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# APP Interface Design of "Shenyang Intelligent Tour" Based on Customization

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**Abstract.** The topic, how the customization demands of different user groups can be satisfied under the "Internet +" background has been studied in this paper. As for smart tourism APP user demands, related research and analysis has been analyzed also. And the following core issues have been concluded: the single content in such kind of APP, the poor adaptability of tourism scene, weak in autonomy of cultural experience and so on. And the new breakthrough of intelligent tourism APP interface design can be realized by customizing the custom content, multi-channel interaction, data visualization, and interface design to reflect the regional cultural characteristics. Indeed, the "internet +" era provides some opportunities for the Shenyang tourism promotion intelligence. Through customized design, the APP's optimization and innovation interface of Shenyang intelligent tour can be realized. Thus, the multi-channel interaction, interface data visualization, interface style into regional cultural elements, and the realization of color free design can be further realized, which makes APP equipped with a better user experience.

## 1. Analysis on the Current Situation of APP Design for Intelligent Tourism

The "Opinions on Further Promoting Tourism Investment and Consumption" (2015) No. 62, issued by National Development Office, pointed out that the financial tree corporate development model of "Internet plus Tourism" and online tourism platform should be developed and promoted actively. The elements, all aspects of enterprise resources and technology should be integrated to promote cross industry "Internet plus Tourism" fusion[1]. Hereon such a background, the market of smart tourism APP has been developing rapidly. Since the momentum of development is too fast and is in the early stage of development, it has led to user's custom requirements being ignored. As a matter of fact, the market share is big, with the low APP usage rate. Therefore, the APP that meets the needs of user customization has been designed, which will be an important direction for the promotion and development of "Shenyang Intelligent Tourism" APP.

According to the statistics of the National Tourism Administration, from 2012 to 2016, the intelligent tourism APPs in APP Store grew rapidly, which almost increased by 11 times. By June 2016, the so-called "zombie APP", which has never been downloaded or scored by users in APP Store, accounts for 70%. Within such APPs, the proportion of smart tourism APP has reached 17.8%[2]. Because the development of smart tourism APP is still in its initial stage, with the rapid expansion of the market, there are many problems, mainly manifested in: first, the customization content is identical and the core function is limited. For example, the APP reservation function of "Suzhou wisdom Tour" does not reflect the spirit of innovation, which is converging with the function module of "Qunar". Moreover, its tour guide interface has not yet been developed completely. It belongs to the blank



interface which can not be operated. Secondly, the problem of interaction channel simplification is prominent. For example, there is a lack of adaptability to the tourism situation in Shenyang on the surface of “Ju You Net”. Third, lack of regional cultural characteristics. Such as “Wisdom Tourism--Beijing” interface visual design is quite common in the market, which does not offer users with the impression of Beijing's exclusive culture.

## 2. User Customization Makes Tourism More Intelligent

### 2.1. Changing the Singleness in the Content Planning

Intelligent tourism APP based on user customization allows users to have more content options. “Customized Design” can meet individual demands of different groups. Targeted service content can be provided to enhance service quality. For example, German AIO intelligent home interface design can be customized to create the design of the operation interface, which includes the background of the interface, gesture control and layout planning of the interface.

### 2.2. Strengthening the Adaptability of the Individualized Tourism Situation

The experience of intelligent tourism APP customization will be affected by the complex environment such as the scenic environment, the use of posture, the network of scenic spots and so on. However, the design of “user customization” will carry out detailed scenario segmentation according to the complex travel environment of users. Environmental changes can actively induce and ultimately achieve intelligent adjustment of functional interfaces indeed. For example, as for the Intraface application developed by Carnegie Mellon university research team, its interface can respond to the needs of users by identifying the characteristics of users' faces and perceiving people's emotions.

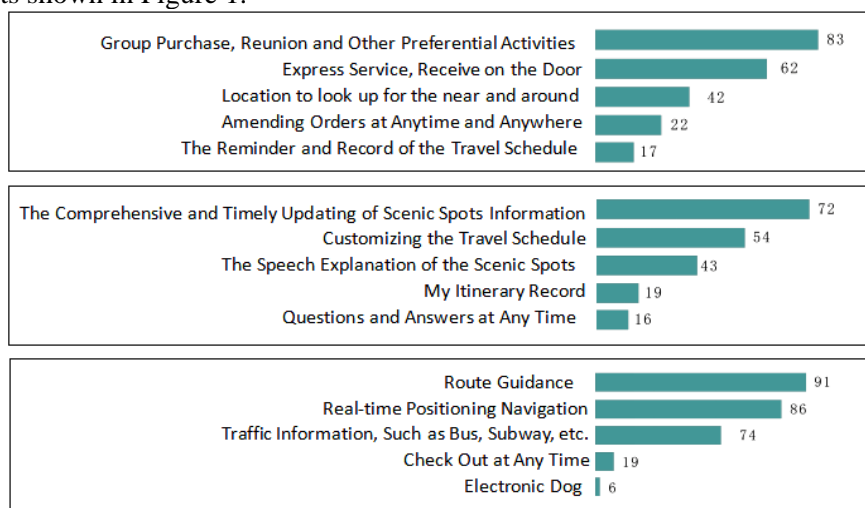
### 2.3. Realizing the Autonomy of Cultural Experience

Customizable design solutions can independently select the theme or culture display method according to the preferences of APP users. In the “Shenyang Intelligent Tourism” APP, Shenyang's characteristic culture has been shown in the way users are interested, with the autonomy of the user reflected. Such as the “Intelligent Confucius Temple in Nanjing” APP, who takes the image of Zhuang Yuan Lang as the representative, the interface display scheme forms a unique image with local characteristics, which promotes the spread and promotion of Nanjing's regional culture greatly.

## 3. User Customization Based Interface Optimization Strategy

### 3.1. Analyzing User Requirements and Subdividing Custom Contents

After making a questionnaire through the software “Wen Juan Xing”, users' needs has been obtained, with the results shown in Figure 1.



**Figure 1.** Results of Questionnaire Surveys.

### 3.2. Multichannel Interaction Satisfies User Independent Handover

The multichannel interaction mentioned here refers to the implementation of interface function planning, which means not only by using a channel to implement the operation, but to use multiple channel interactions for maximizing the freedom degree of the user interface [2].

**3.2.1. The Ingenious Use of Voice and Visual Channels.** Screen switching is the most common example of using visual channels. The facial recognition technology is used to determine whether the interface screen is vertical or vertical according to the direction of the user's face. And further, voice channel is more practical in intelligent travel interface. For example, in Harbin, where reached minus40 degrees Celsius, manual hand-held method for interface is unavoidable to make users feel quite cold. Using voice channel to perform simple handoff command operation can make users more convenient in different scenarios, which reflects the wisdom of interaction.

**3.2.2. Paying Attention to Design Gestures for User Experience.** When designing gestures, users' behavior habits and psychological models need to be fully considered. For users who uses Apps for the first time, there should be appropriate guidance and prompts. And the author has added a quick command when optimizing the APP interface of "Shenyang Intelligent Tourism". Users can set up a fingerprint or a gesture in activating a common function according to their usage habits. As a result, the interface components are simplified and the operation process is reduced.

### 3.3. Visualized Presentation of Data

The visualization of interface data can provide clear and specific data analysis for users' customized content with the user's customized needs met. Data visualization design is mainly data graphic design. The data chart can be divided into two elements: the value of a description or description of things[3]. Mainly through these two ways, the "Shenyang Intelligent Tourism" APP user customized content data visualization design has been completed.

**3.3.1. Graphical Representation of Complex Data.** It is a graphical representation of complex data, whose method is more beneficial to the user's intuitive understanding. With the continuous development of science and technology, the visualization of complex data has evolved from static to dynamic. According to the user's visual preferences, dynamic data display is more vivid and intuitive to present relevant real-time data of intelligent travel. At the same time, it is also necessary to conform to the user's stream of sight. This should be designed according to the focuses of users.

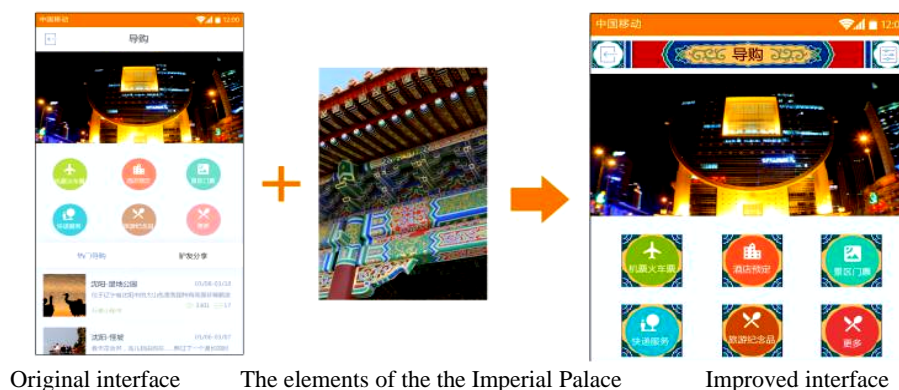
**3.3.2. Presentation with the Help of Scene.** It means finding real-life scenes that are similar to data. For example, as for the personal travel interface of "Shenyang Intelligent Tourism", the sun is replaced by the chart. Along the sunrise trajectory, one day's journey can be planned, with each itinerary as a track location. Each stroke point is a locus position. Using graphics instead of words, the scene is clear to the user drawing on itinerary information, as shown in Figure 2.



**Figure 2.** Personal Travel Interface of "Shenyang Intelligent Tourism".

### 3.4. Rational Interface Design Embodies Regional Cultural Attributes.

Because of the "Shenyang Intelligent Tourism" APP's users mainly are outlanders. The regional emotional needs of these users need to be fully considered. With the introduction of regional cultural elements in Shenyang, intelligent tourism services with typical local characteristics should be provided to these users. For example, when talking about the building of the the Imperial Palace in Shenyang, the Grand Marshal house, and many other scenic spots, we can tell that they are uniform in symmetry and rhythm together with color harmony. With the improvement of modern design method, it can be transformed into a new visual element that is more in line with user interface aesthetic needs, as shown in Figure 3.

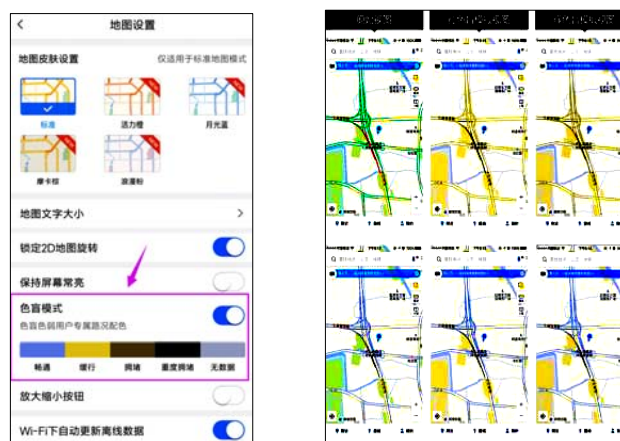


**Figure 3.** Optimization Process of the Theme Interface about the the Imperial Palace in Shenyang.

### 3.5. Optimization of Color vision in Barrier Free Interface Design

The main object of the optimization design of color vision is red green color blindness, blue yellow color blindness and all color blind people. Through the classification and color cognition characteristics of people with color disorder are summarized and analyzed. And the barrier free color optimization scheme has also been proposed to create barrier free environment for visual interface information transfer.

**3.5.1. The Establishment of Color Matching Logic for People with Color Perception Disorder.** The normal interface color is dominated by normal people with color vision. The green and red color blindness, blue and yellow color blindness, and total color blindness of the corresponding population can be selected respectively when the color - free pattern of color perception is opened. The unique "color matching logic" that allows this group of people to understand and realize better, for example, the red and green color blindness set up in the official version of the Amap V7.7.8. The road condition can be displayed after the adoption of the matching color of red green blindness, which clearly indicates the real-time traffic condition to the crowd, as shown in Figure 4.



**Figure 4.** Amap--Design for Red and Green Color Blind Color Matching.

**3.5.2. A variety of Visual Variables Are Taken to Distinguish.** Various visual variables such as shape, annotation, number and many others are taken for design distinction. For example, in the functional interface of "Shenyang intelligent tour", color blindness and non color blind color recognition chromatography are considered as reference. In the interface with low color discrimination, the color that can be identified by both color blindness and normal population is regarded as the dominant color, with the text and icons combined to annotate. Even without color recognition, color handicapped people can get information through different visual variables, as shown in Figure 5.



**Figure 5.** The Barrier Free Design of “Shenyang Intelligent Tourism”.

#### 4. User Customization Makes Tourism More Intelligent

With its unique convenient advantages, intelligent tourism APP has become a kind of main carrier. And the interface design is the key content of information interaction. By analyzing the user's behavior requirements in this paper, the use requirements of different groups are met by methods of custom content subdivision, multi channel interactive mode, visual presentation of data, and color barrier free design. On this basis, innovation is optimized. After combining the regional characteristics of Shenyang, the information framework, flow chart and wireframe are constructed to establish the user interface design model of Shenyang intelligent tour APP interface.

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