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Application System based on Route Inquiry

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Abstract: The traditional tourism system's information inquiry is incomplete, images are not intuitive and the results are not three-dimensional. In order to solve these problems, this paper proposes system management design and application based on tourist routes inquiry. Firstly, based on MAP technology, it achieves a cross-check of space and attribute data, then explores the knapsack problem through the genetic algorithm, making the travel route arrangements more reasonable and providing latest shareable maps for tourists, and finally conducts simulation experiment on system model. The results show that compared with the traditional one, this tourism management system's information inquiry is faster, and also its inquiry results are more three-dimensional and visual. It is much more convenient for tourists with practicality.

Keywords: System; Routes; Network; Application; Incomplete Images

1. Introduction

Storage and processing of tourism System's information is related resource information about information and tourism business, it is a business decision support system. With the continuous development of information technology, e-commerce has been developed rapidly. With emergence of some third-party payment software like Alipay payment, Yu Ebao, tourism industry becomes more and more information-based and it needs to provide online services and queries. Meanwhile tourism information is also included in the "Twelfth Five Year Plan" of China, there are opportunities and challenges, which is bound to accelerate the development of tourism system management's application[1-3]. Tourism management information system will be greatly applied in hotels, resorts, travel agencies and so on. Compared with other industries, tourism has its own characteristics. Tourism information resource is its intermediary, it delivers information such as routes and destinations to its employees and visitors. It is crucial for tourism information's collection, screening, processing and delivery, therefore it is very important to tourism industry's healthy development [4-5]. Tourism is a multi-industry with wide industry range, involving human geography, store merchandise, tourist attractions planning, tourism accommodation and other industries, it is comprehensive. From this we can see that the development of tourism information systems is not only a hot spot within the tourism industry, it also can promote the development of its related industries. Thus, to promote the construction of tourism information systems has become a popular issue and a imminent task today.

At home, in the early 1980s, some tourism enterprises already used the travel management information system. In 1981, Hotel of China introduced the PRIME560 tourism management system [6]. 1985, Jinjiang Hotel introduced Conie's tourism management information system [5]. From the late 1990s with the advent of Internet network, to 2000, tourism management system has been gradually used by travel agencies and hotels all around our country.

2. Tourism Information Management System

2.1. Travel Information Systems Entity Framework

The tourism management information system this paper mainly includes four entities: attractions, provinces, regions, appraisal. Their association is shown in Figure 1.

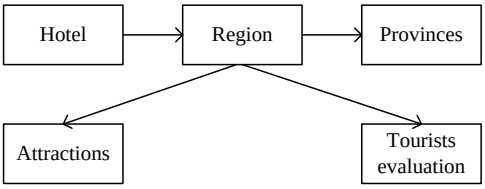

Figure 1. Tourism Information Management System Contact Framework

2.2. Travel Data Query of MAP Technology

MAP technology can be used to timely acknowledge the data flow and processing conditions of the information systems, and it is a typical model of tourism information systems. It is able to divide the function modules, compile data and process information data flow, as shown in Figure 2.

As can be seen from Figure 3 that the flow is: visitors enter a query, the system processes the query then returns the query information to tourists; tourists feed back on

attractions and give corresponding rating and reviews; System administrator is able to add and modify every table in the database, which greatly improves the rate of queries, making it more convenient for visitors.

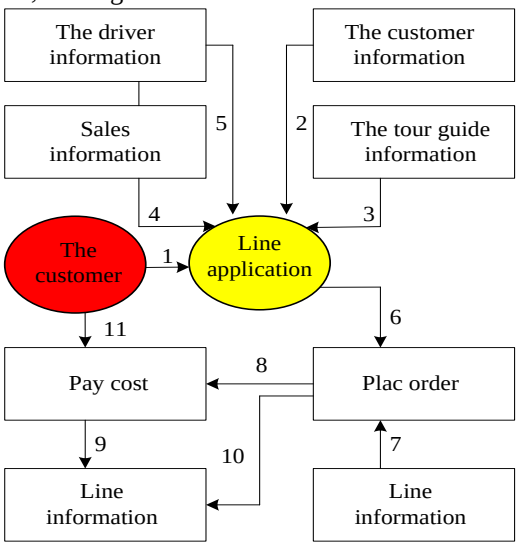

Figure 2. Travel Management System Data Flow

3. Tourism Knapsack Optimization of Genetic Algorithm

In this proposed tourism management system, there is a problem needed to be solved: in the planed playtime, visitors can select sights with praise as high as possible . This can be attributed to the following knapsack problem: backpack capacity T defined as planed play time, P as the rating, sights are represented with 1,2,,,N , t_i as the play time of sight Ii denoted Ii , p_i indicates the rating of sight i , $i=1,2....n$. In addition, use x_i to indicate whether select sights or not, $i,e..,r,f$ and c,μ_0,v_0,γ,s respectively denotes choosing and not choosing sight i. Then the above knapsack problem is transformed into the following optimization problem:

$$\begin{pmatrix} r \\ s \\ t \end{pmatrix} = \begin{bmatrix} y_{10} & y_{11} & y_{12} \\ y_{20} & y_{21} & y_{22} \\ y_{30} & y_{31} & y_{32} \end{bmatrix} \quad (1)$$

In the genetic algorithm, the chromosome is composed as binary string with 0 and 1:

$$R = ht[y|-c] \quad (2)$$

Meanwhile, this chromosome is written as $c=(x_c,y_c,z_c)$ and the value range of X is noted as $t=\begin{bmatrix} y_\gamma & m & \mu_0 \\ o & y & v_0 \\ o & o & 1 \end{bmatrix}$, then get the fitness $c_i=\cos\theta_i, s_i=\sin\theta_i$, which is the objective function value of the above optimization problem.

In the genetic algorithm, the randomly generated initial population, as well as cross-new chromosomal aberrations may not meet the constraints of problem (3):

$$T=\begin{bmatrix} 1 & o & o \\ o & c_x & s_y \\ o & -y_v & c_x \end{bmatrix} \times \begin{bmatrix} c_y & o & s_v \\ o & 1 & o \\ -s_v & o & c_x \end{bmatrix} \times \begin{bmatrix} c_v & s_v & o \\ -s_v & c_v & o \\ o & o & 2 \end{bmatrix} \quad (3)$$

Therefore, we use the following greedy method for chromosome amending.

GA greedy method for correcting encoding steps are as follows:

Step1. For chromosome $i=x,y,z$, its corresponding sights are c_x,c_y,c_z , then put them in descending order of the highest praise to form a new attraction serial number.

Step2. k=1;

Step3. If $p(\xi|\phi)=\sum_{k=1}^{u} w_i t_i(\zeta)$, them turn to Step3, otherwise turn to Step4.

Step4. Suppose that (x,y,z,i)

Step5. Set all genes of chromosome $i=x,y,z$ to 0 which are corresponding with c(i), $\sum_{k=1}^{u} w_i=1, t_i(\zeta)$,to form a new chromosome $G_{aus}-s_{ian}$,so in this case, $\sum_i$ is a chromosome that meets condition (3-2).

4. Conclusion

The so-called traveling salesman problem, is the distance problem: let the traveling salesman travel through a city or even N cities for one time, and the line can not be repeated, then finally go back to the departure point, and a shortest route should be designed for the traveling salesman. It is one of the most representative optimized combination problem and an NP-hard problem, for its possible path number and the number of cities grow exponentially. Therefore it is generally difficult to precisely obtain its optimal solution, so seeking its effective approximation algorithm is of great theoretical significance. On the other hand, after simplification, a lot of practical problems, such as drilling alignment options of a printed circuit board and goods distribution routes of chain stores can be modeled as a traveling salesman problem. Thus research of the traveling salesman problem's solving method also has important application value, since travel planning is a typical traveling salesman problem.

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