

## **Technological innovation in the management of priority touristic destinations and magic towns of Mexico**

GUZMÁN-ARENAS, Adolfo, REYES-BONILLA, Jorge Arturo, DORANTES-VILLA, Claudia Jisela

A.Guzman', J.Reyes'',C.Dorantes'''

'Computing Research Center (CIC). Instituto Politécnico Nacional

"School of Engineering, Mechanics and Electrical (ESIME-ZAC). Instituto Politécnico Nacional

''' Higher School of Computer Science (ESCOM)

' aguzman@ieee.org

'''cjdorante@yahoo.com.mx

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## **Abstract**

The project carries out a comprehensive analysis of 2610 tourist indicators, classified into nine tourism components, given the need to try to select the indicators that allow observing the competitiveness and sustainability of the place; As well as the development among other factors, a matrix of affinity between the indicators and the SWOT analysis of the Competitiveness Agendas (CAs) of the priority tourist destinations and magic Towns. Once you have the core of what the database is to store, the design and implementation of an information system for decision-making is carried out, supporting the General Directorate of Destination Management (DGGD) in the Secretariat of Tourism, to automate the processes of the Magic Towns Program; In addition to the indicators of the CAs that feed nine tourist components.

## **Introduction**

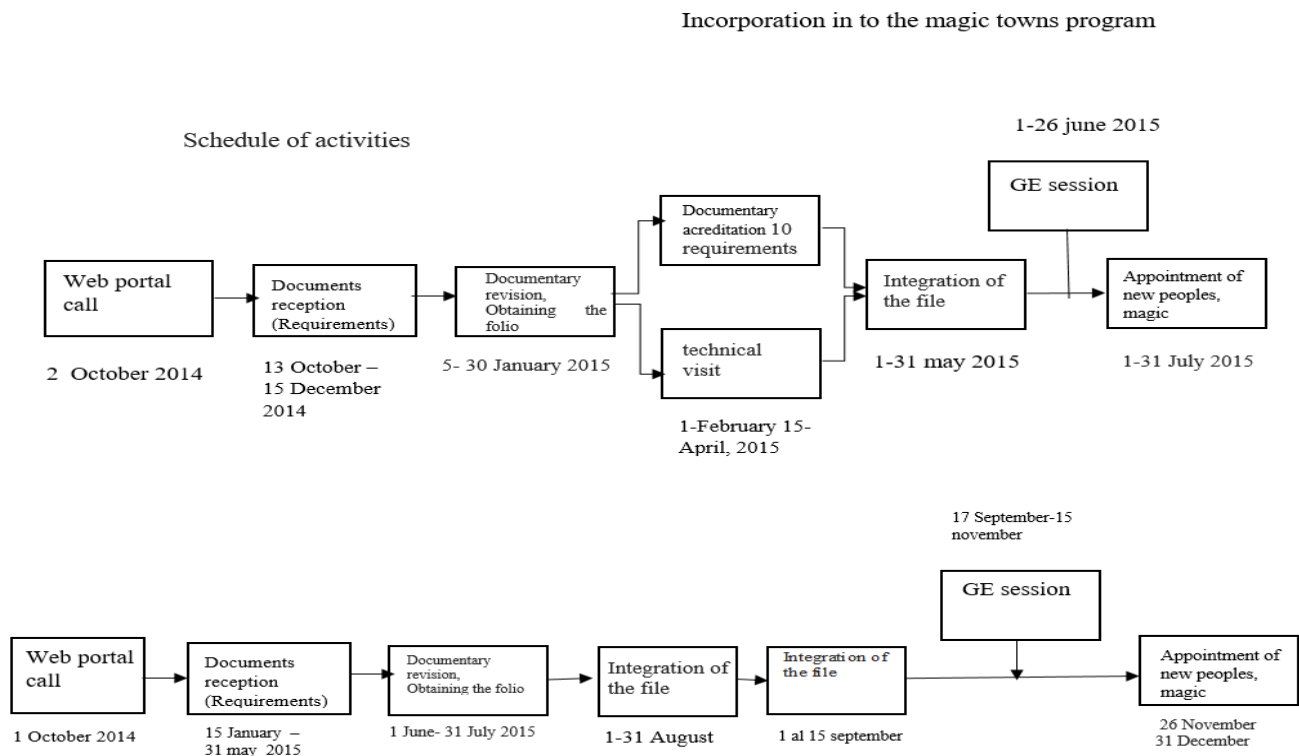
In this chapter, the result of the analysis of tourist indicators is presented; Through technological innovation embodied as an Information System for evaluation of magical towns or localities who wish to enter the program and store important content of priority tourist destinations. The Sector DGGD requires that the information contained in the Competitiveness Agendas of the 44 Priority Tourist Destinations in the 83 Magic Towns be automated in the evaluation of the performance of the tourist destinations, within the framework of the coordination agreements in this area Of reassignment of resources, as well as in the Manual of indicators of the Magic Towns Program. Therefore, an information system is developed with Web technologies that manages the information related to the priority tourist destinations and magical towns and that can provide a behavior of the tourist development of the destinations and localities. In order to contribute to decision making by accessing information stored in a database. With the information registered by the users, indicators related to nine tourist components are captured; Which allows to build ACs. It is intended to observe, the tourist development, the sustainability and competitiveness of the destination; Through environmental, economic and sociocultural indicators oriented to decision making. In addition, elements are included for the SWOT analysis (strengths, opportunities, weaknesses and threats), which later allow for a SWOT evaluation.

## **Methodology**

An Information System for the management of priority tourist destinations and magical towns of Mexico is required for the Directorate General of Destination Management (DGGD) in the Sector developed with Web technologies that manage the following:

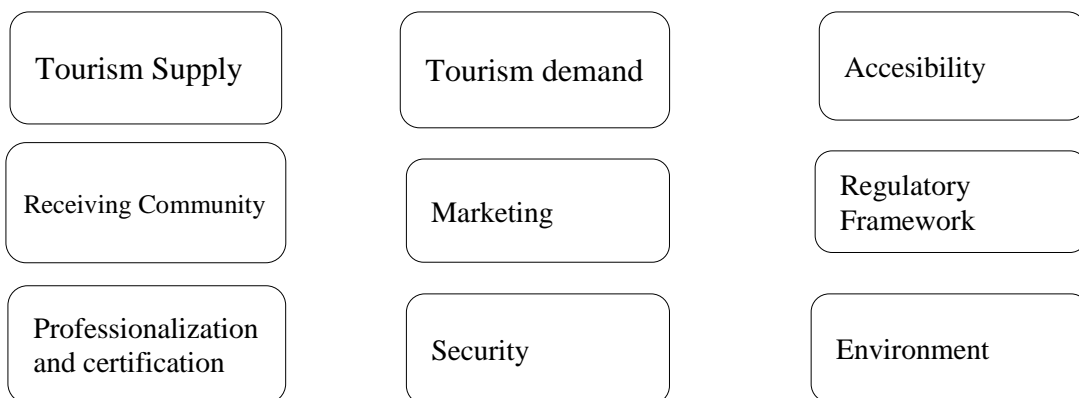
- 1) The entry and permanence to the Magic Towns Program. Figure 5 shows the current process of the Sector

**Figure 5** Sector Processes for the Magic Towns Program. (Sector, 2015)



2) Information related to priority tourism destinations (Competitiveness Agendas 2015) and various sources. It is required that the indicators related to the nine tourism components can be captured in the system (see figure 2); And so-called SWOT elements, due to a previously made analysis of 2610 indicators collected and the SWOT analysis contained in the Competitiveness Agendas of priority tourism destinations and magical towns. This allows to observe the priority tourist destinations and the magical towns.

**Figure 5.1** Tourist components currently used by the DGGD, including Environment proposed by Project 242853. Own elaboration Project 242853



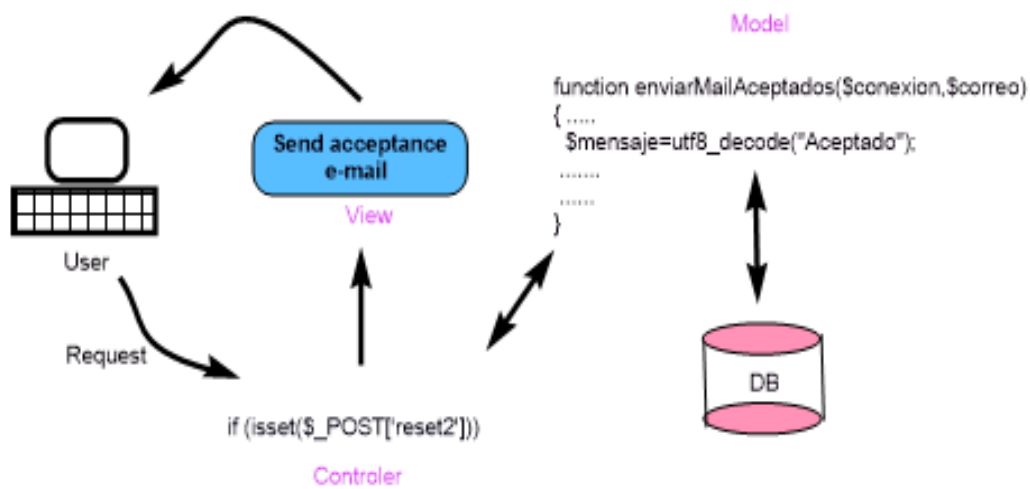
It is intended that the information system be of support for the DGGD and may have information related to the degree of development, competitiveness and sustainability of the tourist destination; Through environmental, economic and sociocultural indicators oriented to decision making. In addition, to include elements for the SWOT analysis.

It is possible to have a deep and general panorama of the tourist indicators related to the tourist components. This analysis is possible using the processes that precede Data Mining (Jiawei Han, 2006); Which involve;

- la extracción y limpieza,
- integración,
- selección y transformación de los datos.

A new analysis is performed on the classification of the information; And in addition, knowledge of the SWOT tool is required to reduce the indicators from 2610 to 906 (see chapter 4). This allows to observe the behavior of the indicators, that is to say, if it is observed in magical town, priority tourist destination or is present in both. It is done a debugging of the sources that are related to the indicators, to obtain a source. The relational model is used to organize and represent the data in a table structure.

**Figure 5.2** Example of sending mail to the locality by the administrator. Own elaboration Project 242853

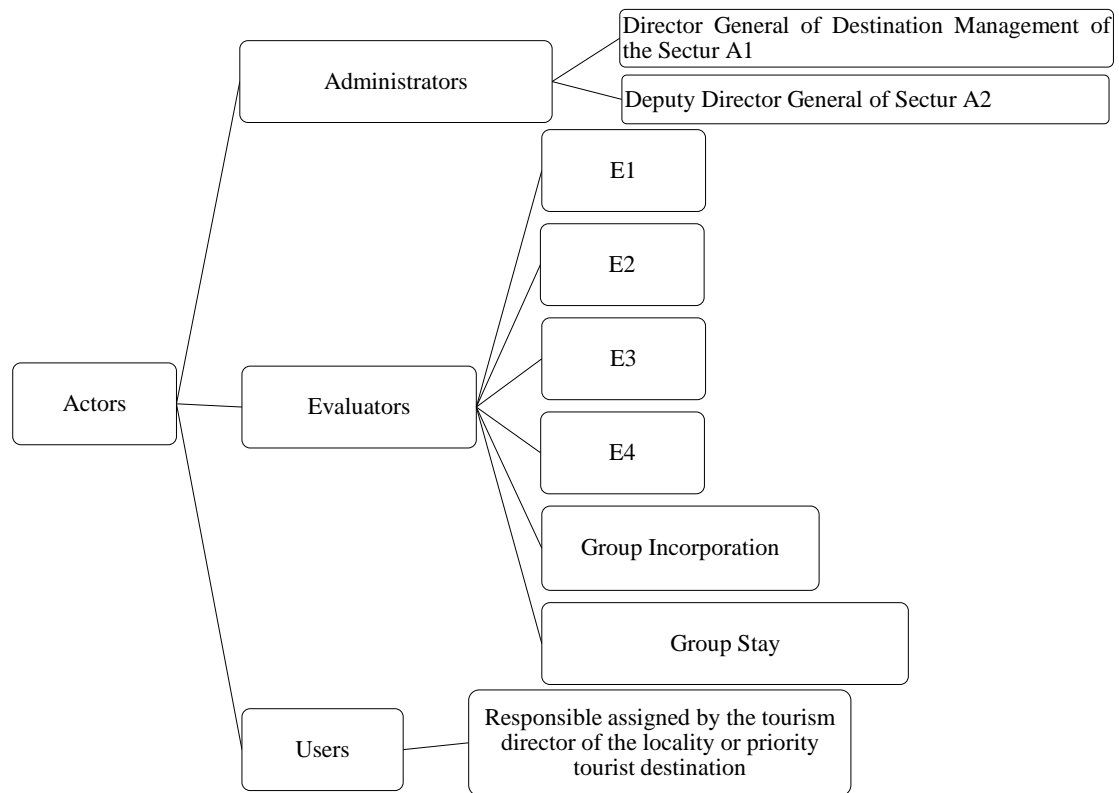


## Development

This part shows a part of the requirements, analysis and design of the Information System for the Management of Priority Tourist Destinations and Magic Towns of Mexico.

## Analysis and design

In this section, some of the requirements and design of the system are presented; As well as the modules that comprise it and some UML diagrams (James Rumbaugh, 2000) that correspond to the analysis and design. Some of the system requirements include the following: The following user profiles are involved in the system (see figure 5.3):

**Figure 5.3** System Users. Own elaboration Project 242853

The evaluation of the localities is distributed by regions, throughout the Mexican Republic, reason why each evaluator has a one region in its charge. The groups of evaluators of the incorporation and permanence processes receive the qualifications of each process by locality or magic town, in order to analyze and make decisions according to the grades received.

1. With regard to the CA in the system, we have the following considerations:
  - The agenda should include the SWOT elements and their relationship to the indicators of the nine tourism components.
  - The agenda can be generated, through a report that contains the information captured by the destination's tourism manager.
2. Regarding the magical towns, it is considered:
  - Performance
  - Inventory of attractions (based on tourism components).
  - Tourist behavior
  - Guidelines

In general, the modules contained in the system are as follows:

Magic Towns, which contains three processes

- a) The Pre-requisites process, where the Locality uploads five documents, which, must be correct to pass to the Incorporation process, in case of having a wrong document, the Locality does not go to the next process.

- b) The Embedding process consists of three subprocesses, which are:
  - Documentary evaluation. The locality carries 27 documents distributed in 10 requirements.
  - Technical visit. It consists of two folders Offer and demand, which allow you to obtain information related to the heritage of the Locality.
  - Tourism plant, where the Locality must load evidentiary documentation, values of indicators and can be self-evaluated. The evaluator then rates the information that the locality loads into the system.

If the City passes this process satisfactorily, it receives appointment of Magic Towns.

- c) The Permanence process is to evaluate the Localities that are already Magic Towns ; This consists of three subprocesses similar to those of Incorporation.
  - Documentary evaluation. The locality carries 27 documents distributed in 10 requirements, these documents are different from those of Incorporation.
  - Technical visit. It consists of two folders Offer and demand, which allow you to obtain information related to the heritage of the Magic Towns.
  - Behavior tourism, contains the indicators of nine tourist components; Tourist demand, accessibility, receiving community, marketing, regulatory framework, professionalization and certification, security and environment; Which must be captured by the Magic Town.

But in documentary evaluation, the documents that are requested to the Magic Town are changed.

Priority tourist destinations. It is made up of the nine tourist components, which according to the previous analysis, have a classification, as follows:

- Component
  - Subcomponent (eg Tourism Vocation)
    - Factor (eg Tourist Resources)
      - Indicator (Eg Existence of Tourist Inventory)

In figure 5.4, a graphical representation of the modules is given.

**Figure 5.4** Information system modules

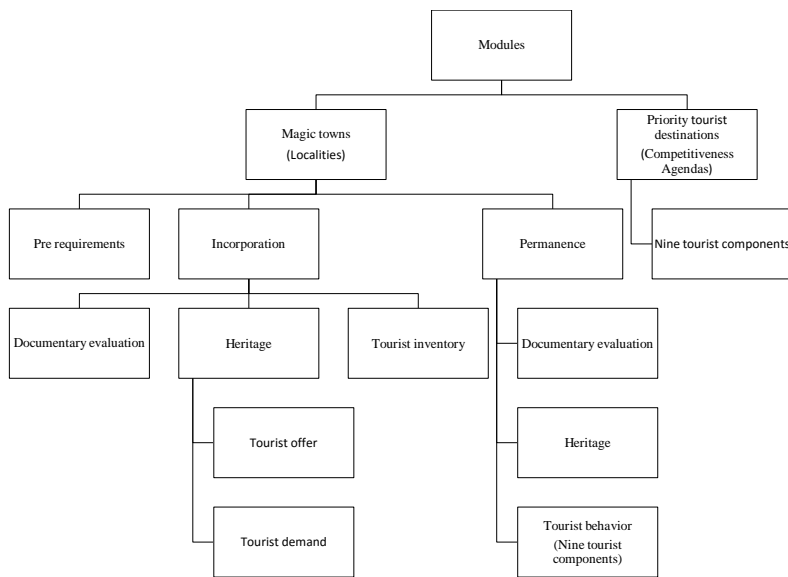


Figure 5.5 presents requirements of the system for registration of applicants, where the person in charge of tourism in the locality must register their data, in order to access the system. Then Adminstor\_1 validates the information and proceeds to authorize the applicant's data.

**Figure 5.5** Use case of Applicant registration. Own elaboration Project 242853

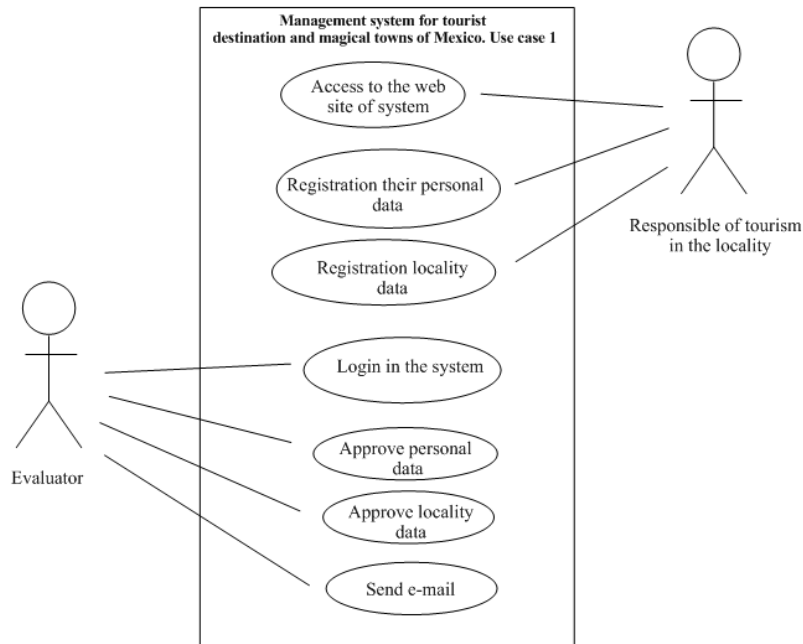


Figure 5.6 shows the activity diagram of the applicants' register, where the behavior of the information flow between the user and the administrator, both users of the system, is observed.

**Figure 5.6** Activity diagram, Applicant record. Elaboration Project 242853

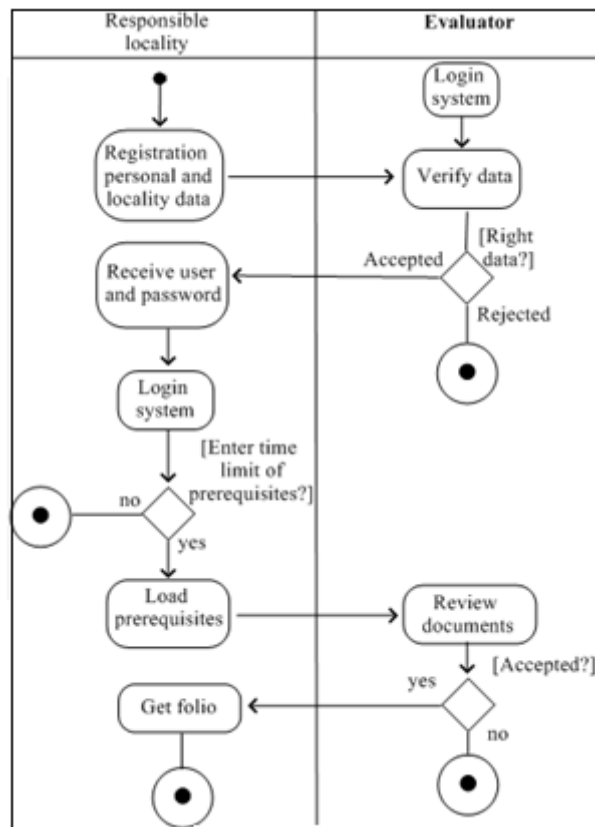


Figure 5.7 presents a table of the system; which represents one of the classifications of the indicators, which for the analysis was called Factor. The script for creating the table is also displayed.

**Figure 5.7** SCIPN table and script. Elaboration Project 242853

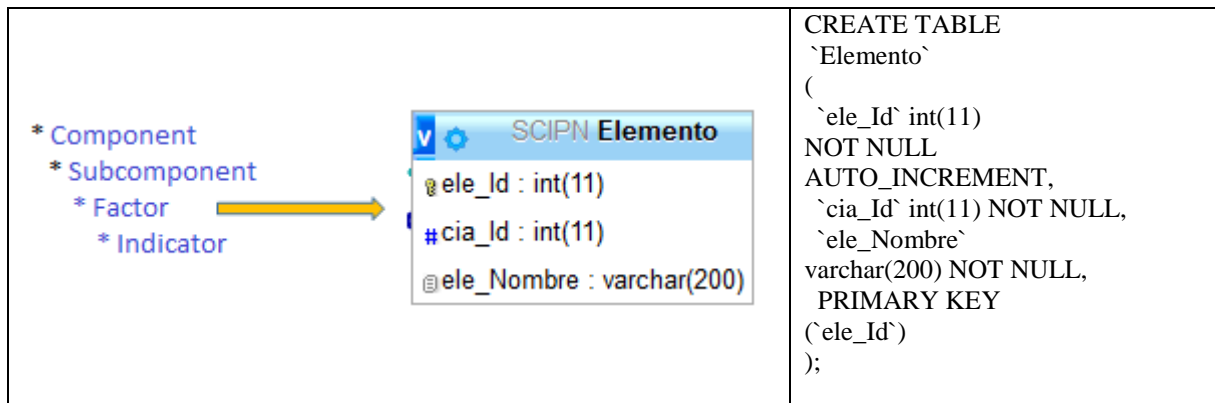
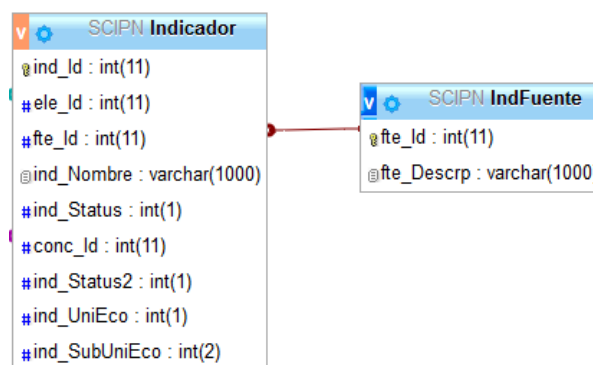


Figure 5.8 shows the ratio of N to 1 between the Indicator and IndFuente table. A source may be related to 1 or more indicators, but an indicator can only have one source.

**Figure 5.8** Relationship N to 1. Elaboration Project 242853



## Results

In this section, the non-functional requirements and some graphic interfaces of the system are presented.

### System architecture

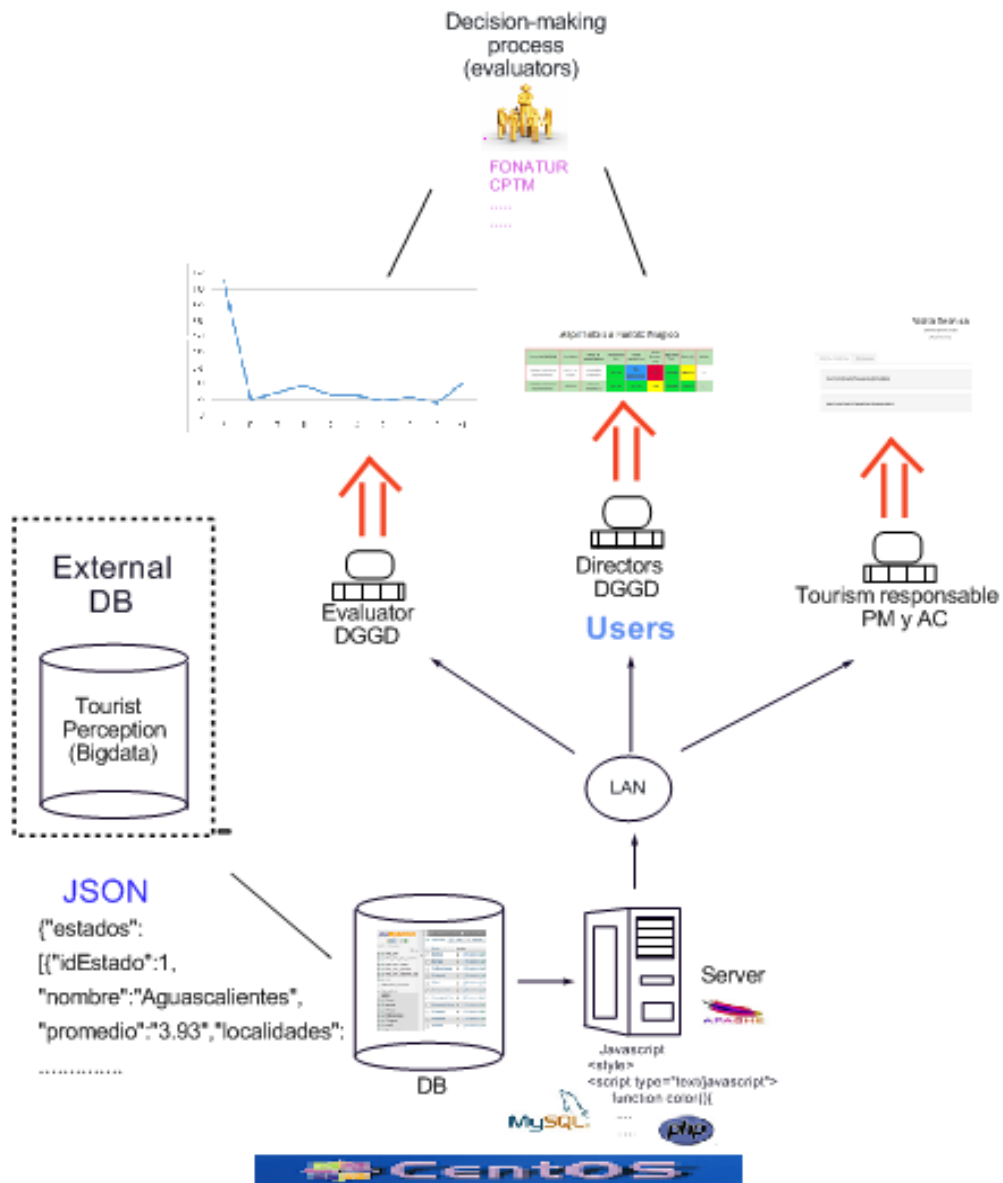
The requirements for the installation and execution of the system are:

- MySQL (open source) as Database Management System (SMBDR).
- Apache2 (open source) as a Web server.
- PHP 7 as language (open source), for Web development
- Linux type OS, CentOS or Ubuntu.
- HTML5
- To use HTML5, you must meet the requirements of the gob.mx Styles Guide, based on the Bootstrap Framework.

Figure 5.9 shows the architecture of the system, where hardware and software requirements are presented. The system takes an evaluation of an external database that stores the perception of the tourist (Bigdata), value that is required in a part of the evaluation of the magical towns.



Figure 5.9 System architecture. Own elaboration Project 242853



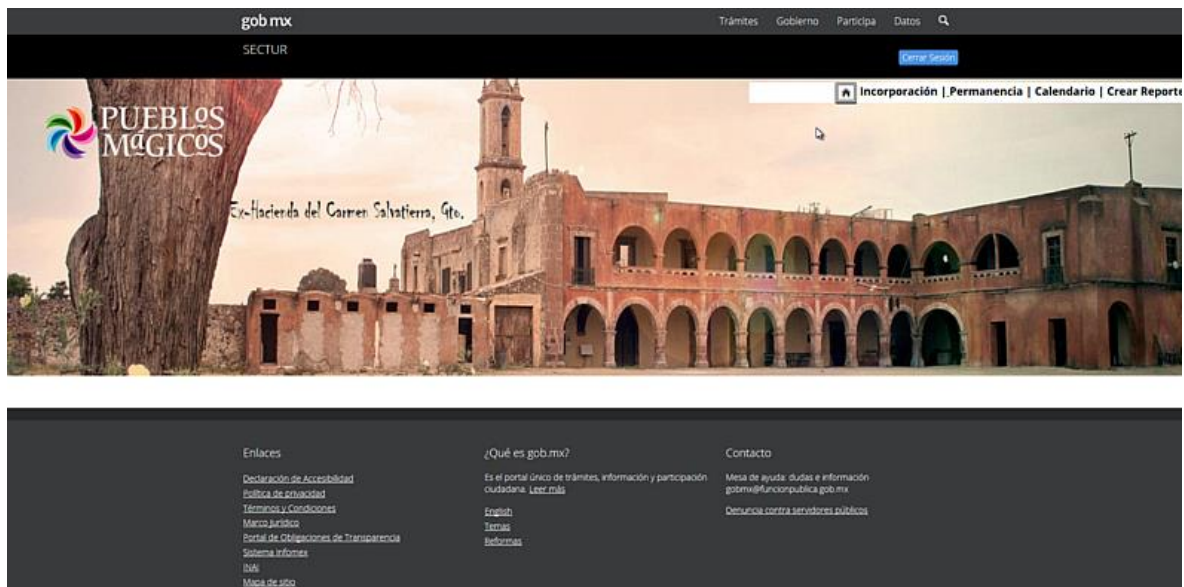
The following interfaces represent the system boot screen and user validation. Figure 5.10 represents the system startup interface, which can be displayed by the general public, but only with valid user and password is access.

**Figure 5.10** Home screen. Elaboration Project 242853



The administrator must enter the system with his user and password and then the screen of figure 5.11 appears.

**Figure 5.11** Administrator Screen. Elaboration Project 242853



The administrator proceeds to capture the start and end dates for the Incorporation and Permanence processes of the participating towns or magical Towns, in addition to the subprocesses that comprise them. As well as the date for priority tourist destinations (CA) to capture information related to the nine tourism components. This screen allows you to save the dates and display them on another screen. (See figure 5.12).

**Figure 5.12** Dates of the convocation Magic Towns and Competitiveness Agendas. Elaboration Project 242853

Proceso	Fecha de Inicio	Descripción	Fecha de Fin
Proceso de Incorporación	16/01/2017	JLKGH	31/01/2017
Proceso de Permanencia	16/01/2017	Captura	31/01/2017
Proceso de Agenda de Competitividad	16/01/2017	Captura	31/01/2017

In the next screen, the call with the bases for the Magic Towns Program is shown on the left side. On the right are reflected the dates of the Incorporation and / or Permanence processes, previously captured by the administrator, (see figure 5.13).

**Figure 5.13** Calling interface for Magic Towns Program and dates of the period. Elaboration Project 242853

PROCESO	SUB-PROCESO	FECHA INICIO	FECHA FIN
Proceso de Incorporación	Pre-registro	16/01/2017	28/01/2017
Proceso de Incorporación	Inscripción	28/01/2017	27/02/2017
Proceso de Incorporación	Oferta Técnica	27/02/2017	27/02/2017
Proceso de Incorporación	Plan de Turismo	27/02/2017	27/02/2017
Proceso de Incorporación	Big Data	27/02/2017	27/02/2017

The person in charge of tourism of the locality or magic town enters the system to capture personal data and of the locality that represents (see figure 5.14). Also, this screen is used to capture the head of tourism of the state that is going to take charge of capturing the information of the Competitiveness Agenda.

**Figure 5.15** Screen of capture of information by the person in charge of the locality. Elaboration Project 242853

The screenshot shows a web form titled 'Responsable del Pueblo Mágico'. At the top, there is a navigation bar with 'gob.mx' and links for 'Trámites', 'Gobierno', 'Participa', and 'Datos'. Below the navigation bar is the 'PUEBLOS MÁGICOS' logo and a 'Convocatoria' link. The main heading is 'Responsable del Pueblo Mágico'. A red note states: 'Todos los campos Marcados con \* son Obligatorios'. The form is divided into two sections: 'Pueblo Mágico' and 'Responsable'. In the 'Pueblo Mágico' section, there are four dropdown menus: 'Seleccione el estado:' (Elige tu estado), 'Seleccione el municipio:' (Elige tu municipio), 'Seleccione la localidad aspirante:' (Elige tu localidad), and 'Seleccione su proceso:' (Incorporación). In the 'Responsable' section, there are three text input fields: 'Nombre(s):' (Nombre), 'Apellido Paterno:' (Apellido Paterno), and 'Apellido Materno:' (Apellido Materno). Below these are three more text input fields: 'Teléfono celular:', 'Teléfono oficina:', and 'Ext:'.

In the screen of figure 5.15, the evaluator logs in; who is in charge of validating the information that registers the person in charge of the locality or magic town from its registration to the Incorporation and / or permanence processes.

**Figure 5.16** Access to the system by the evaluator. Elaboration Project 242853

The screenshot shows the landing page for the 'Programa de Incorporación y Permanencia a Pueblos Mágicos'. The top navigation bar includes 'gob.mx', 'Trámites', 'Gobierno', 'Participa', and 'de este sitio?'. Below the navigation bar is a banner image featuring a hot air balloon over a mountain range. The banner includes the 'PUEBLOS MÁGICOS' logo and the text 'Vuelo en Globo Tequisquiapan, Gro.'. Below the banner is the title 'Programa de Incorporación y Permanencia a Pueblos Mágicos'. In the upper right corner, there is a menu with options: 'Registro', 'Incorporación', and 'Permanencia'. A text box at the bottom of the page contains the following text: 'Un Pueblo Mágico es una localidad que tiene atributos simbólicos, leyendas, historia, hechos trascendentes, cotidianidad, en fin magia que te emanan en cada una de sus manifestaciones socio-culturales, y que significan hoy en día una gran oportunidad para el aprovechamiento turístico.'

In the interface of figure 5.16, the evaluator chooses the Registry option in the upper right menu. Then, the screen of figure 5.17 appears, where it selects the option Responsible Validation MP, to validate data of the person in charge of the Locality; Or choose the option Responsible Responsibility of Agendas, if you must validate the data of the person responsible for the priority tourist destination (Competitiveness Agenda).

**Figure 5.17** Menu to validate users. Elaboration Project 242853



Next, the interface of figure 5.18 is shown, where the evaluator can see registered users with their data to proceed to verify them and give them the go-ahead when activating the check box.

**Figure 5.18** Validate PM (magic towns ) or AC (competitiveness agenda). Elaboration Project 242853



When the evaluator proceeds to validate, the person in charge of the Locality or Competitiveness Agenda, the person in charge of the Locality or Competitiveness Agenda receives an email with user data and password so that he can enter the system (see screen of Figure 5.19).

**Figure 5.19** Receiving e-mail with username and password. Elaboration Project 242853



## Conclusions

The analysis of various sources of information, the Magic Towns Program (PM), the manual of indicators, the competitiveness agendas, alignment with the PND and the PST among other sources, is represented in the technological innovation that results in a system of information. Coya purpose is to support the Secretariat of Tourism (Sectur), in the processes of Incorporation and Permanence of the Magic Towns Program. In addition to incorporating a module where those responsible for the priority tourist destinations can enter destination information, through tourist components tourism supply, tourist demand, regulatory framework, accessibility, marketing, receiving community, security and environment; Which contain indicators to observe sustainability and competitiveness; As well as, progress in tourism development.

Through the results of the MPs, the filters of the SWOT elements with respect to the tour components and various reports, is intended to be useful in decision making for the various actors of the Sectur.

## References

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