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The Development Status and Citizen Satisfaction of Smart Cities in China

中國智慧城市發展現狀與民眾滿意度

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摘要

隨著以中國特色社會主義為核心的社會發展，城市化水準的逐步提高必然成為中國經濟和社會發展的核心與基礎。而如此快速的城市化擴張也帶來了許多問題及挑戰，城市基礎設施不完善、交通運輸擁堵、政務服務繁瑣、環境污染等諸多考驗。智慧城市理念的提出為我們面對這些問題提供了新的路徑和解決方案，智慧城市發展已經成為必然趨勢。在近幾年，中國也同樣在大力建設智慧城市，但在智慧城市的發展過程當中有一個必然不能忽視的重要基礎要素:人本因素，所以民眾滿意度是我們在智慧城市建設中的風向標。本研究為了更好的衡量中國智慧城市發展的主要因素，從民眾滿意度的為切入點進行探討，並進行因素之間的分析。本研究以中國民眾對於智慧城市發展的滿意度為研究物件，結合多元IPA和DEMATEL對市民滿意度進行研究。共計發放問卷調查共280份問卷。確定出中國智慧城市發展中5項急需加強改善的因素，6項次需改善的因素，7項繼續保持的因素以及4項供給過度的因素。其中“催生培育雲計算、大資料、物聯網、移動互聯網、4G通信、三網融合、數位內容等新一代資訊技術產業”、“整合共用治安監控、交通監控、社區安防、社會監控等視頻監控系統”和“一站式的網上審批服務系統”三方面的服務要素，是改善的重中之重，應及時採取回應的措施。

關鍵字：智慧城市、物聯網、移動互聯網、多元 IPA、 DEMATEL

ABSTRACT

The social development centered on socialism with Chinese characteristics, the gradual improvement of urbanization level will inevitably become the core and foundation of China's economic and social development. Such rapid urbanization expansion also brings many problems and challenges, such as imperfect urban infrastructure, traffic congestion, cumbersome government services, environmental pollution and many other tests. The concept of smart city provides us with new ways and solutions to these problems. The development of smart city has become an inevitable trend. In recent years, China is also vigorously building smart cities, but in the process of the development of smart cities, there is an important basic element that can’t be ignored: human-oriented factors, so citizens satisfaction is our vane in the construction of smart cities. Therefore, in order to better measure the main factors of the development of China's smart cities, this study explores the satisfaction of the public as a starting point, and carries out the analysis between the factors. This study takes Chinese citizens satisfaction with the development of smart cities as the research object, and combines multiple IPA and DEMATEL to study the satisfaction of citizens. A total of 280 questionnaires were distributed. Five factors urgently need to be strengthened in the development of China's smart cities, six factors need to be improved, seven factors to continue to maintain and four factors to oversupply are identified. Among them, "fostering new generation information technology industries such as cloud computing, big data, Internet of things, mobile internet, 4G communication, three networks integration, digital content and so on", "integrating video surveillance systems such as sharing public security surveillance, traffic surveillance, community security, social surveillance" and "one-stop online approval service system" are the most important service elements for improvement. Take timely response measures.

Keywords：smart city, internet of things (IoT), mobile internet (MI), multiple IPA, DEMATEL

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1.Introduction

The development of city wisdom is accompanied by the progress of scientific and technological innovation in the times, and the government will play a vital role in this innovation reform. As for the government, whether the effective urban management and network government platform can be effectively operated or not, the public's opinion is the core of the future government's strategic development. With the development of economy, smart city is a new generation of innovative applications of information technology such as Internet of Things, cloud computing, big data, spatial geographic information and a deep integration of urban transformation and development. It promotes the new ideas and models of urban planning, construction, management and service intellectualization, and reflects the essential needs of the city towards green, low-carbon and sustainable development. Since IBM put forward the concept of "Smart Earth" in early 2009, the development of "Smart City" in the world is in the ascendant. At present, hundreds of cities at or above the prefecture level in China are building "smart cities", and some economically developed cities in the eastern coastal areas have begun to build "smart cities". China also responds positively to the national policy. In order to speed up the construction of smart China, China has gradually stepped out of a path of smart city construction, which aims at benefiting the citizens with information, means of innovating institutional mechanisms, guarantees the construction of "broadband China" and supports the transformation and upgrading of industries with information technology. Xiamen has won the "2016 China Smart City Construction Smart Tourism Excellent Application Award", and has been selected as the national pilot city of information for the benefit of the citizens, and the "broadband China" model city and other honors.

With the continuous advancement and improvement of China's urbanization policy, the development of cities plays an increasingly important role in such a populous country as ours. But can today's urban development model match the needs of policy? Whether we can solve and face the challenges: inefficient urban management, serious traffic jams, far from perfect public safety supervision, environmental pollution that is difficult to eradicate, and so on. When cities are faced with these difficulties and challenges, how to effectively and rationally use new measures and policies becomes very important. Cities must use a new system and reasonable science and technology to improve the fundamental development system, so as to maximize the effective allocation of the only resources. The innovation of science and technology will be the dominant factor to change and promote urban development. In 2008, because of the outbreak and spread of the global financial crisis, IBM put forward a new concept of "Smart Earth" as the focus of accelerating economic construction in the world in the future. In February 2009, IBM Forum in Beijing, China, first introduced the core theme of "Brighten the Smart Earth, Build the Smart China", which is an information technology to change the way of interconnection among government, enterprises and citizens, including building smart environmental protection, smart medical care, smart transportation, smart industry and commerce, etc. It effectively optimizes the allocation of resources, operational efficiency and actively improves the city. Good society and citizens livelihood.

In order to effectively measure the development indicators of smart cities, this study considers the integration of multiple IPA and DEMATEL to determine the development strategy. In the past, some scholars have applied and studied the combination of IPA and DEMATEL. Xiao (2016) used IPA analysis method and DEMATEL method to study the performance evaluation of Shanghai Zhangjiang Innovation Zone, in order to obtain more accurate indicators improvement strategies. Geng and Li (2014) pointed out that the traditional IPA method does not take into account the market competition factors and the interaction between the various attributes, so the fuzzy IPA and integrated DEMATEL method are used to evaluate and determine the indicators that need to be improved.

2.Literature Review

Since the concept of "smart city" was put forward, in order to meet the different development needs of different countries and regions, scholars and institutions have also understood and defined the concept of "smart city" from various perspectives. Although so far there has not been a truly accurate and unified definition of smart city, these definitions all share a common core idea: to effectively use modern science and technology and information technology means, to fully integrate

and utilize urban resources as the core, to make infrastructure, environmental protection, transportation and public utilities more intelligent, to provide individuals, enterprises and society more convenient and fast. Efficient urban services.

The core of the definition of smart city is not only the application of information technology in urban resource allocation, but also a more important fundamental human factor. However, we can see that the development of smart cities in China is still more focused on two stages: smart cities and digital cities. By comparing and studying the concepts of digital city, smart city and smart city, we can draw a conclusion that the development stages of these three cities are progressive. At the same time, we can clearly realize that the concept of smart city in China still stays and focuses on information technology to a certain extent, and ignores human-based factors. Through a more thorough understanding of the development strategy of the three urban modes, we can see that smart city is an innovative city, which uses information technology innovation to promote industry and management of the city. At the same time, it is also a smart service city. Through the development of high-tech, it can better serve human beings and promote the sustainable development of life to bring more wisdom to human beings. Beautiful and green city life.

2.1.The Present Situation of Smart City

From 2010 to November 2017, every city in China started a construction boom in full swing, with nearly 600 pilot cities. At present, some major cities have put forward feasible development plans, involving urban management, infrastructure, policies and regulations, information platforms and other aspects of all-round content, as shown in Table 1 below. With the increasingly mature construction of smart cities, the pressure of economic downturn can be alleviated to a certain extent, and it has become the highlight of promoting national development. However, in the process of construction, it is gradually facing some outstanding difficulties and challenges. At present, there are three major problems in the construction of wise cities in China: technology, cognition and practice can't meet the needs of wisdom; imperfect supervision, construction and maintenance mechanism; and isolated information island. In the process of breaking through the difficulties of scientific and technological innovation and establishing a good urban service system, we should not neglect that the citizens are the principal part of the city. All the urban information technology systems established should serve and educate citizens and be related to citizens. Only by taking citizens as the core subject of urban construction can we sustain healthy development and create a better urban life for the citizens.

At present, most of the studies on smart cities are from other aspects. Xu Qingrui, Wu, Xu, Wu, Chen (2014) proposed the vision and strategic goal of smart cities with Chinese characteristics, namely, to achieve the comprehensive sustainable development of "economy, society and ecology", by analyzing the research results of smart cities at home and abroad, and by visiting some provinces and cities in China. Feelings of security and happiness in the lives of residents. Suha, Armando, and Hafedh (2012) studied new insights into smart city planning. The main findings are divided into eight aspects: technology, management and organization, political background, governance, citizens and communities, economy, infrastructure and natural environment. Gu, Yang and Liu (2013) are the research subjects of smart city construction, which should attach great importance to differentiated positioning and regional characteristics to stimulate the vitality of smart city development; adhering to the principle of "application is the king", guiding project construction with market demand; adhering to technical support, relying on technological innovation and strategic emerging industry development; promoting the integration of wisdom and solving the problem of "information isolated island". Deng (2010) summarized and refined the evaluation index system of "smart city" based on the connotation and development characteristics of "smart city" after analyzing and studying the evaluation index system of urban informatization. But less from the perspective of the public to measure the development of smart cities, in order to obtain more objective reference basis for development.

2.2. The Research on Satisfaction of Smart City

In the process of building a smart city, citizen satisfaction is the basis and focus. In this regard, scholars at home and abroad have studied the public satisfaction in the construction of Smart City: Girardi and Temporelli (2016) proposed Smartainability method to evaluate the sustainable development of Smart City in the economic, environmental and social neighborhoods and the public satisfaction; Nigro (2016) adjusted the model

of Argentina's urban public satisfaction to improve the urban public satisfaction as a benchmark. The core theme is to optimize urban diversity and security. Li and Cao (2018) explored the relationship between the factors affecting the satisfaction degree of smart city construction by establishing the structural equation model of the satisfaction degree of smart city construction. Zou (2016) established the model of the citizens satisfaction degree of smart city based on the basic idea of system dynamics to study the influence of different factors on the citizens satisfaction degree. To sum up, the research on the satisfaction degree of smart cities focuses on the neighborhood of the satisfaction degree of citizens, and the research results on the satisfaction degree of citizens mainly focus on the interpretation of concepts and the construction of models. In the process of the development of China's smart cities, it is necessary to use more scientific and perfect models to measure which factors are the key improvement factors, which factors are the excessive supply, and how to explore the core improvement factors under the interaction of the relevant factors.

3. Research Design and Method

This paper integrates multiple regression IPA and DEMATEL, and combines the importance and satisfaction of each factor with the causal relationship between each factor to analyze the satisfaction of citizens. Integrating multiple regression IPA and DEMATEL makes the research more credible.

3.1. Research Method

In the past, scholars only used IPA to improve the satisfaction of citizens, and found the factors that should be improved through IPA matrix, then improved the factors. Such research did not take into account the relationship between the factors. For example, Peng (2019) used six major world cultural heritage sites of Peking Man sites as research objects, and used IPA analysis method to analyze in-depth the satisfaction of tourists. By integrating IPA and DEMATEL, this paper combines the importance and satisfaction of each factor with the causal relationship between each factor to analyze the satisfaction of citizens. Integrating multiple regression IPA and DEMATEL makes the research more credible.

Importance-Performance Analysis (IPA) is the most widely used model to discuss and improve service quality. Importance-performance analysis is proposed by Martillaand James (1977) to construct a two-dimensional strategy matrix centered on the average of satisfaction and importance. Quadrants in the matrix can represent different management implications and provide managers with appropriate resource allocation strategies based on the distribution of evaluation attributes in the matrix. IPA analysis can generally be divided into the following four steps: (1) listing the elements of a product or service and trying to develop them into a questionnaire; (2) letting users evaluate the importance and performance of these elements separately (two aspects, the former refers to the importance of consumers' preferences for product or service elements, and the latter refers to the performance of the product or service provider in these aspects). Degree; (3) Longitudinal axis is the important degree, horizontal axis is the performance degree, and use the grade of each element as the coordinate, and mark the element coordinate in the two-dimensional coordinate; (4) The evaluation average of the horizontal axis and the vertical axis as the central dividing point, and divide the space into four quadrants such as I, II, III, IV.

The Decision Making Trial and Evaluation Laboratory (DEMATEL) was originated from the Battelle Association of the Geneva Research Centre in 1973 and is used to study complex and difficult problems in the world (such as race, energy, etc.). In recent years, DEMATEL method is very popular. Because this method can effectively understand the complex structure of causal correlation. By observing the degree of the influence between two elements, the causal relationship and the strength of the influence among all elements can be calculated by using matrix and correlation theory, thus the centrality and causality of each factor can be calculated, and the important influencing factors and internal structure of the problem can be revealed. DEMATEL has three basic hypotheses: (1) Define the nature of the problem: (1) At the stage of the formation and planning of the problem, know clearly what the nature of the problem is, so as to set the problem correctly; (2) Define the interrelated degree between the problems: express the interrelated intensity with other elements by 0-4, etc.; (3) Understand the nature and characteristics of the factors of each problem: Make supplementary explanations after the analysis of relevant issues (including agreed and disagreed opinions, etc.). DEMATEL, based on the essential characteristics of objective things, establishes the interdependent and restrictive forms of variables to reflect all the characteristics and trends of the system itself.

3.2. Research Design

According to three academic papers, Wang (2013) designed 13 indicators to study the development of smart cities; Wang and Duan (2014) directly designed 16 indicators to consider the development of smart cities; Liu, Wang, Liu, and Zhou(2015) designed 9 indicators to study the development of smart cities (in Table 1).

Table 1 The Summary Table in Index Selection

Dimensions	Indicators	Sources of extraction indicators
Intelligence Infrastructure Construction	Fixed broadband household penetration	Wang (2013)
	Optical Fiber Home Access Coverage	
	Pervasiveness of 3G and 4G Users	
	Digital Family Coverage	
	WIFI coverage	
	Terminal Access Bandwidth Speed	
Application of Intelligent Management	One-stop Online Approval Service System	Wang and Duan (2014)
	Standardized and standardized public service process	
	Integrity Information Sharing Platform to Achieve Interdepartmental Credit Information Exchange and Sharing	
	Coverage of Social Security and Employment Services	
	Intelligent Management of Vehicle, Road, Parking and other Transportation Facilities Resources	
Intelligent Environmental Protection Construction	Intelligent Environmental Protection Project, Overall Supervision of Soil, Atmosphere, Noise, Water and other Environmental Pollution Sources	Wang (2013)
Intelligent Public Service	Integrate and share video surveillance systems such as public security surveillance, traffic surveillance, community security, social surveillance, etc.	Liu, Wang, Liu, and Zhou(2015)
	Full appointment and sharing of medical information	
	Providing telemedicine and health management services	
	Sharing Educational Resources	
	Implementing "One Card Universal" and "Lending and Returning" in Public Libraries	
	Provide one-stop information service of "eating, living, traveling, shopping and entertainment"	
	Community Informatization and Community Grid Management	
Intelligent Public Support System	Promote the cultivation of cloud computing, big data, Internet of Things, 4G communications, three networks integration, digital content and other new generation of information technology industries	Wang and Duan (2014)
	Developing new service industries such as intelligent logistics, intelligent tourism, Intelligent Finance and intelligent trade	
	Introduction of High-level Talents in Intelligent Cities	

Based on the past research on the development of smart cities by scholars and visits to several

government departments and University teachers, 22 indicators suitable for measuring the development of smart cities in China are sorted out and summarized (e.g. Table 2). Respondents were asked to check out on the five-point scale of Richter, and the last item was added. Respondents were asked to fill in their overall satisfaction with the development of China's smart cities in the range of 0 to 100.

Table 2 Evaluation Indicators

No.	Indicators
X1	Fixed broadband household penetration
X2	Optical Fiber Home Access Coverage
X3	Pervasiveness of 3G and 4G Users
X4	Digital Family Coverage
X5	WIFI coverage
X6	Terminal Access
X7	Bandwidth Speed
X8	One-stop Online Approval Service System
X9	Standardized and standardized public service process
X10	Integrity Information Sharing Platform to Achieve Interdepartmental Credit Information Exchange and Sharing
X11	Coverage of Social Security and Employment Services
X12	Intelligent Management of Vehicle, Road, Parking and other Transportation Facilities Resources
X13	Intelligent Environmental Protection Project, Overall Supervision of Soil, Atmosphere, Noise, Water and other Environmental Pollution Sources
X14	Integrate and share video surveillance systems such as public security surveillance, traffic surveillance, community security, social surveillance, etc.
X15	Full appointment and sharing of medical information
X16	Providing telemedicine and health management services
X17	Sharing Educational Resources
X18	Implementing "One Card Universal" and "Lending and Returning" in Public Libraries Provide one-stop information service of "eating, living, traveling, shopping and entertainment"
X19	Community Informatization and Community Grid Management
X20	Promote the cultivation of cloud computing, big data, Internet of Things, 4G communications, three networks integration, digital content and other new generation of information technology industries
X21	Developing new service industries such as intelligent logistics, intelligent tourism, Intelligent Finance and intelligent trade
X22	Introduction of High-level Talents in Intelligent Cities

4. Results

According to the effective gender distribution in this study, the number of males is relatively large, accounting for 51.5% of the total survey. According to the age distribution, the number of citizens aged 21-30 is 117, accounting for 41.2% of the total, followed by 62 citizens under 20, accounting for 23.5% of the total, 56 citizens aged 41-50, accounting for 22.1% of the total, and 25 citizens aged 31-40, accounting for 13.2% of the total. According to the distribution of educational level, the number of undergraduates educated is 175, accounting for 64.7% of the total effective survey. In addition, from the effective occupational distribution of this study, the number of students is 153, accounting for 57.4% of the total, followed by the number of working citizens and individuals are 35, the proportion of the total effective survey is the same, 13.2%. In addition, the number of executives is 30, accounting for 11.8% of the total effective survey.

The score of each item is regarded as an index, and the overall satisfaction score is a factor variable. The SPSS20.0 software is used for multiple regression analysis, regression model and so on. The results of regression coefficients of each item and the mean values of each item are as follows (in Table 3). Regression coefficients of each item are regarded as importance, and the mean value is performance. IPA model is drawn (in Fig. 1).

Table 3 Regression Coefficient and Mean Value

Item	Mean	Regression coefficient	Item	Mean	Regression coefficient
X1	4.013	-0.057	X12	3.468	0.143
X2	3.896	0.179	X13	3.608	0.093
X3	3.873	0.029	X14	3.532	0.150
X4	3.796	0.068	X15	3.481	0.105
X5	3.785	0.047	X16	3.706	0.043
X6	3.494	0.140	X17	3.722	0.224
X7	3.418	0.060	X18	3.771	0.187
X8	3.795	0.035	X19	3.835	0.087
X9	3.405	-0.042	X20	3.696	0.109
X10	3.506	-0.028	X21	3.785	0.102
X11	3.380	0.081	X22	3.557	0.175

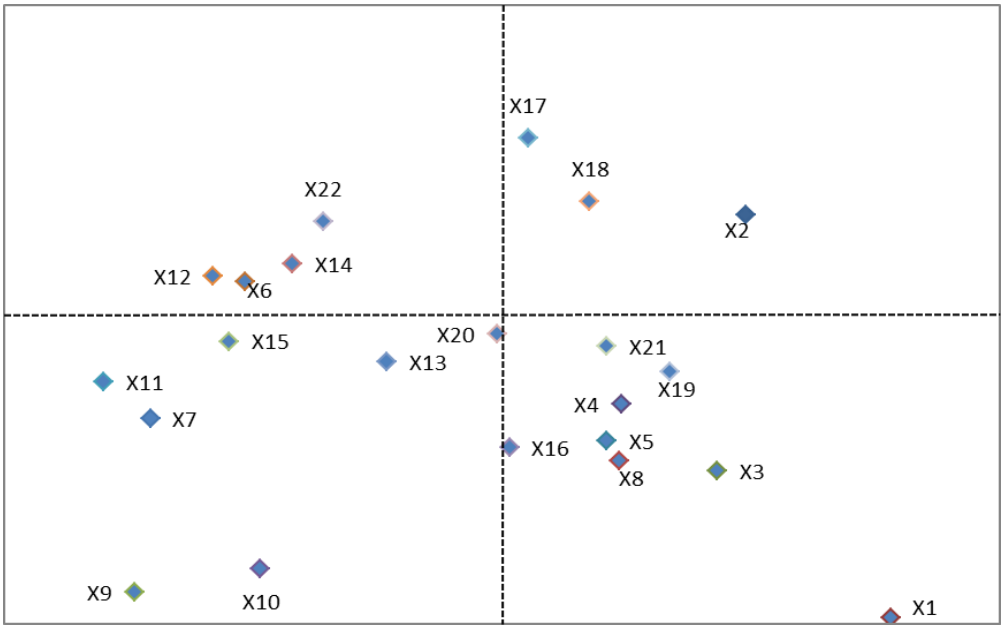

Figure 1 IPA Model Diagram of Chinese Citizen Satisfaction

According to the traditional IPA model, the factors that fall into the first quadrant (continue to be maintained) are: X17 (the implementation of "one card universal" and "loan and return" in public libraries), X18 (providing "food, housing, travel, shopping and entertainment" one-stop information service) and X2 (the coverage of optical fiber households). The factors falling into the second quadrant (strengthening improvement) are: X22 (introduction of high-level talents in smart cities), X14 (sharing of full appointment and medical information), X6 (bandwidth speed of terminal access), X12 (intelligent environmental protection project, comprehensive supervision of environmental pollution sources such as soil, atmosphere, noise, water, etc.). The factors falling into the third quadrant (lower ranking) are: X20 (fostering a new generation of information technology industries such as cloud computing, big data, Internet of Things, mobile Internet, 4G communication, triple-network integration, digital content), X13 (integrating video surveillance systems such as public security surveillance, traffic surveillance, community security, social surveillance), X7 (one-stop online approval service system), X15. (Providing remote medical and health management services), X11 (intelligent management of vehicles, roads, parking facilities, etc.), X10 (coverage of social security and employment services), X9 (integrity information sharing platform to achieve cross-sectoral credit information sharing). The factors falling into the fourth quadrant (excessive supply) are: X19 (community informatization, Community Grid management), X21 (fostering emerging service forms such as intelligent logistics, intelligent tourism, intelligent finance, intelligent trade), X5 (WIFI coverage), X16 (realizing education resources sharing), X4 (digital family coverage), X8 (standardized, standardized public service process), X3 (3). G, 4G user penetration rate.

After the above calculation, the comprehensive influence matrix of each index is obtained. Then the weight vector Ws reflected by the interaction of evaluation indexes is obtained by formula calculation. Then the regression coefficients and influence weights are synthesized, and the new importance Wf of each evaluation index is calculated by using the formula. Draw new IPA diagrams based on new importance and performance (in Figure 2).

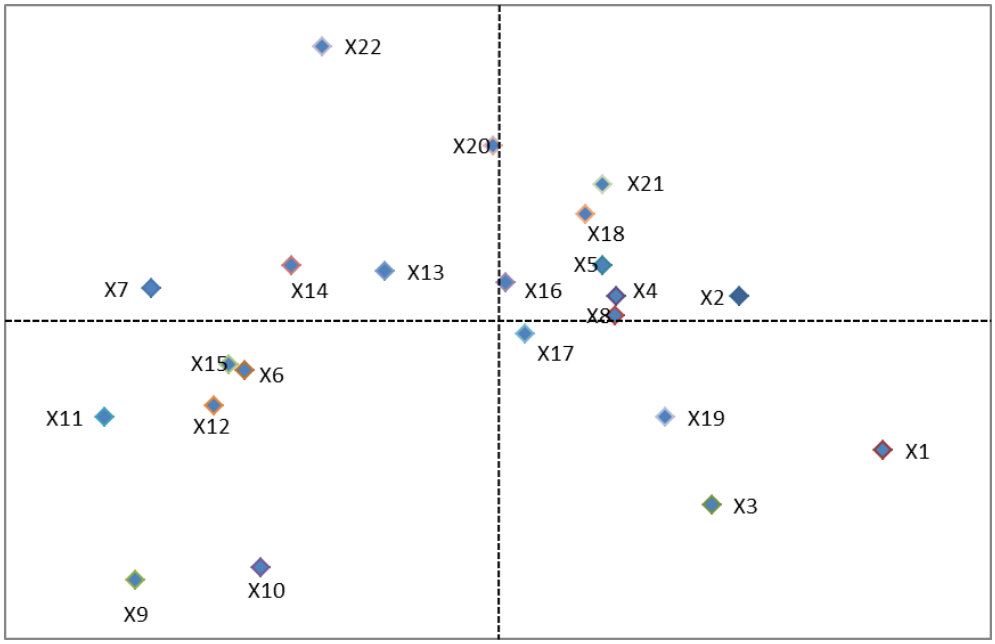

Figure 2 New IPA Model Diagram of Chinese Citizen Satisfaction

According to the new IPA analysis chart of Chinese citizens' satisfaction, there are seven indicators in the first quadrant of "Keep up the good work". The order of importance is: X21 (cultivating new service forms such as intelligent logistics, intelligent tourism, intelligent finance, intelligent trade), X18 (providing one-stop information service of "eating, living, shopping and entertainment"), X5 (WIFI coverage). Rate, X16 (Sharing Educational Resources), X4 (Digital Family Coverage), X2 (Optical Fiber Household Coverage), X8 (Standardized and Standardized Public Service Processes).

The second quadrant is "Concentrate Here". There are five points in this quadrant, ranked by importance: X22 (introduction of high-level talents in smart cities), X20 (fostering new information technology industries such as cloud computing, big data, Internet of things, mobile internet, 4G communication, triple-network integration, digital content), X14 (full appointment and sharing of medical information), X13 (integration and sharing of public security monitoring, traffic monitoring, community). Video surveillance systems such as district security and social surveillance, X7 (one-stop online approval service system).

In the third quadrant, there are 6 items in low priority. According to their importance, the order is X15 (providing remote medical and health management services), X6 (terminal access bandwidth speed), X12 (intelligent environmental protection project, comprehensive supervision of environmental pollution sources such as soil, atmosphere, noise, water body), X11 (vehicle, road, parking lot and other transportation facilities). Intelligent management of source, X10 (coverage of social security and improving employment service capacity), X9 (integrity information sharing platform to achieve cross-sectoral credit information sharing).

Fourth quadrant "Possible Overkill" means high satisfaction. Four indicators in the "over-supply" region are ranked according to importance: X17 (implementation of "one card for general use" and "lending and repayment" in public libraries), X19 (community informatization, Community Grid management), X1 (fixed broadband household penetration rate), X3 (3G, 4G user penetration rate).

By comparing the original IPA model graph with the modified IPA model graph integrating DEMATEL, the results show that different strategies should be adopted because some indicators appear in different quadrants. Overall, 11 indicators moved to different quadrants. Indicators 6 and 12 move from the second quadrant to the third quadrant. Indicators 20, 13 and 7 move from the third quadrant to the second quadrant. Indicators 17

move from the first quadrant to the fourth quadrant. Indicators 21, 5, 16, 4 and 8 move from the fourth quadrant to the first quadrant (e.g. Table 4). The image limits of the other 11 indicators did not change.

Table 4 Changes in the Quadrant of Indicator Location

Index	6	12	20	13	7	17	21	5	16	4	8
Primitive quadrant	Ⅱ	Ⅱ	Ⅲ	Ⅲ	Ⅲ	Ⅰ	Ⅳ	Ⅳ	Ⅳ	Ⅳ	Ⅳ
New quadrant	Ⅲ	Ⅲ	Ⅱ	Ⅱ	Ⅱ	Ⅳ	Ⅰ	Ⅰ	Ⅰ	Ⅰ	Ⅰ

According to the new IPA analysis chart of Chinese citizens' satisfaction, there are seven indicators in the first quadrant of "Keep up the good work". From the above indicators, we can find that in fostering emerging service industries, in terms of one-stop information service, WIFI coverage, in terms of education resources sharing, in terms of digital family coverage, optical fibre. The coverage of households and standardized public service processes have been recognized by Chinese citizens. These indicators are of high importance. Xiamen and China should continue to maintain the service level of these projects and further strengthen them within the allowable capacity.

The second quadrant is "Concentrate Here". There are five points in this quadrant, and there is a big gap between the second quadrant and the satisfaction of citizens. Based on the above indicators, we find that China can increase the introduction of high-level talents with knowledge reserve of smart cities, and focus on cultivating and improving the new generation of information technology industry. In order to improve citizens' satisfaction with medical security services, we should also focus on strengthening and improving the public health care system. In addition, the video surveillance system in China should also be improved to build an integrated and shared city-wide surveillance system. In order to serve the citizens better, China should integrate the online approval system more and make the one-stop service system more convenient.

There are 6 items in the third quadrant "Low priority". Although these four indicators are in the third quadrant X15 (providing remote medical and health management services), X6 (terminal access bandwidth speed), X12 (intelligent environmental protection project, comprehensive supervision of environmental pollution sources such as soil, atmosphere, noise, water body), X11 (vehicle, road, parking lot and other types of transportation facilities). Source's intelligent management, but with a high degree of importance, and the experience of citizens will bring a direct feeling, it is worth improving its satisfaction. The importance of X10 (coverage of social security and employment services) and X9 (credit information sharing platform for cross-sectoral communication) is not so high as that of the second quadrant, so managers can put them on hold for a while and consider them after solving the indicators of the second quadrant.

The fourth quadrant is "Possible Overkill". For Chinese citizens, the importance of these indicators is relatively low, while the performance and satisfaction of Chinese citizens are relatively high. We should reasonably control the investment of resources in these projects.

5. Conclusion

In this paper, by integrating multiple regression IPA and DEMATEL models, the key service elements of China's smart cities are evaluated, and the priority of improvement or maintenance is determined. Through the summary of the research work in this paper, the following conclusions can be drawn:

(1) Designing the index system of influencing factors of overall satisfaction for the development of out-of-door smart cities: Based on the combination of literature analysis and expert screening, this paper screens out representative and comprehensive influencing factors of Zengcuo's tourist satisfaction, and adds several influencing factors according to the actual situation of the development of China's smart cities. Established a fixed broadband household penetration rate, fiber-optic household coverage rate, 3G, 4G user penetration rate, digital household coverage rate, WIFI coverage rate, terminal access broadband speed, one-stop online approval service system, standardization, standardization of public service processes, integrity information sharing platform, to achieve cross-sectoral credit information sharing, social

security and sharing. Enhance the coverage of employment services, vehicles, roads, parking lots and other transportation facilities and resources of intelligent management, intelligent environmental protection projects, comprehensive supervision of soil, atmosphere, noise, water and other sources of environmental pollution, integration and sharing of public security monitoring, traffic monitoring, community security, social monitoring and other video monitoring systems, full appointment and medical information sharing, providing remote access Medical and health management services, education resources sharing, public libraries to implement "one card universal" and "lending and returning", provide "eating, housing, travel, shopping and entertainment" one-stop information services, community informatization, Community Grid management, fostering cloud computing, big data, Internet of Things, 4G communications, three-network integration, digital content and other new generation of information technology industries, foster wisdom Logistics, smart tourism, smart finance, smart trade and other emerging service industries, the introduction of high-level talents in smart cities are 22 variables of the overall satisfaction evaluation index system for the development of China's smart cities.

(2) This paper proposes a method for evaluating the service quality of China's smart cities by integrating multiple regression IPA and DEMATEL: obtaining basic information of citizens through questionnaires and evaluating information on various indicators not only expectations and satisfaction, but also overall satisfaction. The reliability and validity of these data were analyzed to determine the validity and reliability of the data. An integrated multiple regression model of IPA and DEMATEL for service quality assessment was constructed to analyze the data by regression and the results were analyzed.

(3) Suggestions on priority improvement of development factors of smart cities are given. By integrating multiple regression IPA and DEMATEL models, it is confirmed that there are 11 priority improvement factors in the development of smart cities in China. Among them, "fostering new generation information technology industries such as cloud computing, big data, Internet of things, mobile internet, 4G communication, three networks integration, digital content" and "integrating video surveillance systems such as public security surveillance, traffic surveillance, community security, social surveillance" and "one-stop online approval service system" are the most important service elements for improvement. Take timely response measures.

According to the integrated IPA model, the second quadrant is the priority factor for managers to improve in the development of China's smart cities. Therefore, according to the factors falling in the second quadrant, the following suggestions are given as shown in the figure below. The introduction of high-level talents in smart cities (X22): The introduction of high-level talents in smart cities is in the second quadrant. Questionnaire survey shows that the satisfaction of citizens with the introduction of high-level talents is low, but its importance is high. Therefore, managers should give priority to strengthening and improving this factor. To foster a new generation of information technology industry (X20) such as cloud computing, big data, Internet of things, mobile internet, 4G communication, three networks convergence, digital content and so on: to foster a new generation of information technology industry, such as cloud computing, big data, Internet of things, mobile internet, 4G communication, three networks convergence, digital content, etc., which is located in the second quadrant. Questionnaires show that citizens are interested in information technology. Industry is a factor of low satisfaction, but its importance is high, so managers should give priority to strengthening the improvement. Full appointment and information sharing (X14): Full appointment and information sharing bit is in the second quadrant of IPA model, which indicates that citizens have high importance and low satisfaction with this factor. Therefore, managers should give priority to improving this factor. Integrating video surveillance systems such as public security surveillance, traffic surveillance, community security and social surveillance (X13): Integrating video surveillance systems such as public security surveillance, traffic surveillance, community security, social surveillance and other factors into the second quadrant of IPA model indicates that the importance of this factor is high and satisfaction is low, so managers should give priority to improving this factor. One-stop online approval service system (X7): One-stop online approval service system is located in the second quadrant, which indicates that the satisfaction of citizens is low and the importance of this factor is high. Therefore, managers should give priority to improving this factor.

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