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THE PERFORMANCE OF PROGRAM MANAGEMENT FOR SEJONG ADMINISTRATIVE CITY CONSTRUCTION

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Reducing the disparity of the capital(Seoul) and other regions because of overcrowding and focusing economic resources on the capital, the government-led administrative city(Sejong), which is located approximately 120km south of Seoul, has been under construction. The government body, NAACC(National Agency of Administrative City Construction), is promoting national strategies development based on a new balanced development paradigm for national integration and national economic leaps. The administrative city is planned to have a population of 500,000 until 2030 and the total area of development spans 72.9km². The project costs total US\$ 20.5 billion, the government spending at US\$ 7.75 billion and urban infrastructure construction costs of developer at US\$ 12.8 billion. The city is divided by six living areas and is planned to have about 1,900 facilities. In order to effectively construct a complex city where various entities participate and a number of facilities are built, program management is applied from start of construction. In this study, it is introduced the techniques of program management that systematically and effectively controlled the administrative city construction as a control tower.

Keywords: "Project Management" ; "Administrative City" ; "Government-led City Construction" ; "Complex City"

EL DESEMPEÑO DE LA GESTIÓN DEL PROGRAMA PARA LA CONSTRUCCIÓN DE LA CIUDAD ADMINISTRATIVA DE SEJONG

Reduciendo la disparidad de la capital y otras regiones debido al hacinamiento y enfocando los recursos económicos en la capital, la ciudad administrativa dirigida por el gobierno, que se encuentra a aproximadamente 120 km al sur de Seúl, ha estado en construcción. El organismo gubernamental, NAACC, está promoviendo el desarrollo de estrategias nacionales basadas en un nuevo paradigma de desarrollo equilibrado para la integración nacional y los saltos económicos nacionales. Se planea que la ciudad administrativa tenga una población de 500,000 hasta 2030 y el área total de desarrollo abarca 72.9km². Los costos del proyecto totalizan US \$ 20.5 mil millones, el gasto del gobierno en US \$ 7.75 mil millones y los costos de construcción de infraestructura urbana del desarrollador en US \$ 12.8 mil millones. La ciudad está dividida por seis áreas de vivienda y se planea tener alrededor de 1,900 instalaciones. Para construir efectivamente una ciudad compleja donde varias entidades participan y se construyen varias instalaciones, la gestión del programa se aplica desde el inicio de la construcción. En este estudio, se presentan las técnicas de gestión de programas que controlaron de manera sistemática y efectiva la construcción administrativa de la ciudad como una torre de control.

Palabras clave: "Gestión de proyectos" ; "Ciudad administrativa" ; "Construcción de la ciudad dirigida por el gobierno" ; "Ciudad compleja"

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1. Introduction

Since recently, the government-led Sejong Administrative City(SAC), which is located approximately 120km south of Seoul, the capital of the Republic of Korea (ROK), has been under construction from July 2007. The ROK has achieved a high level of economic growth in a short period of time; however, with overcrowding and the point of focus being placed on the capital, there have been the adverse effects of an increasing economic disparity between the capital and other regions. Accordingly, the government body established in 2003 is promoting 21st-century national development strategies based on a new balanced development paradigm for national integration and national leaps. Establishing national balanced development strategies which can develop the capital and other regions in a complementary way, the government has promoted a administrative city construction, relocation and decentralization of public agencies, etc. in order to boost overall national development.

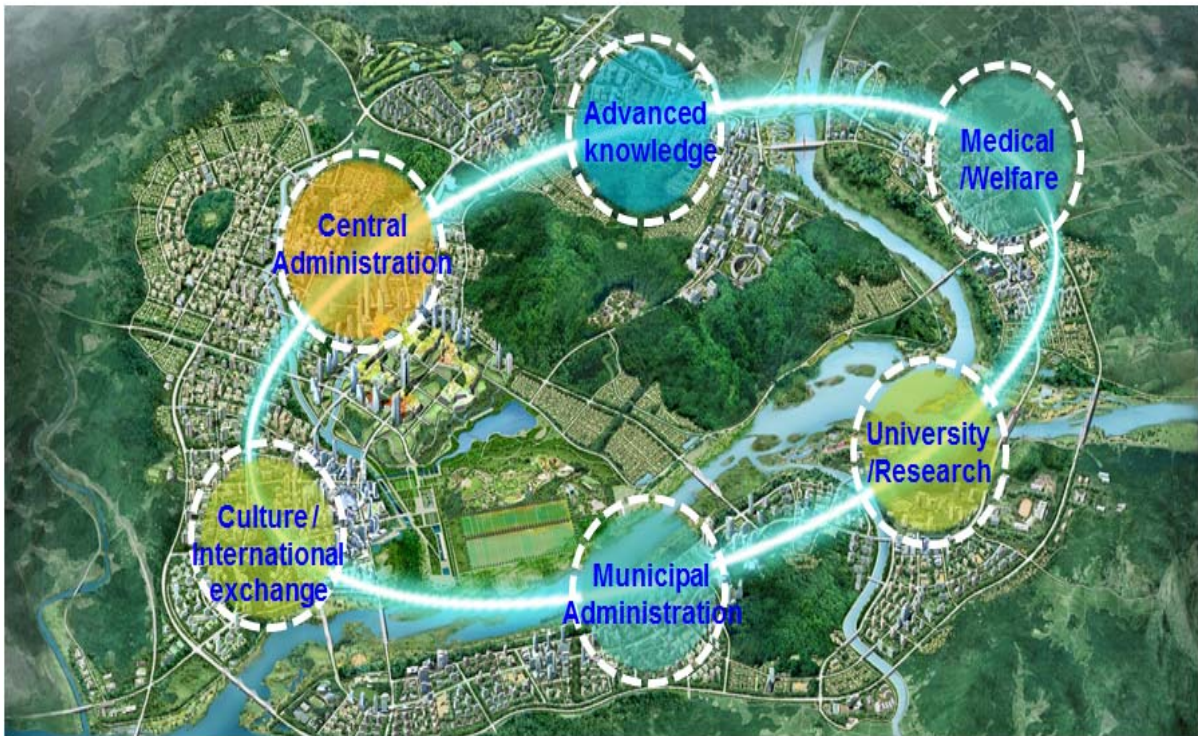
Following this, the National Assembly enacted and promulgated the 'Special Law for the Yeongi-Gongju Area SAC Construction for follow-up countermeasures of new administrative cities' for a new administrative capital construction project. It also appointed the Korea Land and Housing corporation(LH), public company, as a developer of infrastructure. The SAC is planned to have a population of 500,000 until 2030. The total area of development spans

72.91km² with a grass coverage area of 52.2%, making it eco-friendly. The city will be completed in stages, which are: the initial stage (up to 2015), the self-sufficient maturity stage (up to 2020), and the completion stage (up to 2030). The project costs total 22.5 trillion KRW (approx. US \$20.5 billion). This includes government spending at 8.5 trillion KRW (approx. US \$7.7 billion), and urban infrastructure construction costs of the developer (LH) at KRW 14 trillion (approx. US \$12.8 billion). This makes it a large-scale city development project that will be conducted over an extensive period of time.

2. Sejong Administrative City(SAC)

The SAC is planned to have a ring-type spatial structure for balanced development, and will have an even spread of six major functions - central administration, culture and international exchange, city administration, higher education and research institutions, medical and welfare institutions, and a high-tech knowledge base - along its bus rapid transit (BRT) system. Based on this, investment priority will be placed on the construction of a cycle-type transit network and metropolitan traffic network connecting nearby major cities for the initial activation of the city structure as well as establishing ensuing business set-ups. Also, in accordance with progressive city growth, the city will be developed with six major areas and small twenty three areas.

Figure 1: Annular Structure of The SAC



As of the end of Feb. 2019, government buildings and most national research institutions were completed, and about 200,000 peoples lived in the city. In the future there will be active development of higher education and research institutions, medical and welfare institutions, and high-tech knowledge-based regions. Project participants are endeavoring under the lead of the National Agency for SAC Construction (hereinafter referred to as "NAACC") to build a high-class city.

3. Program Management of SAC Contraction

Some existing new cities in Korea were developed as being mainly nearby residential cities. But the SAC will be a new-concept, self-sufficient city which reflects all planned elements leading balanced national development. The SAC project will see more than 1,900 facilities constructed over time up until the year 2030 with an investment total of approximately KRW 106.8 trillion - US\$ 94.5 billion (public investment: KRW 22.5 trillion – US\$ 19.9 billion, private investment: KRW 84.3trillion – US\$ 74.6 billion). Also, due to the vast diversity of business entities participating in the project, there has been the need for introducing program management which plans, regulates, and oversees the activities of said entities. In addition, as the city will be directly planned and the entire project overseen by the state with the introduction of special laws and regulations, the need for systematic development strategies has arisen.

The mission and goal, strategies of program management is as follows;

Figure 2: Mission and Goal, Strategies of Program Management

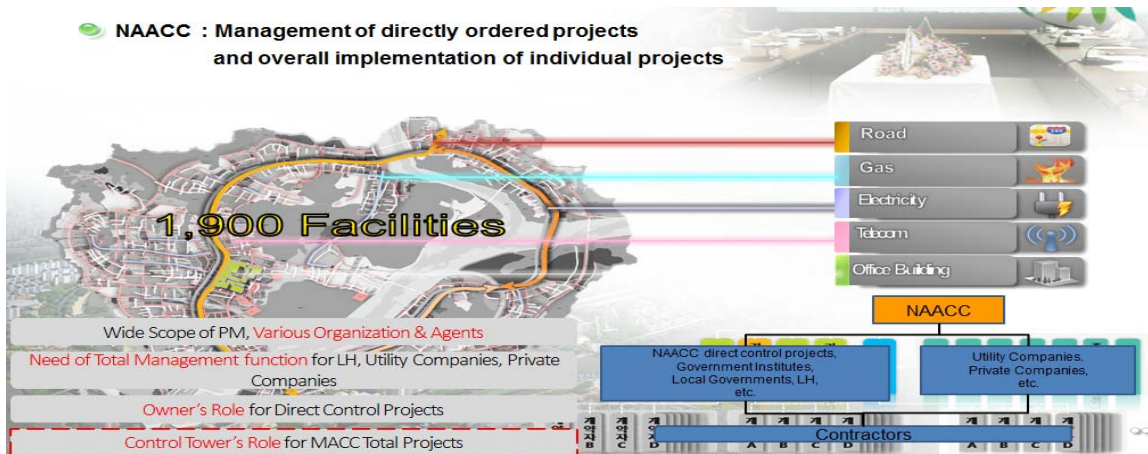


3.1. Organization Hierarchy of SAC Construction

NAACC, starting with the developer LH, is performing the role of control tower of the SAC construction project by serving as an orderer of those projects under its direct administration together with the comprehensive administration function of utility contractors such as Korea Electric Power Authority, Korea Telecom, and Korea District Heating Corporation, etc.

The organization hierarchy of SAC is as follows:

Figure 3: SAC's Organization Hierarchy



Also NAACC has four bureaus and thirteen divisions. Four bureaus are urban planning and infrastructure, public architecture, planning coordination and thirteen divisions are city policy, promote urban growth, urban specific landscape, traffic planning, green energy environment, etc.

3.2. Structure of Program Management

NAACC has developed and put into operation the procedures of the main areas for participating entities to perform duties in a unified and consistent manner by constructing the

duty performance standard guidelines and standards in order to maintain system consistency between higher and lower levels of the organization. It has also built an optimized program management system by putting together a human resources organization with expert knowledge and vast experience in project management. NAACC is performing program management with the system platform as shown in Figure 3 below:

Figure 4: Platform of Program Management System



NAACC has put together main area procedures and a program numbering system of a duty classification system standard which sets forth the authority and roles of each operating body. It has also built a process management system which contains the entire program plans, and has integrated the information of various contractors. This aids rapid decision making of policy decision makers. In addition to this, it has developed and is currently operating a Multi-functional administrative city Program Administration System (MPAS) for systematically managing the entire program.

3.3 Program Management Information System

MPAS provides smooth communication between all program management bodies, which includes, NAACC, Korea Land & Housing Corporation, individual developers, and so on. It also systematically manages the entire program through unification and centralization of the information system. It was developed for rapid decision making of the SAC construction general manager.

Figure 5: Multi-functional administrative city Program Administrations System(MPAS)

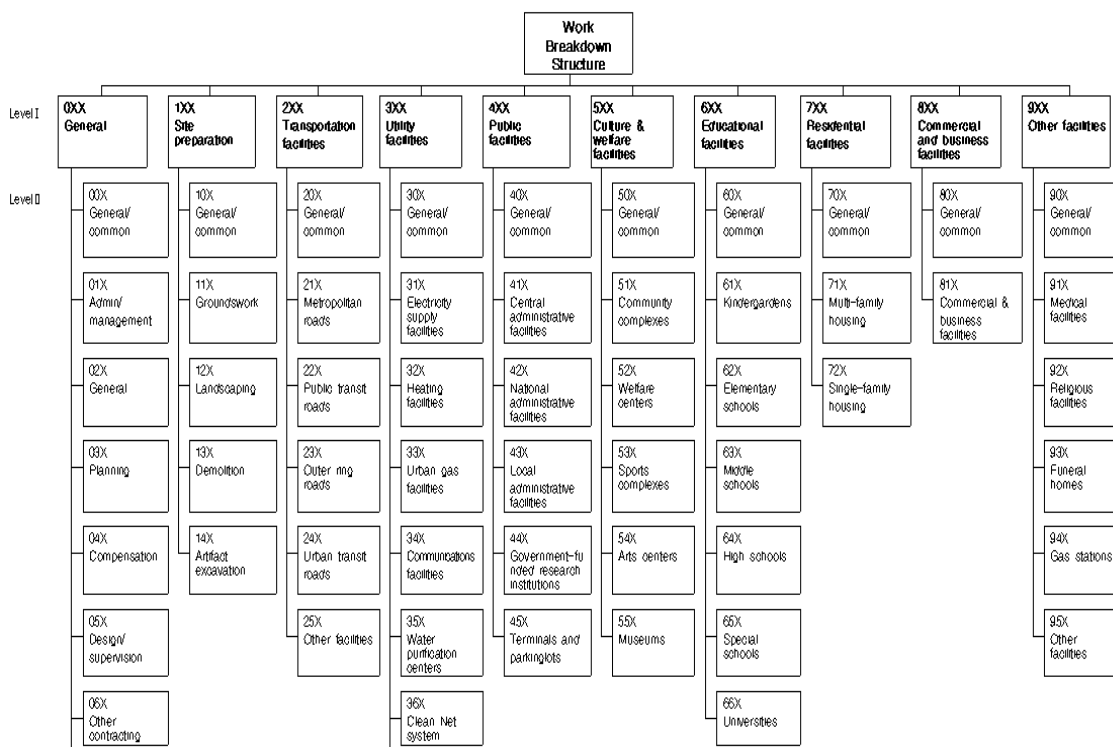


MPAS' main functions are being a cyber monitoring room, an overall management system, and a construction agency contractor management system. The cyber monitoring room has been created to analyze the information collected from the comprehensive management system in the form of regional and basic spheres of living, and the status of the SAC construction can be apprehended at a glance through the dashboard where this information is contained. In addition, the comprehensive management system has been designed so that all planned and underway projects can be controlled and managed in line with the work breakdown structure (WBS). It has also been designed so that construction information such as the schedules and progress of all contractors reported by the contractor management system, project payments, and monthly process reports can be collected and analyzed in real time. Also, the contractor management system, which handles practical information on each user in the program, is designed in such a way as to allow management and reporting of actual contract information, progress schedule, daily construction reports, monthly progress, actual payments, and so on.

3.4. Program Management Numbering

The entire operations of the program have been determined by systemizing with identification numbers assigned to unit operations related to the program, regions, and so on. In addition, the program has been classified into work breakdown structure (WBS), project numbering system (PNS), section breakdown structure (SBS), activity numbering system (ANS), organization breakdown structure (OBS), and project budget code of accounts (PBCOA), etc. In case of WBS, WBS defines the scope into manageable items the program management team can understand and provides further detail. The city's WBS is as follows;

Figure 6: Work Breakdown Structure

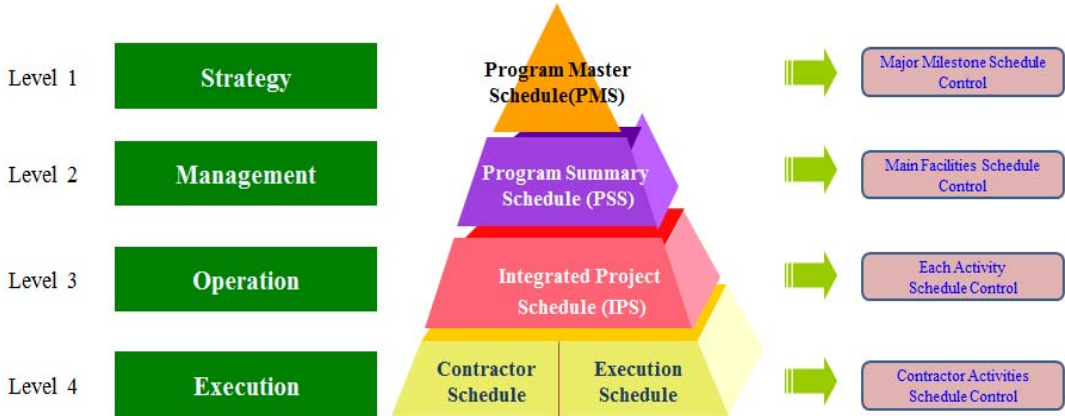


3.5. Time Management Hierarchy

For time management hierarchy, it has been developed consisting of the following:

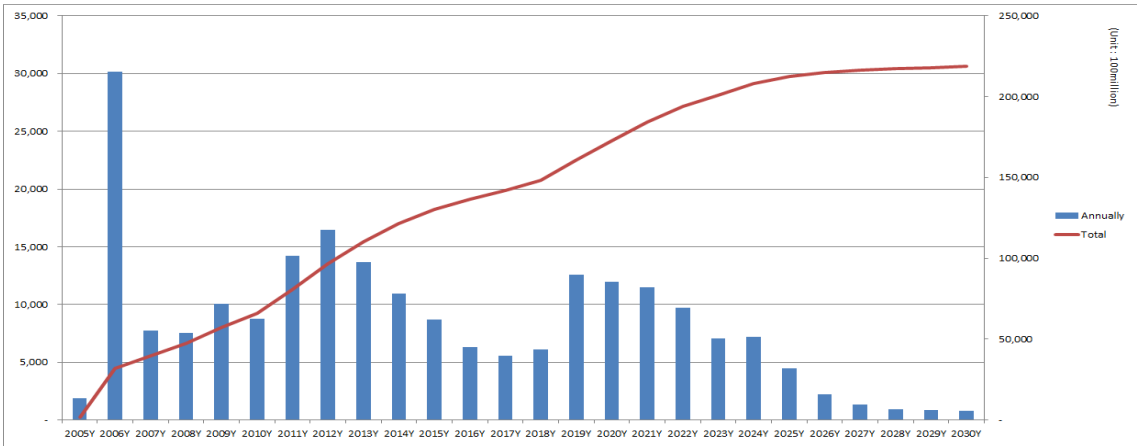
- Level 1 : Program Master Schedule (PMS) - which is categorized into milestones, or significant points in time, the main sphere of living, and main infrastructure;
- Level 2 : Program Summary Schedule (PSS) - which manages the construction work schedule of the main unit facilities on the basis of the Program Master Schedule
- Level 3 : The Integrated Project Schedule (IPS) - which subdivided into units which are able to manage unit facilities on the basis of the Program Summary Schedule (PSS)
- Level 4 : The contractor progress schedule - which is autonomously drawn up by subcontractors in the lower execution stage and operated.

Figure 7: Time Management Hierarchy



In addition, by applying each unit facility time and cost information, it provides a tool to set annual cost plan and to forecast budget information.

Figure 8: Annual budget planning



3.5. Program Management Communication Channel

The entirety of Time management, Cost management, executive’s construction status meeting for overall business administration and interferences management are administered based upon the foregoing program management information system. This will be followed by planning out and analyzing construction processes on an annual basis for the goal of concluding the program by 2030, reflecting various changes in set-ups such as developmental plans and milestones. Another notable point is the Senior Program Management Meeting held on a monthly basis to consult issues and interferences arising from various contractors. As of Feb 2019, a total of 433 cases have been consulted for methodical implementation of associated businesses such as progress reviews and process analyses, 96.3% of which (417 cases), have been resolved with the remaining 16 cases still underway. Among the consulted cases, on-site management affairs account for the greatest portion, and this is followed by improvement in services and compromising schedule.

Table 1: Result of the senior program management meeting held

Division	total	Recent Discussions
cost reduction	6	<ul style="list-style-type: none"> • Prevention of double excavation of bypass road • Recycling of rock in a construction site • Recycling waste asphalt .etc.
Improvements	107	<ul style="list-style-type: none"> • Improvement of Mugunghwa Park ecological passage and parking lot • Review of Renewable Energy Power Facility Installation • Improvement the pedestrian safety of BRT car stop • Review the Improve parking lot line etc.
Rescheduling	67	<ul style="list-style-type: none"> • Review schedule of the stable water supply in 2018 • Review the north side of central park planning road construction schedule • Review the schedule of the infrastructure facility around the school • Review of the early completion of Urban Symbol Plaza etc.
Field Control	252	<ul style="list-style-type: none"> • Review quality improvement of bridge packing • Review of earth worker plan for development of remaining life-zone • Review the parking facility of construction equipment and vehicle • Check the infrastructure facility for housing facility move in 4-1 area etc.

4. Conclusion

With relocation of central administrative authorities and state-run research agencies successfully concluded to become cornerstones of the SAC, it is now planned to conclude the remainder of the public sector constructions, such as urban infrastructures and administrative offices for the sake of the citizens by fully capitalizing on the program's administrative functions stated above. Rich experiences and cutting-edge technologies developed during the course will be helpful for some other planned urbanization projects to be conducted domestically and internationally, as well as management of other programs. Maintenance of the SAC will not be delayed in an effort to take the City to a whole new level for gaining a competitive advantage by carefully considering the city's life cycle cost (LCC) based upon the roles and effects that the comprehensive program management serves.

Finally, by applying program management, Sejong City has achieved systematic and efficiency management of large-scale city construction. It is a good experience in urban city construction and can be contributed to strengthening community competitiveness through speedy decision making, minimizing risks, efficient communication, etc.

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