

# Design and Implementation of APP Information Platform System for Precision Poverty Alleviation Based on Rural Tourism

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## ABSTRACT

Rural tourism is the product of the fast pace of modern life and the "urbanization problem". In the past ten years, my country's tourism industry has developed rapidly. Tourism has become a necessity in people's lives. Rural tourism can connect all aspects of the city, so it is gradually becoming a necessity in the tourism industry. Among them, rural tourism precision poverty alleviation involves a large number of people and rapid information communication, which poses a serious challenge to precision poverty alleviation management. The purpose of this paper is to study the system design of a precision poverty alleviation APP information platform based on rural tourism. This article analyzes the entire system requirements based on the object-oriented analysis method, and uses UML technology to determine the system requirements model. This article introduces the business process of the precision poverty alleviation data management system platform, analyzes the operation and non-functional requirements of the system, and elaborates the physical architecture design, software architecture design and related technologies adopted by the platform. Module design includes operation process, class structure and database design. This article starts with the purchase of tourism resources and the causes of poverty among the poor, and conducts a field questionnaire survey. The survey shows that the education level of poor tourist families accounts for only 23%. This shows that education is a deep-seated factor in poverty alleviation in poverty-stricken areas. Attaching great importance to the education of people in poverty-stricken areas is of great significance to the fight against poverty.

**Keywords:** Rural Tourism, Precision Poverty Alleviation, Information Technology, SSM Technology

## 1. INTRODUCTION

The poverty alleviation data management system platform accurately assists the poverty alleviation departments of governments at all levels in the management of the archive data of the poverty-stricken villages and poor households in the jurisdiction, and supports the linking of specific poverty alleviation with the causes of poverty in the poor villages. It can be based on the actual situation of each poor household and poor village Formulate corresponding rescue measures, concentrate efforts, and provide the highest degree of support. As far as possible, we will achieve precise poverty alleviation targets, accurately arrange poverty alleviation projects, accurately use poverty alleviation special funds, accurately implement assistance measures, accurately arrange persons responsible for poverty alleviation, and accurately understand poverty alleviation.

This paper designs in detail the physical architecture and software architecture of the poverty alleviation data management platform, as well as the design of the

interaction process, data flow process, class structure, and computer-related description. This article gives a demand analysis of the precision poverty alleviation system, and specifically describes the overall business analysis involved in the system, the management of poor households, and the daily work processes and functions of the persons responsible for poverty alleviation.

## 2. RELATED WORK

In the research on the system design of the precision poverty alleviation APP information platform based on rural tourism, many scholars have conducted research on it and achieved good results [1, 2]. Applications, and other new methods combine traditional file lists and other information.

Zahra introduces a tourism recommendation system, which extracts user preferences to provide personalized recommendations [3]. Unati believes that tourism has become the number one source of foreign exchange for many African countries, diversifying their economies

from agriculture or mining. The purpose of developing tourism is to improve the quality of life and living standards of local communities [4]. Aries developed a model based on system dynamics by using three subsystems, namely "tourist quantity subsystem", "switching behavior of tourist travel subsystem" and "carbon dioxide emission subsystem" [5]. Just like this, with the rural tourism precision poverty alleviation information management system, the fairness and scientificity of poverty alleviation can be ensured, and the efficiency of poverty alleviation management can be improved [6, 7].

The above discussion proves that many experts and scholars have put forward their own opinions on tourism informatization. However, no one has paid attention to the targeted poverty alleviation APP for rural tourism at present. The research in this paper will make up for the deficiency of the current research direction.

### **3. RESEARCH ON THE SYSTEM DESIGN OF THE PRECISION POVERTY ALLEVIATION APP INFORMATION PLATFORM SYSTEM BASED ON RURAL TOURISM**

#### ***3.1. System Requirements Analysis***

##### *3.1.1. Business analysis*

The goal of the mobile APP is to facilitate the work contact between helpers and poor households and the poverty alleviation office, reflecting the sunshine poverty alleviation. The main modules include poverty alleviation policy publicity, implementation of poverty alleviation work, poverty alleviation warnings, poverty alleviation project management, and poverty alleviation work attendance, etc. Helpers are the main users of the mobile APP. Its functional modules include policy query, I want to sign in, list of poor households, supervision and management, message list, self-inspection, etc.

##### *3.1.2. Business analysis of daily work of poverty alleviation personnel*

Enter households every week to carry out assistance work, and record the poverty trajectory of poor households. Collect and sort out the income situation of helping households as soon as possible, and carry out the appraisal and review of poverty-stricken households' applications for poverty alleviation in a timely manner.

##### *3.1.3. Analysis of poor household management business*

Poverty household verification refers to the fact that the Poverty Alleviation Office organizes personnel to investigate the actual situation of the household's

economy and household after receiving the application. If the household meets the conditions of a poor household, the household is accepted as a poor household. The verification of poor households follows the procedure of "four discussions and two disclosures" to form a primary selection list. The two village committees and the village working team will identify them according to the working method of "one entry, two look, three calculations, four to five, and six decisions". Report to the relevant superior department for review.

#### ***3.2. System Design***

##### *3.2.1 Perfect personal information*

The subjects involved in this module are those responsible for assistance and poor households. After the user logs in, the first step is to complete his personal information. The system will judge whether the evaluation information is qualified (such as basically cannot be empty, the birthday does not match the ID card, etc.). If the information is not qualified, the system will give a prompt message. Allow users to make corresponding changes to each other. After the information is qualified, the evaluation information will be saved to the database [8].

##### *3.2.2 Performance evaluation of the person responsible for assistance*

This module involves poor households and persons responsible for assistance. The operation object of the evaluation can only be the person responsible for the assistance, and the evaluator can be a poor household or the person responsible for the assistance. After the evaluation is completed, the system will judge whether the evaluation information is qualified.

##### *3.2.3 Log management*

The main body involved in the log management module is the person in charge of assistance, and only the person in charge of assistance can perform the operation. When filling in, ensure the completeness of the information, check whether the filled content is qualified, whether there are related files uploaded, etc., and also return in the log interface. You can see the log contents of other persons responsible for assistance as part of the basis for subsequent evaluation operations [9, 10].

#### ***3.3. Poor Household Classification Based on Decision Tree Model***

For a piece of data  $x$ , its probability of appearing in the entire data set is  $p$ , then its entropy is defined as:

$$H(X) = -\sum_{i=1}^n p_i \log_2 p_i \quad (1)$$

The concept of information gain is aimed at data features, and the change that a data feature brings to the information entropy of the entire data set is defined as information gain. The higher the information gain, the more important the data feature is to the whole system, and the better the classification effect.

The calculation formula of information gain is as follows:

$$IG(S|T) = Entropy(S) - \sum_{value} \frac{|S_v|}{S} Entropy(S_v) \quad (2)$$

Where S is the set of all samples, value(T) represents the set of all values of attribute T, v is one of the attribute values of T, Sv is the set of samples in S whose attribute T is v, and |Sv| is in Sv The number of samples included.

Among them, the conditional probability is expressed by the item set support count:

$$confidence(A \Rightarrow B) = P(A|B) = \frac{Support\_count(A \cup B)}{Support\_count(A)} \quad (3)$$

Among them, support\_count (AUB) is the number of transactions that include itemsets AUB, and support\_count (A) is the number of transactions that include itemsets A.

### **3.4. Model Design for Accurate Push of Poverty Alleviation Policies**

#### *3.4.1 Portraits of poor households*

Only by seeing the real poor can we help the real poor. In order to ensure that we truly understand the six modules of poor households' personal information, income, health and accounting information, last year's income information, relocation information, helping people pairing information, and enjoying policy information, we collect statistical information. Try to accurately identify the situation of poor households in all directions and draw the portrait of the poor.

#### *3.4.2 Industry support policies for precision poverty alleviation:*

##### 1) Industrial development subsidy policy

Rewards and subsidies: poor households with file registration; poor households newly develop tea, flower and seedlings and other planting industries; newly develop live pig, native chicken, and Chinese bee breeding; select and develop other breeds and breeds that can achieve the goal of increasing income and alleviating poverty , Plus and other items.

##### 2) Financial industry poverty alleviation policies

Compensation objects and conditions: have full civil capacity; abide by laws and regulations, have good credit, and have no bad credit records; poor households have the will and ability to develop industries.

##### 3) E-commerce poverty alleviation award and subsidy policy

Reward and subsidy objects and conditions: poor households' e-commerce entrepreneurship, e-commerce employment, e-commerce product sales, traditional production and processing enterprises' transformation to e-commerce, etc.

### **3.5. APP Architecture Design**

#### *3.5.1 Functional architecture*

To help cadre type users log in to the APP, they first need to check their poverty alleviation targets, that is, whether the paired poor households are correct. If they are not correct, they can manually add or delete them. You can view the personal information of poor households. The personal information of poor households is mainly divided into 6 parts, namely, living conditions, income information, relocation, pairing information, enjoyment of poverty alleviation policies, and historical assistance records. These information data items are displayed in strict accordance with the data structure in the National Poverty Alleviation Development Information System organized and developed by the Office of the State Council's Poverty Alleviation and Development Leading Group Office. Among them, the enjoyment of poverty alleviation policies and the historical assistance record function are newer than those of the National Poverty Alleviation Information System. In addition, the information about enjoying the poverty alleviation policy will be summarized and extracted based on the assistance records of the assistance cadres, showing when the poor households have enjoyed which poverty alleviation policy, and what subsidies they have received.

#### *3.5.2 Network topology*

The Precision Poverty Alleviation APP is a Hybrid App with a C/S architecture. The main information and data are stored in the data server, and the mobile phone caches some user data locally, which not only reduces

the loss of traffic during user use, but also ensures real-time updates.

The firewall acts as a powerful barrier to isolate internal and external networks and filter illegal data. The packet filtering firewall built on the Linux operating system platform filters and restricts TCP/IP data packets, effectively blocking most network attacks and ensuring system security.

#### **4. INVESTIGATION AND RESEARCH ON TARGETED POVERTY ALLEVIATION AND POVERTY-STRICKEN FAMILIES BASED ON RURAL TOURISM**

##### **4.1. Selection and Design of Samples**

This article has done research on local tourism resources, development status, population status, economic status, participation of poor people in tourism, tourism industry, and tourists. We investigated four scenic spots in a certain city as research objects. In today's society, more and more targeted poverty alleviation work has been launched. It is necessary to

subdivide poor families and adopt targeted poverty alleviation strategies.

##### **4.2. Questionnaire Collection and Demographic Characteristics**

In July 2020, four major scenic spots and one township were selected in a certain city to do a questionnaire survey, and combined with in-depth interviews to obtain the information needed for the research. Among them, 300 questionnaires were issued to poor families in the scenic area, and a total of 300 valid questionnaires were returned, with an effective rate of 93.3%.

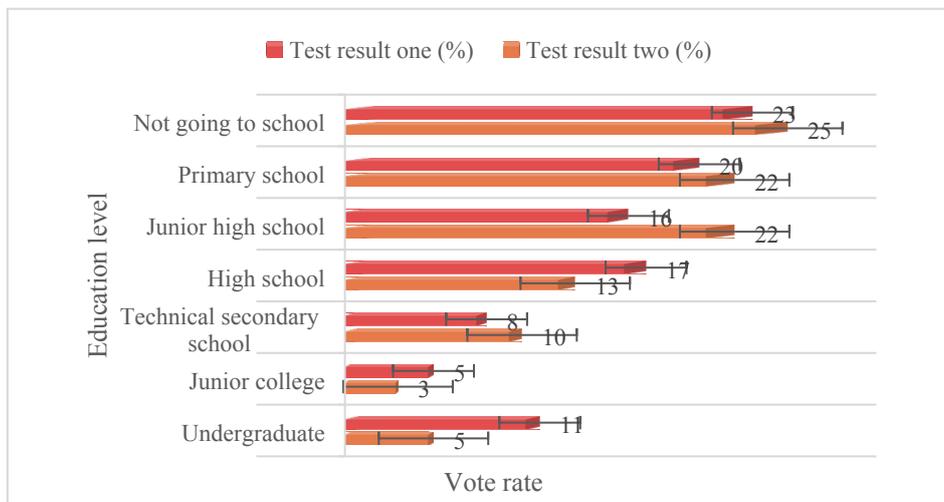
#### **5. INVESTIGATION AND ANALYSIS OF POVERTY-STRICKEN FAMILIES BASED ON RURAL TOURISM**

##### **5.1. Analysis of the Educational Level of the Labor Force of Poor Families**

This paper investigates and analyzes the labor education level of poor families in tourist areas. The results of the survey are shown in Table 1.

**Table 1.** Proportion of education level of labor force in poor families

Education level	Test result one (%)	Test result two (%)
Not going to school	23	25
Primary school	20	22
Junior high school	16	22
High school	17	13
Technical secondary school	8	10
Junior college	5	3
Undergraduate	11	5



**Figure 1.** Proportion of education level of labor force in poor families

It can be seen from Figure 1 that the poor population generally has a low educational level, with the highest proportion of non-school and primary school educated population, reaching 24%; followed by junior high school and high school educated population with a higher proportion, each accounting for 19% and 15%; undergraduates The proportion is 8%, and only 4% of junior college students. Low education will limit the employment of workers. Most of them can only participate in low-tech, high-intensity, and high-risk occupations. Income mainly depends on physical fitness and work attitude. Once a physical illness or disability

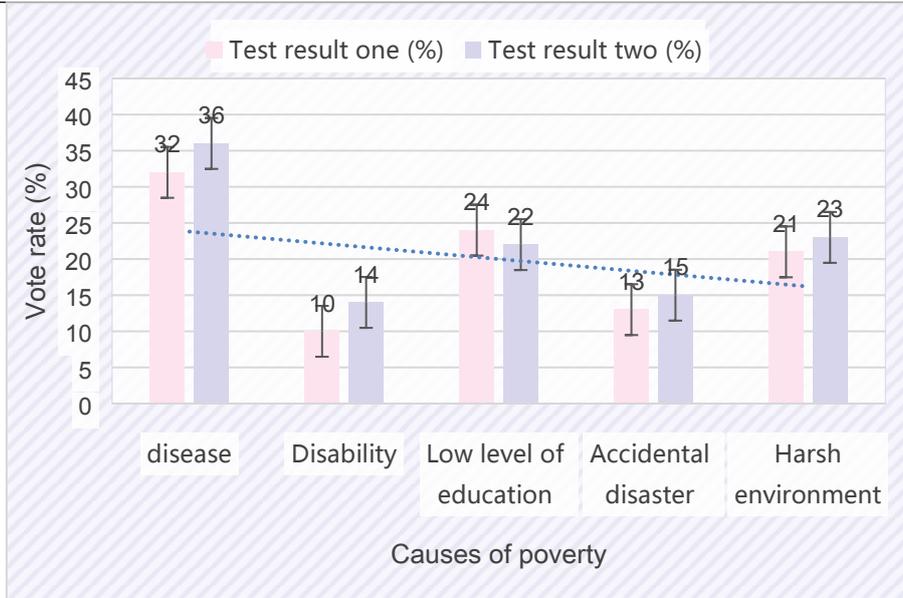
occurs, it is difficult Reemployment. Efforts to improve the comprehensive cultural quality of the people in poverty-stricken areas is an important measure to increase the economy of the poor.

**5.2. Analysis of the Causes of Poverty of Poor Families**

This paper analyzes the causes of poverty of poor families in tourist areas, and the results of the survey are shown in Table 2.

**Table 2.** Causes of poverty in poor families

Causes of poverty	Test result one (%)	Test result two (%)
Disease	32	36
Disability	10	14
Low level of education	24	22
Accidental disaster	13	15
Harsh environment	21	23



**Figure 2.** Causes of poverty in poor families

As shown in Figure 2, it can be seen that the main causes of poverty among poor households are diseases, which account for 34% of the total. Medical insurance in poverty-stricken areas has been fully popularized. According to the survey, local villagers’ rural endowment insurance and rural cooperative medical insurance have achieved full coverage, and families established as poor households can see a doctor free of charge. Therefore, disease is the trigger for poverty. Lack of labor is the main factor; low education level accounts for 23%, education is a deep-seated factor in solving poverty alleviation in poverty-stricken areas, and a high degree of attention to the education of the masses in poverty-stricken areas is of far-reaching significance to poverty alleviation.

**5.3. Tourism Poverty Alleviation and Effectiveness**

Since 2015, the regional government has taken the tourism industry as the focus of targeted poverty alleviation and vigorously developed global tourism. Based on the original tourism resources, it has severely damaged tourist attractions. The construction of scenic spots attracts tourists to visit, and the effect of tourism income has been significant. The results of the experimental investigation are shown in the Figure. 3 shown.



Figure 3. 2015-2019 tourism data statistics

As shown in Figure 3, the number of tourists received and tourism revenue in this region fluctuated and increased during the study period. There was a slow increase in 2015-2016, and the growth rate of tourism revenue increased significantly in 2017-2018. The number of tourists during this period It also increased significantly, mainly due to the government's strong support and investment in rural tourism. However, the location conditions are relatively poor, resource development is slow before 2018, and the overall development level is not high.

## 6. CONCLUSIONS

This article focuses on how to accurately implement policies and manage the poverty alleviation work. After extracting user characteristics and drawing user portraits, this article designs and implements a policy push function based on the decision tree model after extracting user characteristics and drawing user portraits. Helping cadres push the poverty alleviation policies that they can enjoy. This paper designs and implements the mobile terminal of the Precision Poverty Alleviation Information System, which combines the daily content of poverty alleviation work, innovatively transforms the work method, and effectively combines the Internet + traditional poverty alleviation mode to reflect precision.

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