Cultural Heritage and User Interface Design

Narges Tavakoli

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CULTURAL HERITAGE AND USER INTERFACE DESIGN

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Fine Arts

in

The School of Art

by
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B.S., University of Tehran, 2011
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ABSTRACT

This study centers around localizing the user interface and experience design of digital products considering the culture of the audience and their visual heritage. Even though it seems the internet has made the distance between developing and advanced countries less than before, there are still fundamental differences between people’s beliefs and expectations. As a graphic designer who is based in The United States and is from Iran, I noticed the digital products (web, mobile applications) produced in Iran disregard the Iranian’s specific needs and emulate western patterns. So, I researched the dissimilarities between the two countries by using Greet Hofstede’s cultural model and its six dimensions. I also used previous studies to show how these indicators can be revealed on the user interface and experience design of a product. Based on the results and after careful investigations of the already existing apps in the market, I designed a Persian calendar application for Iranians inside and outside of the country (users of this app can be people from Afghanistan too). The user interface and experience design of this app implicate almost all of the cultural indicators of Iran such as high-power distance, collectivism, femininity, high uncertainty avoidance, and short-term orientation. Additionally, I aimed to retrieve Iran’s visual heritage by using it in a more modern, simple style in my app design. I was inspired by old Islamic astronomy and astrology books to create my design system and illustrations for the app. I intend to code the app and release it to the market as well as conducting more usability tests. This app is a successful example of localization and a replacement for the phones' default calendar app because of its comprehensive features including Persian and Gregorian dates, scheduling, list of holidays, praying times, date and time converter, setting reminders (e.g. birthday, auto payments, holidays), changing the language, and syncing with other calendars like Google and Outlook. These features are concluded by surveying the target audience through a questionnaire. Additional items were also developed to showcase and augment the design and usability of the app. These include a wall calendar, twelve postcards for each month, and buttons that users can order online through the application’s social pages like Instagram.

Keywords: User interface design, user experience design, culture, Persian calendar, mobile application.
1. INTRODUCTION

1.1. Research Motivation

The number of people in different geographical locations having access to all types of technology is increasing due to the Internet and digital innovations. The impact that technology and culture have on each other is unquestionable. This mutual relationship has been studied broadly. The Internet, smartphones, home gadgets such as TV, security equipment, vacuum cleaners, etc. are examples of modern technologies and digital advancements that have influenced our life. As a result, local cultures around the world have introduced new, modern lifestyle concepts such as e-commerce, e-learning, e-marketing, and information security. Local cultures are influencing various aspects of these new technologies as well. It is this trend that has become the subject of my research. The acceptance and integration of emerging technology in different countries depend on the perceptions and expectations of users with different cultural backgrounds. When confronting the technology, the primary point of interaction is user interface design (UID) which is crucially important in the success of a digital product. An interface that is well designed can accomplish trust, satisfaction, and an increase in the rate of return users. In order to achieve these outcomes, the role of culture should be considered in preferences and perceptions of the target end-users.

There are numerous models of culture that are utilized by scientists and practitioners which can assist in studying and designing user interfaces across cultural boundaries.

Geert Hofstede’s model is one of the most broadly used models. It contains six cultural dimensions which are Power Distance (PD), Individualism vs. Collectivism, Masculinity vs. Femininity, Uncertainty Avoidance (UA), Long vs. Short Term Orientations (LTO/STO), and Indulgence. Knowledge of cultural models for developments related to user preferences is exceptionally useful in controlling the design of a user interface to better meet the cultural preferences of the target audience. Previous studies show how different cultural dimensions have impacts on various interface designs and how visual elements such as typography, color, images/graphics, icon, page layout (information organization and navigation), language, and metaphor are important factors to be considered while designing interfaces either internationally

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or for a cultural group. However, there is a lack of investigative studies that consider the requirements to assist with designing for non-western cultures like the Middle East and Central Asia. For this reason, my thesis study has focused on cultural factors affecting user interface design in Iran, a country located in the Middle East.

Over the past two decades, mobile and web app production has increased significantly in Iran. In fact, the sanctions imposed on Iran by global governments have forced designers and programmers in the country to create different digital products. However, they begin by observing existing apps in western countries like America then try to emulate the existing design in an effort to enhance people’s life in Iran. It is clear they do not consider the huge cultural difference between these two countries while creating their own digital products. As a result, the interface of most applications in Iran looks the same as their western counterparts. This study will demonstrate the difference between the cultural indicators of Iran and the United States and how these dissimilarities can result in improved user interface design for applications and websites in the future.

To study the cultural dissimilarities between Iran and the United States, the Hofstede cultural model, and its six dimensions that influence user interface design in Iran have been studied in my thesis. With this knowledge, I created a Persian calendar application for iOS platforms. Persian calendar officially known as Jalali calendar (also known as Hijri Shamsi, Iranian, etc.) is a solar calendar that has twelve months with 31 days for the first six months followed by five 30-day months, and a final 29- or 28-day month. Iran and Afghanistan are the two countries that use the Jalali system today. Persian calendar origins the year when the prophet of Islam moved to the city of Medina to establish his center to disseminate Islam. It begins on the spring equinox on about March 21, unlike the Gregorian calendar which begins with New Year's Day in January. Also, Norouz (the Persian new year) is celebrated based on the rotation of the earth around the sun and it happens when the earth makes a complete circle around the sun (which varies based on the time zone you live in). However, the Gregorian new year is celebrated based on the rotation of the earth around itself and is celebrated at 12:00 AM regardless of the location.

There are two main reasons for designing a Persian calendar app. First, the default calendar applications on most mobiles including iPhone cannot be switched to the Persian calendar and so

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Iranian users have to install other applications in order to access this information. Second, the user interface and experience (UI/UX) design of existing Persian calendar apps in the market have not been designed based on Iranian needs and comprehension and do not communicate the Iranian cultural indicators in a presentable way. My calendar app is being used as a case study showing how local designers can improve the user interface and experience of their products by considering the users’ cultural prospects and including references to the visual heritage of their society. The audience for this calendar app is the Iranian community whether they are living in Iran or other western countries (using a Gregorian calendar). Iranians living in Iran who work with companies in America or Europe with a Gregorian calendar need to know about the Gregorian dates and holidays and Iranians living in those countries need to know about the dates and holidays in Iran. Also, people from Afghanistan can be the users of this app.

1.2. Research Questions and Goals

In this research, the following two main questions were proposed:

- What cultural characteristics based on the Hofstede model can be considered in user experience and interface design of applications targeted for Iranian users?
- What design suggestions can be made to improve the interface of a Persian calendar app considering the cultural heritage of Iran?

1.3. Literature Review

Various studies have been conducted to research the relationship between user interface design and culture using different methods and theories. These studies include website and mobile application interface design but they have mainly focused on web design. There are numerous models of cultural studies that are utilized by scientists and practitioners which can help in identifying and designing user interfaces. The most popular theory that has been used extensively to explore different aspects of culture and user interface design since 1991 is Hofstede model.3 Despite the criticism and shortcomings expressed by researchers, Geert Hofstede’s model is one of the most broadly used. It contains the six cultural dimensions explained earlier which assigns a score to each country for each dimension. This model has been created for use in the organizational

behavior area but since it has been open-source⁴ and has a simple structure, it has been widely used in other areas such as human-computer interaction. Aaron Marcus⁵, an American user-interface and information-visualization designer has suggested a model that matches user interface components with cultural dimensions.⁶

Considering the cultural studies of user interface design and human-computer interaction in general, it has been discovered that some cultures (e.g., West Asian countries such as Iran) have been overlooked. There is only one study that has investigated the impact of Iranian culture on the design of Iranian university websites. Maryamossadat Mousavi & Datis Khajeheian (2012) have studied possible ways to improve the websites by a culturally compatible design. Also, Hana Ghazy A. Almakky⁷ (2017) researched different ways to accommodate Facebook User Interface Design web apps to the Saudi Arabian Culture. Additionally, cultural studies of mobile interface design are fewer than web interface design. Kim & Lee ⁸(2005) investigated the UI elements such as icons on mobile phone interfaces which might be influenced by cultural attributes. The icon recognition test has been conducted for 20 icons in different styles (10 subjects from Korea and 10 from America). The test is taken in two countries and the results show a possibility of cultural impact on icon recognition based on the abstraction degree. Also, Aryana and Oritsland⁹ (2010) investigated other mobile HCI researches in order to identify common patterns in approaches, tools, methods, and findings in this area and compare their strengths.

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4. Denoting software for which the original source code is made freely available and may be redistributed and modified.


2. THEORETICAL FOUNDATION

2.1. Human-Computer Interaction (HCI) and User Interface Design (UID)

The Association for Computing Machinery ACM SIGCHI (1992) defines human-computer interaction (HCI) as

“A discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them”.

The user interface is “a set of interactive elements that allow the user to perform a task in a context” User interface design facilitates the interaction process between a computer and its users and may actually comprise the entirety of the user experience.\(^\text{10}\) According to Aaron Marcus

“UIs must be designed for specific user groups, not merely translated and given a superficial “local” appearance for quick export to different markets”.\(^\text{11}\)

2.2. Internationalization and Localization

When it comes to making a more culturally compatible user interface design two concepts come to the mind, internationalization and localization. Internationalization means designing a product in a way that is acceptable for most countries and different cultures around the world by having generic icons, options to change the language, numbers, date formats. On the other hand, localization means designing a product for only a specific cultural group which needs much effort to meticulously study their behaviors, backgrounds, and expectations to reflect them in both content and visual design of the digital product. Previous studies have shown that users interact and find information more effectively in localized websites than websites developed in the US.\(^\text{12}\)

My thesis research has been focused on the localization of a Persian calendar application to make it more harmonious to the Iranian culture.

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\(^{10}\) Almakky, (2017).

\(^{11}\) Marcus, (2003).

\(^{12}\) Almakky, 2017.
2.3. Cultural Difference between Easterners and Westerners

Studies of cultural models like Hofstede also reveal opposite traits and behaviors of eastern and western cultures. Eastern cultures are authoritarian, have hierarchical systems, and greatly value human relationships. They are a collective society meaning their self-image is “We” instead of “I” and they avoid uncertainty. Moreover, people in western countries are more likely to think in a systematic, abstract, and linear way as opposed to eastern countries where people’s thinking style is synthetic, tangible, relying on boundaries and parallel. 13

2.4. Influence of Objective and Subjective Culture on Mobile Applications

Culture can be classified into objective and subjective. Objective culture is the aspect of it that can be easily observed and assess which is represented in terms of text orientation, date and number formats, page layout, color, and language while subjective culture is the psychological feature of a culture such as expectations, principles, values, and patterns of thinking. To study subjective aspects of culture influencing user interface design, most researches in the area of HCI use the Hofstede cultural model and Marcus (2003) suggestions.14

3. IRAN CULTURAL MODEL AND USER INTERFACE DESIGN

3.1. Hofstede cultural Model for Iran

All designed artifacts are cultural objects including apps and websites which are immediately accessible by people all around the world. Thus, localization of user interfaces and the importance of understanding and applying different aspects of a culture (objectively and subjectively) to a digital product becomes a challenge for designers and developers. For example, western websites like FedEx which offer to send packages to Saudi Arabia or Iran showing an Asian woman without an Islamic hijab is not appropriate in Arabic and Iranian culture. Also, a Jordanian website or app in Arabic or Farsi words reading from right to left using the English language layout is frustrating for users. Furthermore, in Iran and some Arab countries, Thursday and Friday are considered to be the end of the week instead of Saturday and Sunday in western countries. These examples indicate that localization goes beyond language and merely translating words to use on a website for a different country.

The Hofstede cultural model was used in my research and the following data were important considerations in my design. Figure 02 displays the six cultural indicator scores for Iran. Each cultural dimension and its meaning for Iranian culture have been discussed and compared to America where most digital products are produced and disperse in Middle East countries including Iran. Additionally, the UI/UX implications of these indicators have been summarized and listed using Mousavi’s (2017) research.

The first cultural Indicator is Power Distance (PD) which is the degree to which less powerful members presume and accept unequal power distribution. Iran receives an intermediate score of 58 on this dimension so it is a hierarchical society where the power only belongs to specific groups and everyone has a place versus America with a scores of 40, where people consider themselves more as equals, power is distributed, and hierarchies are flatter. Implications for app UI/UX design for high PD cultures as Iran include:

1. Highly structured, guided access to information and symmetrical design of the content.
2. Focusing on religions and traditions with frequent use of religious or national symbols.
The second cultural indicator is Individualism vs. Collectivism. This dimension indicates whether or not people’s self-image is defined as “I” or “We”. Individualist societies like America with a very high score of 91, people only take care of themselves and their immediate family. Whereas in Collectivist societies like Iran with a score of 41, people belong in groups and human relations are highly valued. Indicators of High Collectivism in app design are:

1. Using formal terminology in passive voice instead of direct and informal language in an active voice.
2. Insufficient attention to the user preferences in the form and content and inflexible design.

The third cultural indicator is Gender Role (GR)s which is the Femininity vs. Masculinity dimension and refers not to physical differences, but to traditional gender roles. A high score (Masculine) on this dimension like America with a score of 62, indicates it is driven by competition, achievement, and success. In countries like Iran with a low score of 43, the dominant values in society are caring for others where the quality of life is the sign of success, and standing out from the crowd is not admirable. Inferences of Femininity on UI/UX design include:
1. Using feminine colors and attractive design features with a focus on details rather than focusing on functionality and effectiveness of the design.

The fourth cultural indicator is **Uncertainty Avoidance** which denotes the extent to which the members of a culture feel threatened by indistinct or unknown future or situation. The US scores below average, with a low score of 46. Iran scores 59 on this dimension and thus has a high preference for avoiding uncertainty. Implications of this dimension on UX design include:

2. Simple interface design with consistent, familiar, objective and tangible pictures and symbols;
3. Simple navigation system with different forms of clues, color codes, site map, as opposed to a complicated navigation system with limited control that encourages users to surf and browse;
4. Limited amount of information, limited options with little scrolling. Open new tabs and windows, as well as limited options to give feedback.

The fifth cultural indicator is **Long vs. Short Term Orientations (LTO/STO)** which describes how every society has to maintain some links with its own past while dealing with the challenges of the present and future. Normative societies like Iran with a score of 14, and America with a score of 26, which is low on this dimension prefer to maintain traditions and norms while viewing social changes with suspicion. Implications for global UX design for STO cultures include soft focus, with warm, fuzzy images, timeless, classic design, emphasis on people images.

The sixth cultural indicator is **Indulgence** which is defined as the extent to which people try to control their desires and impulses, based on the way they were raised. Cultures like America with a score of 68, are described as Indulgent and countries like Iran with a score of 40, considered as Restrained. People in societies like Iran have the perception that their actions are Restrained by social norms and feel that indulging themselves is somewhat wrong.\(^{15}\)

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3.2. Current User Interface Design in Iran

Mobile applications are extensively used in Iran and are either an equivalent of a western app designed and coded by local designers and programmers or is a likeness of the original version. Nevertheless, international trading and technological sanctions enforced on Iran over the last two decades have made access to technology and the original apps difficult for Iranians. However, the growing demand for new technology has encouraged developers and designers inside the country to create their own digital products and since they are recreating western apps they follow the same user interface and experience design. Despite the two very different cultures, designers often use color schemes, layout, icons, navigations, and images that are similar to their western counterparts. For example, Iranians aren’t able to access Apple’s App Store and so created their own application named Sib, meaning apple in Farsi, using an apple for the logo.16

Another example of cross-cultural confusion is the calendar application. The default calendar on most cell phones including the iPhone uses the Gregorian calendar and there isn’t an option to switch to a Persian calendar. So, Iranian users have to install another calendar app on their phones or use other websites. Persian Calendar app is a Persian calendar app that has been designed for Android platforms and has the same user interface and experience design of the Google Calendar app. There are also several other Persian calendar apps for iOS and Android platforms. However, none gives reference to Iranian society and its visual cultural heritage. This was the main reason I designed an iOS Persian calendar app considering Iranian needs and their cultural model.

4. DESIGNING A PERSIAN CALENDAR APPLICATION

This section centers around my Persian calendar app design process including industry research, user research, information architecture, wireframe/sitemap, visual design, prototype, and usability tests.

4.1. Industry Research

Industry research means finding other competitors and critically analyzing their products to create the most successful product in the market. This assisted me to discover the crucial features of a calendar app and to avoid their flaws. In my research, I studied the two most popular Android (Persian Calendar, Shamim) and iOS (iPersia Calendar, Persian Calendar) Persian calendar apps to assess the main features of a Persian calendar app and also the degree to which they are in alliance with Iran’s cultural indicators. The Android Persian Calendar app with more than one billion installs (based on Google Play store) is the most popular app in Iran which follows the interface of the Google calendar app.

Hofstede’s cultural model indicates that Iran is a country with high power distance, collectivism, femininity, high uncertainty avoidance, short-term time orientation, and low indulgence. I investigated the UX implications for four of these indicators in the UI/UX design of the four calendar apps to find out how successful they are in terms of representing the cultural factors in their user interface (figure 02). The result (Yes and No) has been shown in Table 01 for each cultural factor implication. It shows that the two Android apps are more successful at meeting the cultural indicators of Iran than the two iOS apps.
Figure 2. Hofstede’s cultural indicators for Iran and their UX/UI implication factors

Table 1. Diagram indicates the Hofstede cultural indicators on the user interface/experience design of each app.

<table>
<thead>
<tr>
<th>App Names</th>
<th>HPD1</th>
<th>HPD2</th>
<th>C1</th>
<th>C2</th>
<th>F1</th>
<th>HUA1</th>
<th>HUA2</th>
<th>HUA3</th>
<th># Yes Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persian Calendar (Android)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>6/8</td>
</tr>
<tr>
<td>Shamim (Android)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>6/8</td>
</tr>
<tr>
<td>iPesia Calendar (iOS)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>1/8</td>
</tr>
<tr>
<td>Persian Calendar (iOS)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>2/8</td>
</tr>
</tbody>
</table>

 Persian Calendar app for Android users meets most of the UX implications for the cultural indicators of Iran (figure 3). High Power Distance has been represented by the organized, symmetrical design of the content, and limited access to data. However, it doesn’t meet the second criteria by its use of a modern style in design rather than the religious, traditional style. It also represents Collectivism by using passive voice and having an inflexible design/content. Since this app is more focused on functionality and design effectiveness as opposed to the consideration of use of color, therefore it does not demonstrate femininity. It shows High Uncertainty Avoidance by using simple interface and navigations and a limited amount of information. This is the most successful Android calendar app in Iran and has more than one million users. However, the significant negative point is that it follows the Google Calendar app interface by using the same
visual elements such as the background. In my user research study where I asked users what other calendar apps they use, *Persian Calendar* app had only 16 out of 62 users.

Figure 3. Persian Calendar App for Android

The second Android app *Shamim*, is also successful in terms of representing most of the cultural indicators for user experience. However, it does not meet the Femininity and the High Uncertainty Avoidance factors meaning it does not reveal a detailed design and limited amount of information. The most successful feature of this app is its religious look and content. The design shows religious colors, patterns, photos, and the content includes special Islamic prayers. This app has over 500,000 users in Iran. However, it had zero users out of 62 in my own user research demonstrating that its target audience is completely different from the audience I researched who were aged between 26 to 35 and did not have strong religious beliefs.
The UI/UX of the iOS app, *iPersia Calendar* only demonstrates one cultural indicator which is its use of formal passive voice (Collectivism). It does not have an organized layout for the information or traditional/religious appearance (Low Power Distance). It gives several options to users to change the content and appearance of the app (Individualism). However, the use of feminine colors and attractive design features with a focus on details are not evident in this app. It lacks a simple interface design with consistent, familiar, objective pictures, and symbols. It has irrelevant information and is very confusing and unorganized with busy backgrounds, too much content within boxes of different sizes, as well as being inconsistent in layout (Low Uncertainty Avoidance).
The iOS popular calendar app *Persian Calendar*, like the other iOS app, does not demonstrate many of the cultural indicators with its UI and UX. The information is not structured and is hard to find. There are few religious or traditional elements (Low Power distance). The design and navigation systems are complex, inconsistent, unfamiliar, and without objectives. Too much information has been included in the app (Low Uncertainty Avoidance). Its content and design are flexible based on user preferences which are in contrast with a collectivist culture, however, in terms of representing cultural indicators it has a passive voice and feminine design meaning more attention has been paid to details rather than its functionality. A list of important features of all four calendar apps have been provided (figure 07). Those highlighted texts in green are the ones that are consistent through the four apps.
Figure 6. Persian Calendar iOS
Figure 7. Existing apps feature list (iOS and Android). Green highlights indicate the consistent features through the four apps

4.2. User Research

In order to have a better understanding of the users’ needs and expectations, I developed a questionnaire as part of my research (figure 8). My target audience of 62 users from the Iranian communities in Iran and the United States took a survey of twelve questions. The results (figure 9) indicate they were between 26 to 35 years of age, female (56.5%) and male (43.5%) with masters and Ph.D. degrees, 64.5% were iPhone users and 35.5% were Android users. They used their apps for making reminders/events/schedules (82.3%) and some needed to use other calendars in order to know about Iranian holidays (60.7%), Persian dates (34.4%), date converters (45.9%), and birthday reminders (44.3%). Furthermore, 80.7% used the iPhone default calendar and Google calendar. The Persian Calendar app for Android had 16 users out of 62. Shamim, the religious app had zero users, iPersia Calendar had 6 users, and iOS Persian Calendar had 11 users. Almost 70% of the users believe their default calendar app on their phones did not provide all the information they need. A summary of features they wish their calendar app had are as follows:

- Option for attaching text or a photo like a diary with saving and retrieve options.
- Reminders/notification for Birthdays, holidays (Persian and American holidays based on the state they live in), bank auto payments.
- Show Persian dates as well as its equivalent Gregorian dates at the same time.
- To-do list.
- Sync with all other calendars, emails, contact lists, etc. on all devices.
- Alarm.
- Stickers, emojis.
- An interesting, simple, and user-friendly UI to get all the info you are looking for.
- Time converter/Time difference.

To summarize, the result shows users need a calendar app showing Persian and Gregorian dates at the same time with features to set reminders, events, and schedules. Even though 70 % of the people in this study think their default phone calendar doesn’t provide their needs, only 17.7% of them use other calendars rather than their default calendar apps. One reason is that there isn’t any calendar providing all the information they need that is user-friendly and has a UI/UX design that convinces them to replace their phone default calendar apps. Almost all iPhone users use their default calendar which doesn’t provide the Persian dates or Iranian holidays (two important pieces of information). It means the already existing apps, especially iOS are not successful in terms of usability and meeting users’ needs and expectations.
Figure 8. User research questionnaire
Figure 9. User research questionnaire result.\textsuperscript{17}

\textsuperscript{17} https://docs.google.com/forms/d/1cE3Dfy7zIM3kTpYiVrGP-oNBNwEuVLnGgMkk0ZUr2dw/edit#responses
4.3. Content Strategy

Based on the feature list resulting from the user research questionnaire (figure 08) and after careful investigation of Iranian’s needs and expectations of a Persian calendar app or user research, I decided what features are essential for my design. These features include showing Persian and Gregorian dates at the same time, switching between two types of calendars/months, scheduling, list of holidays, praying times during a day based on the location, date and time converter, settings for the language and choosing the primary calendar, syncing with other calendars like Google and Outlook, setting reminders (e.g. birthday, auto payments, holidays). Figure 10 shows the newly developed features.

![New iOS APP Features]

Figure 10. New iOS app calendars feature list (green indicates missing elements from other apps)

4.4. Information Architecture (AI), Sitemap, and Wireframe

After deciding the essential features of the app and consideration of Iran’s cultural factor indicators (figure 2). I created the app’s sitemap (Figure 11) where the features are grouped and placed over different pages considering hierarchy, a simple navigation system, and layouts with limited control to encourage users to surf and browse (High Uncertainty Avoidance). Then, based on the sitemap the wireframe was created (figure 12). Careful thought was given to the placement and labels for each element. Before starting to visually design the app, the wireframe was tested by a small group of users. In this usability test, key tasks such as switching between two calendars, setting reminders, scheduling, dates conversions, and change of language were requested of the users. Based on feedback, changes and developments were made.
Figure 11. App sitemap, the green highlights show the new features of this app
Figure 12. app wireframes
4.5. Design System

The design system of the app included consideration and development of color, typeface, icons, buttons, and illustrations/zodiac signs. In my design approach my aim was to design an app which is simple and easy to use and at the same time has visuals that reflect the uniqueness of Iranian cultural heritage. For that reason, I was inspired by the colors and illustrations in the *Book of Fixed Stars by Abd al-Rahman al-Sufi* a Persian astronomer (known as Azophi in the west). Additionally, I used this reference to consider “Femininity” in the user interface design meaning use of feminine colors and attractive design features with a focus on details rather than focusing on functionality and effectiveness of the design. This reference combined delicate illustrations of twelve zodiac constellations with Farsi letters in Thuluth script (figure 17) representing stars and the magnitude of stars at that time (AD 964).

My inspiration for designing the logo came from a tool called an Astrolabe. It is one of the oldest angle and altitude measuring devices (figure13). Astrolabe is a Greek word that means to take a star. Additionally, it had been used by astronomers and navigators in ancient times, the Islamic Golden Age (AD 800 – 1258), the European Middle Ages (AD 476 – 1453), and the Age of Discovery (15th century). All Astrolabes are circular shaped with ornamental designs on the surface. Four color themes indicating different seasons in the app have been applied to the logo (figure 14, 15). The logo has been used in the Instagram profile picture to promote the app and other printed materials like cards and wall calendars.

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Figure 13. Astrolabe in ancient times

Figure 14. An Astrolabe and the app icon concept

Figure 15. Icons, final App icon (iOS), and the app icon on an iPhone screen
Colors have been selected based on the *Book of Fixed Stars* with twelve accent colors based on different seasons. As the seasons/months change, the accent colors vary on the interface of the app as well. This simple design approach has been used for the icons in order to meet “High Uncertainty Avoidance” in Iran’s culture which incorporates a simple interface design with consistent, familiar, objective, and tangible symbols and color codes (figure 16).

![Color Codes](figure16.png)

Figure 16. The app colors
Two sans serif typefaces in Latin and Farsi have been used in the app. *Proxima Nova* (figure 18, right) for the English version and *Iranians* (figure 17, right) for the Farsi version. To create the printed materials two serif fonts *ITC Caslon No.224* (figure 18, left) for English and *Thuluth script* (figure 17, left) for Farsi has been used.
In this study zodiac illustrations were created for both traditional and modern styles (figure 19 to 22). This was to maintain the visual heritage of Iran combined with a modern approach to use in the app. My illustrations were inspired and developed from the many star, sign, and constellation references found in the book “The book of fixed stars” by Azophi. In this book, Azophi combined observations and descriptions of Ptolemy, the Greek astronomer with Arabic astronomical traditions. The book contains forty-eight illustrations of each constellation appear twice in mirror image, shown as observed from the earth and from the sky. 19 In order to make the illustrations for the app, I created a series of two groups of zodiac signs (twenty-four total). The first set is similar to Azophi’s illustrations to reflect a more traditional style. The second set is a more modern interpretation keeping the main forms and shapes abstract. I used simple illustrations in the app for more effective communication.

The traditional illustrations are used to create cards (figures 23 and 24), wall calendars (figure 25, 27, 28) and buttons (figure 26). To highlight the zodiac illustrations for the month and to provide information about the personality of the people who were born in that month based on Islamic astrology, I used the book Following the Stars: Images of the Zodiac in Islamic Art. 20 This book is about Islamic astrologists who read the stars in the sky in relation to the planets and predictions about people and events. For example, a person’s zodiac sign is determined by the position of the sun within one of the constellations. With the birth of a new baby, a horoscope would be cast based on the current position of the planets within the constellations. An astrologist read the positions of the planets amongst the stars and would define particular aspects of someone’s personality and character.21

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Figure 19. Illustrations for the cards and wall calendars for the months of Spring (traditional style on top and the modern style on the bottom)
Figure 20. Illustrations for the cards and wall calendars for the months of Summer (traditional style on top and the modern style on the bottom)
Figure 21. Illustrations for the cards and wall calendars for the months of Autumn months (traditional style on top and the modern style on the bottom)
Figure 22. Illustrations for the cards and wall calendars for the months of Autumn months (traditional style on top and the modern style on the bottom)
Figure 23. A birthday card example, Front (zodiac illustration) and back (information about the characteristics of people who were born in that month based on Islamic astronomy)
Figure 24. Birthday card for Cancer (front)

Figure 25. Wall calendar and buttons for Pisces
Figure 26. Buttons
Figure 27. Wall calendar

Figure 28. Wall calendar
After creating the illustrations and building the design system, different pages of the app were designed based on the wireframes. Figure 29 to 32 illustrates the twelve-month pages in the Persian calendar that can be switched to the Gregorian calendar by tapping on the icon in the top right corner of the page (figure 33). Figure 34 demonstrates the options to set different reminders. Figure 35 demonstrates the holidays’ list and the option to filter different reminders. Figures 36 displays the date converter and time for prayers feature. Figure 37 indicates more options to modify the app including language, primary calendar, the display time for prayers on the main page (figure 38), change of time zone, and turn the holiday notification on (you can choose between Iranian, the US holidays, or both). Figure 39 to 42 shows the app's Instagram page where users will be able to access to promotional posts such as iPhone and iPad versions of the app, printed materials, and an informational video which walk them through different pages of the app. They can also order printed items such as wall calendars, birthday cards, and buttons through the Instagram page. All the social media pages are accessible within the “contact us” page of the app.

Referring to the Hofstede model my design meets the following cultural indicators. “High Power Distance” by structured and guided access to information, symmetrical design on the main page, and focus on traditions by using illustrations inspired by Azophi’s book. Collectivism by applying formal terminology in the passive voice and giving users only limited access to change or modify the app. Femininity by using fourteen different colors and attractive illustrations. High Uncertainty Avoidance by a simple consistent navigation system, icons, and color codes.

22. https://www.youtube.com/watch?v=5umsOoJuBGI

Figure 29. App pages for the months of spring

Figure 30. App pages for the months of summer
Figure 31. App pages for the months of autumn

Figure 32. App pages for the months of winter
Figure 33. The app option to switch from Persian to the Gregorian calendar for every month
Figure 34. App pages to set different reminders
Figure 35. App pages for lists of holidays, reminders, schedules, birthdays, auto payments and the filtering option
Figure 36. App pages to find out praying times based on location and time converter
Figure 37. The app setting page (top left), search (bottom left), and other pages of the app
Figure 38. Display time for prayers on the main page.
Figure 39. The Persian calendar app’s Instagram page to promote the app, wall calendar, and birthday cards.
Figure 40. Birthday card promotion on the app’s Instagram page.
Figure 41. Buttons promotion on the app’s Instagram page.
Figure 42. App promotion for iPhone on its Instagram page.
Figure 43. App promotion for iPad on its Instagram page.
The app and all the printed materials alongside information on their design process were planned to display in an exhibition at LSU’s Glassell Gallery in downtown Baton Rouge. These items included the app sitemap, wireframe, research process, icons, app logo, illustrations, birthday cards, buttons, and wall calendars. Devices including two iPads and two iPhones were provided so visitors can actually use the app prototype and navigate through different pages. Additionally, a TV screen was supposed to use to display the app informational video. (figure 44)

Figure 44. Glassell Gallery reception layout plan.
There are different types of usability tests including Functionality (testing all the links, Forms, Html & CSS, visibility in the search engine, database connection), Usability (Navigation, Content, Presentation, Task success), Errors & Exception meaning what happens when things go wrong, Compatibility to Devices and Browsers that the app/web has been designed for, Performance (Web-load and web-stress testing), Security (Protect forms from/data hackers). However, in this study only a design the prototype has been created for the app and so it is not possible to provide all the necessary usability tests. However, one usability test has been done for this app using Adobe XD prototypes. The wireframe has been tested by different users and based on the feedback necessary changes have been applied to the wireframes. Some of these changes include adding a button to switch between calendars from the main page instead of the setting page, adding birthday and autopayments reminders, and adding an option to change the time zone. However, the visually designed app can be tested to get additional feedback from users, to analyze, and to incorporate into the final app.
5. CONCLUSION

In my thesis research, the influence of culture on user interface and experience design has been studied. Also, Hofstede's cultural model and its six dimensions for Iran and the United States have been discussed. My motivation for this study was the increased number of mobile and web app production in Iran that seem to ignore many of the usability studies. As an Iranian UI/UX designer, I noticed the UI designs of these apps are almost the same as their western counterparts. It made me think about the cultural difference between Iran and the west (America) and I intended to explore the ways designers can localize a digital product specifically for a cultural group and based on their particular needs and expectations. My Persian calendar app design for Iranian audiences considers many aspects of their culture. In fact, localization is revealed both on the app user interface design (by using illustrations, colors, types, and icons that are uniquely related to Iranian visual background) and user experience design (by surveying the users before creating user journeys and including features that specifically fit their needs). Using this app enhances the life of Iranian users by preventing them from moving between different calendars or missing important dates, holidays in the Persian, or Georgian calendar. So, I intend to develop the code for the app, release it to the market, and encourage users to install it by publishing promotional posts on social media like Instagram. This study shows that knowledge of cultural models is necessary for UI/UX designers to understand the audience, their backgrounds, and their prospects. It is also crucial to ensure that the created design system for an app is clear and comprehensible for local users and that correctly targeted to meet their needs. This research also leads me to realize that valid further investigations need to be conducted in the area of culture and different forms of its representations on the user interface and experience design of digital products especially in the Middle Eastern countries. There are more apps/websites in those countries that their UI/UX design need to revised. Furthermore, I believe visual resources (early printed books, typography, ceramics, paintings, etc.) are a significant part of any culture and possible ways of applying them to the user interface design can be extended more in the future studies.
BIBLIOGRAPHY


VITA

Narges Tavakoli is a graphic designer based in the United States and from Iran. She earned a Master’s in visual communication from the Art University of Tehran, the biggest art institute in Iran, and a Bachelor’s degree in statistics from the University of Tehran, Iran's most prestigious university. Narges moved to the US in 2017 to pursue an MFA degree at Louisiana State University. She is passionate about all fields of design, like illustration, typography, editorial, and user interface design. However, her main concentration is on user interface and user experience design now. She has learned a great deal about UI/UX design working in various startups and e-commerce companies. Narges started teaching at LSU and she will begin a tenure track position as an Assistant Professor in Graphic Design and Interactive Media program at the University of Wisconsin-Stout in Fall 2020.