

# Research on Influencing Factors Model of Smart City Collaborative Governance Based on SEM

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**ABSTRACT.** *Focusing on the connotation of the influencing factors of smart city collaborative governance, using quantitative analysis and literature analysis to identify the smart city collaborative governance includes nine potential variables. Based on the data collected by questionnaire, using the statistical analysis tools of SPASS and SEM method, this paper constructs the influencing factors structure model of smart city collaborative governance, and reveals the path parameters and the mechanism of the model. Relevant suggestions are put forward to improve the collaborative governance of smart cities.*

**KEYWORDS:** *Smart city, Collaborative governance, Influencing factors, Path analysis, Structural equation model*

## 1. The Influencing Factors of Smart City Collaborative Governance

This paper starts with the existing research results, studies the framework of China's urban governance intelligent level evaluation system, makes a theoretical analysis of the collected characteristic elements, and analyzes the core elements or main characteristics that constitute the goal. On this basis, according to the principles of policy, science, system, guidance and operability, this paper designs various principles Indicators, through logical analysis and classification of similar options, and then hierarchical and modular research, builds a community of influencing factors of smart city collaborative governance, and finally forms a complete smart city collaborative governance evaluation index system.

## 2. Research Variables

A. Network Infrastructure; B. Social Participation; C. Ecological Civilization Construction; D. Collaborative Governance System; E. Collaborative Governance Mechanism; F. Legal Guarantee; G. Collaborative Subject; H. Intelligence Synergy; I. Development of Information Service

## 3. Research Hypotheses and Theoretical Model

In this paper, six factors affecting the collaborative governance of smart cities, including network infrastructure, social participation, ecological civilization construction, collaborative governance system, legal guarantee and information service development, are taken as exogenous latent variables. Three indicators such as collaborative governance mechanism, Intelligence synergy and collaborative subject are taken as the endogenous potential variables.

### A. Research Hypotheses

H1: network infrastructure has a positive effect on social participation;

H2: social participation has a positive effect on collaborative governance system;

H3: legal guarantee has a positive effect on collaborative subject;

H4: legal guarantee has a positive effect on intelligence synergy;

H5: collaborative governance system has a positive effect on collaborative subject;

H6: development of information service has a positive effect on collaborative subject;

H7: ecological civilization construction has a positive effect on legal guarantee;

H8: ecological civilization construction has a positive effect on cooperative subject.

#### 4. Empirical Analysis

##### A. Questionnaire Design and Research Samples

###### 1) Questionnaires Design

According to the investigation and research on smart city collaborative governance and the full comparative analysis, there are 29 secondary indicators (Table 1), which mainly consider the influencing factors on smart city collaborative governance from the selected collaborative governance mechanism, legal guarantee, collaborative subject, intelligence synergy and information service development. The actual variables are obtained by using the questionnaire “smart city collaborative governance” designed and used in this paper to obtain quantitative data, while the qualitative data are expressed by grade standards.

###### 2) Research Sample

This paper takes the government, social organizations, enterprises, the public and so on as the investigation objects, distributed a total of 2000 questionnaires, a total of 1962 valid questionnaires. The standard deviation calculated by SPSS software is basically in the fluctuation of 1.0, the average value is basically in the fluctuation of 3.5, and the data is stable.

##### B. Test of Reliability and Validity of the Questionnaire

The overall Cronbach's value is 0.907, each single Cronbach's Alpha is greater than 0.7, and the CITC is greater than 0.5, so each single factor is effective.

That  $KMO > 0.5$  (reference standard), the closer the value is to 1, the better the effect of factor analysis, so the above data is more suitable for factor analysis. At the same time, the F value of Barlett sphericity test is 0.000, which indicates that the index data of the influencing factors of smart city collaborative governance are normally distributed, which meet the requirements of SEM for data analysis. Therefore, the reliability and validity of the questionnaire are up to standard.

##### C. Construction of Initial Models and Corrections

###### 1) Building Initial Models and Tests

The initial model diagram is not presented here due to the effective length of the article.

All the evaluation indexes except CFI are up to standard, indicating that the overall fitting degree of the model is better and has a better fitting degree. When the CFI value is greater than 0.9, it shows that the model is acceptable and CFI=0.898 in this model. Therefore, the model needs to be further optimized according to the modification suggestion.

###### 2) Building Initial Model Modification

Each path of the model is modified repeatedly by AMOS software, and the results are shown in tables 1,2,3

Table 1 Validation of the Initial Structural Equation Model

Relationship between variables	Estimate of estimates	Error S.E.	C.R.	P
Social participation ← Network infrastructure	0.614	0.028	2.013	0.017
Collaborative governance system ← Social participation	0.712	0.032	2.132	0.012
Collaborative subject ← Legal guarantee	0.526	0.041	2.023	0.002
Intelligence synergy ← Legal guarantee	0.615	0.033	1.963	0.017
Collaborative subject ← Collaborative governance mechanism	0.714	0.052	2.126	0.020
Collaborative subject ← Information service development	0.543	0.034	1.931	0.008
Collaborative subject ← Intelligence synergy	0.217	0.016	1.943	0.014
Collaborative subject ← Ecological civilization construction	0.536	0.041	2.052	0.001
Ecological civilization construction ← Legal guarantee	0.362	0.062	2.121	0.011

Table 2 Recommendations for Covariance Modification of the Initial Model

Relationship between variables	MI	Par Change
Collaborative governance system ↔ Network infrastructure	6.265	0.516
Social participation ↔ Network infrastructure	5.227	0.345
Ecological civilization construction ↔ Social participation	5.416	0.227
Legal guarantee ↔ Collaborative governance system	6.215	0.426

Table 3 Recommendations for Modifying the Standard Deviation Regression Coefficients of the Initial Model

Relationship between variables	MI	Par Change
Intelligence synergy ← Network infrastructure	7.278	0.446
Intelligence synergy ← Ecological civilization construction	6.331	0.416

3) Building Final Model

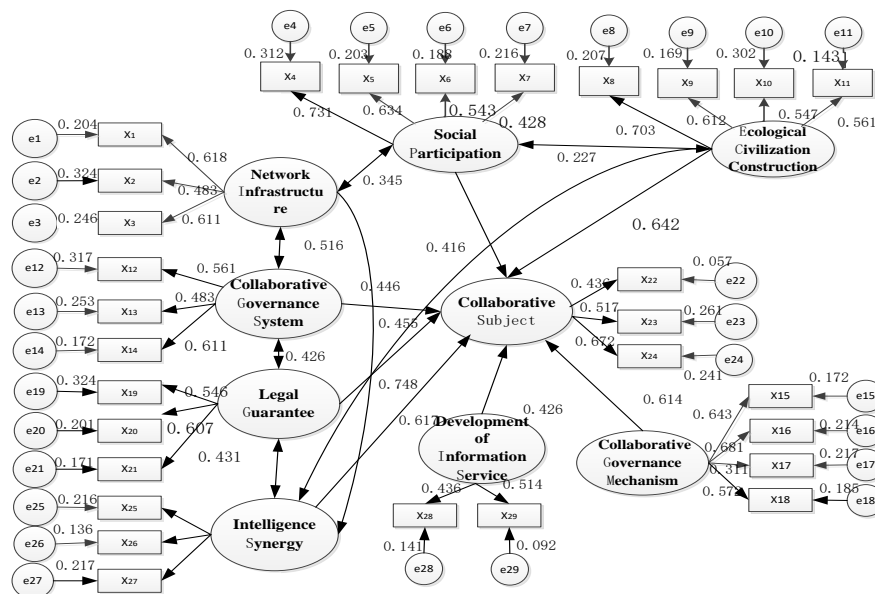


Fig.1 Final Structure Model of Influencing Factors of Cooperative Governance in Smart Cities

5. Analysis of Conclusions

About the hypothesis H1 analysis: through the above analysis, the network infrastructure will have the positive influence to the social participation.

About the hypothesis H2 analysis: through the above analysis, the social participation will have the positive influence to the collaborative governance mechanism.

About the hypothesis H3 analysis: through the above analysis, the ecological civilization construction will have the positive influence to the collaborative governance mechanism.

About the hypothesis H4 analysis: through the above analysis, the synergetic governance system will have the positive influence to the collaborative governance mechanism.

About the hypothesis H5 analysis: through the above analysis, the collaborative governance mechanism will have the positive influence to the intelligent synergy.

About the hypothesis H6 analysis: through the above analysis, the cooperative governance mechanism, the intelligent synergy, the legal guarantee and the information service development will have the positive influence to the cooperative subject.

About hypothesis H7 analysis: through the above analysis, social participation and synergetic governance system have a significant correlation.

About the hypothesis H8 analysis: through the above analysis, the ecological civilization construction and the collaborative governance system have the remarkable correlation.

According to the comparison of the influence degree of each evaluation index on the collaborative governance of intelligent city, it can be seen that the direct influence coefficient of the legal guarantee on the cooperative subject is 0.748, compared with other factors, the direct influence degree is more obvious.

## 6. Countermeasures and Suggestions

A. The construction of smart city should establish the core concept of modern urban governance, and turn the urban social governance from single government management to multi-agent participation in consultation and joint governance. We should attach equal importance to service and management, and strive to achieve systematic, comprehensive and source management.

B. Strengthen the construction of rule of law in the collaborative governance of smart cities. Strengthens the system construction of coordination between the upper and lower levels of government and government departments at all levels, realizes the proper distribution of power and responsibility among government departments, and forms effective synergy effect.

C. Focus on strengthening the construction of public finance collaborative mechanism and material guarantee mechanism, provide sufficient material and financial resources support for the collaborative governance of smart city, build the governance linkage mechanism between government and non-governmental organizations, and realize complementary advantages.

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