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Toward Effective and Sustainable Smart City Model: Case study exploration of varying smart city approaches and outcomes

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Case study exploration of varying smart city approaches and outcomes

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ABSTRACT

This panel aims to explore selected cases of smart city projects to improve our understanding of the critical institutional factors and processes that lead to effective and sustainable smart city outcomes. This panel discusses compelling smart city cases, including Busan Metropolitan City, Songdo, Gimpo, and Namyang-ju. These cases apply different approaches to run smart city practices that are characterized as either a large-scale, top-down, capital-intensive and hardware-focused smart city project or a small-scale, bottom-up, less capital-intensive and data-training focused (as opposed to hardware-focused) smart city project. This panel will highlight the varying outcomes and impacts of different smart city approaches and identify key institutional factors and strategies that contribute to effective and sustainable smart city outcomes.

KEYWORDS

Smart government, Smart government models, government innovation, data analytics, drone

1 PANEL OBJECTIVE

Smart Cities or Smart Government has become the central topic in the e-government field. The smart activities creatively invent emerging technologies with innovative approaches to achieve a more agile and resilient government (Garcia et al., 2014). The emergence of new technologies has expanded the sphere of government's technological capacities that allow the government to see, understand, respond to the public needs more effectively in a timelier fashion. This panel explores the distinctive features of smart city projects and technologies in South Korea and the US to understand the impact of different smart city approaches based on Meijer & Bolivar (2015)'s emphasis on institutional change and process. This panel enables identify vital institutional factors and strategies that contribute to the positive outcomes and those that pose as challenges and barriers.

2 FEATURED CASES

2.1 Governance Structure and Strategies for building a Sustainable Smart City: A Case Study for "Smartopia Gimpo" and Songdo Smart City Projects in South Korea. Panelist: Seunghwan Myeong (Professor, Inha University)

The case of *Smartopia Gimpo* reflects a movement of a sustainable smart city with a clear goal of improving disaster and emergency management by providing a specific purpose and plans for the construction, operation, growth, and innovation of the platform infrastructure. The platform infrastructure was also integrated with related systems in Gimpo with a focus on disaster and emergency management. However, according to the relationship analysis at each stage of smart city construction, the operating system for the role of e-governance was planned after the platform construction, so the technical scalability was not sufficiently considered. The case of Gimpo illustrates that even in the planning and operation of highly advanced smart city hardware and infrastructure, the organizational level system thinking should precede before the information system investment is made in order to ensure the system's optimal performance.

The Songdo smart city project as U-City ("ubiquitous city") began in the early 2000s. The project began as one of the most comprehensive and heavily invested smart government projects at the center of Incheon Free Economic Zone and has made considerable achievements in terms of network infrastructure, U-City infrastructure and public services. Songdo has become synonymous to the U-City model in Korea and abroad, however, it has also received a number of criticisms that the technology-oriented and supplier-led top-down approach has not facilitated citizen participation and resulted in low citizen satisfaction. The case of Songdo points out that the mayor's leadership, citizen participation, governance, and data-driven urban government operations are contributing factors to success. An effective smart city plan should aim to strengthen social participation and inclusion in order to distribute the benefits of the new technology to all members of the society, reduce the digital divide and overcome the risks of technological determinism and surveillance society.

2.2 Building a data-centered smart city through a culture of innovation and citizen engagement: a case study Namyang-Ju's DASAN Innovation and Busan Metropolitan City by Michael Ahn (Universtiy of Massachusetts Boston) and KiHang Cho (Metropolitan City of Busan)

The case of *Smartopia Gimpo* reflects a movement of a sustainable smart city with a clear goal of improving disaster and emergency management by providing a specific purpose and plans for the construction, operation, growth, and innovation of the platform infrastructure. The platform infrastructure was also integrated with related systems in Gimpo with a focus on disaster and emergency management.

2.2.1 Namyang-Ju's DASAN Innovation. The city of Namyang-Ju has been one of the leading innovators among local governments in South Korea through data-driven and citizen-centered approaches with less emphasis on hardware and infrastructure development. The city utilized a strategy of creating an innovative culture through extensive employee training and the application of new ideas for service improvement. As a result, the city has developed and implemented various innovative practices. For instance, its Big Data Analytics helped the city to understand the key characteristics of its citizens, their pressing needs, and their locations, enabling the government to custom and focus their service efforts to the target population; improve the effectiveness of its public transit such as bus routes and intervals; predict and prevent the spread of seasonal infectious diseases; drastically improved the effectiveness of parking violation control and improve the respond to natural disasters such as flooding. This study will take a close look inside Namyang-Ju's smart city system, identify the change agents that transformed an ordinary Korean provincial city government into one of leading local innovators in Korea, and discuss elements that will help sustain the culture of innovation at Namyang-Ju.

2.2.2 Busan Metropolitan Government's Big Data Drive. Busan, the second-most-populous city, is a center of economic, culture, transportation, and logistics in the southeastern region of South Korea with a population of 5 million inhabitants and neighborhood residents. As part of smart city initiatives in 2018, the city government created a division and hired analytics specialists to apply smart city and big data technologies to innovate administrative services and improve service qualities. Busan is building a smart city as a living lab centering on DC AL Data Hub with cutting-edge technologies. To drive the success of the Smart City Busan project, the big data specialists suggested strategies to prioritize public services based on analysis of population movement, employment, public transportation use during the 2018 -2019 period. Besides, the city government is planning to build a data warehouse to standardize and structure different datasets. The data warehouse will run much efficiently to construct and manage its platform through the cloud system, so universities and research institutes can utilize the database effectively. This study will explore Busan's big data and living lab approaches to smart city projects and their outcomes to date.

2.3 Smart Governance of Unmanned Aircraft Systems (UAS, aka drones) in Metropolitan Areas by Yu-Che Chen and Chengyu (Victor) Huang (University of Nebraska Omaha)

The increasing affordability and technical sophistication of drones have promoted their use for personal, commercial, and governmental purposes. Such a fast-developing technology poses challenges for the government to bring such a variety of uses into a regulatory compliance framework to ensure public safety and protect individual privacy. This study focuses on the use of drones by individuals. Such use is most diverse in flying patterns and impacts while presents serious public safety and privacy concerns. More critically, there is minimal or no enforcement on such use to ensure compliance. This study will share the results of a national survey that examines factors affecting individuals' compliance with government regulations on drone use. The findings offer practical policy and management recommendations to advance public safety. More broadly, it offers insights into mechanisms to ensure compliance with regulations on emerging technologies when direct government enforcement is either ineffective or cost-prohibitive.

3 PANEL ORGANIZATION AND PANELISTS BIO

3.1 Panel Organization

The 75-minute panel will be structured in the following manner. The panel chair will introduce the overall theme and objective of the panel presentations and each presenter will have approximately 15 minutes to present their cases. Since some panelists present two cases in their presentations, we decided to allot more time for the presentation to give enough time to elaborate on their case studies. Moderator will facilitate a question and discussion session for the remaining 15 minutes. Dr. Seung-Hwan Myung will serve as the panel chair and Dr. Younhee Kim will serve as the moderator of the panel (see Table 1).

Table 1: Panel Organization.

Topic	Time	Speaker
Introduction to Panel Theme	10 min.	Panel Chair
Case Presentation	50 min.	Panelists
Questions and Discussion	15 min.	Moderator

3.2   Panelist Bio

Seunghwan Myeong (Panel Chair), Ph.D., is a professor in the Department of Public Administration, Inha University (Incheon, Korea). He received his Ph.D. from Syracuse University in 1996. His research interests are e-government, smart city, industrial security, and smart governance. He served as a President of the Korean Association for Policy Studies (KAPS) in 2018.

Yu-Che Chen (Panelist), Ph.D., is Professor of Digital Governance in the School of Public Administration at University of Nebraska at Omaha. Dr. Chen is the Director of the Global Digital Governance Lab. Dr. Chen received his Master of Public Affairs and Ph.D. in Public Policy from Indiana University—Bloomington. His current research interests are in collaborative cyberinfrastructure, smart and connected communities, big data, e-governance performance, and open government. He has published a single-authored book entitled Managing Digital Governance (2017) by Routledge and the Routledge Handbook on Information Technology in Government (2017) as the lead editor. He is Associate Editor of the International Journal of Public Administration in the Digital Age (IJPADA). He serves as the Board Member of the Digital Government Society.

KiHaing Cho (Panelist) is a director of the Statistics and Big Data Division in the Busan Metropolitan Government. As a big data specialist, he oversees a various range of data-related functions of the Busan Metropolitan Government. He served as a big data analytics specialist in the City of Namyangu. Before joining the public sector, he worked at Korea Credit Bureau, CIGNA, AIA, and Hyundai Card Co.

Younhee Kim (Moderator), Ph.D., is an associate professor of public administration in the School of Public Affairs at Penn State Harrisburg. Her research interests are in the broad areas of public and performance management, focusing on performance measurement, public entrepreneurship, organizational development, information technology management, and e-governance. Her recent work has appeared in numerous journals, including International Journal of Health Planning and Management, Public Money & Management, Public Performance & Management Review, Administration & Society, and Journal of Technology Transfer.

Chenyu 'Victor' Huang (Panelist) is an Assistant Professor in the Aviation Institute at University of Nebraska Omaha. He has a bachelor's degree in Electrical Engineering, Master's Degrees in Air Transportation Planning and Management and Aerospace and Aviation Management, and Ph.D. focusing on Aviation Technology from Purdue University. He is an FAA certified Advanced Ground Instructor, holder of FAA Private Pilot License and Remote Pilot Certificate with sUAV. Dr. Huang also has an ATC background, and has a history of conducting aviation and aerospace related research activities partnering with research institutions, aviation and aerospace industry, and government. His research interests are in the areas of Unmanned Aircraft System (UAS) operations, statistical modeling of transportation operations, and solutions to flight safety enhancement.

Michael Ahn (Panelist), Ph.D., an Associate Professor and MPA Graduate Program Director at the University of Massachusetts Boston. His research explores topics such as Smart Cities, e-democracy, Artificial Intelligence and Open Data policy and their potentials and implications for public administration. Michael's articles have appeared on journals such as Public Administration Review, American Review of Public Administration, and Government Information Quarterly and he is serving as a National Council Member of the American Society for Public Administration (ASPA), and a chair of the Section on Science and Technology in Government (SSTIG) and previously he served as the president of Northeaster Conference on Public Administration (NECoPA).

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