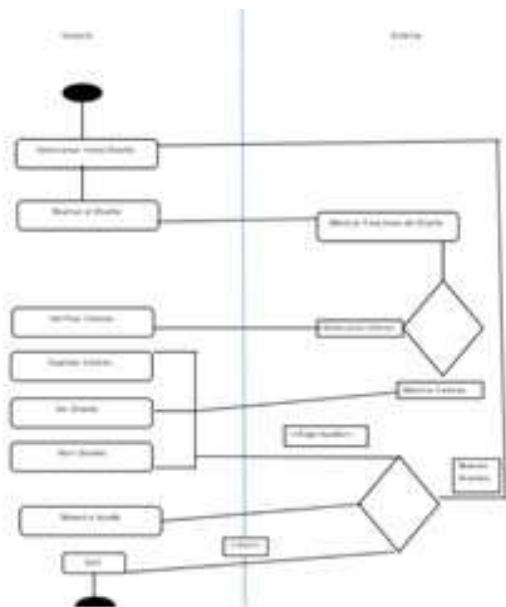


Figure 1 Diagram of activity of the technological application for blacksmith shop el oak

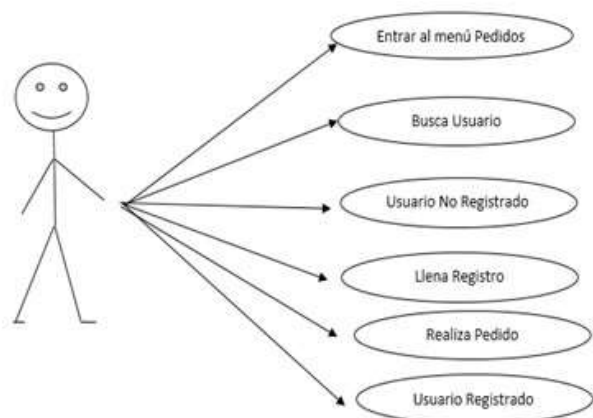


Figure 2 The use case diagram shows the actions of the system

Another result was the technological application shown in figure 1 mapping of the technological application

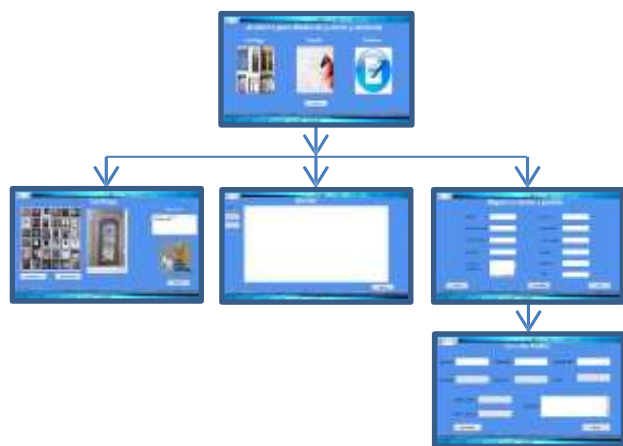


Figure 3

System Number

Home screen contains the main modules of the system, catalog, design and orders.



Figure 4 System Menu

Catalogue

In the catalog window, the blacksmith places the description of each of the products, showing an image.



Figure 5

Design

The design screen contains the tools to make freehand designs.

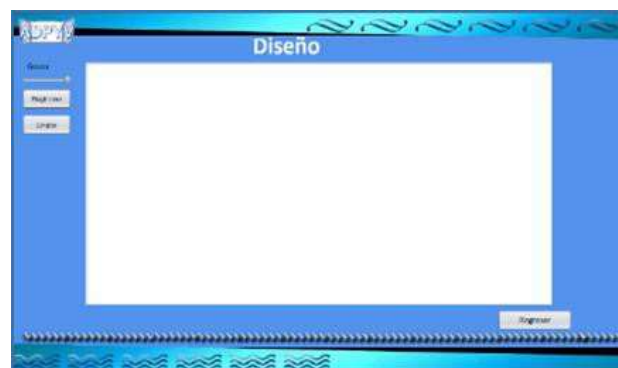


Figure 6 Interface for freehand design

Record

In the registration screen it is observed that the blacksmith will be able to store his orders from his clients.



Figure 7 Rcustomer registration and orders

Query

On this screen, the blacksmith will make queries by first name, last name, order dates.

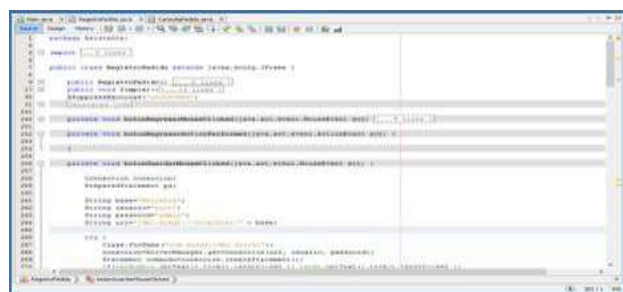


Figure 8

The test plan was carried out after its development to detect the improvements to the application, the module and the number are shown. test. As shown in Table 2 Test Plan

N o.	Module	Responsible	Faithcha	Ttype of test	Test cases
1	Nnew record	Benito Castillo Zuniga	February 27	Database	CP01
2	Pesaid	Benito Castillo Zuniga	/March or	Fease of use	CP02

Table 2 Ptest lan

An important result was the agreements with the herrera el oak microenterprise, the sessions of agreements on the design of the application, the evaluation of the application by the blacksmith.

Conclusions

Thes Information and communication technologies are a key element for the development and growth of microenterprises as a tool for technological development in processes that contribute to increasing levels of competitiveness and productivity. ICTs are of great importance in the business sector since they have achieved modernization according to the requirements demanded by society.

There is still a long way to go to reach competitive levels, but to the extent that technology is implemented in blacksmiths, it will help local economic development.

In the investigation carried out, it was detected that the degree of adoption of the use of ICTs in the blacksmithing micro-enterprises in Ixmiquilpan is null, due to the fact that 100% of the respondents consider necessary a technological tool that allows them to expand markets and increase their competitiveness and productivity.

The application allows transforming the way blacksmiths work and gradually involves them in the use of ICTs when designing doors and windows, registering clients and having a digital catalog.

The process is slow since it includes training and sensitivity in micro-enterprises to use technology in their processes. It is important to mention that it is planned to improve the design of doors and windows by implementing 3D image modeling and design software, with display, animation and rendering modes,

The application will be in charge of the El Roble ironworks with the agreement to make improvements, it is considered as future work to measure its performance

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