

Research of AI Cycling Package Tour and the Essential Succeeded Factors

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ABSTRACT: We got the impression that cycling activities are races to be the majority before, which sightseeing tourism is now all the rage; they have already transformed into one of the most popular leisure activities. Through the impacts of wireless communication devices, Internet of Things (IoT) sensing technology and Artificial Intelligence (AI) smart technology, and traditional mode of cycling activities changed even more. Because the lack of domestic and foreign research on cycling Package Tour, the main point of this article is to discuss the key factors on successful AI cycling Package Tour. By setting up the critical success factors indicator, it can provide reference of coming plan travel productive strategy to travel agency and bicycle clubs.

The research has two phases. First phase of qualitative research, with in-depth interview, discuss AI Internet of Things and sensing technology...etc. this information equipment applies on six main perspectives of Package Tour, including tour guide, accommodation environment, transportation, dining arrangement, attraction content and traveling safety. Later, I adopted the Delphi method to establish the most substantial key factors on cycling Package Tour. The second phase of qualitative research is to confirm the critical factors lead to success on AI cycling Package Tour further.

The research showed that travel agencies and bicycle clubs consider tour guide and attraction content are the two most importantly critical success factors on AI cycling Package Tour; however, they think tour guide, accommodation environment and attraction content these three perspectives are critical success factors on cycling Package Tour. There are differences between the critical success factors to them, other perspectives are the same. The research result can offer travel agency and bicycle clubs some references about digital programming and operating stroke, provide practical advice, to contribute the development on cycling Package Tour in the future.

KEYWORDS: AI Bicycle, Critical Success Factor, Package Tour

1. INTRODUCTION

Travel has become a fashion for most Taiwanese people, especially compatriots regard Package Tours as preferred mode of traveling abroad [1]. Group Package Tour is the most prevailing way of going abroad in great majority of Asia countries [2]-[4]. Escorted tours have been viewed as the main force of tourism industry [5]. Package Tour is the product to respond to different needs from customers; Inclusive Package Tourism is the indispensable basic item for travel. Furthermore, Package Tour service is one of the core competencies for travel agencies [6].

AI Cycling Package Tour is a rising travel product, especially it is an important market for travel agencies. However, domestic research on Cycling Package Tour is still insufficient. Thus, the purpose of this research is to be hoped through related literature collation, interviewing travel agencies and bicycle clubs, adopting Delphi method and collecting a huge amount of questionnaire distribution to set up complete AI Cycling Critical Success factor. To offer travel agency some practical suggestions on AI Cycling Package Tour and provide some reference of generating strategy on Cycling Package Tour in the future.

2. THEORETICAL BACKGROUND

If you are using Word, use either the Microsoft Equation Editor or the Math Type add-on (<http://www.mathtype.com>) for equations in your paper (Insert | Object | Create New | Microsoft Equation or Math Type Equation). “Float over text” should not be selected.

A. Definition of AI Cycling

In recent years, every country actively promotes green and pollution-free public bicycle system. Countries that carry out public bicycle systems have increased day by day; it can help decrease traffic flow and reduce energy consumption and carbon emission [7]. Transportation system in city must have comprehensive planning, with consideration of city integral development, providing the public the service of seamless transfer, the choice of rental station is one of the critical factors before establishing the system. How to choose an appropriate location, offer the public convenient rental and transferred service are important to enhance usage intention of the public, even to increase the whole usage rate of the public transportation [8].

Due to the promotion of Intelligent Applications Technique of Internet of Things, the current domestic situation of one person one cellphone even speeds up the usage rate on information carrier. Therefore, how to utilize mobile smart devices which have increasing ownership rate and combine with communication network service to offer users more various and efficient location-based service through modern bicycle rental service become an interesting and important issue. With the Cloud Messaging Integration Service Platform provides users with a much more convenient and complete Integration service environment and utilizes public bicycle systems to separate parking spaces in different stops or time-division available bicycle numbers. Through Information Management Mode introduce concept of risk management, establishing six main Operation Service Indicators, including cars shortage, places shortage, reliability, fluctuating rate, average waiting time, usage rate [9],[10]. For sure that trending of cycling tourism with increasing information has improved to digitized bicycles; that is, bicycles are shipped with digital AI Information Device System. Figured out that developing Navigation Planning method is applicable to cycling, utilizing exclusive digital electronic map to be path planning map for this system to meet the need of professional bicycle riders to have physical training or cyclists to challenge physical limits [11]. The system can automatically calculate the path distance, detect real-time traffic information, which contains the easiest and the most difficult path planning by considering the changes of heights in the path. Besides, after taking Mass Rapid Transits (MRT), renting public bicycles is now a new fashion. Therefore, regarding the need from the users of You-Bike as the source, utilize Volunteered Geographic Information (VGI) of Open Street Map (OSM) to find out the factors around the sharing location which influence the usage rate the most, estimate which characteristic location cause higher rental rate of You-Bike sharing station. Aim to different road quality, have bicycle path and sidewalk or not, and different rental location, such as MRT station, school, or riverside bikeway entrance to assess the operation efficiency of public bicycle sharing station and accessibility [12]. However, bicycles are not easy to manage, indirectly causing the number of bicycle burglary cases to rise. Through 8051 single-chip microcomputers to combine GPS, texting devices and bicycle. Single-chip microcomputer against GPS module will take turns recording the newest anchor points on memory, and return immediate longitude, latitude, time and date...etc. information with the texting device. In order to track the history path in data bank to search for bicycle action monitoring [13].

B. Definition of Cycling Sightseeing

Bicycle riders can be separated into two types. One is bicycle fanatics who use bicycles as transportation, and the other is occasional rider who only rides a bike on good weather and view bicycle as one of transportation choice [14]. Due to different types of bicycle tour, diversified view, mild climate, friendly people and well-planned bicycle tour route are positive benefits to increase bicycle tour population. During the tour, the scenery around, safety, riding quality and crowding directly influence the experience of travel [15]. Nowadays, bicycles are no longer to just be transportation, they can also supply sightseeing element, especially in the development of destinations. At the same time, it can offer some references for sightseeing networks and establish sustainable transport development mode [16]. Suggested that features of bicycle sightseeing include Self, away from home, Temporary, Comprehensive; features of bicycle include Quietness, environmentally friendly, having close contact with natural environment, less-polluted carrier than vehicles [17]. Take the UK for instance, there are about 25 million bicycle tourists per year, contribute 500 million GBP per year to tourism receipts [15]. Bicycle trending remodel the role of bicycle, bicycles are no longer just a transportation to riding instead of walking and commute; at the same time, they become one of important sightseeing tour carrier [18]. As long as those bicycle riders have recreation or sightseeing, they are all fallen into category of bicycle sightseeing [19].

C. Definition of Package Tour

Packaging, referred to a combination of related products and other ancillary services, provide single-priced

products and apply to tourism and recreation industry. Packaging is composed of related tourist facilities, activities, services these physical and non-physical composition and be sold with single price [20]. Tourism product is generated due to the interaction effect happened in specific time in response to tourists and the resource of tour destination [21]. Therefore, tourism products that sold by travel agencies must be based on the resource of tour d Definition of Package Tour estimation, and the resource of tour destination must need the travel agencies to offer combination and design these services to form the Packaging.

D. Definition of Critical Success Factor

Critical success factor (CSF) or key success factor (KSF), first proposed by Massachusetts Institute of Technology, is a set of analytical methods which aim to organizational information need. Its main assumption is that any one of organization must grasp some important factors. If they want to manage successfully, they can find some possible factors that influence the survival of the company from Porter 5 forces analysis, and master competitive advantage from it.

In conclusion, Critical Success Factor is the most important part for the company. Through understanding and analyzing CSF to set up competitive advantage of company and achieve the goal of company's success. Learned from literature review, the analytical method of CSF can be separated into two types. One is researchers subjectively express their opinions and analyze through reference collection and experience in person. The other is researchers objectively analyze critical success factors with statistical quantitative methods. There is research with a combination of two types to conduct analysis of critical success factors.

Therefore, this research first collects related literature, understands related background of bicycle sightseeing and packaging, and utilizes related perspective on package tour. With in-depth interviews, organizing related factors and conducting Delphi method to set up complete critical success factors.

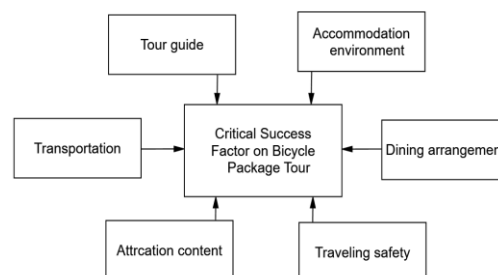
H1: How to Establish Critical Success Factor on AI Bicycle Package Tour?

3. RESEARCH METHODOLOGY

This research, according to the combination of general background information and related literature discussion, establishes Conceptual Framework (Fig. I.). In the light of the definition of domestic and foreign scholar on package tour and observation of tourism status to organize related perspective on package tour and import application of AI smart technique and sensing technology. There are six perspectives: tour guide, accommodation environment, transportation, dining arrangement, attraction content and traveling safety. Developing semi-structured interviews from these six perspectives, having in-depth interviews with travel agencies and bicycle clubs, conducting Delphi method to set up critical success factors on bicycle package tour.

Fig. I. Conceptual Framework

E. Research Method



This research has two phases. First phase is three-rounds Delphi method, and it combines Qualitative Research (Semi-structured questionnaire) and Quantitative Research (Likert scale).

F. Delphi method

Delphi method, also known as Expert judgment, is one of group decision making methods. Most situations are used on Qualitative Research. Linstone and Turoff [22] mentioned that specialist quantitative criteria need fifteen to twenty-five people engaging is the best. The number of experts interviewed by the research are twenty people, samples are travel agencies which have bicycle package tour products in consolidated travel agencies and Class-A travel agencies and cycling teams are announced by Cycling Lifestyle Foundation. Interviewees are supervisors and coordinators in

Product Department, the captains of cycling teams and itinerary planning principal. Therefore, they have unique and professional opinions on Bicycle Package Tour.

G. Snowball Sampling

Because Bicycle Package Tour is still an original topic of academic research, this research adopts Snowball Sampling. This method is used when it is difficult to find specific parent-member from the first interviewee. After that, ask the first interviewee to recommend the next representative interviewee, so the sample will expand like rolling a snowball until it conforms to required sample amount for the research.

H. Survey Techniques

Using Delphi method to establish critical success factors of bicycle package tour and design questionnaire. Due to the consideration of time, manpower and cost, so this research, directed toward travel agencies and bicycle club's members in Kaohsiung City and Pingtung County, conduct Survey Techniques and data analysis.

I. Data Analysis

In order to find out critical success factors of bicycle package tour, this research adopted Delphi method to conduct two-phased survey. Under the circumstances of non-interfering experts, they provide precious advice respectively, so the result can be much closer to practical operation. After returning questionnaires, in the light of experts' advice to organize, correct contents and reply to experts. Answered repeatedly until reaching a consensus. After questionnaire quantitative recovery, use SPSS20.0 Statistical Package to file obtained materials, perform analysis, consolidate and determine whether degree of convergence of index factors will reach the agreement or not. We can learn from previous literature of Delphi method that there is still no conclusion of Delphi's best convergence. If evaluate the circumstance of Convergence opinions against objective statistical analysis, Median, Mean, Mode, Quartile deviation, and Standard deviation...etc. are the most common statistical methods. In principle, it judges and decides by researchers themselves [23]. Thus, this research refers to commonly used statistical methods in domestic and foreign areas and take these four standards as test criteria.

There are narratives below:

1) Standard Deviation, S. D.

The standard value must be less than 1, this shows that the statistical dispersion between experts is low.

2) Mean

Experts consider when the means of obtained score with indicators' important level is the same as Mode after rounding off to the first decimal place is determined index convergence.

3) Quartile Deviation, Q. D.

When Quartile Deviation of experts' opinion distribution to specific issue is less than or equal 0.6, it means that experts reach high consensus to this topic; if Quartile Deviation is between 0.6 and 1.0, it means that experts reach moderate consensus; when Quartile Deviation is more than 1.0, it means that experts reach no consensus (Table I).

Table I: Standard Table of Consistency. Data source: Holden and Wedman [24]

Degree of Conformance	HIGH	MODERATE	LOW
Quartile Deviation (Q. D.)	Q.D.<=0.60	0.6<Q.D.<=1.00	Q.D.>1.00

4) Kendall's Verification

Kendall's coefficient of concordance W is used to calculate the Degree of Conformance on three groups of information and above, and it is appropriate for inter-coder reliability. If the value is between 0 and 1, the bigger W-value is, the higher the conformance is. If the value is 0, it means the lack of conformance; if the value is 1, it represents high consistency.

4. RESEARCH RESULTS AND FINDINGS

J. In-depth Interview

1) Tour Guide

According to experts' interview content, it is mainly summarized seven specific factors: get familiar with itinerary content, have ability of attractions explanation, have well physical condition, have bicycle related knowledge, have service enthusiasm, have first aid skills and have ability of crisis handling.

2) Accommodation Environment

According to experts' interview content, it mainly summarized five specific factors: arranging accommodation according to clients' needs, having a quiet and comfortable environment, bicycle parking space, well geographical location and special scenery.

3) Transportation

According to experts' interview content, it is mainly summarized six specific factors: have transportation system accessibility, provide professional tour bus, have logistics supply vehicle, experience different transportation, consider bicycle shipping problem, and consider luggage shipping problem.

4) Dining Arrangement

Dining arrangement is one of the most important parts in tourism, especially bicycle package tour have more physical strength than general tour. According to experts' interview content, it is mainly summarized five specific factors: provide special flavor meal, dishes richness, healthy meal, enough food, and depend on local circumstance.

5) Attraction Content

The attraction content is usually the main shaft and attraction of package tour. According to experts' interview content, it is mainly summarized seven specific factors: have key thematic, arrange by seasons, have natural view, have cultural characteristics, have challenging route, have well climate, and have complete bikeway.

6) Traveling Safety

No matter which type of tourism, the most important of all is safety, even bicycle package tour has no exception. According to experts' interview content, it mainly summarizes five specific factors: pay attention to members' physical condition, examine bicycle condition, recon route status, provide risk handling plan, and notice weather changes.

K. Delphi method

This research uses In-depth Interview and Delphi method to conduct the survey. At first, conduct In-depth interview with open-ended questionnaire and experts' group, then obtain 35 index factors after interview. Based on these 35 index factors to distribute the first-phased structured questionnaire of Delphi method. In the first phase structured questionnaire, not only have the experts check the importance of index factors but also ask them whether the opinions need to be corrected or increase other index factors. Noticing from returned results, two groups of experts all proposed to modify and increase question items. The second phase questionnaire content adopted the reserved 34 index factors and added a question item. In total, 35 index factors are distributed in the structured questionnaire.

Table II: Critical Success Factor of Bicycle Package Tour, travel agencies first and second phase analytical comparison.

Perspective	Factors	First phase			Second phase		
		M1	Q. D	Kendall's W	M1	Q. D	Kendall's W
Tour Guide	Service Enthusiasm	5.00	0	0.23	4.90	0	0.60
	Ability of Crisis Handling	4.90	0		4.80	0.13	
	Familiar with Itinerary Content	4.80	0.25		4.70	0.5	
	Ability of Attractions Explanation	4.60	0.5		4.70	0.5	
	Well Physical Condition	4.50	0.5		4.30	0.5	
	First Aid Skills	4.50	0.5		4.20	0.13	
	Bicycle Related Knowledge	4.30	0.5		4.10	0	
	Ability of Repairing	ADDED			3.40	0.5	

	Bicycle						
Accommodation Environment	Bicycle Parking Space	4.50	0.5	0.16	4.60	0.5	0.61
	Well Geographical Location	4.20	0.5		4.30	0.5	
	Arrangement for Clients' Need	4.10	1 *		4.40	0.5	
	Special Scenery	4.10	0.13		4.30	0.5	
	Quiet and Comfortable Environment	3.80	0.63		3.30	0.5	
Transportation	Bicycle Shipping Problem	4.70	0.5	0.43	4.90	0	0.70
	Luggage Shipping Problem	4.70	0.5		4.80	0.13	
	Transportation System Accessibility	4.50	0.5		4.60	0.5	
	Logistics Supply Vehicle	4.50	0.63		4.80	0.13	
	Professional Tour Bus	3.90	1 *		3.80	0.5	
	Experience Different Transportation	3.40	0.5		3.90	0.13	
Dining Arrangement	Enough Food	4.40	0.5	0.20	4.90	0	0.74
	Dishes Richness	3.80	0.5		4.20	0.13	
	Depending on Local Circumstance.	3.70	0.5		4.00	0	
	Healthy Meal	3.60	0.5		3.40	0.5	
Attraction Content	Arrange by Seasons	4.50	0.5	0.18	4.80	0.13	0.62
	Natural View	4.50	0.5		4.90	0	
	Key Thematic	4.40	0.5		4.60	0.5	
	Well Climate	4.30	0.5		4.00	0.13	
	Complete Bikeway	4.00	1 *		4.30	0.5	
	Cultural Characteristics	3.90	0.63 *		3.70	0.5	
	Challenging Route	3.60	0.5		3.50	0.5	
Traveling Safety	Notice Members' Physical Condition	5.00	0	0.23	5.00	0	0.64
	Risk Handling	5.00	0		5.00	0	

	Plan						
	Examine Bicycle Condition	4.90	0		4.80	0.13	
	Recon Route Status	4.80	0.13		4.30	0.5	
	Notice Weather Changes	4.60	0.25		4.20	0.13	
Integrated Conformance	Kendall's W =0.38			Kendall's W =0.56			

Notation: 1.M1=Mean ; M2=ModeS.D. =Standard Deviation ; Q.D. =Quartile Deviation2. 5=very important,4=important,3=normal · 2=unimportant · 1=very unimportant3. *Represents lower coefficient item.

Table III: Critical Success Factor of Bicycle Package Tour, bicycle clubs first and second phase analytical comparison

Perspective	Factors	First phase			Second phase		
		M1	Q.D	Kendall's W	M1	Q.D	Kendall's W
Tour Guide	Familiar with Itinerary Content	4.90	0	0.30	5.00	0	0.61
	Ability of Crisis Handling	4.70	0.5		4.90	0	
	Well Physical Condition	4.50	0.5		4.80	0.13	
	Bicycle Related Knowledge	4.50	0.5		4.60	0.5	
	First Aid Skills	4.40	0.5		4.60	0.5	
	Ability of Attractions Explanation	4.20	0.63*		4.20	0.13	
	Service Enthusiasm	4.10	0.63*		4.10	0	
	Ability of Repairing Bicycle	ADDED			3.40	0.5	
Accommodation Environment	Bicycle Parking Space	4.50	0.5	0.41	4.70	0.5	0.68
	Quiet and Comfortable Environment	4.10	0.13		4.20	0.13	
	Arrangement for Clients' Need	4.00	0.25		4.10	0	
	Well Geographical Location	3.80	0.5		3.50	0.5	
	Special Scenery	3.60	0.5		3.40	0.5	
Transportation	Bicycle Shipping Problem	4.20	0.5	0.46	4.70	0.5	0.70

	Luggage Shipping Problem	4.10	0.5		4.60	0.5	
	Transportation System Accessibility	4.10	1*		4.50	0.5	
	Logistics Supply Vehicle	3.30	0.63*		3.40	0.5	
	Professional Tour Bus	3.00	0.5		3.30	0.5	
	Experience Different Transportation	4.50	0.5		4.70	0.5	
	Transportation System Accessibility	3.8	1*		DELETED		
Dining Arrangement	Enough Food	4.20	0.5	0.24	4.40	0.5	0.62
	Depending on Local Circumstance	3.60	0.5		4.20	0.13	
	Dishes Richness	3.50	0.5		3.40	0.5	
	Healthy Meal	3.40	0.5		3.50	0.5	
	Special Flavor Meal	3.30	0.5		3.30	0.5	
Attraction Content	Well Climate	4.20	0.63*	0.32	4.10	0.13	0.63
	Arrange by Seasons	4.20	0.5		4.30	0	
	Key Thematic	4.00	0.25		4.20	0.5	
	Natural View	3.90	1*		4.10	0.13	
	Cultural Characteristics	3.70	0.5		3.20	0.5	
	Challenging Route	3.50	0.5		3.80	0.5	
	Complete Bikeway	3.40	0.63*		3.10	0.5	
Traveling Safety	Notice Members' Physical Condition	4.70	0.5	0.17	5.00	0	0.51
	Examine Bicycle Condition	4.70	0.5		4.90	0	
	Notice Weather Changes	4.60	0.5		4.50	0.5	
	Risk Handling Plan	4.50	0.5		4.30	0.5	
	Recon Route Status	4.40	0.5		4.20	0.13	
Integrated Conformance	Kendall's W =0.38			Kendall's W =0.50			

Notation: 1.M1=Mean ; M2=Mode ; S.D. =Standard Deviation ; Q.D. =Quartile Deviation2. 5=very

important, 4=important, 3=normal · 2=unimportant · 1=very unimportant3. *Represents lower coefficient item.

Table IV: Critical Success Factor of Bicycle Package Tour, bicycle clubs and travel agencies attach importance analytical comparison.

Perspectives	Critical Success Factor Sequence of Travel Agencies		Critical Success Factor Sequence of Bicycles Clubs	
Tour Guide	Service Enthusiasm	1	Familiar with Itinerary Content	1
	Ability of Crisis Handling	2	Ability of Crisis Handling	2
	Familiar with Itinerary Content	3	Well Physical Condition	3
	Ability of Attractions Explanation	4	Bicycle Related Knowledge	4
	Well Physical Condition	5	First Aid Skills	4
	First Aid Skills	6	Ability of Attractions Explanation	5
	Bicycle Related Knowledge	7	Service Enthusiasm	6
	Ability of Repairing Bicycle	8	Ability of Repairing Bicycle	7
Accommodation Environment	Bicycle Parking Space	1	Bicycle Parking Space	1
	Well Geographical Location	2	Quiet and Comfortable Environment	2
	Arrangement for Clients' Need	3	Arrangement for Clients' Need	3
	Special Scenery	4	Well Geographical Location	4
	Quiet and Comfortable Environment	5	Special Scenery	5
Transportation	Bicycle Shipping Problem	1	Bicycle Shipping Problem	1
	Luggage Shipping Problem	2	Luggage Shipping Problem	2
	Transportation System Accessibility	2	Logistics Supply Vehicle	3
	Logistics Supply Vehicle	3	Professional Tour Bus	4

	Professional Tour Bus	4	Experience Different Transportation	5
	Experience Different Transportation	5	Transportation System Accessibility	Deleted
Dining Arrangement	Enough Food	1	Enough Food	1
	Dishes Richness	2	Depending on Local Circumstance	2
	Depending on Local Circumstance.	3	Special Flavor Meal	3
	Healthy Meal	4	Dishes Richness	4
	Special Flavor Meal	Deleted	Healthy Meal	5
Attraction Content	Natural View	1	Arrange by Seasons	1
	Arrange by Seasons	2	Key Thematic	2
	Key Thematic	3	Well Climate	3
	Complete Bikeway	4	Natural View	3
	Well Climate	5	Challenge Route	4
	Cultural Characteristics	6	Cultural Characteristics	5
	Challenging Route	7	Complete Bikeway	6
Traveling Safety	Notice Members' Physical Condition	1	Notice Members' Physical Condition	1
	Risk Handling Plan	1	Examine Bicycle Condition	2
	Examine Bicycle Condition	2	Notice Weather Changes	3
	Recon Route Status	3	Risk Handling Plan	4
	Notice Weather Changes	4	Recon Route Status	5

5. CONCLUSION

Because of the prevalence of leisure exercise, the concept of environmental protection is deeply rooted in our belief roots and causes the start of bicycle exercise. Bicycle-related tourism activity has sprung up. However, compatriots' current tourism type is still subject to package tours, so this research uses Critical Success Factors of bicycle package tour as the main topic. Based on six main perspectives of package tour: tour guide, accommodation environment, transportation, dining arrangement, attraction content and traveling safety, through In-depth interview and discussion with travel agencies and bicycle clubs. Take Delphi method to find the critical success factors that have the most conformance as the reference of operating e-bicycle package tour in the future.

To sum up, combining bicycle package tour and AI technology can offer the current situation of each Scenic area and efficiently improve present accuracy in Taiwan bicycle tour market. Moreover, through 5G AI technology conducting In-depth tourism can provide participants lodging, dining, road condition or dangerous areas... etc. this news at the first time, especially in the circumstance without tour guide.

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