

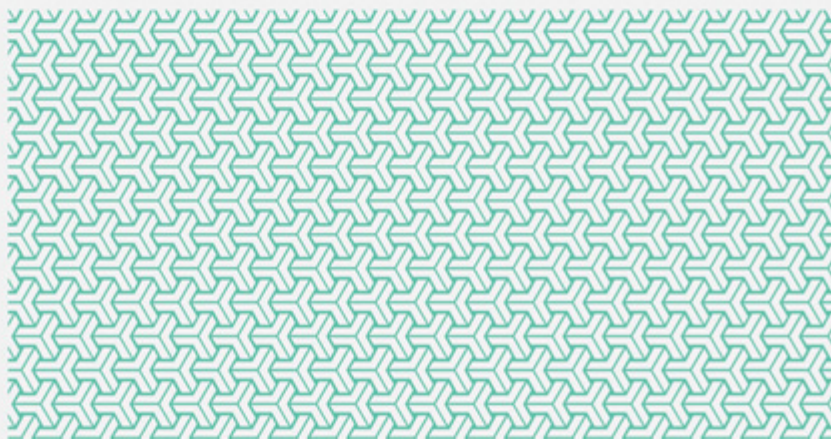
스마트도시계획 모니터링 및 성과 평가를 위한 지표 연구

A Study on the Monitoring and Performance Evaluation Indicator for Smart Cities Comprehensive Plan

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□ Study Overview

Starting with the ubiquitous, 41 local governments have developed smart city plans based on the "Smart City Act", and plans are increasing and proliferating among them, with some areas developing plans in three phases.

Under these circumstances, it is becoming increasingly vital to diagnose the promotion through monitoring activities such as evaluating the performance and implementation of previous plans and presenting the correct direction for current plans. However, unlike urban planning or urban regeneration programs, there are only a few diagnostic indicators and tools for the process and effectiveness of smart city planning.

In the case of certain smart city technologies and services launched and run as part of a smart city project, KPIs (key performance indicators) are provided and utilized for project management and assessment throughout the planning phase; however, it is difficult to self-diagnose the plan due to the lack of evaluation indicators for smart city planning components as a whole.

As a result, the primary objective of this study is to discover and develop evaluation indicators that can continuously monitor project implementation in the planning process over a five-year period and check performance during subsequent planning for the goals and achievements proposed by local governments when developing smart city plans.

□ Survey and analysis of performance evaluation indicators for smart city plan

The types of domestic smart city performance evaluation indicators are more subdivided than those of other nations, according to an analysis of the structural types of domestic and international smart city performance evaluation indicators. In the case of foreign nations, most evaluation structures converged to a certain kind (dimension – subdimension – indicator), however in South Korea, each performance evaluation index was separated into a different type. Comparing domestic and international smart city performance evaluation indicators revealed that indicators for smart city service categories including economy, environment, and safety are actively utilized. Domestically and globally, ICT, information and communication, and social (health, welfare, and inclusion)-related sectors were also utilized, albeit with different terminology.

Sectors relating to data, mobility/transportation, and administration were more prevalent in South Korea than in other nations. In South Korea, the frequency of data sector performance (certification) indicators was 87.5%, although there was no data-related sector outside of South Korea.

In South Korea, the mobility/transportation sector is used 100.0% of the time, however internationally, only roughly 33.0% of the mobility/transportation-related sectors are used. The frequency of administrative sector indicators utilized in South Korea is approximately 87.5%, whereas the frequency of governance indicators used abroad is estimated to be relatively low at 25.0%.

The evaluation categories of environment and sustainability, inclusivity, and quality of life were employed more diversely and specifically in foreign nations than in domestic smart city evaluation indicators.

The majority of the performance evaluation indicators offered in the smart city plan (draft) are content-related to "matters involving smart city services taking regional peculiarities" in the "Smart City Act". It only presents performance evaluation indicators relating to smart city service achievement by field; other indicators that may be used to evaluate plan formation, execution, and achievement are not offered.

Among the smart city service categories, indicators relating to the economy/regional industry, information and communication, and data were fairly aligned with the elements of the smart city plan creation stated in the "enforcement ordinance of Smart City Act". When identifying indicators for overall smart city planning in the future, it is vital to assess the applicability of service performance evaluation indicators for each smart city planning sector of the local government in connection to information and data.

Indicators pertaining to all parts of smart city planning are presented for domestic smart city certification, except regional status analysis, planning goals and promotion strategies, connections with adjacent cities, and international collaboration. Consequently, it is determined that smart city certification indicators may be used to identify smart city planning performance evaluation indicators. Given that the present smart city planning performance evaluation indicators are concentrated in the smart city service field, it is anticipated that performance indicators that can cover smart city planning aspects can be identified by analyzing the smart city certification indicators.

Indicators that can check the progress of smart city planning service projects and performance evaluation indicators on whether or not the final goal is reached, as

well as indicators that can be used to evaluate each stage of plan, such as plan establishment – plan (project) in progress – (project) completion, are also required. In addition, performance indicators and monitoring systems must be incorporated into urban master plans, regeneration initiatives, and development plans utilized by local governments.

As a consequence of analyzing the contents of the plans through the operation of the support desk for smart city planning, results with varied performance objectives or indicators were produced among similar services, highlighting the necessity to select suitable indicators.

Moreover, a large number of instances were analyzed in which indicators that lacked a causal link with the planned project were established or abstract goals that lacked justification were presented. It is also vital to match the indicators that may draw appropriate outcomes from initiating smart city projects.

In the event of providing several performance targets for a single service, difficulties develop regardless of the service's original intent, and problems that burden local governments as a result of setting excessive performance targets were also identified.

In conclusion, it was determined that the type and amount of indicators, measurement units, performance indicators, and measuring methodologies must be presented straightforwardly to accurately assess performance goals for individual services.

☐ Development of performance evaluation indicators for smart city plan

The configuration of the performance evaluation index system for the smart city comprehensive plan was geared at assessing the smart city plan contents and performance in accordance with the plan.

The primary components of smart city planning were classified into four categories: promotion system, cooperation system, financial resources, and smart city services. Additionally, smart city services were classed as smart city services for achieving smart cities, and the promotion system, cooperation system, and financial resources were defined as governance for creating and managing smart cities.

The development of a specific organization (department), the construction of a project management system, and the preparation of institutional foundations as indicators comprise the promotion system as a governance sector. In terms of the

cooperation system, the framework of the indicator system is the construction of a cooperation system with associated organizations, international collaboration, reinforcement of citizens' capacity, and citizen engagement. In terms of financial resources, the index system covered obtaining financial resources for the operation of the promotion system and cooperation system, securing financial resources for planning and demonstration of urban services, and so on.

In the case of the smart city service sector, it is separated into comprehensive service plans, service setup performance, and quality of life enhancement impact based on services. The comprehensive service plan includes the creation of an annual roadmap and the preparation of a detailed implementation plan as an indicator system. The service setup performance sector systematizes setup performance against the setup plan and service execution status. Finally, an indicator system for smart city planning performance evaluation was constructed in the sphere of quality of life enhancement impact according to service by systematizing improvement of citizen acceptance, usage satisfaction, and different urban indicators.

The performance evaluation indicators for smart city planning have been reclassified based on the planning elements contained in the Smart City Act and the Act's enforcement ordinance. The aforementioned indicator system was utilized to match the currently used performance evaluation indicators for smart city planning. Consequently, the overall indicator system and indicator list were produced by identifying performance evaluation indicators applicable to each smart city planning sector.

Indicators comprised of a single evaluation element are permitted in plan items under the Act and the enforcement ordinance. However, when numerous evaluation components are offered, a policy decision-making procedure is necessary to determine priorities. Hence, the process of determining priority was carried out through a study of the evaluation variables' relevance and urgency. In consideration of the smart city planning formation technique and significant components, the evaluation sector was classified into four categories: "Governance", "Infrastructure and Industry", "Financial Procurement and Operation", and "Smart City Service".

As a result of the analysis, among the detailed evaluation factors in the governance sector, "Smart city-related dedicated organization," "project management system," "consultative body for project implementation," "support for data utilization," and "utilization of citizen participation" have been identified

in the focused improvement area whereas the “division of roles by associated institutions in relation to the smart city” and “creation of a collaboration framework among related institutions” were situated in the continual management area.

In the infrastructure and industry sector, 'infrastructure construction status' and 'utilization of the Urban Integrated Operation Center' were the highest-priority topics for improvement, meanwhile 'strategy for fostering local industries' and 'fostering of industrial ecosystem' were ranked in the low-priority improvement area.

Among the detailed evaluation elements pertaining to the financial procurement and operation sector, "smart city-related technological development and research budget," "smart city creation budget plan," and "private investment attraction for smart city creation" are identified in focused improvement area while other detailed evaluation elements were included in the improvement area with low priority.

In the smart city service sector, the focused improvement area included the "step-by-step promotion strategy for each service," "service reflecting local characteristics," and "enhancement of the quality of life of local citizens through smart city service" whereas other detailed evaluation factors were situated in the strategic approach area.

☐ Utilization of indicators and direction for policymaking

The performance evaluation indicators for smart city planning proposed in this study may be continually reviewed and employed throughout the whole planning and promotion process.

In the initial phase of creating a smart city plan, the region-specific performance evaluation indicators can be identified and incorporated.

Considering the performance evaluation indicators represented in the plan during the 5-year planning period as the implementation stage after the plan is authorized, it performs a role in providing the direction and objectives for monitoring and implementing the plan's contents and projects. During this period, it is also crucial to define and apply the application period based on the features of short-term or medium- to long-term indicators.

These indicators can be utilized even while reviewing the existing smart city plan before the development of the reorganization plan or even after the planning period has ended. Following the conclusion of the planning period, performance

evaluation indicators can be utilized to monitor plan execution.

Through this evaluation, it is feasible to reorganize into a more developed smart city plan, and it is recommended to design a policy to construct a circulation system by modifying and supplementing the performance evaluation indicators accordingly.

In order to incorporate these performance evaluation indicators into policymaking, the Smart City Act should mandate that local governments undertake performance evaluations, and performance evaluation indicators should be employed in this process.

If the method for applying performance evaluation indicators and precise details can be freshly formed and attached to the guidelines for developing smart city planning, a series of institutional systems may be constructed.

Furthermore, if more objective figures and indicators are identified and inspected using these performance evaluation indicators during the operation of the help desk, which is the preliminary review stage of smart city planning, the reliability, and effectiveness of the review stage will be increased, thereby enhancing the efficacy of smart city planning and aiding in the resolution of urban issues.

Keywords

Smart Cities Comprehensive Plan, Monitoring, Performance Evaluation, Indicator, relative Importance, urgency