Where We Are Now in Digital Transformation of Cities and Real Estate — New Ways of Value Creation Using Data Platforms

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Abstract

Recently, in the field of urban/area development, companies cannot simply continue to provide services limited to the conventional real world due to changes in the external environment, such as lifestyle changes caused by the spread of the novel coronavirus infection (COVID-19) and the proliferation of online services. In this paper, we will focus on digital transformation (DX) in the urban and real estate fields, something which advanced companies have recently begun to address, and how DX can be applied to provide personalized services to customers, realize a seamless customer journey, and optimize space through data collection, data linkage, and utilization. In addition to describing those three initiatives and related cases, we will also introduce NEC's Urban and Real Estate DX Suite and core data platform services that are realizing those digital transformations.

Keywords
smart buildings, smart cities, personalization, OMO, IoT, face recognition, customer contact, data utilization, agile

1. Introduction

Recently urban and area development domains have reached a major turning point: with the spread of high-quality IT services such as Amazon and YouTube, people's daily activities have become online-centric. When people go out, their destinations and travel routes are to some extent determined by online information and services, making it difficult for them to have serendipitous encounters, such as finding unexpected stores or products. Also, the spread of the novel coronavirus infection (COVID-19) has drastically changed the very way people live. People are spending more time at or around home, and services that can be used without having to go out to the stores, such as e-commerce and home-delivery services, are increasingly considered as purchasing options. In this social context, companies cannot simply continue to provide services that are limited to the conventional real world.

This paper introduces digital transformation (hereinafter referred to as DX) in the urban and real estate domains, which advanced companies have begun to address in recent years. In section 2, we will discuss highly effective urban and real estate DX initiatives that have an impact on the improvement of sales of existing businesses, the establishment of new business areas, and the reduction of existing costs. Section 3 introduces NEC's DX offerings to realize these initiatives, and then we will conclude with a summary of this paper.

2. Urban and real estate DX initiatives

In section 2, we will introduce three DX initiatives and case studies as effective approaches to the digital transformation of urban and real estate: providing personalized services to customers to improve sales in existing businesses, realizing seamless customer journeys to establish new business domains, and collecting, linking, and utilizing data for space optimization to reduce existing costs.

2.1 Provision of personalized services to customers

As customers' needs are diversifying in terms of lifestyles, concerns, wants, and self-fulfillment, it is becoming increasingly difficult to reach out to customers on

a continuing basis, even with conventional information dissemination and service provision. As such, service providers are unable to gain an edge over a variety of online services.

In recent years, leading companies have been improving the value of the customer experience by providing personalized information and services in accordance with the customer's situation at various customer touchpoints, including both real and digital. Specifically, we have established various customer touchpoints, including digital ones, and integrated them under a single customer ID to increase the number of customer flow routes. This creates an Online Merges with Offline (OMO) customer experience, differentiating it from conventional online services and improving sales through cross-selling.

For example, Mori Building Co., Ltd. previously used different customer IDs for each online service, but the company introduced NEC's ID integration platform and data utilization platform and is now using common IDs for various services and analyzing customer behavior data connected with these IDs to provide information and services tailored to each customer (**Fig. 1**)[1].

2.2 Seamless customer journey

Many companies have established digital customer touchpoints such as smartphone apps, but because these services are only for a part of the customer journey, these services are not used by all but the most loyal customers in many cases. For example, an application that can be used at a specific commercial facility does not cover the entire customer journey, which includes transportation around the city and consumer activity outside the facility. This makes it difficult to create enough incentives for a large number of customers to use the service.

In recent years, area management organizations and other organizations have been increasingly working to provide a variety of services that encompass the entire customer journey by establishing a common ID and interface for the entire area, rather than being limited to the service domain of a single company. This will not only increase the incentives for customers to use services, but also enable each service provider to collect data on customer attributes and behaviors across the customer journey, making it possible to approach customers with the appropriate target timing.

For example, in the Nanki-Shirahama smart city tourism experiment (in Wakayama Prefecture), NEC's face recognition platform was used to provide users who registered their face information on their smartphones with personalized information in a series of journeys or interactions with the customers as tourists, such as receiving personalized information on tourism signage at the airport, keyless check-in at some hotels, and face recognition at theme parks and shops[2].

2.3 Data collection, linkage, and utilization to optimize space

When operating facilities, the number of people will differ in accordance with the time of day and location. This information cannot be completely visualized even with detailed customer contact, and the lack of such information results in uniform costs for security, lighting, air conditioning, and other services when managing the space. Also, with the recent spread of COVID-19 infections, crowd density in each space has become a major factor in business continuity and customer satisfaction.

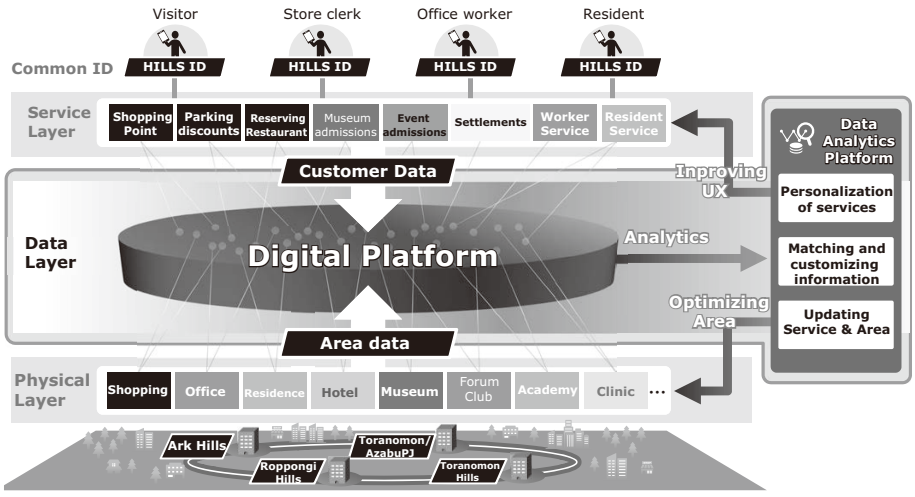

Fig. 1 Hills Network installed for the Mori Building.

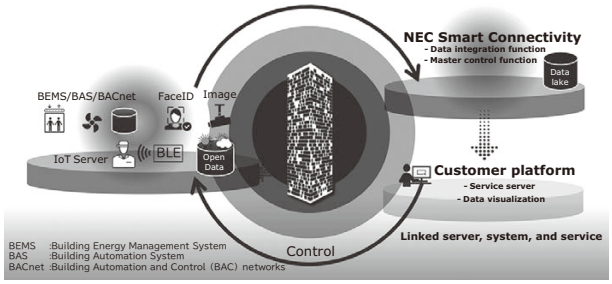

Fig. 2 Data application at Urbannet Nagoya Nexta Building.

Efforts to visualize spatial data by analyzing camera images and utilizing IoT sensors as well as the distribution and analysis of such data to optimize space management costs and improve customer experience have therefore been promoted in recent years.

For example, NTT Urban Development Corporation's Urbannet Nagoya Nexta Building, scheduled for completion in 2022, is currently under study as a smart building that will use NEC's onsite data distribution platform in the building to optimally manage and operate building security with robots, display information about crowding on signage, and detect suspicious activity by using cameras (**Fig. 2**)[3].

3. DX Offerings to promote urban and real estate DX

To realize the aforementioned urban and real estate DX, NEC has established the Urban and Real Estate DX Suite, which includes products utilizing advanced technologies — such as face recognition for entrance and exit to a facility, payments, and video analytics — and consulting services such as DX strategy formulation support and agile development start-up support. Section 3 introduces three DX offerings as core data platform services: Connected ID service, Connected Data service, and support services for management strategies in data utilization.

3.1 Connected ID service to facilitate collection of customer data

To provide personalized services and seamless customer experiences, it is necessary not only to integrate and link multiple customer touchpoints, but also to collect and utilize data for each customer. Connected ID service[4] is a service that enables linkage between multiple customer IDs that consumers are familiar with and also enables the collection of the customers' data. To protect privacy, however, when linking collected customer data to external organizations, users themselves can choose whether or not to link the data (**Fig. 3**). For example, when visiting a brick-and-mortar store, users can be shown the location of products that were their favorites in the online store, and this will enable an unprecedented OMO experience by advocating ID linkage and the utilization of customer data.

3.2 Connected Data service to distribute data between organizations

To realize the advanced management of spaces and the provision of personalized services, an environment is required that enables the real-time, safe, and secure distribution and complex utilization of a variety of data, not only customer data, across services, organizations, and companies. Connected Data service[5] is a service that enables real-time distribution of various types of data and also promotes safe data utilization by controlling authority management functions even across organizations (**Fig. 4**). For example, by combining data on human flow within a facility and operating data on lighting, air conditioning, cleaning robots, and other utilities, customer experiences and operations can be optimized through real-time data linkage by reducing the use of air conditioning, lighting, and cleaning robots in areas and at times when no one is around.

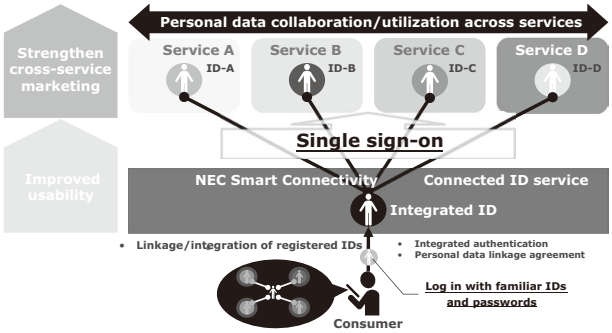

Fig. 3 Connected ID service overview.

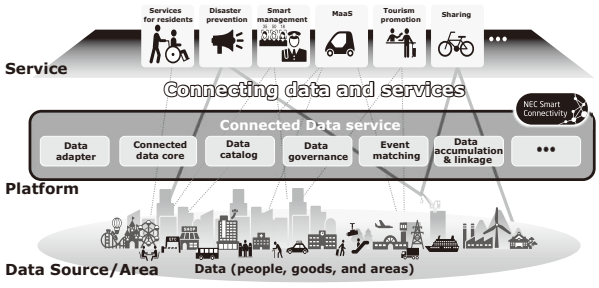

Fig. 4 Connected Data service overview.

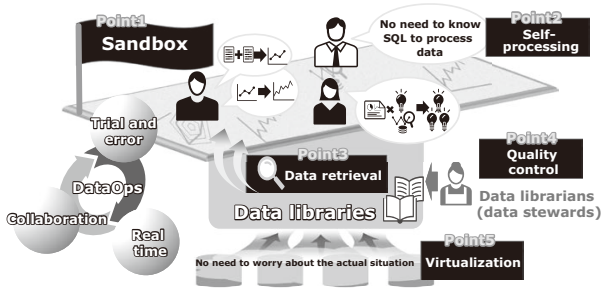

Fig. 5 Outline of support services for management strategies in data utilization.

3.3 Support services for management strategies to optimize data management and analysis

To provide personalized services and achieve advanced spatial management, we must not only collect and link data through the aforementioned Connected ID service and Connected Data service but we must also create an environment to centrally manage and analyze data and then plan appropriate customer experiences and policies based on the data. Support service for management strategies in data utilization[6] is a service that provides a platform to enable a variety of users with different organizations and job titles to jointly use data and also provides the total service necessary to support that use (**Fig. 5**). For example, we analyze data such as customer attributes as well as online and offline consumer behaviors, examine the content of the personalized information provided, review the results of how the data was used and consider ways to improve results, agile services, and marketing measures.

4. Conclusion

In this report, we have described effective urban and real estate DX initiatives as well as case studies based on the recent business environment in the urban and area development domains, we have also described DX offerings that serve as a platform for realizing these initiatives. We believe that by deploying various applications on these platforms, we will be able to promote DX to produce effects that have not been possible with the limited digitalization to date. Also, the business environment, technologies, and services in urban and area development are being renewed on a daily basis, and new elements must constantly be incorporated. In the aforementioned DX Suite, we will work to improve the scalability and functionality of our platform services to provide agile responses to future changes in the external and internal environment.

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