Hindawi
Wireless Communications and Mobile Computing
Volume 2021, Article ID 5567616, 10 pages
https://doi.org/10.1155/2021/5567616

Research Article

System Dynamic Simulation of Online Customers for Cruise Travel: Based on the Customer Life Cycle Perspective

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Received 27 January 2021; Revised 19 February 2021; Accepted 20 March 2021; Published 5 April 2021

Academic Editor: Wenqing Wu

Cruise tourism is an emerging tourism industry. Under the current online consumer market, expanding the number of online customers is an important consideration for the sound development of cruise tourism, starting from the reality of cruise travel, integrating life cycle theory, demand theory, and network consumption behavior theory, defining the evolution model of customer life cycle, using system dynamics for simulation analysis to discover the dynamic changes in the number of cruise travel online customers in different life periods. The analysis of the simulation results found that at different stages of the life cycle evolution of cruise travel network customers, travel demand is comprehensively affected by various factors such as basic needs, novelty, offline experience, Internet word-of-mouth, and information quality. The number of potential customers first accelerates and then declines. The trend is flat, the number of waiting customers is normally distributed over time, and the number of existing customers and lost customers tends to stabilize after an accelerated increase. The simulation results with word-of-mouth factor as the test function show that the model has good robustness and sensitivity. The number of waiting customers is sensitive to changes in word-of-mouth impact factors, and the number of existing customers has not increased significantly. Finally, summarize the development strategies of cruise tourism from the perspective of life cycle: increase the promotion of cruise tourism network and expand the range of potential customers, highlight the characteristic orientation of cruise tourism differentiation, induce waiting for customers to pay online, improve the quality of cruise tourism experience and maintain existing customer loyalty, and optimize the quality of travel information on the online platform to attract lost customers to turn back.

1. Introduction

Cruise ships in foreign countries can be traced back to the beginning of the 19th century and have a history of more than a hundred years, but they are new things in China and belong to the field of emerging industries [1]. Previous studies believe that the market for innovative products is mainly driven by supply and demand, and the latter is obviously a more effective way of emerging industries to diffuse in the face of consumer demand [2]. As a capital and technology-intensive innovative product, cruise ships have a large initial purchase investment and high subsequent operation and maintenance costs. The sustainable development of cruise tourism is full of high risks. Only after a period of rapid development with a certain scale of customer groups and the formation of scale effects in the cruise tourism market can the uncertainty of the future development of cruise tourism be effectively reduced. Consumers face the new form of cruise tourism, from understanding to acceptance, familiarity, and then exit, presenting a phased life cycle evolution process. Customers in different life cycle stages have different levels of understanding of cruise ships and different travel

experiences, which will generate different travel needs accordingly. At different stages of the life cycle, it provides customers with cruise travel services corresponding to their needs, that is, on the basis of meeting the basic travel needs of first-time customers, and then providing higher-level travel services, can we attract as many loyal customers as possible to participate in cruise travel.

An international market survey of cruise travel shows that customers participating in cruise travel are satisfied with the overall product as high as 98%. Among them, the satisfaction of travel intermediary channels is 89%. Cruise travel has the highest satisfaction among all types of tourism projects. Both the customer satisfaction rate and the revisit rate get the highest scores [3]. Cruise travel has such a high satisfaction rate and return rate, which has a lot to do with the cruise ship's ability to provide different levels of travel services. Cruise travel has such factors as leisure atmosphere, exotic destinations, entertainment and food on board, status symbols, and cruise appearance. It can meet the travel needs of customers at different levels.

Emerging industries cater to the trend of individualization and diversification of consumer demand and become the inevitable choice for major countries in the world to cultivate new kinetic energy for economic growth [4]. Under the macrobackground of China's "Strategy for a Powerful Maritime Power" and the "Maritime Silk Road Strategy" of the 21st century, the cruise tourism industry has shown rapid development. The number of tourists has shown exponential growth for many years, which has become a driving force for China's economic development and tourism industry expansion. By 2016, after a decade or so of rapid development, the number of Chinese cruise travel customers surpassed Germany to rank second in the world. However, compared with the national population base, the market penetration rate has not exceeded 0.2%, which is much lower than the global average of 3.03%. The Chinese cruise tourism market still has huge potential and room for growth. How to make full use of various cruise tourism promotion channels, provide cruise tourism products that meet customer needs, and continue to cultivate loyal customers is the direction of future efforts. The current cruise travel market promotion includes traditional channels and online channels. According to relevant statistics, the current penetration rate of cruise travel Internet channels is close to 60%. It will continue to grow in the future [5]. Therefore, in the process of expanding the scale of the cruise travel market through online channels, relevant companies must consider the changes in the needs of online customers in different life cycles and take reasonable countermeasures according to the stages of the evolution of the life cycle of online customers [6, 7]. This article selects online customers as the research object, uses demand theory and life cycle theory, combines the differences between online consumption and traditional consumption, and constructs demand-led system dynamics for the life cycle evolution process of cruise travel online customers from initial stage to maturity to exit Model, and perform simulation analysis to evaluate the demand and quantity change characteristics of online customers in the life cycle evolution process, so as to provide enlightenment for the maintenance of cruise travel online customers.

2. Literature Review

2.1. Current Status of Cruise Tourism. In the beginning, cruise ships were mainly high-end social venues involving the social elites and the wealthy. They met both leisure and social needs. After more than 40 years of rapid development, the customer structure of the cruise industry has undergone significant changes, and it has become a tourism project widely participated by the general public for the purpose of satisfying leisure. It is one of the fastest growing and most effective tourism projects in the modern tourism industry [8]. Cruise tourism is positioned as a new tourism industry in China, and national and regional incentive policies for cruise tourism and cruise construction have been introduced one after another. The number of cruise travel trips has continued to grow rapidly. From a total of 100,000 trips in 2006, the number of trips increased rapidly to more than 2 million in 2016, an annual increase of about 70%. Since 2015, the State Council has issued a number of policy documents on promoting the development of cruise tourism, encouraging companies to develop and build cruise ships, and granting 15-day visa exemption to international passengers entering the country via cruise ships. In 2017, six departments including the Ministry of Transport and the National Tourism Administration jointly issued the "Several Opinions on Promoting the Integrated Development of Transportation and Tourism," proposing to promote the construction of cruise ports and increase cruise travel routes. China has continuously introduced cruise tourism development policies, strengthened support for the cruise industry, and provided guidance from ports, infrastructure, and visa concessions for inbound tourists [9]. China cruise tourism ushered in a policy dividend period.

Faced with the rapid development of cruise tourism, cities such as Shanghai, Xiamen, and Shenzhen regard cruise tourism as a key emerging industry and take cruise homeports as their urban development positioning. The mainland city of Wuhan plans to build a homeport for inland cruises based mainly on the Yangtze River mainline tourism. However, as a new form of tourism, there are still many problems in China cruise tourism [10]. First of all, as an emerging industry, the number of cruise travel customers, the participation structure of business entities, and the degree of competition are all undergoing dynamic changes. There are risks such as technological uncertainty, strategic uncertainty, and rapid cost changes from high to low. The characteristic is that only by closely tracking the changes in customer demand and quantity and ensuring that the number of cruise travel customers maintain a certain scale can various risks be effectively reduced [11]. Secondly, the current Chinese cruise travel is completely occupied by international cruise companies, and local cruise companies are still in the embryonic stage. They need to accumulate experience in cooperative agency, ticket sales, ship management, and customer management, especially around the dynamic changes in customer demand. Travel customer discovery, cultivation, and value mining are all facing knowledge gaps. Finally, China's cruise tourism promotion and sales model is dominated by "chartered ships," which is different from the "one-to-one" service

model of European and American cruise markets that meets individual needs. The charter model with Chinese characteristics shows price competition and low-end services. Problems such as unclear rights and responsibilities have seriously damaged the brands of charter parties and cruise companies. Customers cannot experience the "high-end image" of cruise travel, which has a negative impact on the growth of cruise travel customers. Under the influence of various unfavorable factors, for a certain period of time in the future, the number of international cruise ships and the number of cruise tourists will experience negative growth, and in the long term, it will show a slow growth trend [12, 13].

2.2. Demand Theory in the Life Cycle. The life cycle theory was first proposed by Hill and Hansen at the end of the 1930s. Taking the life cycle of life as a reference, the evolution process of things is divided into different stages such as birth, growth, maturity, and decline. Later scholars combined with specific objects to propose customer life cycles, product life cycles, and enterprise and industrial life cycles [14]. The customer life cycle is based on the business relationship established by the enterprise and the customer and is divided into four evolutionary periods according to the characteristics of the business relationship in different periods: relationship establishment period, relationship growth period, relationship maturity period, and relationship degradation period. During the development of the customer life cycle, customer needs and customer value will also change dynamically due to changes in business relationships. In the process of continuous transformation from the customer's first purchase to short-term customers to loyal customers, customers' judgment criteria for products and services are becoming more and more objective and rational. Customer needs develop from curiosity and cost to a solid relationship of dependence, and customer value will also occur from appearance, peak to disappearance [15]. When companies implement important decisions such as strategic planning, major policies, and performance appraisal, if they only use traditional customer value evaluation indicators such as market size and maintenance costs and ignore the dynamic value of customers based on life cycle and demand changes, then the company's operations countermeasures will have a short-term tendency, thus deviating from the company's long-term value maximization goal.

The hierarchy of needs theory believes that all human behaviors are to meet certain needs, and after satisfying the lowest-level needs, human behaviors will begin to shift to higher-level needs. Therefore, in the dynamic evolution process of the customer life cycle, demand plays an important guiding role. After the first stage needs are met, more advanced needs will guide consumers into the next stage of the life cycle. In the mature period, customer needs are relatively stable and can bring the greatest value to the enterprise, but every stage of the customer's life cycle is indispensable. With the dynamic evolution of the customer's life cycle, with changes in customer demand as the core, the relationship between the enterprise and the customer follows a certain evolutionary law under the comprehensive influence of various factors, and the form of external development manifests as the development from one state to another [16]. The relationship establishment period is the first stage of the evolution of the customer's life cycle. Customers and companies begin to tentatively contact each other and do not know each other well. Driven by the customer's curiosity for products or services, they have a desire to buy and become potential customers, and they begin to collect information and data, comparing and selecting the products or services of enterprises. The relationship growth period is the second stage of the life cycle. The relationship between the company and the customer develops rapidly. After the first stage of comparison, the customer makes a decision whether to purchase, thereby realizing customer value. For customers in the growth period, companies should continue to increase marketing investment and guide customers to make purchase decisions through price factors and brand factors. The maturity period marks the development of the relationship between the customer and the enterprise to the highest level. Customers have continuous consumer demand for the products or services provided by the enterprise and show a certain degree of loyalty.

2.3. The Theory of Customer Consumption Behavior under the Network Environment. The round-the-clock convenience and easy accessibility of online channels make it a trend for consumers to inquire, compare, and select cruise tours and complete online bookings through website platforms. Compared with traditional channels, the characteristics and influencing factors of Internet channels have both commonalities and differences. The commonality is that the customer needs of the two channels have an experienced process from unfamiliar to familiar to emerging products and, then, to exit, showing the characteristics of the phased evolution of the life cycle; the difference is that customer needs in online channel to purchase products through online platforms are not only affected by website popularity and word-of-mouth but also by user reviews and cost-effectiveness. Traditional marketing theory believes that customer consumption behavior is mainly divided into goal-oriented and shopping experience. Goal-oriented is task-driven, characterized by focusing on efficiency, rationality, and caution. Consumers hope to buy what they want as soon as possible and do not care about the amusement and pleasure of the purchase process. The shopping experience type is just the opposite. Customers focus on the various experiences of the purchase process, such as surprise, participation, and the meaning of the product. Therefore, buyers often make purchase decisions based on intuition rather than rational and rational consumption behavior.

Online consumption behavior can also be divided into goal-oriented and shopping experience. Compared with traditional customers, goal-oriented online customers spend more time thinking and do not make purchase decisions as quickly as traditional customers; experiential online customers visit websites with different characteristics according to their hobbies, like to interact with people who have common hobbies through social media, and actively participate in online shopping evaluation [17]. In China's online consumer market, young and middle-aged rational consumers

occupy an absolute proportion. Online customers have a process of thinking about online product search. Since there is no face-to-face communication, online consumers have enough time to compare product performance, price, and quality. Therefore, whether it is a target customer or an experiential customer, in the online environment, the rational motive occupies a larger proportion. Related studies have found that compared with traditional consumption models, online customers have a very high churn rate. If they can reduce the exit rate of online customers and extend their life cycle, it will significantly increase corporate profits [18]. Previous models for predicting customer purchasing behavior include probabilistic model groups based on past transaction behaviors and optimization models based on data mining and structural risk minimization [19].

3. Construction of Online Customer Life Cycle Evolution Model

Previous studies have suggested that China's cruise tourism has entered a period of slow development after rapid development, but there is a lack of systematic research on solutions, and there are relatively few studies that predict the development of cruise tourism from the combination of life cycle, demand theory, and network customer characteristics. It provides space for this research. System Dynamics (System Dynamics abbreviated as SD) is a method system for studying the dynamic behavior of information feedback systems, which is based on feedback control theory and computer simulation technology [20]. According to the stage division of the customer life cycle theory, combined with the needs of cruise travel online customers and consumption behavior characteristics, the cruise travel online customer life cycle is divided into four periods: potential customers, waiting for customers, existing customers, and lost customers, constructing the evolution model of the online customer life cycle and conducting system dynamics simulation analysis.

There is a big difference between the online customers of cruise travel and traditional customers. The former has the inherent advantages of obtaining information and can easily obtain abundant travel information. Its purchase decision is a process of repeated comparison. Each stage has a long-time span, and there is sufficient time to consider the pros and cons of each tourism format. The first is the evolution process from potential customers to waiting customers. Affected by the gradual improvement of living standards, people with a certain stable income, who like leisure travel and have the ability to purchase online become potential customers of cruise travel, whether they decide to buy and become waiting customers, are affected by the comprehensive influence of service reputation, service value, competitors, product performance, and the number of existing customers, as well as the word-of-mouth communication of experienced customers. Although the life cycle evolution of the first stage is comprehensively affected by various factors, potential customers are choosing cruise travel for the first time. Whether they decide to purchase becomes a waiting customer is mainly affected by basic travel needs. Therefore, once a certain factor reaches a degree of satisfaction, they will take the next step. The evolution of waiting customers to existing customers is the most critical transformation process in the life cycle. Waiting for customers to make a payment decision after deciding whether to approve cruise travel after deciding whether to purchase on the cruise travel network is mainly to see whether they compare different travel products. The more travel products you are prepared to pay for, the more unique the cruise travel can be found. Finally, there is the evolution process from existing customers to lost customers. This is not only affected by the offline experience of cruise travel but also by the branding and information quality improvement brought by the investment of cruise travel websites. This stage is about whether customers can maintain their loyalty. On the basis of satisfying basic travel needs, they need to provide customers with higher-level and more complex needs, including social needs, respectful needs, and quality needs. Since online customers rely more on website information, the return of lost customers is closely related to website satisfaction. During the evolution of the cruise travel online customer life cycle stages, from potential customers to the evolution of existing customers, companies can only evolve to the next stage after satisfying the specific needs of customers. If the needs at this stage are not met, the evolution of the customer life cycle will end. Therefore, cruise companies need to take distinctive service measures for customers in different life cycle stages and constantly promote potential customers to develop into waiting customers and, then, develop into existing customers, in order to form a certain scale of cruise travel customer groups.

The system dynamics simulation model is established based on the causality analysis. The main variables include state variables, rate variables, auxiliary variables, and constants. State variables include potential customers, waiting customers, existing customers, lost customers, revenue, and products in use; the rate variable is a quantity of differential nature, indicating how fast the accumulation effect changes, including purchase rate, completion rate, churn rate, and order rate. Auxiliary variables are diversified in form and are the amount of information in the system dynamic model. In this model, it is the most variable; constants are important parameters that determine the system structure [21]. The system dynamics model of the evolution process is shown in Figure 1. The settings and key variable values are in Table 1.

4. Results and Countermeasures

4.1. Potential Customers and Wait Customers. The system dynamics software, Vensim PLE, is used to construct a simulation model. The data used comes from cruise travel customer data on a travel network platform, and other data comes from empirical data or industry standards [22]. Since it mainly analyzes the evolution of the life cycle of online customers, it selects landmark variables such as potential customers, waiting customers, existing customers, and lost customers and analyzes the simulation results of their number changes. In the initial stage of the simulation, all consumers who are interested in traveling are considered potential customers, so it is assumed that the number of

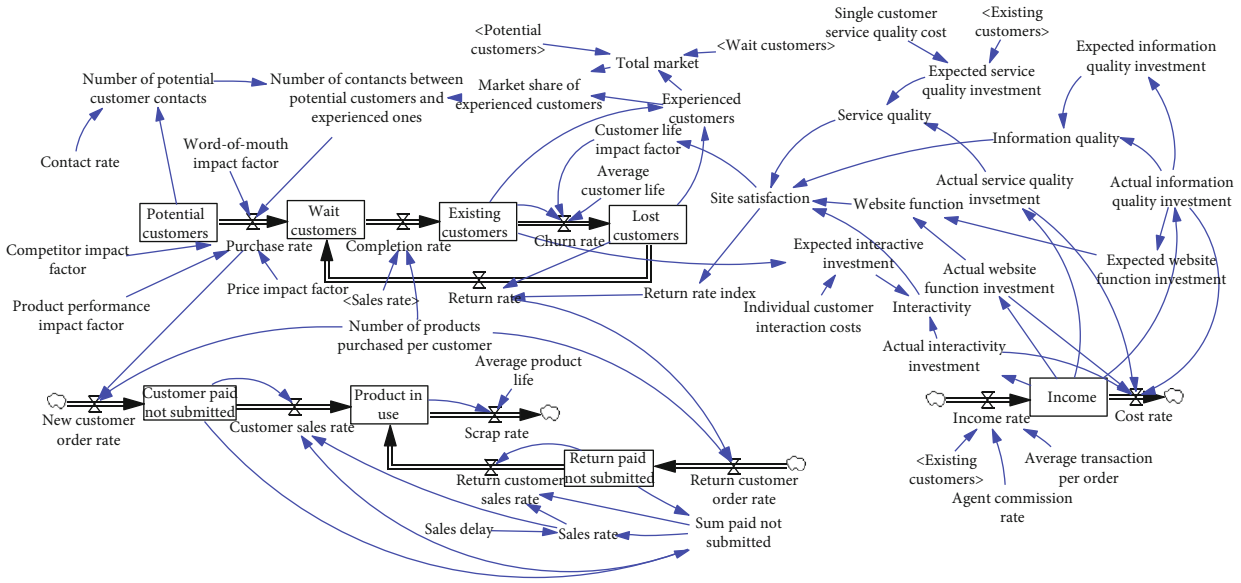

Figure 1: System dynamics model of cruise travel online customers.

Table 1: Settings and key variable values.

Settings and variables	Value	Settings and variables	Value
Initial time	0	Price impact factor	0.6
Final time	200	Sales delay	1
Time step	0.25	Single customer service quality cost	0.9
Contact rate	50	Individual customer interaction costs	1.5
Competitor impact factor	0.5	Agent commission rate	0.2

potential customers in the initial stage is the maximum. With the evolution and development of the customer life cycle, changes in the number of different types of customers show unique characteristics. As potential customers of cruise travel turn to waiting customers and then to existing customers, the number of potential customers has always been in a downward trend, experiencing an accelerated decline to a gentle process, and the evolutionary trajectory presents a steep exponential decline, as shown in Figure 2.

The evolutionary dynamics of waiting customers are more complicated. It can be seen from Figure 3 that waiting customers are characterized by smooth growth before the first wave peak. After reaching the maximum value, they will show a wave-like decline and will stabilize after an accelerated decline. The direct influencing factors of waiting for customers include purchase rate, return rate, completion rate, the number of products purchased per customer, and the total number of unpaid orders, among which the purchase rate, return rate, and the number of products purchased per customer increase the number of waiting customers, while the completion rate led to a reduction in waiting customers. The direct reason for the change in the waiting customer curve is caused by the difference between the purchase rate and return rate and the completion rate. If the difference is positive, the number of waiting customers increases, and the curve shows an upward trend; if the difference is negative, the number of waiting customers decreases, and the curve shows a downward trend, resulting in complex changes in the waiting customer curve.

4.2. Existing Customers and Lost Customers. Existing customers are important customers of cruise travel, and the relationship between customers and the company is in the best condition. The goal of cruise travel companies is to maintain a certain number of scale stability through the rapid increase of existing customers. Figure 4 shows the overall growth of existing customers, from the initial slow increase to exponential growth, and, finally, stabilized the rapid growth period from the 20th to the 140th month, about a 10-year cycle. The simulation results are consistent with the judgment of the cruise industry news. Although existing customers have maintained a slow growth, they have gradually stabilized. The direct influencing factors of the existing customers are the churn rate and the completion rate. The completion rate changes from large to small and, finally, approaches the churn rate gradually, making the difference between the two from large to small, and finally to zero, so existing customers show an S-shaped growth.

In-depth analysis of the three curves in Figure 4, it is found that the difference between the completion rate curve and the churn rate curve is exactly in line with the slope of the existing customer curve. The completion rate is from greater than the churn rate to equal, and the current customer's quantity has stabilized after S-shaped growth.

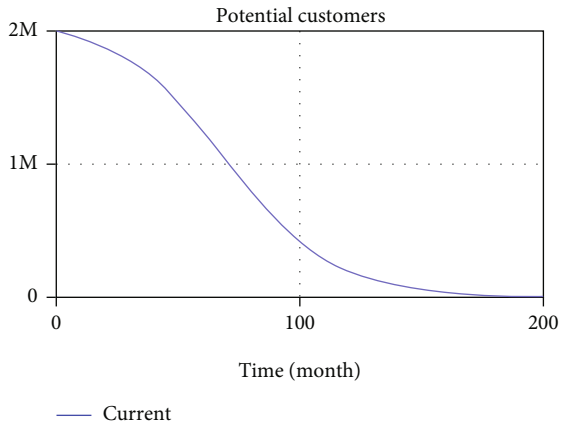

Figure 2: Potential customer simulation results.

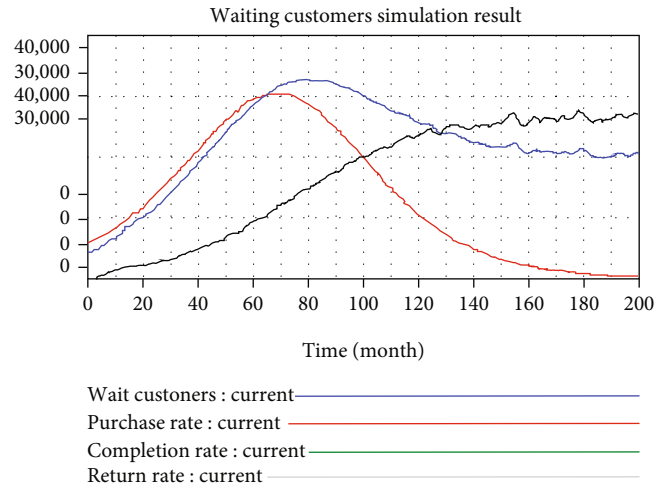

Figure 3: Wait customers simulation results.

Figure 5 shows that the evolution trajectory of lost customers presents an elongated S-shaped curve, and the final state also tends to be stable. Return rate and lost rate directly affect the rate of change of lost customers, and others are indirect factors. The curves of the lost rate and the return rate are similar to the shape of the lost customers, all of which are elongated S-shaped, but the lost rate is always greater than the return rate and tends to be equivalent in the later stage of the simulation. The difference between the lost rate and the return rate is always greater than zero, and the rule that the difference changes from large to small determines that the number of lost customers continues to increase, and it shows an elongated S-shaped growth. The simulation results show that lost customers always exist. While the rapid growth of wait customers and existing customers, if cruise travel and website service quality cannot keep up with the substantial increase in the number of customers, lost customers will show an accelerated growth trend. Therefore, online sales platforms, cruise tourism companies, and travel agencies need to work closely together to provide high-quality services to meet the needs of existing customers, while increasing the number of waiting customers and existing customers, while reducing the number of lost customers [23].

5. The Impact of Word-of-Mouth Test Function

In order to obtain more information from the simulation model and the feedback system described by it, especially to discover the different guiding effects of requirements, the test function is used to conduct different types of perturbation experiments on the model and analyze the response characteristics of the model parameters in different periods. The influencing factors of the evolution of the customer life cycle of cruise travel network include competitors, product performance, services, prices, sales rates, and average customer life. Various factors are inherently manifested in the satisfaction of different needs, and affecting the purchase rate, completion rate, the lost rate, and return rate led to the dynamic evolution of the customer life cycle. Website competitors, website product performance, and network product prices have a positive impact on the purchase rate. Perturbation experiments on the model can select one or a few of the key variables to achieve the goal. Word of mouth and investment costs affect both the lost rate and return rate and play a vital role in the life cycle evolution system. Therefore, it selects word-of-mouth influence factors for model testing and analyzes the implications of countermeasures.

5.1. The Impact of Word-of-Mouth on Waiting Customers. First, it uses the step function to output the word-of-mouth impact factor. Assuming that the word-of-mouth impact factor = 0.005, the output of the step function is 0.005 + STEP (0.001, 20). The meaning of the word-of-mouth factor step output is that the customer life cycle of the cruise travel network at the 20th month of evolution, the website platform began to improve its reputation, and it will continue. The main methods of improving word-of-mouth include general competitive strategies such as product price reduction and preferential activities, or high-quality competitive strategies such as improving the quality of tourism information, choosing international excellent cruise ships, and cooperating with authoritative media. It can be seen from Figure 6 that the peak of waiting customers starts from the 20th week and immediately increases due to the influence of the word-of-mouth influence factor. The peak appearance time is advanced from $t = 110$ to $t = 80$, and the later impact is counterproductive, which shows that the word-of-mouth factor cannot always affect the increase in the number of waiting customers. This phenomenon shows that waiting customers to cruise travel is the basic travel demand and changes in potential or direct influencing factors will immediately lead to customers purchase decisions. The word-of-mouth factor is more sensitive to the impact of each stage of the life cycle, but the role played by each stage of the life cycle is different. With the rapid increase in the number of potential customers converted into waiting customers, the order processing capacity of the website platform and the reception capacity of cruise travel are facing challenges. Therefore, for the website platform and cruise companies, they need to make countermeasures before improving the word-of-mouth factor. Otherwise, even if a large number of potential customers are converted into waiting customers, the expected goals will

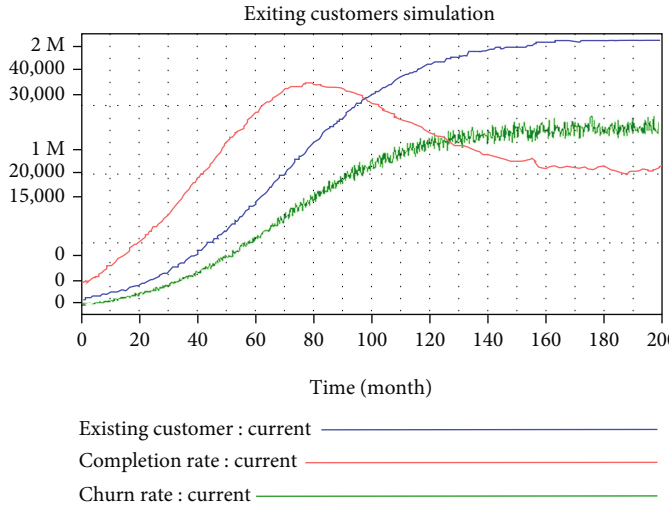

Figure 4: Existing customers simulation results.

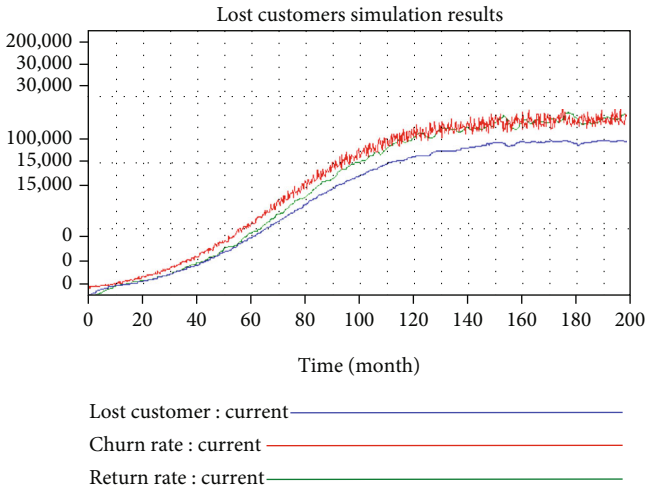

Figure 5: Lost customers simulation results.

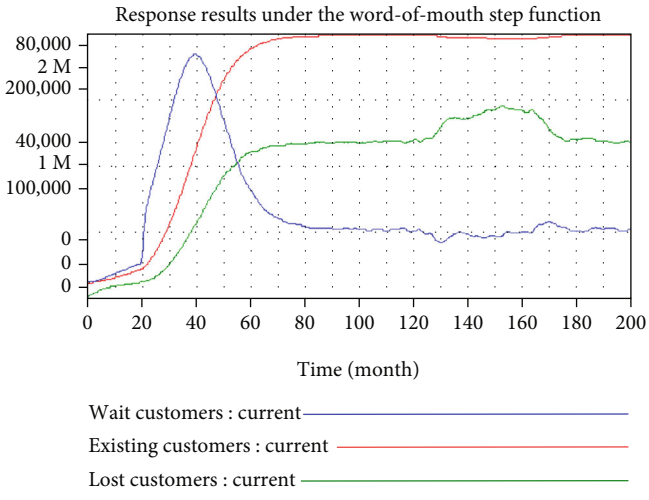

Figure 6: Response results under the word-of-mouth step function.

not be achieved due to insufficient order processing capacity and cruise ship passenger capacity.

5.2. The Impact of Word-of-Mouth Step Function. From Figures 4 and 6, it can be seen that, compared to the word-of-mouth impact factor = 0.005, on the same life cycle time axis, if the word-of-mouth impact factor is increased, the evolutionary trajectories of existing customers and lost customers will move upward. It is above the original trajectory, but the upward movement of the curve has not waited for the increase of customers. The waiting customers of the cruise travel network increase, and the existing customers may not increase by the same amount, and there is a time delay. First of all, potential customers choosing cruise travel includes curiosity needs and basic travel needs, but waiting customers have a wealth of information about cruise travel, there is a higher level of service needs, and at the same time, as the number of existing customers increases, the volume of lost customers will increase accordingly. Therefore, it is particularly important to maintain the quality of service and even improve the quality of service when the existing customers increase. Secondly, although waiting customer substantially increase, the order processing capacity and cruise reception capacity have not been improved accordingly. Therefore, for website companies and cruise companies, when a large number of potential customers became waiting customers, the existing customers did not increase by the same magnitude or even greater increase. In this case, we must carefully analyze the reasons and, then, develop a targeted strategy. If it is the result of insufficient order processing capacity, it is relatively easy to solve, as long as the website system is upgraded and the cruise number is increased. However, if it is because the higher service needs are not met, it will be more complicated, because whether it is a website platform or a cruise tour, the service level is the performance of the enterprise gradually fixed after long-term operation, and the service quality is easy to decline. It can be difficult to maintain or improve. The reasons for service quality may come from different aspects for different customers.

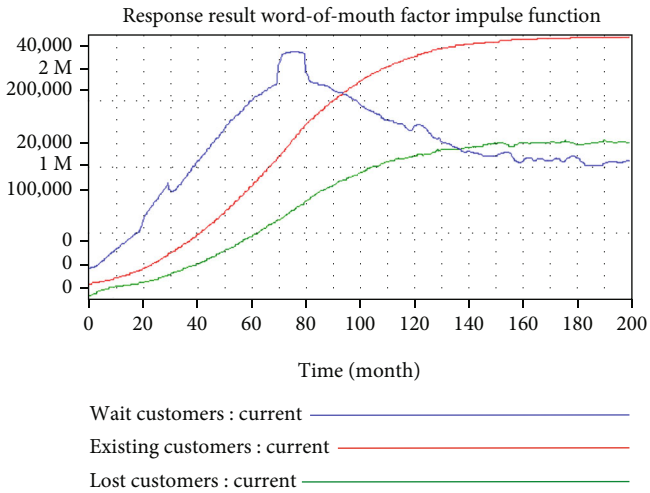

Figure 7: Response result of word-of-mouth factor impulse function.

This requires detailed and comprehensive research and interviews for lost customers and classification solutions. Obviously, this is a systematic and long-term process.

5.3. The Impact of Word-of-Mouth Pulse Function. The pulse function is an interval jump output, which can test the influence of a sudden change of a factor on the system. Assuming the word-of-mouth influence factor = 0.005, the pulse output of the word-of-mouth influence factor is 0.005 + 0.001* PULSE TRAIN (20, 10, 50, 200); its management meaning is as follows. The cruise travel network platform improves word-of-mouth in various ways, and the 20th month lasts for 10 months. After 50 months, the value of word-of-mouth impact factor increases again and lasts for 10 months. This means that the operator will organize a similar activity every 40 months to improve word-of-mouth until the end of the 200th month, and each time the word-of-mouth impact factor is increased to 0.006. The specific situation is shown in Figure 7, which shows that every time the organization's word of mouth is improved through various activities, there will be a peak in booking behavior, leading to a surge in the number of waiting customers, but the peak of waiting customers lacks continuity and will fall as the word-of-mouth value drops. Further analysis of Figure 7 found that by repeatedly and intermittently using various methods to improve word-of-mouth, existing customers will not have peak fluctuations like waiting customers. The number development trajectory is only a slight smooth upward shift and loss. The development trajectory of the number of lost customers has basically remained unchanged, indicating that the indirect improvement of word-of-mouth has a slight positive effect on the increase of cruise customer visits.

The enlightenment is that website platforms and cruise companies take intermittent measures to improve the organization's reputation, waiting customers reach peak accordingly, existing customers have a slight smooth upward movement, and the lost customers are basically unchanged. The impact of word of mouth on cruise travel customers is effectiveness and timeliness at the beginning of the cycle, and the intermittent effects that appear in the later period will gradually decrease until it no longer affects. Therefore, only in the initial stage can we establish and maintain the continuity of online reputation and service reputation in order to have a profound impact on increasing the number of cruise tourists. Whether it is a website platform or a cruise company, it should pay attention to the importance of the continuation of the initial reputation and ensure the continuity of service quality in all links of website service, image display, and cruise travel [24].

6. Conclusion

This paper uses the system dynamics method to construct the life cycle evolution process of cruise travel network customers and has passed the model test and rationality test of simulation software. Under extreme conditions and sudden changes in word-of-mouth variables, the changes produced by the model and the actual system behavior are consistent, and the reason for the change can be found, indicating that the simulation model established in this paper can simulate the life cycle process of cruise travel network customers. The simulation results of the model and the response analysis of the test function found that the cruise travel online customers showed different quantitative characteristics in the potential stage, waiting stage, current stage, and lost stage of the life cycle, and the evolutionary development of potential customers, waiting customers, and lost customers is significantly affected by online travel information, while existing customers are mainly affected by the real experience of cruise travel. In order to increase the number of existing customers of cruise travel, cruise travel-related companies should promote the evolution of potential customers, waiting customers and lost customers, and adopt different countermeasures for customers in different life cycle stages: potential customers adopt promotional strategies and waiting customers to adopt Motivation strategies, existing customers to maintain strategies, and lost customers to take back strategies.

(1) Potential customers are people who are potentially interested in cruise travel. The simulation model finds that the size of the potential group has a direct impact on the number of existing customers. Judging from the experience of international market development, young and middle-aged people are the backbone of cruise tourism consumption. The future development of China's cruise tourism customer base should focus on the active cultivation of young and middle-aged groups. This requires that in the process of cruise tourism promotion, attention should be paid to the advantages of strong penetration of online channels and rich tourism information, especially the role of online channels in attracting young and middle-aged groups. Relevant business entities can conduct in-depth cooperation with well-known comprehensive websites and brand-based tourism professional websites and maximize the scale of potential customers by expanding the scope of publicity, increasing the intensity and accuracy of promotion

(2) Cruise tourism has a long history of development abroad, but it is a new thing in China. The evolution from potential customers to waiting customers, in addition to considering consumption level, online shopping experience, and customer reputation, more attention should be paid to stimulating customer curiosity and basic tourism needs. After a ten-year period of rapid growth in cruise tourism, the next step in its development is not only to attract new customer groups through service quality improvement but also to improve the quality of website platform information and continue to increase the scope of publicity that reflects the new characteristics of cruise tourism, attracting lost customers look back

(3) From the model's response to the test function, it can be seen that waiting customers are more sensitive to changes in the word-of-mouth impact factor, but frequent and intermittent use of the word-of-mouth factor can only bring about a short-term increase in the number of orders, no fundamental change in the number of existing customers. What really attracts existing customers to stay and lost customers to return is the reputation of the website and the quality of cruise travel services. Continuous website investment is the foundation for maintaining the high-quality operation of online channels. Therefore, the selection of network partners is the key to ensuring high-quality online reputation

(4) After more than ten consecutive years of rapid development, China's cruise tourism has entered a period of stable development, and the number of trips and the number of cruise ships calling at has stagnated or even declined. The simulation results confirmed that under the existing countermeasures, the rapid development period of China's cruise tourism market is about 10 years, which is consistent with the actual situation. However, China has a huge population base, and the annual number of trips of millions of people is still low compared with developed countries. The resident penetration rate of cruise tourism is only a fraction of that of developed countries. Therefore, it should take differentiated countermeasures for online customers in different life cycles: the publicity strategy of potential customers, the incentive strategy of waiting customers, the retaining strategy of existing customers, and the returning strategy of lost customers, China's cruise tourism market will usher in a new round of development climax

From the perspective of life cycle, the cruise travel network customer development process is essentially a time-varying system. The driving mechanism of the same individual customer in different life cycle stages may change, and further analysis is needed. Moreover, the development process of cruise travel network customers is in a dynamic process. When conducting simulation research on it, some variables and parameters should be paid attention to. Subsequent research should improve the predictive effectiveness of the model and need to adjust model variables and parameters appropriately.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

This research is funded by the National Social Science Foundation of China (19BJY208).

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