

Tourism In Chimborazo: Design Of A Mobile Application

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Abstract

Mobile applications have drastically changed the behavior of tourists, interaction and communication in real time are the new demands of the market, therefore the objective of this study was to provide information to tourists about the routes of the province of Chimborazo, for which a mobile application was designed, which responds to the existing problem of the lack of a mobile application for the identification of tourist routes in the province of Chimborazo. The research is of docum¹entary type that helped to review the state of the art, the method used for its analysis is deductive and inductive to synthesize and delimit the problem. The Design Thinking methodology was used for the design and prototyping of the application interface, resulting in a design focused on the user's requirements, meeting the characteristics of interaction, functionality, versatility and innovation. The user test identified the interaction and usability of the application as 80% favorable, the harmony of the elements and representation of the icons as 80% favorable and the legibility of the texts as 60% acceptable. It was concluded the importance of the design of a mobile application that provides a solution to the needs of potential tourists based on the characteristics of the user suitable for a strategic promotion of the area, with a view to positioning and economic repotentialiation.

Keywords: *Interaction Design, Design Thinking, Usability, User Interface.*

INTRODUCTION.

With the generational change and the transfer and evolution of technology, globalization allows economic, cultural, political, social and technological aspects to be integrated to provide benefits to society, helping to solve the problems that may arise. It is clear that technology is a tool in the development of society that helps to manage different types of information and to organize it. This same advance has triggered that mobile devices are considered the most accessible means to develop activities in a dynamic and functional way with the use of the tools they offer, i.e. mobile applications. One of the strategies in the competitive environment of the business sector is the use of mobile applications to generate direct communication channels with customers and to make available the services they provide and the users need. Technological advances have generated the creation of devices with tools that facilitate the transmission of information providing a unique user experience and ensuring a quality of life in relation to the services offered for consumption.

Tourism is the fastest growing sector in Ecuador, located in the third place that contributes to the GDP of Ecuador, the biodiversity of the regions and proximity provides potential

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tourists with first-hand experiences and in a short time. Comparing Ecuador with the development of mobile applications that encourage tourism is in an average, here is the opportunity to contribute to the development and encourage tourism. When analyzing the possible reasons why tourism in Chimborazo has not developed consistently is the lack of information and organization in the dissemination of existing sites and the timely updating of complementary services in tourist routes. Since the Nevado Chimborazo was declared in 2016 as the highest point from the center of the earth beating Everest, the tourist influx has increased considerably generating the need for the design of an application to help the location of tourists and the services provided by the Province, directly or indirectly influencing each of the inhabitants in the economic activity that they undertake.

Due to the problem of the lack of a mobile application, it is necessary to design a mobile application for the identification of the tourist routes of the Province of Chimborazo, thus allowing the technological inclusion in the tourism sector and thus consolidate the existing communication between potential tourists and the development of the routes and complementary services, contributing directly and indirectly to the economy of the locality. The application of new technologies has modified people's lifestyles, with great changes in communication from the creation of the telegraph to the use of the Internet. Motorola in 1973 launched the first cellular phone. Another breakthrough " the evolution to smart phones capable of supporting software. These applications have diversified their focus from entertainment, communication, providing users with real-time information" (Peñuela, 2016, p. 137).

The wide range of smart mobile devices that the population has access to and the globalization in communication through digital media, making these devices the main means of information exchange, i.e. service provider (World Health Organization, 2016). According to the study conducted by the Graduate School of Business Administration, trends in the use of mobile applications have increased considerably in Latin America. Other trends that have been gaining ground in Ecuador and are incorporated into the ranking will be in health, tourism, commerce, vehicle sales, re-potentiating the communication chain service providers and consumers (Emprendimientos, 2017).

In a study conducted by Masaquiza (2015), entitled *Aplicaciones móviles para la promoción turística de la parroquia Salasaka, cantón san pedro de Pelileo provincia de Tungurahua*, presents the problem of not having a tourism observation process through a mobile application. The objective is to determine the influence of mobile applications for the promotion of tourism in the Salasaka Parish, San Pedro de Pelileo Canton, Tungurahua Province.

Hernandez and Ramirez, (2017) in their degree thesis *Analysis and development of parameters and criteria in the implementation of mobile applications for tourist information in the city of Guayaquil*, mentions that the problem is based on answering the following question *What are the parameters and criteria most valued by tourists in mobile applications for tourist information in the city of Guayaquil, for which the development of a proposal based on criteria that includes an assessment of the needs of potential tourists and include it in the design of the application is proposed.*

From the results obtained Hernandez and Ramirez, (2017) conclude the importance for the tourist to obtain tourist information in a fast, varied, optimal and reliable way. In addition, mobile tourism has mostly influenced the establishments belonging to the tourist plant, thus creating their own applications, which exclusively include information on the services provided by these establishments, becoming an application to help the tourist establishment but not to help the tourist, who needs the relationship of the entire tourist plant for optimal development in the destination Guayaquil (Hernandez and Ramirez, 2017).

Several definitions are considered for the development of the research where mobile applications considered small computer programs that are designed and compatible to run on smartphones, Tablet, computers among others. Big brands have platforms such as Apple App Store, Google Play, Windows Store, to market their mobile applications (Jimenez and Garcia, 2015). Usability is the attribute of a product that gives quality to it refers to the ease of use. This feature is aimed at a specific user and its functionality responds to the initial objective for which it was designed (Hassan, 2015).

Utility are the attributes that share a mutual relationship between usability and usefulness. Usability defines the degree to which the user takes advantage or exploits the usefulness of a product, the time of use in relation to the benefit that using it justifies the necessary effort. Montero et al. (2018) defines: The area of human-computer interaction (HCI) can provide theoretical support and methodologies for the appropriate design of e-learning systems where the factors of communication, consistency, flexibility, feedback, help or minimization of errors take precedence and thus make the interaction of students with the system as natural and intuitive as possible (para. 4).

Information architecture is known as the ability to organize information for a better understanding by users, as defined by Wurmanen (1975) as: "The study of the organization of information with the aim of enabling the user to find his way of navigation to knowledge and understanding of information" (p. 13). The evolution of technologies has had a positive impact on tourism and its development and adaptability to change. Therefore, at the beginning we talked about tourism 1.0 (traditional) where people were connected to the network and tourism providers offered information, later Web 2.0 gave the opportunity for tourists to interact with digital media in real time, being a boom in social networks, being called tourism 2.0 (Musi, 2015).

Finally, collaborative tourism 3.0 is the evolution of a new era in the culture of interaction, decision making from applications based on the opinions of other users is the starting point for the traveler 3.0, he can book his stay, his means of transportation and finally share his experience through photos and videos in real time from the beginning of the trip until when it culminates (Sotelo, 2015).

METHODOLOGY.

The Design Thinking methodology was used, each of the steps focused on satisfying the user's requirements, identifying the characteristics of the user experience, allowing to obtain a product according to solve the lack of such information. In the empathizing stage, the needs of the potential user were identified, working from the brief of the brand and the application, where the brand values, characteristics for the management of the visual identity are specified. Identifying the direct and indirect competition that the product has, user profile, typography, chromatic and composition elements according to the purpose, relevant data for the development of the application being that the typological features of the brand will allow to obtain an adequate graphic line in the whole composition.

In the definition stage, an OTI matrix was proposed, which is a tool that allows specifying the objectives, the main and secondary functional tasks and the elements that are present in the interface, facilitating the development, design and interaction of the application. In addition, accompanied by a Bechmarketing Report that analyzes the internal characteristics, advantages and disadvantages, the competition and its functionality, considered a management tool for the comparison of internal aspects and their relationship evidencing the best practices of an area of interest such as brand, product or service.

In Idear begins the process of generating ideas, it is important to consider all proposals eliminating value judgments with expansive thinking. A navigation map was planned

where you can identify the main and secondary screens with their order of interaction, first sketches of the elements that make up the mobile application as the composition of the Layout between typography, shapes, images, iconemes and texts, the brand was designed based on the needs of the product in relation to the characteristics of the user profile.

In the prototyping stage, the design of the proposed ideas is reached, the construction of the prototypes allows visualizing the possible solutions, by identifying the elements that must be improved for a satisfactory result. The wireframing was designed with the purpose of identifying the elements that will be part of the product, the relationship between aesthetics, functionality and interaction between the panels, with the moodboard approach as inspiration where the color palette, reference images, iconemes, typographic fonts that are suitable for the composition in the grid were identified. Once the elements were identified, the prototype was made with the help of Adobe AI and XD to test the interactivity and identify possible errors.

At this stage the prototypes are tested with potential users of the interface, this phase allows identifying possible solutions to the timely detection of errors in the system, allowing feedback on significant improvements of possible shortcomings (Apat, 2017). In the verification of the prototype, a user test was performed with the purpose of detecting possible errors in the interaction between the application and the user.

RESULTS AND DISCUSSION

Empatiza

Using the technique of interviewing potential tourism users, the following questions were asked as part of the Briefing.

Figure 1. Brand briefing

<p>Name / Route</p> <p>Characteristics / Organic features, color, shapes</p> <p>Service / Tourist route recognition</p> <p>Keywords / Agility, accuracy, ease, functionality.</p> <p>Values / Confidence in the service, accuracy, timeliness, functionality.</p> <p>Competition / Julio Verne, Anden Aventura, Rio Turis, Chimborazo Tours, Nómada Travel.</p> <p>Competitiveness / Agile, accurate and timely information.</p>

Source: Own elaboration

Figure 2. Application brief

<p>App features / Interactive, simple icons, humanistic typography.</p> <p>Content / Georeferencing, galleries, routes, operators.</p> <p>Functionalities / Information, communication, operators, connection with social networks.</p>
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Source: Own elaboration

Define

Table 1. OTI Matrix

OBJECTIVES TASKS	FUNCTIONALITIES INTERFACE	DISPLAY
Register user	Registration	Registration panel
Locate Tourist	Routes Search	Map
Report route	Consult routes	Routes and gallery screen
Information about the place	More information	Information about each tourist route
Information on the operators that can provide the service	Navigate routes	Information on the services provided by the operator
Prices	Consult prices	Price button
Contact	Information	Contact Information

Source: Own elaboration

Table 2. Bechmarking Report

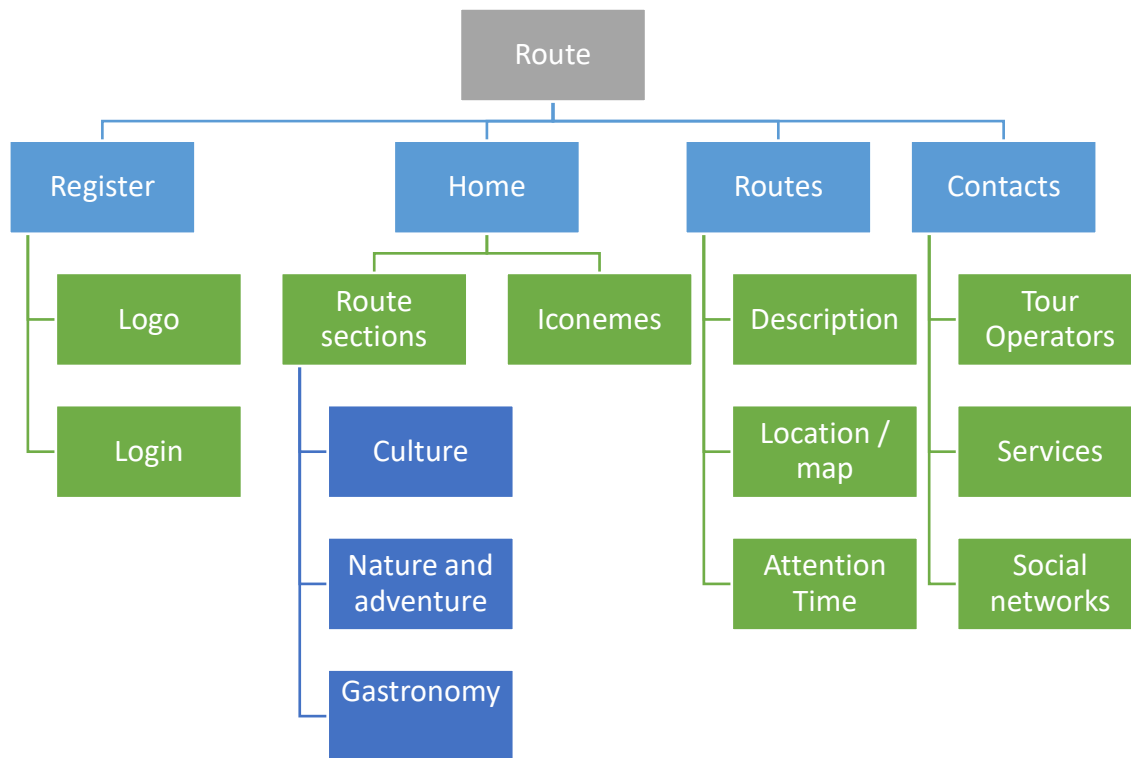
TYPE	DEFINITION	ADVANTAGES	DISADVANTAGES
Internal	Organization of tourist routes according to the classification of MINTUR sites	Shorter search time, interactivity, functionality and agility	Similar names
Competitive	Being a new application in the market, with a different approach, not so much commercial but of service. Direct competition in the local area is not registered. Expanding the area of scope Cuenca in April 2019 launches its VISIT CUENCA application to the market.	Complete information that meets users' needs.	Distances
Functional	The Visit Cuenca application, in its interface has the classification of recommended routes, events, hotels, restaurants, travel agencies, bars discos, general services and the possibility of contacting certified tour guides.	Functional and interactive	Poor image quality

Source: Own elaboration

Idea

In the planning of the mobile application, the interaction channels are analyzed, that is to say; the flow of information, determining the screens and their connections with the submenus with the hierarchy level of each one of them.

Figure 3. Navigation map



Source: Own elaboration

Sketches

- Branding

In the design of the mobile application for the recognition of the tourist routes of the province of Chimborazo, it was necessary to create a visual identifier, for this an analysis of the ROUTE phonotype was made with a view to an internationalization and the name has greater positioning, being that the English language is spoken by most of the world.

In the sketching process, from the brief of the brand, a relationship with the organic features of nature is made, so the design is based on calligraphic features, curvilinear shapes, thin and thick counterforms for greater visual stain in the composition.

In this phase of the process of creating a visual identifier, to make the modular composition, the "X" factor is applied in the proportion of the elements, both horizontally and vertically, being 8 x 3.5 x.

Figure 4. Brand creation process

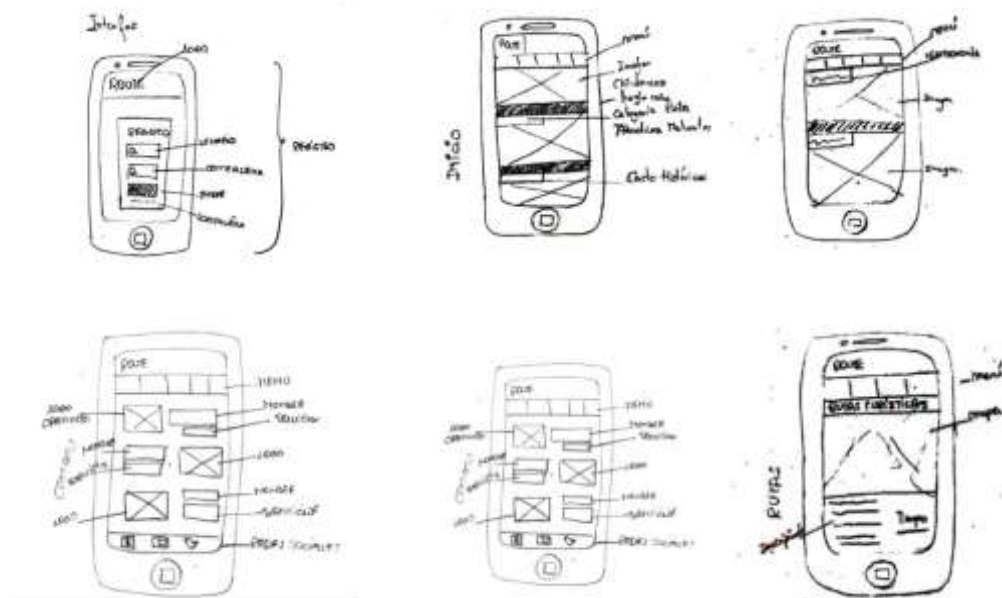


Source: Own elaboration

Interface

In the IDEA stage of the Design Thinking methodology, the interface of the mobile application is sketched, considering the visual, aesthetic and functional elements that should respond to its design.

Figure 5. Interface sketch



Source: Own elaboration

Prototipo

Wireframing

In this stage, the ideas are translated into a prototype of real size and specifications. Based on the navigation map, each screen of the graphic interface is designed and the interaction cycles between screens, icons and images are carried out.

Figure 6. Wireframing



Source: Own elaboration

Moodboard

For the moodboard design of the mobile application, conceptual, visual and relational elements were considered according to the visual identity of the brand. The chromatic used responds to the harmony of analogies, cold shades of green color connoting nature. The typography is dry stick for easy reading, the elements are bitmapped images that identify the tourist sites.

Figure 7. Moodboard

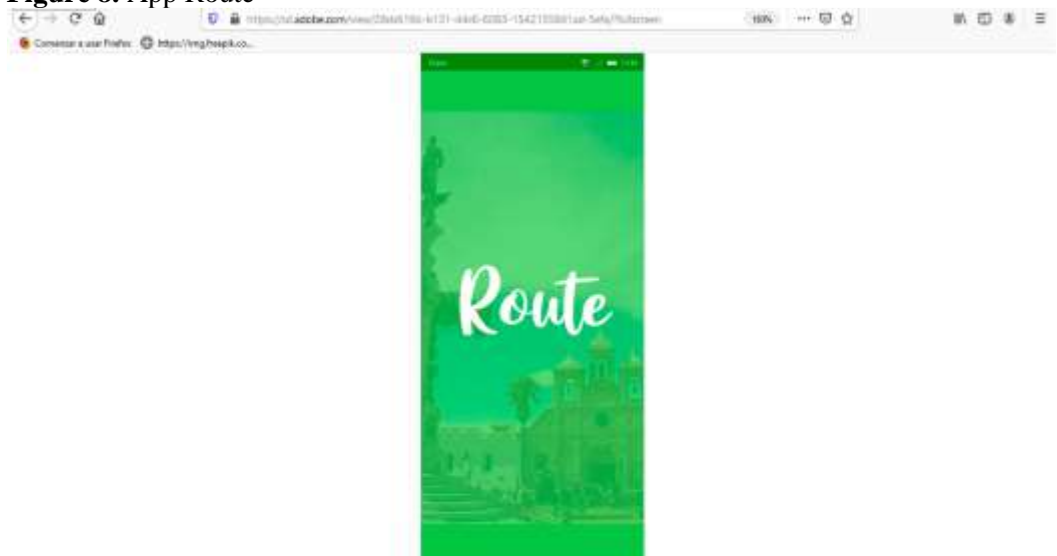


Source: Own elaboration

Final design

The mobile application designed with a focus on strengthening tourism in the province of Chimborazo, which contains tourist routes designed according to the requirements of potential users and the classification of tourist sites according to categories, the following is the link: <https://xd.adobe.com/view/28cb616b-b131-44c6-6083-1542155841ad-5efa/>

Figure 8. App Route



Source: Own elaboration

Results Test Report

- Summary

The mobile tourism application aims to help identify the tourist routes of the Province of Chimborazo to potential domestic and foreign users, with this for the design of the same has a structure based on the characteristics of interactivity and readability. All the tools will be 3 clicks away from the user, the structure will be user friendly, the pictogram designs will maintain a coherent graphic line, both in shapes and colors, responding to the user's

preferences. Initially, the application will be totally free and the operating costs will be compensated with the online subscription of potential tourists. It will incorporate a geo-referencing system so that the user will know the route of the selected tourist route, with the description, images, opening hours, cost and contact information of the site. Regarding the behavioral characteristics of the potential consumer, the forms will be straight in the design, the chromatics in green tones generating a harmony according to analogous colors that represent nature.

Description of the test

The user test allows to identify the usability and interaction problems of the application with the user, with the purpose of correcting them. The objectives to be achieved, the user profile, the main and secondary functionalities are proposed.

Test objectives

- Identify possible usability errors of the tourism mobile application.
- Rectify the possible interaction errors of the application.
- Fulfill the activities proposed to the user in front of the mobile application.

User profile

Table 3. User profile

Gender	Female Male
Age	18 to 50 years old
Location	Chimborazo
Social Stratum	B (Middle class)
Activity	Public or private area
Preferences	Extroverted, hardworking, functional, technological, enjoys social networks and their mobile applications for exercise, health tips, food.
Needs	Phone resource that allows him to have information of tourist places to visit on his vacations.

Source: Own elaboration

Table 4. Functionalities

Main functionalities	Secondary Functionalities
Tourist route scheme	Description of the tourist site
Site identification	Hours of operation
Georeferencing of the route	Cost
	Contacts

Source: Own elaboration

Table 5. Tasks

Tasks	Excellent	Acceptable	Unacceptable
Login / Registration	< 3 minutes	3 to 5 minutes	> 3 minutes
Home Screen Navigation	< 1 minute	1 to 3 minutes	> 3 minutes
Identify tourist route	< 4 minutes	4 to 6 minutes	> 6 minutes
Georeferencing the route	< 3 minutes	3 to 5 minutes	> 3 minutes
Interaction between sites belonging to the routes	< 3 minutes	3 to 5 minutes	> 3 minutes

Source: Own elaboration

Based on the results of the user test, 80% said that it is necessary to create a mobile application aimed at identifying the tourist routes of the province of Chimborazo. 100% of

the users mentioned the importance of the registration screen and that the compositional elements are in accordance with the harmony of the graphic elements used in the design. 80% of the icons are satisfactorily recognized with the routes they represent. The interactivity and the graphic interface obtained an excellent rating (60%).

CONCLUSIONS.

The users of multiplatform digital products share specific characteristics, such as being informed by these media, friendly environments, are propositive, enjoy learning and adapt to new scenarios, characteristics that frame the user profile, for this a study is conducted where the behavior is determined, consumption preferences that facilitates the design of a friendly environment and allows an intuitive interaction, helping to meet the specific objective of identifying user needs to meet them in the interface.

By identifying the places in the Province of Chimborazo with the greatest cultural and historical attraction, it allows a coherent planning of the routes, by dividing them with the classification of Tourist Inventories of the MINTUR they achieve an association and greater understanding of the information shown to the users, fulfilling the specific objective of knowing the tourist routes of Chimborazo to involve them in the user's interface.

The importance of an adequate methodology allows achieving a product aligned to the user's needs, Design Thinking responds satisfactorily from its initial phase to the testing of the usability and navigability of the product, focused on strengthening the local economy, fulfilling the specific objective of designing a mobile application using the Design Thinking methodology for the knowledge of the tourist routes of Chimborazo in the user interface. In addition, this study is the baseline for future research, being versatile for changes according to customer requirements and the use of new information platforms.

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