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A Direction of Realization for Smart Green City

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Abstract: Historically, cities have not only been developed with the cutting-edge technologies of the era being applied, but have also changed the lifestyles of the citizens through this. Technologies are accelerating the speed of the development as times flow and are increasing the importance; especially, technologies and knowledge are being dealt with more importantly in the state-of-the-art cities of the current era represented by Smart City. However, Korea's construction industry focus on building physical environments and construction itself showing the limitations in creating the urban development integrating the knowledge and technologies of the era. In this context, the study aims to extract the change directions of the Korea's construction industry to realize the Smart Cities. To this end, the study analyzed the characteristics of city composition programs and projects targeting on the public and private institutions of the developed countries. Korea's construction industry is necessary to take the position to consider the non-physical factors as well as to make efforts to construct the physical environments; and, through this, the comprehensive solutions should be able to be presented on the environmental, social and economic issues and problems that we are facing internally and externally. And the comprehensive views on the areas and industries related to the city composition and the role to integrate these effectively in line with the purposes are required. The construction industries should be transformed into the self-leading industries that will continue to change the lives of the citizens and create the new lifestyles through this.

Keywords: smart city; construction industry; role and development

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1. Introduction

Historically, cities have not only been developed with the cutting-edge technologies of the era being applied, but have also changed the lifestyles of the citizens through this. Cities are the places where knowledge and technologies are accumulated as well as the places where the lives of the citizens are being realized. The applications of knowledge and technologies change the lifestyles of the citizens. Technologies have developed cites repeating the applications and declines; Cities are the cumulative formations of knowledge and technologies. Technologies are accelerating the speed of the development as times flow and are increasing the importance; especially, technologies and knowledge are being dealt with more importantly in the state-of-the-art cities of the current era represented by Smart City.

Smart Cities have varying composition purposes and goals to achieve depending on the conditions and situations, but are the places that the places and the state-of-the-art technologies are integrated as in the composition of the historic cities in terms of the big framework of the composition. Construction has been conducting a key role in the composition which is not different in the Smart City as the model of the new city. However, Korea's construction industry focus on building physical environments and construction itself showing the limitations in creating the urban development integrating the knowledge and technologies of the era; in addition, it is lacking in the consideration of the citizens' life so it has limitations in creating a Smart City as a good city.

In this context, the study aims to extract the change directions of the Korea's construction industry to realize the Smart Cities. To this end, the study will examine the limitations of the Korea's construction industry; analyzed the characteristics of city composition programs and projects targeting on the public and private institutions of the developed countries associated with the urban development in terms of the urban development process, city composition factors, application technologies and the industry.

Table 1. Case analysis object.

Division	Public institution	Private institution
Case	JICA(Japan International Cooperation Agency)	SEFI (le Syndicat des Entrepreneurs Fran ais Internationaux)
	USAID(United States Agency for International Development)	

2. Results and Discussion

2.1. Limitations in Korea's Construction Industry

The performances of development projects are partly determined by the properties, authorities, competencies, etc. of the responsible and participating subjects in the project processes such as planning, investment, construction, management & supervision, supports, coordination, etc.. Looking at the urban

developments in terms of the project subjects, there have not existed the developers in terms of the comprehensive meaning in Korea that can take the responsibility for the whole process of a city composition project; consequently, the construction companies tend to have conducted central roles in performing the urban development with relative capital mobilization capabilities. The problems appearing with the emergence of the construction companies as the developers are that the areas of construction are emphasized in the development processes. It causes the urban development to be made by the construction companies mainly pursuing the profit generation in the construction stage focusing on the physical aspects and the floor area ratio. The urban development conducted with the construction as the core process focusing on the quantitative supply of the physical environments caused relative lack of the considerations in the urban planning stage, which consequently means that it contained the limitations in terms of the systematic and comprehensive city composition. Most of the Korea's urban developments have been concentrated in the new town developments focusing on the residential centers so far. With the continuation of the structure until recently, Korea's urban development industries have been recognized as the new town construction focusing on the residential centers.

Relating to the composition of the state-of-the-art cities in which technologies and industries of the various fields should be integrated and new lives of the citizens should be considered, it would be difficult for the Korea's construction industry with the focus on the construction of the physical environments to secure the competitiveness in realizing new cities as the Smart Cities.

2.2. Direction for Realizing the Smart Cities

The urban development projects examined through the cases are based on the knowledge on the social and economic system enabling to resolve the global issues and the problems faced by the cites and to function the cites; and the diverse and comprehensive knowledge on the all the matters including the fiscal preparation and implementation schemes for the project execution; as well as the knowledge relating to the physical construction of the cites. And the comprehensive approaches have been done in the scope of the project, city composition process, city composition factors and application industry sectors.

For the scope of the project, all the institutions are commonly presenting the comprehensive solutions on the physical factors (hardware) and non-physical factors (software) reflecting the market demand along with the consideration of the environmental, social, and economic issues in the global perspectives.

For the city composition process, the strategic planning of the nations and cities are regarded most importantly, through which the relatedness with the associated project execution are being enhanced. The comprehensive city composition projects are executed by designing the whole process of the projects focusing on the development surveys, planning stage in the project execution stage; the participation has been made directly or indirectly in the whole process of the development survey to maintenance through public-private partnerships. Comprehensive solutions for the entire project process (planning, design, construction, and maintenance) are provided and member companies are participating as the project execution subject of the individual processes. The planning process contains the contents on the financial plans directly related the feasibility of the project and building of the implementation schemes. These institutions are generating the long term high value markets as well as the short term profits through the comprehensive design on the city composition process.

In terms of the city composition factors, a variety of city composition factors are being provided mainly with the construction of the social & economic infrastructures and the associated services. And the diverse city composition factors such as individual buildings including residential centers and government buildings, infrastructures, technology services, etc. are contained.

For the technologies and industries applied, the diverse technologies & industries are being applied comprehensively. The supports for the realistic entries of the diverse industries are being made through the presentation of the macro views in the city composition and the utilization of the public-private partnerships in realization. Execution of projects in the industry sectors utilizing the professional areas of the member companies, cooperation with external organizations and the institution level efforts to integrate these are being made in combination. Various industries relating to the city composition as well as the construction industry are applied to the cities in fusion through these.

Table 2. Analysis result.

	Scope of project	Process	composition factors	Technology & Industry
contents	-respond to comprehensive issues (global, national and regional / environmental, social and economic) -building a physical and non-physical environment	-establish the strategic plan of urban development -focus on F/S, plan and design -including construction, operation and maintenance	-social and economic infrastructure and service -comprehensive factors from individual construction to urban development	-the diverse technologies and industries are being applied

3. Conclusions

Smart City is being presented as a new city model for the environmental, social and economic issues that our societies are facing. Korea's construction industry now needs changes in order to realize the Smart City effectively. It is necessary to take the position to consider the non-physical factors as well as to make efforts to construct the physical environments; and, through this, the comprehensive solutions should be able to be presented on the environmental, social and economic issues and problems that we are facing internally and externally. And the comprehensive views on the areas and industries related to the city composition and the role to integrate these effectively in line with the purposes are required. The construction industries should be transformed into the self-leading industries that will continue to change the lives of the citizens and create the new lifestyles through this.

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Conflict of Interest

The authors declare no conflict of interest.

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