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Research on Smart City Evaluation Based on Maslow's Hierarchy of Needs &SEM

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Abstract

The smart city differentiates itself according to the economic status of the country and the policies of the municipal government in question. When it comes to addressing the issues of urban evolution, urban depiction and scheme plays significant role in increasing the link between places and people, the urban shape and movement, among other things. The British Standards Institution defined as the best solution sharp solutions and ways that bestow the urban difficulties. Without taking the needs of their residents into consideration, most cities hastily adopt urban information technology after it has been established. This study has incorporated five needs of Maslow's Hierarchy as independent variables. Self-Actualization Demands (SLAD), Physiological Demands (PSD), Social Demands (SOD), Safety Demands (SFD), and Esteem Demands (ESTD) are the independent variables. However, Evaluation of Smart Cities (ESC) is used as dependent variable. The data was processes on AMOS 26v. Furthermore, the results have indicated that there is some association

Keywords: Smart City, Economic Status, Maslow's Hierarchy of Needs, SEM

I. Introduction

All over the world, the process of urbanization is being developed much more speedily than it was developed before. The rate of global urbanization increased by 50% in 2007, and it is anticipated to increase to almost 70% by the period 2050(Zhang, Y., et al., 2019).The population of urban that was estimated at 1.4 billion in period of 1970 is estimated to accelerate to 6.3 billion by period of 2050, with percentage of 60% of the population of world is anticipated to be condensed in areas of urban. It generates numerous going on conversations related to how to sort the innovative non-rural proa blems. smart cities are considered one of the best solutions to solve urban challenges and problems. The

development of the smart city is a contextual non-rural establishment framework that relies on the development of a city rely on IT and technology of communication(Falco, G., 2021). The particular explanation of smart town differentiates based on the country's town's policy and degree of economic conditions (Kiskis, 2017). Still, it can sight as a town that utilizes ICT to enhance the town's establishment and quality life follows the resilience of urban. As in today's world, the attentiveness in the establishment of smart towns is growing gradually; most countries are encouraging their construction in the area of a smart city (Leung, K. Y., & Lee, H. Y., 2021). China's scheme to fund almost two trillion yuan by period of 2025 is to remold percentage of 80% of their towns into smart towns by meeting the needs of the citizens (Miller & Wager, 2017). By 2010, Japan had funded billions of yen in establishing correlated systems to smart cities. Making thing investment aims to reconstruct the areas affected badly after the Great East Earthquake (Laufs, J., Borrion, H., & Bradford, B., 2020). In period of 2015, a plan related to smart town which incorporated a $160 million R$D plan of investment to rectify all the challenges and problems associated with urban was publicized by white house (Pitts, 2017). Navigant investigation considers this tendency, and the market of smart town is anticipated to evolve continuously, increasing from $424 billion in 2017 to 12 trillion in 2020 (Ji, T., Chen, J.-H., Wei, H.-H., & Su, Y.-C., 2021). Complicated persuade on the systems, infrastructures are created because of the prompt urbanization of regions related to the city and promoting the requirement for inventive, durable solutions to the challenges related to the urban evolution (Csukás, M. S., & Szabó, R. Z., 2021).

Urban depiction and scheme have a going on part in approaching the challenges due to urban evolution utilizing enhancing the relationship between places and people, the urban form and movement (Rao, 2017). British standards institution defined sharp proposals and approaches that bestow the urban challenges as the best solution (Giourka, P., et al., 2020). These include the implementation of autonomous and semi-autonomous systems of technology. These systems can be achieved by developing digitized associations between telecommunications and cloud networks, embedded sensors, and different devices of ICT, which are the things of the internet (Roman, K., 2019). Although, the establishment of the smart city is fundamentally an interdisciplinary undertake relatively than merely presenting a technological fix for the challenges created by urban (Bédard, F., 2020). It undertakes the essential consolidation of concrete and digitized in created environment to provide a supportable, substantial, and embracing future for the residents of smart cities (Tripathy, H. P., Pattanaik, P., & Kamilla, S. K., 2020). From the 21st century, the procedure of worldwide urbanization

has been increasing slowly and surely. In 2009, for the first time, IBM offered the perception of the smart city in its project by the name of smart Earth (Lim, Y., Edelenbos, J., & Gianoli, A., 2019). The notion and enactment of the smart city expanded speedily worldwide, which activated the establishment of a smart town (Uygur et al., 2017). The definition and idea of a smart town have become an innovative inclination of global urban evolution. Although, many problems were encountered in the construction of the smart city. Several cities consider themselves smart cities and come forward. In most cities, this new idea of city is utilized like a form of advertising by small endowments made to the substantial expenditure and establishment (Kubina, M., Šulyová, D., & Vodák, J., 2021). The customary establishment ideas are realigned with the conception of a smart city. Different scholars and researchers have interrogated and criticized this situation at different periods. In the establishment of the smart city in China, the things of internet, different networks, sensors, cloud computing, and other smart technologies are considered the focal point of industrial evolution in most cities, which probably leads to innovative overcapacity (Swan, M., 2018). Most cities impulsively follow the establishment of urban information technology beyond considering the citizens' requirements (Vasiltsov, O., 2018). The justifiable degree of new idea of creating city should encounter the requirements of citizens to be as assertion that is true motive for constructing new concept of city. In the perspective of highlighting the issues enduring in present quick expansion and progression of the new concept of city, this study examines the assessment of new concept of city by point of view of citizens' requirements (Al Khalifa, F., 2021). By investigating the citizen's needs, requirements, and intelligent purposes, an accurate perspective for the establishment and development of the city could be furnished (Akbari, A., Lotfalian, N., & Hasanpour, M., 2021). If we view the hierarchy of needs, which are presented by Maslow’s the requirements of human could be dispensed down into five volumes. Incorporating physiological, safety, respect, affection and self-realization (Zhang et al., 2017). Constructing a new concept of city must position at encounter requirements of citizens living in urban. Analyzing this these cities constructed on the requirements of citizens could aid us in figuring the correct way of the establishment of the smart city. However, in this study, the framework for sake of analysis of new concept of city is distinguished into the five levels of Maslow's hierarchy of needs (Kumar, T., & Mani, M., 2019).

II. Literature Reviews

Reviews on smart city research

There are different concepts and definitions, which corporations embrace at the global level, international organizations, academia, and many more. No consensus is present on the idea and concept of a smart town ,in other words (Crutzen, D. B. N., 2021). Hollands talk about the problems and issues that arise while developing a smart city's proper consent on which everyone agrees. This was done by putting forward all the hidden elements that create the problem. First, by 2000, there was no refined definition of the concept of smart cities, and neither any other indicators have been attached. Secondly, many researchers from different countries have examined and worked on ICT (Rudewicz, J., 2018). However, the idea of quality life is unknown, and the association between quality life and technology is still weak and vague. The word 'smart' meaning is still not clearly defined, and its linkage with the city is still not clear. Other researcher hall states that the definition of smart towns is one of the plans to make the future secure and safe (Zeng, W., Huo, X., & Yu, Z., 2020). The future will be more environmentally and eco-friendly, which is achieved through all the policies and structures related to the smart city. All the infrastructures and systems, which incorporates water, power, and transportation, are planned, established, and supported utilizing the latest consolidated materials, networks, sensors, internet things that are connected with systems of computerized including the technology of tracking, different sets of databases, and algorithms relayed to the decision-making (Wei, S., Kuang, F., Guo, Z., & Ren, B., 2021). Bakici et al. declared that a smart town is advance in terms of technology-based can associate information and people utilizing innovative technologies (Singh, P. K., & Ohri, A., 2020). The development of smart cities aims to develop a durable, greenish city that depicts innovative and competitive technology and an accelerated quality of life for the people. The other researcher Giffinger holds on that a smart town is a community, that is smart, which incorporates several factors such as individuals, governance of the government, environment, economy of the nation that is constructed on the base of smart infrastructure (Abdel Rahman Megahed, S., 2019).

Year	**Author**	**View**
2018	J. Rudewicz	First, by 2000, there was no refined definition of the concept of smart cities, and neither any other indicators have been attached. Secondly, many

		researchers from different countries have examined and worked on ICT
2019	S. Abdel Rahman Megahed	a smart town is a community, that is smart, which incorporates several factors such as individuals, governance of the government, environment, economy of the nation that is constructed on the base of smart infrastructure
2020	P. K. Singh & A. Ohri,	a smart town is advance in terms of technology-based can associate information and people utilizing innovative technologies
2020	W. Zeng, X. Huo, &Z. Yu,	The word 'smart' meaning is still not clearly defined, and its linkage with the city is still not clear. The definition of smart towns is one of the plans to make the future secure and safe
2021	S. Wei, F. Kuang, Z. Guo, &B. Ren,	The future will be more environmentally and eco-friendly, which is achieved through all the policies and structures related to the smart city. All the infrastructures and systems, which incorporates water, power, and transportation, are planned, established, and supported utilizing the latest consolidated materials, networks, sensors, internet things that are connected with systems of computerized including the technology of tracking, different sets of databases, and algorithms relayed to the decision-making
2021	D. B. N. Crutzen	No consensus is present on the idea and concept of a smart town

Reviews on smart city evaluation system research

Year	Author	View
2018	S. Mozuriunaite	The society of city protocol enlarged ISO standards and put forward other nine elements
2018	S. A. I. A. Al-Nasrawi	A smart town concept is based on enhancing and improving the lives of the citizens by giving them a quality life and resolving all the urban challenges
2019	O. V. Mathisen, M. E. Sørbye, M. Rao, G. Tamm, & V. Stantchev	Lifestyle changes led to the need to establish smart cities,
2019	H. Kopackova	The assessment framework incorporated five different indicators: ethnic freedom, economic evolution, environment, and capital related to human, with almost 45 other indicators
2019	H. Xu & X. Geng	The four sectors include the smart city network linkage sector, the smart urban area of industry, the smart urban area of service, and the smart urban area of humanities, divided into almost 21 indicators
2019	V. Javidroozi, H. Shah, & G. Feldman	The verifiable evolution and battle of European traditional intermediate cities is estimated using a range of criteria with smart indicators. The classification proposes six components of non-rural intelligence, including smart economy, government governance, smart people, smart mobility, sharp living, and territory.
2019	M. M. Kil	distinguished into five smart indicators, which incorporates smart economy, governance of smart government, mode of sharp portability, sharp

		territory, and sharp way of life and publish 18 indicators
2019	F. Al Khalifa	the intelligence community forum, depicted a set of analysis systems that measured the degree of intelligence. The methods utilized are the connection of the broadband, workers, which are knowledgeable, innovation, smart involvement, publicity, and marketing. It can be further distinguished into 18 sub-estimation measures
2020	A. S. Parlak,	The categorizing proffer six components of non-rural intelligence, which incorporate intelligent economy, government governance, people which are smart, intelligent mobility, sharp life, and territory. They also incorporate almost 33 subsidiary measures and almost 74 post-secondary measures
2020	Z. Wu, L. Liu, S. Li, & H. Wang	The framework incorporated 4 features: global network, intelligent implementation, a system of reliance of public and awareness. It incorporates many substandard elements and 57 post-secondary elements.
,2020	S. N. V. Sánchez, E. Mahaek, & A. Lekagul	the development of smart cities, which is because it will solve the urban challenges, should be developed based on the requirements and needs of the people。
2020	H. Doost Mohammadian & F. Rezaie	the definition and process of the smart town could be explained as town, which rely on exceptionally smart networks and networking of societal, the conversation connecting things with people and objects with objects that evolve
2020	G. Ying& L. Zonghua	The way working styles are evolving, and culture is being innovative by different traits; people's lifestyles

		are changing, resulting from the value-added contents utilizing networks and the internet
2021	R. Yuan	The UCLG of local put forward a smart city assessment framework, which rely on six non-rural indicators of intellect.
2021	Z. Fang, S.-L. Shaw, B. Yang, P. Santi, & W. Tu	The assessment indicator system of the smart city developed by the researcher Chen Ming and Wang mostly incorporates 4 areas: substructure of smart city, non-rural smart production, non-rural smart humanities, and service.
2021	P.-D. Jarvis, A. Damianou, C. Ciobanu, & V. Katos	examination in countries related to western mostly splits the intellect elements of smart cities into many kinds of manufacturing while highlighting social and capital of human. Many of the examinations located in area of China are developed which rely on abroad examination outcome, emphasizing much on assessment of evolution degree of IT

Ten years ago, a few researchers of Europe started to inspect the estimation of smart city. In period of 2007, the territorial science capital belonging to TU Wien and the Netherlands Dealt technology university, cooperatively issued about categorizing of smart city in the intermediate municipalities of Europe (Javidroozi, V., Shah, H., & Feldman, G., 2019). It estimated the verifiable evolution and battle of customary intermediate municipalities of Europe utilizing a progression of standards with intelligent indicators. The categorizing proffer six components of non-rural intelligence, which incorporate intelligent economy, government governance, people which are smart, intelligent mobility, sharp life, and territory. They also incorporate almost 33 subsidiary measures and almost 74 post-secondary measures (Parlak, A. S., 2020). In 2012, Dr. Boyd issued the top ten smart city categorizing the world. Moreover, put forward a model with the name of smart city wheel, distinguished into five smart indicators, which incorporates smart economy, governance of smart government, mode of sharp portability, sharp territory, and sharp way of life and publish 18 indicators(Kil, M. M., 2019). The ICF, the intelligence community forum, depicted a set of analysis systems that measured the degree of intelligence. The methods utilized are the connection of the

broadband, workers, which are knowledgeable, innovation, smart involvement, publicity, and marketing. It can be further distinguished into 18 sub-estimation measures (Al Khalifa, F., 2019). The UCLG of local put forward a smart city assessment framework, which rely on six non-rural indicators of intellect; the number of assessment indicators is almost 48 (Yuan, R., 2021). From the University of Amsterdam researcher called Patrizia examined the association between the elements of smart city and put forward a framework of network for analyzing the execution of smart city. The assessment framework incorporated five different indicators: ethnic freedom, economic evolution, environment, and capital related to human, with almost 45 other indicators (Kopackova, H., 2019). The society of city protocol enlarged ISO standards and put forward other nine elements and other particular factors for the means of smart city. In comparison with additional states, there is a smaller investigation on the assessment system of smart city in the country of China. The current research is mostly produced with the help of circumstances of assessment system of non-rural challenges and on the estimation outcome, which researchers of further nations carry out. The researcher Deng Xiang gang put forward that the assessment system of a smart city can be distinguished mainly into four sectors (Mozuriunaite, S.,2018). The four sectors include the smart city network linkage sector, the smart urban area of industry, the smart urban area of service, and the smart urban area of humanities, divided into almost 21 indicators (Xu, H., & Geng, X., 2019). The assessment indicator system of the smart city developed by the researcher Chen Ming and Wang mostly incorporates 4 areas: substructure of smart city, non-rural smart production, non-rural smart humanities, and service. In combining, almost 23 assessment indicators are present. By taking the example of Nanjing, a system of the index was utilized to develop a visible analysis (Fang, Z., Shaw, S.-L., Yang, B., Santi, P., & Tu W., 2021). Deng and Li Xianyi developed a model smart city framework for assessment. The framework incorporated 4 features: global network, intelligent implementation, a system of reliance of public and awareness. It incorporates many substandard elements and 57 post-secondary elements. Most of the additional researchers utilize assessment models of additional authorities to construct an assessment model of the index for smart cities (Wu, Z., Liu, L., Li, S., & Wang, H., 2020). By summarizing, examination in countries related to western mostly splits the intellect elements of smart cities into many kinds of manufacturing while highlighting social and capital of human. Many of the examinations located in area of China are developed which rely on abroad examination outcome, emphasizing much on assessment of evolution degree of IT (Jarvis, P.-D., Damianou, A., Ciobanu, C., & Katos, V., 2021). The current assessment inspection of smart city is mainly relied on the viewpoint to estimate the degree of intelligence

of their territory by disregarding individuals, which are the piece of non-rural services. There exists neither assessment from the focal point of compensation of requirements in the current examinations of smart city. However, the development of smart cities, which is because it will solve the urban challenges, should be developed based on the requirements and needs of the people, which will satisfy them, which a hierarchy of needs can achieve (Sánchez, S. N. V., Mahaek, E., & Lekagul, A., 2020). As there are various and countless viewpoints on the concept of a smart town, it is obvious that a smart town embraces innovative automations to enhance the degree of productivity correlated with using non-rural substructure responsibilities. A smart town concept is based on enhancing and improving the lives of the citizens by giving them a quality life and resolving all the urban challenges (Al-Nasrawi, S. A. I. A., 2018). However, the definition and process of the smart town could be explained as town, which rely on exceptionally smart networks and networking of societal, the conversation connecting things with people and objects with objects that evolve (Doost Mohammadian, H., & Rezaie, F., 2020). The way working styles are evolving, and culture is being innovative by different traits; people's lifestyles are changing, resulting from the value-added contents utilizing networks and the internet (Ying, G., & Zonghua, L., 2020). All this led to the need to establish smart cities, which incorporate all these needs (Mathisen, O. V., Sørbye, M. E., Rao, M., Tamm, G., & Stantchev, V., 2019).

Methodology

III. Maslow's Hierarchy of Needs Theory

American psychologist Maslow.A.H. proposed the hierarchy of needs theory from the perspective of human motivation, which emphasizes that people's motivation is determined by people's needs. And in every period, one need dominates, and other needs are subordinate. It divides human needs into five levels from low to high: physiological needs, safety needs, social needs, esteem needs, and self-actualization needs.

- Safety Demands (SFD)
- Social Demands (SOD)
- Esteem Demands (ESTD)
- Self-Actualization Demands (SLAD)
- Physiological Needs (PSD)
- Evaluation of Smart Cities (ESC).

In the smart city evaluation system, the five needs of Maslow's hierarchy can be used as independent variables. Self-actualization needs (SLAD), physiological needs (PSD), social needs (SOD), safety needs (SFD), and esteem needs (ESTD) were independent variables. However, the Smart City Assessment (ESC) was used as the dependent variable. In mathematics, the equation y=f(x), the independent variable is X, and the dependent variable is Y. The independent variable is the cause and the dependent variable is the effect. The change of the independent variable in this equation is the reason for the change of the dependent variable, the independent variable itself will change, and the dependent variable is to change according to the change of the independent variable. That means that the Smart City Assessment (ESC) can change as Self-Actualization Needs (SLAD), Physiological Needs (PSD), Social Needs (SOD), Safety Needs (SFD) and Respect Needs (ESTD) change.

To better evaluate the Smart City, this paper has used the Maslow's Hierarchy of Needs. Maslow's Hierarchy of Needs Theory divides human needs into five levels from low to high: physiological needs, safety needs, social needs, esteem needs, and self-actualization needs. Maslow's Hierarchy of Needs Theory conforms to the general law of the development of human needs and the law of the development of urban needs. Cities have different needs at different stages of development. Only when the bottom-level needs of the city are met will they develop to a higher level of demand. The development of smart cities must be based on the needs of urban development,as the figure 1 Masnow Model shows:

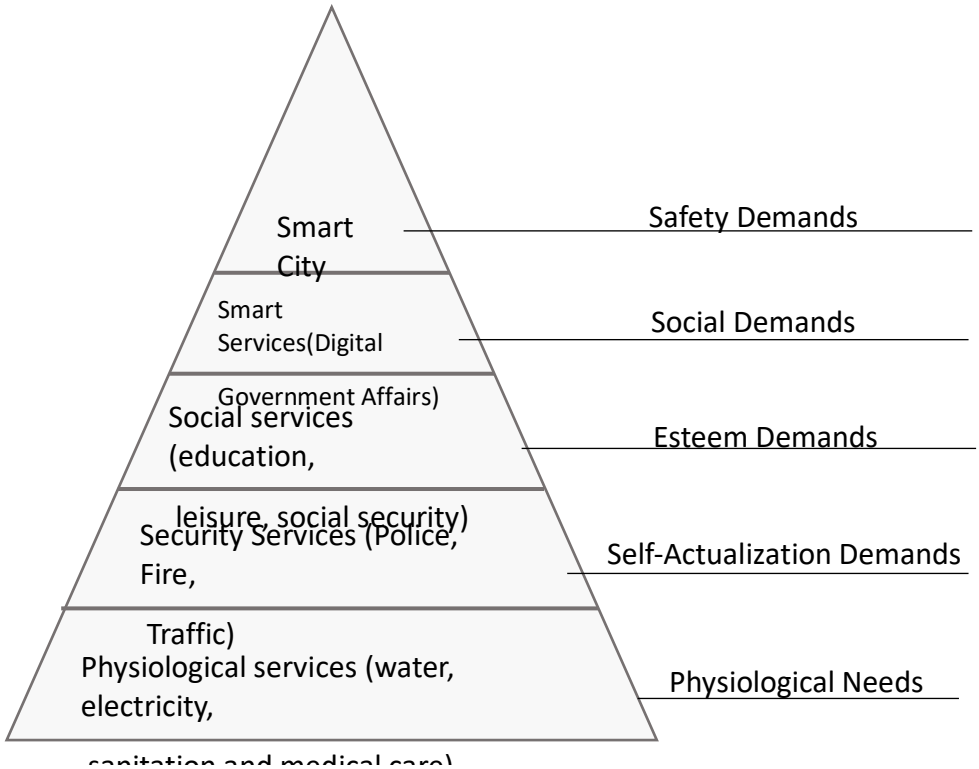

Figure 1: Masnow Model

- Physiological needs are the most basic requirements for human beings to maintain their own survival, including requirements for hunger, thirst, clothing, housing, and transportation. If these needs are not met, human survival becomes a problem. In this sense, physiological needs are the most powerful driving force for people's actions. In the construction of smart cities, it is mainly reflected in water, electricity, sanitation and medical services, basic housing security, clean and hygienic food, and basic communication services.
- The need for safety is the need of human beings to ensure their own safety, get rid of the threat of career and loss of property, avoid occupational diseases, and be exposed to severe supervision. In the construction of smart cities, it is mainly reflected in public security, fire protection, transportation, etc. to ensure the safe life of residents, which is a rigid demand in the construction of smart cities.
- Social needs, belonging needs, that is, people have a feeling of belonging to a group, hoping to become a member of the group, and to care and take care of each other. It is related to a person's physical characteristics, experience, education, and religious beliefs.

In the construction of smart cities, it is mainly reflected in education, leisure, social security, and friendship services.

- The need for respect, everyone wants to have a stable social status, and requires that personal abilities and achievements be recognized by the society. In the construction of smart city, it is mainly reflected in comfortable government affairs office, healthy market environment, more harmonious work and more convenient life.
- The need for self-actualization refers to the need to realize one's ideals and aspirations, exert one's ability to the greatest extent, and complete everything commensurate with one's ability. In the construction of smart cities, it mainly reflects green living and office environment, more decent old-age life, and happier living atmosphere.

According to Maslow's Hierarchy of Needs Theory and different scholars' research on the evaluation index system of smart city, the connotation and basic characteristics of smart city, this paper constructs the evaluation index system of smart city development.

Questionnaire survey to determine smart city evaluation system

The development of smart cities is not only the concern of the country and the government, but also closely related to people's lives. Choosing a questionnaire survey method can systematically collect the needs of people at different levels and make the data more authentic.The final questionnaire was determined according to the purpose of the questionnaire, the construction of the aforementioned index system, the principles of questionnaire design, the actual situation of pilot smart cities, and the opinions of relevant experts. The questionnaire mainly includes two parts: the first part is the basic information of the respondents, including name, occupation, age, etc.; the second part is about the five aspects of the evaluation system. The survey method of the questionnaire is mainly based on the network survey, and the field survey is carried out in 11 districts of Guangzhou. The survey respondents include 11 major bureaus and commissions, relevant government personnel of pilot smart cities, and smart city research scholars. A total of 300 questionnaires were distributed. A total of 282 questionnaires were recovered, and invalid questionnaires with omissions and obvious regularity of answers were excluded. A total of 267valid questionnaires were recovered, with an effective recovery rate of 89%.According to the results of the questionnaire survey, the analysis results in Table 1.

Table 1 Smart city development evaluation index system

topic	latent variable	observed variable	content
Evaluation of Smart Cities(ESC)	Physiological needs(PSD)	Smart network A1	fiber access, broadband per household, wireless coverage, etc.
		Infrastructure A2	Social and engineering infrastructure necessary for urban survival and development
		Smart Housing A3	Whether the smart housing system (smart home, energy-saving design, etc.) is complete
		Smart Communication A4	Mobile Informatization, Diversity of Communication Modes, etc.
		Smart Chain Food A5	"Internet + Food" smart supervision to promote the high-quality development of the food industry
	Safety Demands (SFD)	Smart medical B1	Whether smart medical care such as smart Internet hospitals and

			medical quality can meet the needs
		Smart Public Security B2	Reach the level of social security prevention and control, and improve the public's social security satisfaction
		Smart Transportation B3	Efficient and Intelligent Construction of Operational Monitoring of Transportation
		Smart Home B4	have a healthy, safe, comfortable, low-carbon and convenient personalized home life
		Smart Bank B5	Create a safer financial system and ensure people's financial security
	Social Demands(SOD)	Smart government affairs C1	Construction of smart database sharing platforms such as smart office, smart service, and smart decision-making

		Smart community C2	community information service system, smart property, smart community service, etc.
		Smart Office C3	Improve work efficiency, reduce communication efficiency, and improve decision-making ability
		Smart Dating C4	Improves Dating Safety, Expands Dating Scope, and Accurately Positions Dating Circle
		Smart Transportation C5	The construction of the transportation smart cloud platform, whether travel information can be obtained in time
	Esteem Demands(ESTD)	Smart governance D1	Construction of corporate governance, project governance, etc.
		Smart Market D2	Realize controllable source, traceable whereabouts, traceable problems, traceable responsibilities, and make food safety guarantee in the bazaar more effective

		Smart Environment D3	Natural environment, pollutant indicators, energy management, smart waste disposal, etc.
		Smart Education D4	Construction of Smart Classroom, Smart Education System, Smart Campus, etc.
		Smart Scenario D5	Smart Payment, Smart Interaction, Smart City Operation Center Construction
	Self-Actualization Demands(SLAD)	Smart energy-saving E1	Green buildings, energy-saving awareness, energy-saving facilities, etc.
		Smart business E2	innovation capability, informatization investment, big data, etc.
		Smart Elderly Care E3	the elderly at home, communities and elderly care institutions to humanize the life of the elderly
		Smart Tourism E4	Improve travel experience and travel quality, and expand the breadth of life

		Happiness Index E5	Life attitude, physical health, good values, etc.

Physiological needs are the most basic level of smart city needs and the minimum demand for smart city construction, mainly including smart networks, infrastructure, smart housing, smart communications, and smart chain food, which are reflected in the most basic living needs of urban residents. When the basic needs are met, the smart city needs will develop to a higher level of demand; security needs are higher than physiological needs, mainly including smart medical care, smart public security, smart transportation, smart home, and smart banking. It is reflected in the further improvement of urban residents' requirements for their own life after meeting the basic needs; social needs are a higher level of needs than security needs, mainly including smart government affairs, smart communities, smart office, smart friends, and smart transportation. Residents add scientific social elements to their lives after meeting their physiological and safety needs, and the requirements for quality of life are further improved; respect needs are higher-level needs than social needs, including smart governance, smart market, smart environment, smart education, and smart Scenario: Self-realization is the highest level of urban demand theory, including smart energy saving, smart business, smart elderly care, smart tourism, and happiness index. It is the ultimate goal of smart city development, that is, a self-balancing ecological green city. The construction of the whole system adheres to the principles of people-oriented, urban needs-oriented, convenient urban residents' life as the goal, green and sustainable development as the purpose, and information and communication technology as the means, which is scientific and rational.

IV. Structural equation model analysis

Data reliability and validity test

(1) Reliability test. At present, most scholars use the reliability coefficient to test (Jinzhang, Liu, 2011). The coefficient is 0-1, and the closer the coefficient is to 1, the higher the internal consistency of each item, that is, the higher the reliability. The

recovered valid volume data were input into SPSS for reliability test. After testing, the overall coefficient of the scale is 0.889, which is within a very credible range. The coefficients of each variable are 0.811-0.876, which are all greater than 0.8, which belongs to the highly credible range [40], so the next step can be carried out. degree test.

(2) Validity test. Bartlett's sphericity test and KMO test were used to test the construct validity of samples, and SPSS was used for analysis. The running results show that the overall KMO value of the scale is 0.912, which is greater than 0.9, indicating that it is very suitable for factor analysis. After orthogonal rotation, the obtained factor loading values are in the range of 0.573-0.876, which are all greater than 0.5, and passed the Bartlett sphere test (P<0.0001).

Full Model Analysis

Combined with the questionnaire design and factor analysis results, this higher-order potential factor is named the smart city evaluation index system, and the questionnaire data is substituted into the model. After several revisions to the model, the final result is shown in the figure 2.

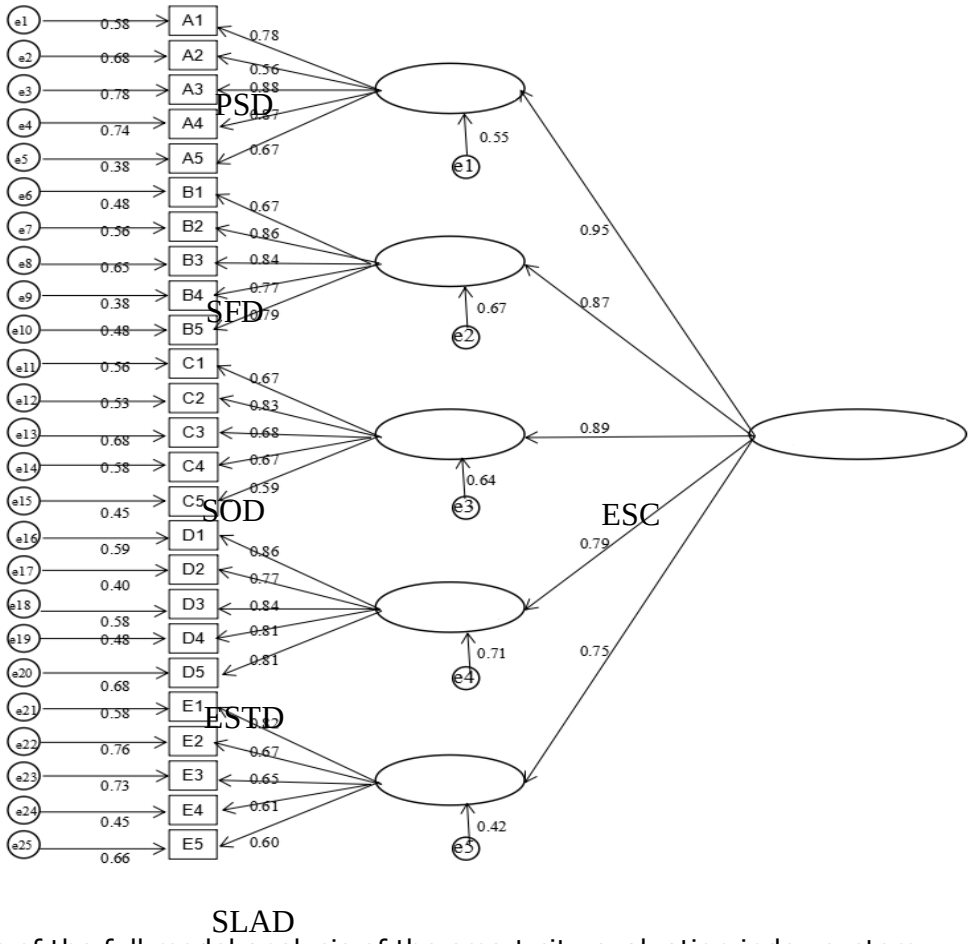

Figure 2 The results of the full model analysis of the smart city evaluation index system

After several revisions of the model, the fitting indicators are as follows:

①Absolute fitness index: RMR value is 0.031<0.05, RMSEA value is 0.047<0.08, GFI value is 0.912>0.9, AGFI value is 0.932>0.9.

② Value-added adaptation index: IFI value is 0.956>0.9, TLI value is 0.954>0.9, and CFI value is 0.934>0.9.

③Simple fit index: PGFI value is 0.678>0.5, PCFI value is 0.878>0.5, PNFI value is 0.623>0.5, CMIN/DF value is 2.071, all within the standard range Inside.

It can be seen that the model and data are adapted, so it can be proved that the smart city evaluation system constructed in this paper is reasonable. Through the first-order confirmatory factor analysis and the whole model analysis of the evaluation

system, the indicators of model fitting basically meet the requirements, indicating that the model and data fit well, and it proves that the evaluation index system constructed in this paper passes the test, and the established evaluation The index system is scientific and reasonable.

Analysis of examples

It is proposed to evaluate the level of smart city construction in 11 districts in Guangzhou, and find out the districts with high level of smart city construction in Guangzhou as a model to improve the level of smart city construction in other districts, thereby improving the overall level of smart city construction in Guangzhou. Evaluate the construction level of 11 district-level smart cities under construction, and use the expert scoring method to evaluate the secondary indicators. We can get the index weight table of smart city evaluation system as shown in Table 2. From this table, we can find that smart city is the same as human needs, and the weights are ranked as follows: physiological needs (0.231), safety needs (0.222), social needs (0.219), respect needs (0.198), self-actualization (0.130). At the same time, a 10-point Likert scale is used for positive scoring, that is, experts score the index system constructed above according to the construction status of each district. The higher the score, the higher the level of smart city construction in the district.

Table 2 Index weight table of smart city evaluation system

variable	**latent variable**	**Secondary indicator weight Wj**	**First-level indicator weight wi**
	A1	0.23	0.231

Physiological Demands (PSD) A	A2	0.21	
	A3	0.19	
	A4	0.17	
	A5	0.2	
Safety Demands (SFD)B	B1	0.21	0.222
	B2	0.25	
	B3	0.11	
	B4	0.12	
	B5	0.31	
Social Demands (SOD) C	C1	0.30	0.219
	C2	0.24	
	C3	0.16	
	C4	0.14	
	C5	0.16	
Esteem Demands (ESTD) D	D1	0.28	0.198
	D2	0.21	
	D3	0.17	
	D4	0.16	

	D5	0.18	
Self-Actualization Demands (SLAD) E	E1	0.24	0.13
	E2	0.19	
	E3	0.22	
	E4	0.14	
	E5	0.21	

Multiplying the weights of the indicators obtained above and the scores for the secondary indicators, the following linear equations are obtained:

A=W1*A1+W2*A2+W3*A3+W4*A4+W5*A5

B=W6*B1+W7*B2+W8*B3+W9*B4+W10*B5

C=W11*C1+W12*C2+W13*C3+W14*C4+W15*C5

D=W16*D1+W17*D2+W18*D3+W19*D4+W20*D5

E=W21*E1+W22*E2+W23*E3+W24*E4+W25*E5

ZONGLEVEL=w1*A+w2*B+w3*C+w4*D+w5*E

After calculation, the construction level of smart cities in 11 districts is obtained. It can be seen from the results that the highest level of smart city construction is in Haizhu District, Guangzhou, with ZONGLEVEL=9.87>8, which is at a higher level; the lowest level of smart city construction is Conghua District, Guangzhou, whose ZONGLEVEL=5.19<6, at a higher level Low level; all other districts are at intermediate level. As shown in Table 3,the final result score ranking is:Haizhu District, Huangpu District, Baiyun District, Nansha District, Panyu District, Yuexiu District, Tianhe District,Liwan District,Zengcheng District,Huadu District,Conghua District.

Table 3 Smart city evaluation rankings and scores in each district

AREA	SCORE	RANK
Haizhu District	9.87	1
Huangpu District	9.78	2
Baiyun District	8.89	3
MamshaDistrict	8.56	4
Panyu District	7.64	5
Yuexiu District	7.35	6
Tianhe District	6.89	7
Liwan District	6.88	8
Zengcheng District	6.78	9
Huadu District	5.34	10
Conghua District	5.19	11

V. Conclusion

It is particularly urgent to build a scientific, rational, complete and Chinese-style smart city evaluation system. Based on Maslow's Hierarchical Demand Theory and the research on smart city evaluation system by different scholars, this paper proposes a relatively complete and reasonable smart city evaluation index system. According to the established evaluation system and the suggestions of relevant experts, a questionnaire was compiled to investigate the domestic pilot smart cities. Based on the obtained survey data, the structural equation model is used to test the constructed evaluation system. The fitting indicators of the model basically meet the

requirements, indicating that the evaluation system constructed in this paper is scientific and reasonable. According to the test results of the model, the construction level of smart cities under construction in 11 districts is evaluated, which further illustrates the rationality and practicability of the evaluation index system constructed in this paper.The research analysis is as follows:

First, Haizhu District, Huangpu District, Baiyun District, Nansha District, etc. pay more attention to the construction of smart cities, and the transformation difficulty coefficient is relatively low, which is in the advanced stage, indicating that these four districts spent a lot of time and Funds to meet people's physical needs, safety needs, social needs, and respect needs. It is mainly reflected in the construction: strong communication infrastructure, ensuring personal safety, health will not be endangered, good anti-threat, anti-attack capabilities, quick recovery from attacks, cities supporting the transformation and development of enterprises and industries through digital services. development, the digitization of industries, and even the smart city itself.

Second, the middle-level districts include: Yuexiu District, Tianhe District, Liwan District, and Zengcheng District. These districts are characterized by old urban areas, an aging population, and older infrastructure, making smart city transformation difficult. Basically meet the physiological needs, safety needs and social needs of people's lives. Mainly reflected in the construction: strong communication infrastructure, emphasis on security issues, improved risk resistance, and developed business economy.

Third, Huadu District and Conghua District have a low level of smart cities, mainly due to the large land area and low population density of these two districts, and the lack of concentrated intelligent control areas. At the same time, the economic development of these two districts is mainly based on agriculture and tourism, which can basically meet the physiological needs and safety needs of the people.

As one of the megacities of Beijing, Shanghai, Guangzhou and Shenzhen in China, Guangzhou's smart city construction is at the forefront of the world. Most of the districts have met the basic needs of people's lives, such as physiological needs, safety needs, and social needs. Although there are still some districts at a relatively low level, with the development of the economy and the improvement of people's living

standards, the construction level of Guangzhou's smart city will continue to develop and progress.The government should provide different construction standards, capital investment and policy guidance according to the economic development of each district.

Vi. Deficiencies and Recommendations

Smart cities are often regarded as one of the most effective approaches to addressing urban challenges and problems. The development of the Smart city is a non-rural establishment framework that is based on the growth of a city that is based on information and communication technologies. The White House made public a strategy connected to smart town in the year 2015, which included a $160 million R$D plan of investment to address all of the challenges and concerns associated with urban life. The definition and concept of a smart town have evolved into an inventive propensity in the growth of global urbanization. Despite this, numerous difficulties were encountered throughout the creation of the smart city. Several cities consider themselves to be "smart cities" and have stepped forward to share their experiences. By making tiny donations to the large spending and establishment, small endowments to this new idea of city are used as a form of promotion in the majority of cities. Taking a closer look at these cities that were built to meet the needs of their residents could assist us in determining the most appropriate method for the development of a smart city. But in this study, the framework is divided into five levels of Maslow's hierarchy of needs in order to facilitate the examination of the new notion of city being explored through it. The British Standards Institution defined as the best solution crisp solutions and approaches that bestow the urban challenges, as stated by the British Standards Institution. Most cities implement urban information technology quickly once it has been built, without taking the requirements of their citizens into consideration first. As independent variables in this study, the five demands of Maslow's Hierarchy of Needs were taken into consideration. The independent variables include Self-Actualization Demands (SLAD), Physiological Demands (PSD), Social Demands (SOD), Safety Demands (SFD), and Esteem Demands (ESTD). The Evaluation of Smart Cities (ESC) is, on the other hand, used as a dependent variable. When it comes to smart city assessment inspection, the majority of the time, the focus is on estimating the level of intelligence of their area without taking into consideration persons, who are a component of non-rural services. In the existing examinations of smart city, there are

no evaluations from the focal point of compensation of requirements, nor are there any assessments from the focal point of compensation of requirements.

Following are the recommendations of the study:

- Future studies can add the role of technology and innovation in developing smart cities.
- The next study can increase the impact of population density and policy guidance in building smart cities,
- Furthermore, the studies indicate that smart cities/smart cities play a significant role in developing economies. Therefore, Maslow's Hierarchy of Needs and Economic aspects of the study could be added in future studies.

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