# Chetoe.com: An Integrated Web 2.0 Service for Automatically Travel Planning

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**Abstract.** With the constant upgrading of the quality of human life, naturally the demand for travel continues to increase. People are no longer satisfied with the old standard travel plans, and they prefer to make their own personalized travel plans from the gathered information within the Internet. In this paper, we design to setup one integrated tourism platform based on the concept of Web 2.0. It will allow users to share the experiences, pictures, and description of various locations though our designed platform. Users can have an automatically generated trip planning before the trip, have an automatically generated tourism manual during the trip, and share the experience of the whole tourism after the trip. Though the integrated travel web site, one user can retrieve the popular tourism locations recently by browsing the site. The user can also have a personal travel plan that match his preferences by easily selecting some options. After the travel, the user can record and share the travel experience of one single tourism location or the whole travel route to others.

**Keywords:** Automatically Travel Planning, Web 2.0 Service.

## 1 Introduction

With the constant upgrading of the quality of human life, naturally the demand for travel continues to increase. In the traditional solution, we can acquire pre-planning travel packages from local travel agencies or follow the suggestion travel routes from the travel books. However, with the rapid growth of Internet and Web 2.0, it is becoming an easy job to obtain the latest and most famous information from search engines or online forums. People are no longer satisfied with the old standard travel plans, and they prefer to make their own personalized travel plans from the gathered information within the Internet. It can best meet the needs of travelers with planning their own travel itineraries, but it is a very time-consuming work to surf various kinds of travel sites and experience sharing blogs.

According to the report of Taiwan Tourism Bureau [1], the total number of trips and the travel times of individual person are both increasing. There are almost 90% of

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the trips are the type of the self-guide trip. It displays that most of Taiwanese have the preference to have a trip by self-guide. Although there existing a lot of travel Web 2.0 services on the web and the functions for a travel within the individual web site are not completed enough. People who can plan their self travel in a web site, but they need to share their experiences among the travel to another web site. Not to mention the automatically travel planning.

In this paper, we will propose a Web 2.0 services that will classify the travel locations into four major types, they are delicacies, attractions, accommodations, and shopping. People can share the travel locations they have visited or visit them on our service through the Google Map. People can also recognize the geographically nearby locations through the map to arrange the travel plan. Our proposed service will automatically plan users' trips according to the travel locations and users' preferences to reduce the time-consuming work.

## 2 Related Works

Web 2.0 is not a standard technique. Engineers put too much emphasize on new technology researches and ignore the importance of community powers from the users themselves. Users can make a web site be abundant and diverse relative to the traditional Web 1.0 services by contributing and sharing personal experiences and knowledge. Therefore, a Web 2.0 service provides a platform for users to participate. The content of the web services are produced by the user's participation. A user in the service can have his unique page through his design of personalization. The web services will grow in a rapid speed and keep freshness according to the peer to peer sharing concepts by the users in the site. Through the power of the entire community, the entire platform will be into an autonomous self-government environment for data quality monitoring and maintain the best condition.

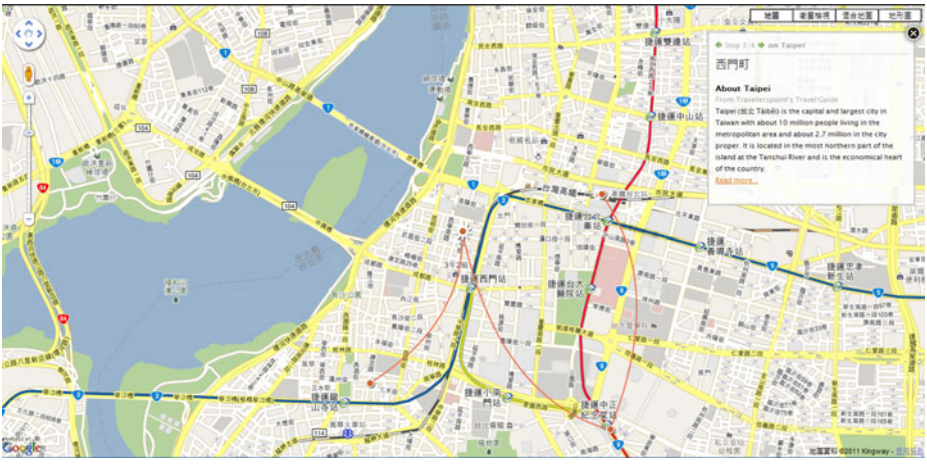


**Fig. 1.** A snapshot of travellerspoint.com

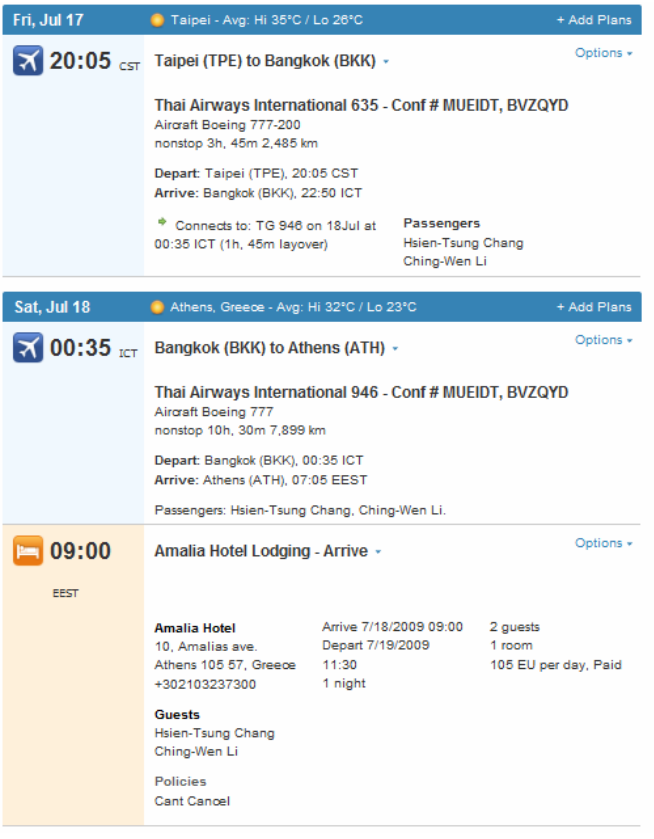


**Fig. 2.** A snapshot of tripit.com

Travellerpoint.com [2] is a Web 2.0 service that provides a wiki system for users to create and edit the location information like humanities, features, and histories. Users can share the pictures they took and the experiences after visited the location to the public domain. The can also manually plan their travel plan by click the "Add New Trip" bottom. The travellerpoint.com will line up the selected locations as demonstrating in the Fig. 1. Unfortunately, it only provides manually trip plan.

Tripit.com [10] is another Web 2.0 service that provides rich physical connection to other services, like global flights schedule and status system, Google Map, and hotel information, attractions information. It can help users to create their own travel planning in detail. Fig. 3 demonstrates a travel plan from Taipei to Athens. The advantage of tripit.com help user to print out the plan or access the plan via mobile devices. It can provide detail information for the user to reference when they need some help. However, tripit.com is also a kind of assistant service for travel planning, user can only plan his own trip manually.

There is no total solution for a travel plan existing in the WWW nowadays, especially the automatically travel planning service. Research is currently the only known discussion of the literature, the traditional thesis about the tour route planning try to

use its own conditions and considerations of many factors. For example, Chang [4] try to identify the most time-efficient shortest path according to the time factor. However, travelers really think about the direction that is diverse, and when more factors are considering then there are more limited, so the formation of the so-called multi-criteria decision making problems. It is utilized in the research of "Dynamic criteria evaluation for tour scheduling optimization" [5]. In the researches of Shih-Jui Lin [6] and L. Coyle [7], they make appropriate recommendations according to the weights of the users to indicate the degree of attention to their preferences. Ying-Hui Lien [8] tries to use Artificial Intelligence Decision Model and human professional knowledge in the area of travel to plan and evaluate a travel route. However, it is a computing power consumption task.

In this paper, we will import the concept of Web 2.0 to build our platform, through the user an endless supply of creative energy and community strength to ensure the freshness of the information. We will also provide automatically travel planning mechanism according to users' preferences.

## 3 Our Proposed System

We try to propose a Web 2.0 service that can be a total solution for a traveler. Fig. 3 is the concept flow chart of our proposed web service. Before your trip, you can visit our service to surf the experiences sharing from others in within the service. You can also join the discussions of some locations that you have visited before. When you have time to start a trip, you can easily setup your preferences, and our service will automatically generate a travel plan for you. Of course, you can adjust and modify the overall plan as your wish. After the planning step, our service will generate a detail trip manual for you. The manual will include the detail information of each location, for example, the position of the location in the Google Map, the telephone, the address, the distance between two attractions, and ticket price etc. The information was created by wiki system from users. You can print it out for your reference within your happy trip. After your trip, you can share your whole trip plan or the experience of a single attraction to others through our services. It will be a positive cycle, a user utilizes the information from our service and the information will help him to generate more information. This cycle will keep the information in the service freshness and useful to new users

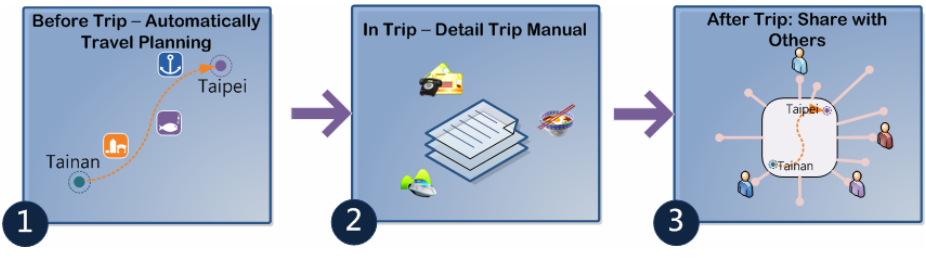


**Fig. 3.** Concept of our proposed system

### 3.1 Location Information

The location information is the most important data in our services. Although the wiki system can provide a platform for users to create the location information, it is a service with empty location information in the beginning. Users almost do not have the passions to contribute their experiences or knowledge in a service with poor content.

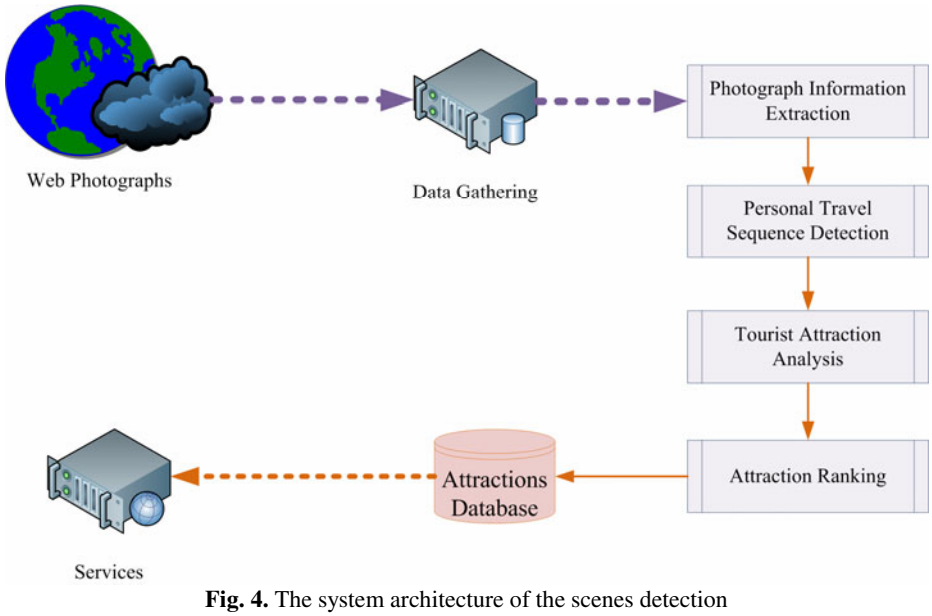


**Fig. 4.** The system architecture of the scenes detection

In our past research result [9], we gather photographs published by users on the Internet, with the sources encompassing the entire network (such as Internet photograph albums, groups and blogs, etc.) as well as more concentrated sources such as Flickr and other online communities for sharing photograph albums. We use the photograph with GPS information which may be embedded by camera or manually. By analysis the photographs we collected, we can easily detect the attractions around the world. Fig. 4 is the system architecture of the scenes detection. The photographs for detecting the attractions will be a good source of pictures to show on own initial attractions information in the wiki system. The descriptions and the sentences around the photographs are also can be utilized as the initial introduction to the attraction. As to the tourist ranking algorithm proposed in the research is also a good hint for the automatically travel planning. We can select the locations by the rank score generate by the algorithms.

With those initial locations information, users can help the service to adjust and modify the data about the locations through the wiki platform. This solution can solve the embarrassment situation for the empty data in the beginning of the web site.

### 3.2 Ranking of a Location

As we mention above, the tourist ranking algorithm proposed in our past research can be a hint for ranking a location. The second clue to rank a location can be the recommendation system in our service. When a user has visited a location, he must have his own opinion to the place. Therefore, he can assign a score to it. If the number of users to assign the score is enough, it will be a significant ranking source for the locations. The recommendation system is widely used in the Web 2.0 services, and it can easily judge the good or bad according to the power of community.

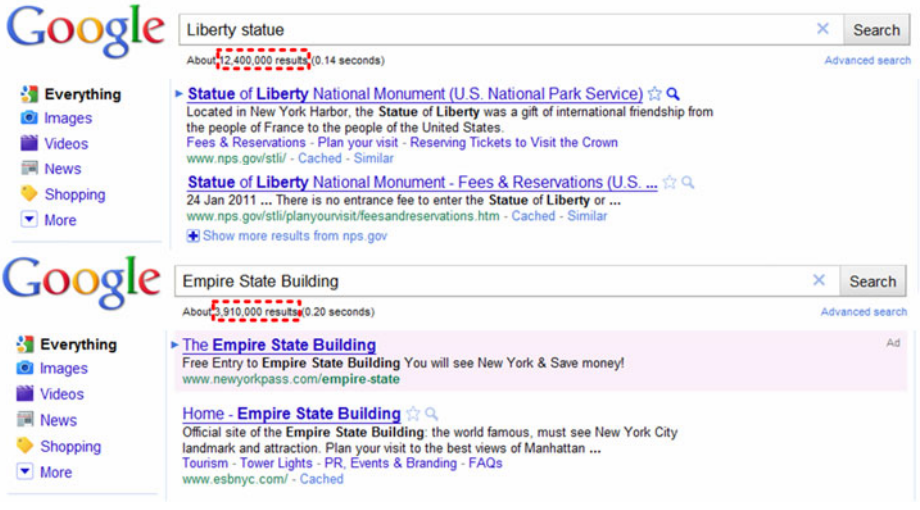


**Fig. 5.** The search results from Google

The number of the search results from Google is also good for ranking a location. As Fig. 5 displays, we submit the query terms “Liberty Statue” and “Empire State Building” to the Google. There are approximate 12,400,000 search results for the Liberty Statue, and 3,910,000 for the Empire State Building. The number of Liberty Statue is more than Empire State Building, this also happens to match the rank with the very people in mind. It is not just a coincidence of course, a location with more results in a search engine means that more people discuss about it. It applies that the location is also an important for traveler to visit. Therefore, the number of search results is a good clue for ranking a location for the travelers.

### 3.3 Automatically Travel Planning

Automatically travel planning is a complicated problem to solve. There are a lot of route types between two locations. For examples, a loop from beginning and destination locations, destination area loop, and single direction via the same route etc. In order to minimize the complexity of the problem, we have an assumption that the travel route is single direction from the beginning location to destination one.

Our proposed algorithm is a greedy one as the concept of Fig. 6. If we now in the location marked as the red balloon "A", there are a lot of locations within the distance of predefined ***k*** kilometers. If there exists no location within the distance, we will larger the distance from ***k*** to ***2k*** even ***4k*** till we have locations within it. We will calculate the score for each location according some vectors they will be discussed latter. The location with the highest score will be chosen as the next location to be visited. In the Fig. 6, the Sun Moon Lake in the bottom of YuChih will be chosen as the next location. We will continue the process till we meet our destination location. The chosen locations are the results from our proposed automatically travel planning algorithm.


**Fig. 6.** The concept of the automatically travel planning

**Ranking Score.** The first vector for the score calculation is the ranking score. As we mention in the above section, we will use the tourist ranking algorithm, recommendation system, and the number of search results from Google to gather the ranking score for each location. The ranking score represents the major part of importance for each location.

**Distance Score.** There are two parts for the distance score, one is the distance from the calculated location to the destination and the other is the distance from the current selected location which is the red balloon "A" in the Fig. 6. If the distance from the calculated location to the destination is shorter and the score is larger, it will make the location selection trend to the destination. And the distance from the current selected location is shorter the score is also lager. It is because we appreciate not to travel long distance from one to another.

**Angle Score.** We will calculate the angle between the current selected location to the calculated location and the current selected location to the destination. If the angle is too large, for example the angle is larger than 90 degrees, and the angle score will be negative for the penalty. It is because the calculated location is away from the destination.

**User Preferences Score.** User can setup preferences for the automatically travel planning. If users love to visit locations that never visited before, the new locations will have positive score. Or if users love delicacies, and the delicacies locations will have higher weights.

**Random Adventure Score.** Our algorithm will generate a random score for each location. This score is designed to prevent that the travel plans are always the same when users set the same start and destination locations. This random adventure score won't influence importance locations. However, if the score of some locations are similar, this design will generate different travel plan for different users. There is a benefit that more locations can be visited and written with experiences if different attractions can be for different people to travel. If you are an adventurous person, you can set the random adventure as the maximum weight, and that trip planning is completely random decision.

Following is the algorithm of automatically travel planning.

```
TravelPlan(start, destination)
  Result:= {start};
  Current:=start;k=PreDefinedk;
  while(Current!=destination)
    SelectedLocation:=NULL; MaxScore:=-1;
    For all locations x distance < k KM from Current
      LocationScore(x)=RankingScore(x)+
                       Distance(x)+
                       AngleScore(x)+
                       UserPreferenceScore(x)+
                       RandomAdventureScore;
      If MaxScore < LocationScore(x)
        MaxScore:=LocationScore(x);
        SelectedLocation=x;
    If SelectedLocation==NULL
      k:=2k;
    else
      k:=PreDefinedk;
      Current:=SelectedLocation;
      Result:=Result+Current;
  return Result;
```

## 4 Results

We name our system as chetoe.com. The chetoe means play and travel in Taiwanese pronunciation. Fig. 7 is the snapshot of our system when users click on the Taiwan President Office. Our system will display the location around the selected place, and users can continue click the location they desired to surf. The different color represents the different type of locations. Fig. 8 is the snapshot of the automatically travel planning system. Users can easily setup the preferences and have the travel plan. The

user can easily adjust or modify the travel planning though our platform, and then generate the detail tourism manual. It will be very useful for the user to reference during the trip.


**Fig. 7.** The locations around the Taiwan Presidential Office


**Fig. 8.** The results of automatically travel planning

## 5 Conclusions

In this paper, we design to setup one integrated tourism service named chetoe.com based on the concept of Web 2.0. It will allow users to share the experiences, pictures, and description of various locations though our designed platform. Users can have an automatically generated trip planning before the trip according to user preference by our proposed algorithm, have an automatically generated tourism manual during the trip, and share the experience of the whole tourism after the trip. Though the integrated travel web site, one user can retrieve the popular tourism locations recently by browsing the site. The user can also have a personal travel plan that match his preferences by easily selecting some options. After the travel, the user can record and share the travel experience of one single tourism location or the whole travel route to others.

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