

# Creation of Digital Services through Consumer Understanding

The COVID-19 pandemic, which began in 2020, created a crisis of a type never seen before and accelerated changes to society and people. People's values and beliefs have changed, and companies are now faced with management issues that are difficult to resolve with the old ways of doing business. Hitachi believes that focusing on and developing a more in-depth understanding of stakeholders surrounding companies and the consumers beyond them will lead to the creation of better business solutions in the future. This article describes the studies Hitachi has conducted on understanding consumer values and digital services by using the railway business as an example.

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## 1. Introduction

Modern society is at a major turning point. The business environment has changed dramatically over the past few years, as companies are increasingly required to address environmental issues. Also, the COVID-19 pandemic, which began in 2020 and spread globally, quickly accelerated changes in society. The restrictions on the exchange of people, flow of goods, and economic activities that accompanied the lockdowns caused a global economic downturn that dealt a severe blow even to companies that had maintained high performance<sup>(1)</sup>. Global unemployment and declining incomes not seen since the Great Depression have created uncertainty about COVID-19 with no end in sight, and have reduced consumption and investment in daily life and changed the way people live their lives. Even so, daily mobility had to be restricted and real contact with people and things decreased, prompting greater use of digital services by consumers, including the elderly, who had typically kept their distance from IT<sup>(2)</sup>. Thus, COVID-19 created a new type of crisis that was different from the Great East Japan Earthquake and the global financial crisis.

Furthermore, with the expansion of stay-at-home consumption and the use of digital services among consumers in the COVID-19 pandemic, companies are transforming

themselves in response to the new normal by using digital technology to form new points of contact with consumers.

Under these circumstances, companies are faced with management issues that cannot be dealt with simply as an extension of their conventional business operations. Hitachi believes that, from now on, it will be possible to create solutions that support the resolution of management issues not only by focusing on the business and operations of companies themselves, but also by gaining a better understanding of the stakeholders and end-users who are the consumers that influence business operations. This article describes the studies Hitachi has conducted on understanding consumer values and digital services by using the railway business as an example.

## 2. Understanding Consumers' Interactions with Railway-related Digital Services

Hitachi has been conducting ethnographic research of customer operations to extract real business conditions, issues, and latent needs based on onsite observations, and has been deriving solutions that bring value to customer management and business. The company has conducted about 200 ethnographic research projects in Japan and abroad at operations sites in a wide variety of domains, including electric power plants, finance, medical care, chemical plants, and

construction machinery maintenance work. In the railway system, ethnographic research has been conducted in operation command, train maintenance, and station attendant work<sup>(3),(4)</sup>. Recently, however, the way of doing business has been changing along with social changes. This is what led Hitachi to consider whether it could create services that contribute to the management and business of its customers by focusing on and understanding not only their businesses, but also their consumers.

With the spread of COVID-19, more and more people are trying to avoid using public transportation. People who use crowded trains and buses for work or errands have expressed strong concerns about infection. Public transportation operators were asked to take measures so that people could move around with as much peace of mind as possible. With measures to alleviate congestion becoming a priority for railway operators, Hitachi embarked on a preliminary study to understand the ways in which consumers move around using public transportation. Specifically, a qualitative study was conducted in a regional core city with the aim of understanding the actual way that people move around in the era of COVID-19 and the values behind it. Although Hitachi has previously conducted field research of passengers served by station attendants using Hitachi's solutions, this time Hitachi attempted to understand them by expanding the scope to include consumers living along the railway operators' lines.

Specifically, the ethnographers first visited the site and actually walked around to understand the geography and transportation characteristics. Next, they conducted remote in-depth interviews with consumers living along the railway and bus lines in the area. The interviews aimed to clarify how consumers move around on a daily basis and how they have changed as a result of the COVID-19 pandemic. The interviews also explored how these consumers moved around and the ideas and values that are connected to these changes. As a result, Hitachi hypothesized that there are three types of ways in which consumers living along the railway and bus lines move around, mainly in regional cities: (1) flexible use of new and different means of transportation, (2) establishment and adherence to their own means of transportation and patterns, and (3) dependence on specific means of transportation under environmental restrictions. It was thought that behind the way consumers move around are not only geographical and economic constraints, but also distinctive differences in values and decision-making logic related to the way they move around. For example, people who choose their transportation according to type (1) have a strong orientation toward actively exploring what interests them in their daily lives, and among various transportation mode options, they actively choose the way of moving around that suits their interests at the time, such as "The weather is very nice today, so I'll enjoy the weather while riding a shared bicycle on the way there instead of

taking the train," or "It's crowded due to the COVID-19 pandemic, and so instead of getting on the train at my usual station, I'll walk to a station along the route while exploring new stores." In this way, these people place value on enriching their daily lives. On the other hand, people who choose their transportation according to type (2) have a strong orientation toward planning for efficiency and cost-effectiveness in their daily lives, and when choosing a means of transportation, they place value on moving around in a way that does not disrupt their pre-made plans because of its importance to them, such as "I would like to avoid taking a bus if possible because delays are hard to predict, and even if the train is crowded due to rain, I'll just bear the inconvenience for a short time because I know that I can travel on an exact schedule with the train." Thus, the differences in the way consumers living along the railway and bus lines move around due to the COVID-19 pandemic are thought to be tied to their respective values and orientations. The true direction of digital services that are effective in both moving around and reducing congestion due to the COVID-19 pandemic become clear only when researchers understand the perspectives from which consumers hold expectations and attach meaning to the transportation network and surrounding places provided by public transportation operators.

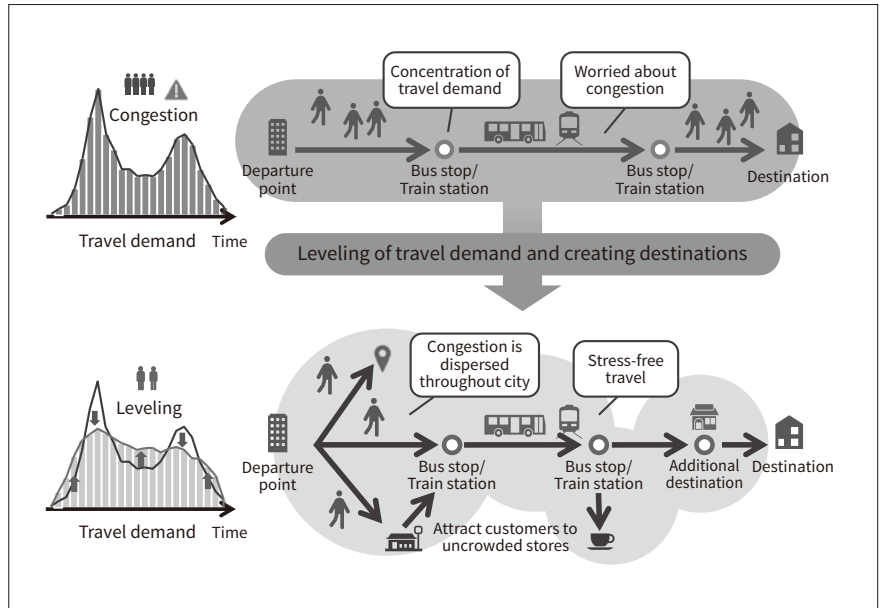
### 3. Digital Services to Support Safe and Comfortable Travel during the COVID-19 Pandemic

In the new normal era, when the COVID-19-induced behavioral changes took place, people became more selective about their mobility. The rapid spread of remote work and online classes reduced the number of work and school commuters, and inbound demand also decreased due to the one-time restrictions on entry from foreign countries, resulting in about 70–80% fewer public transportation users than before the spread of COVID-19. The drop in the number of users was also accompanied by a corresponding decrease in the use of commercial facilities at stations and along railway lines. The future with lower public transportation ridership, which was thought to be 10 to 15 years away, has suddenly become a reality. With this as a background, Hitachi and Nishi-Nippon Railroad Co., Ltd. have been studying ways to revitalize transportation and the city's economy while ensuring that people can move around safely and comfortably (see **Figure 1**). Since many users are particularly concerned about congestion due to the COVID-19 pandemic, Hitachi and Nishi-Nippon Railroad examined how to level congestion and promote mobility during non-peak hours. This was done by focusing on "nudges" as a means to achieve this.

To "nudge" means to prod someone lightly with an elbow and is used to refer to methods or practices that, rather

**Figure 1 — Aiming for People’s Safe and Comfortable Travel and Urban Revitalization**

The total volume of travel is increased by decentralizing travel demand to level congestion and by creating stress-free travel destinations.



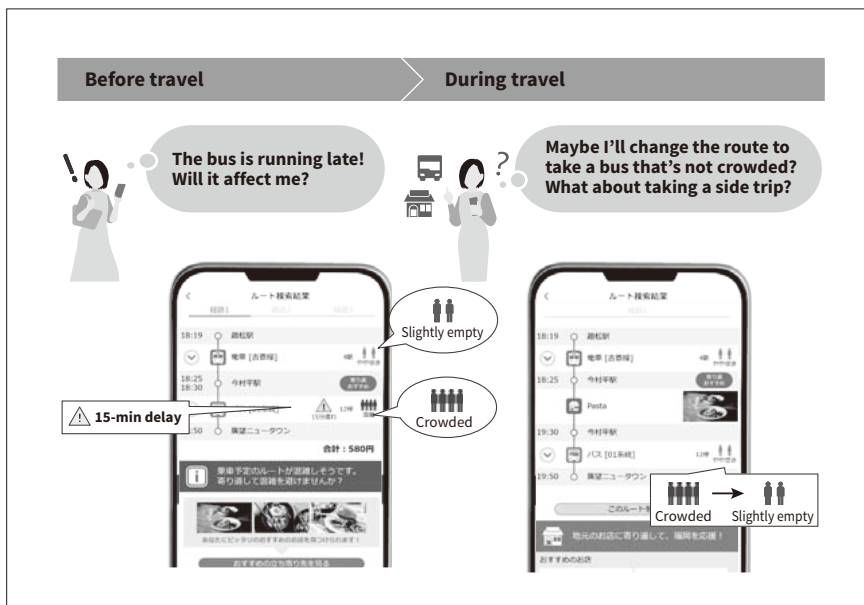
than forcing people, encourage them to act in a certain way at their own volition. However, a single nudge may have little effect on behavior change. Accordingly, Hitachi has developed nudge-linking technology to link a series of related nudges and nudge personalization technology to change the content of nudges according to the type of user, with the aim of expanding the effectiveness of nudges. Then, Hitachi developed a prototype web app that can be used with smartphones that utilizes this nudge-applied technology and conducted the Demonstration Project for Safe and Comfortable Transportation in Fukuoka in 2021 and 2022 (see **Figure 2**).

When performing a route search on the web app, it presents the congestion status of the means of travel, suggests alternative routes that are less congested, and encourages travel at times that avoid congestion by changing departure

times or stopping at commercial facilities. The user selects a travel route that matches his or her preferences by looking at the information presented. This will naturally encourage users who are concerned about congestion to take action to avoid congestion, resulting in a leveling of overall congestion.

In order to maximize effectiveness, it is necessary to understand the characteristics of the city and the characteristics and values of its people, and to provide recommendations that match the preferences of the users. Therefore, it was decided to classify the types of consumers living along the railway lines by analyzing them, determine which type they are through a questionnaire when they start using the web app, and switch the content of the proposals to match the preferences of the users.

The demonstration project confirmed the effects of reducing congestion during peak hours and stimulating



**Figure 2 — Services Provided by Demonstration Project for Safe and Comfortable Transportation**

By checking congestion and operation conditions before traveling and choosing to change routes or take side trips, people can naturally avoid congestion while moving around.

demand by prompting users to visit and stop by commercial facilities. This is expected to contribute to the revitalization of transportation and commercial services while providing safe and comfortable transportation.

## 4. Conclusions

As people's working styles and lifestyles continue to change in the wake of COVID-19 and other events, there is also a shift from a concentration of people in large cities to a decentralization of people in rural areas. Companies are expected to move toward a future in which they will be more oriented toward coexistence with local communities and will walk together with the local people. Hitachi will also contribute to the wellbeing of people and the realization of a society that does not exceed the planetary boundaries, by providing digital services that support a sustainable future for customers and communities.

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