Special feature article

Technical Innovation in Railway Service: The JR East App

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1 Introduction

“JR East Group Management Vision V (Five)—Ever Onward” established on October 30, 2012 has “Eternal Mission” and “Pursuing Unlimited Potential” as its important keystones, and it sets down three basic courses of action under each of those keystones. One of the courses of action under “Eternal Mission” is “service quality reforms” where we again place reforming the company’s service quality as an important keystone for management, aim to be “No. 1 in customer satisfaction in the railway industry”, and go forward with a variety of efforts to achieve those. This paper introduces a specific effort for those service quality reforms: the JR East App.

2 Background to Working to Better Provide Information

JR East has been continuously surveying customer satisfaction since fiscal 1997 to identify trends in how customers see the company overall. Surveys are broken down into eight types—safety/security, provision of information in normal situations, provision of information in service disruptions, stability, amenity, accessibility, dealing with customers, and products—where more than 100 items are evaluated on a five-level scale. Fig. 1 summarizes the results of fiscal 2013 survey results. The vertical axis shows satisfaction level for the individual items, and the horizontal axis shows their level of influence on the overall satisfaction level for JR East as deviation scores.

From Fig. 1, we can see that while the overall level of satisfaction for JR East is high for “provision of information”, sufficient satisfaction is not gained particularly in terms of provision of information in service disruptions, making this a theme for which urgent efforts need to be made. Up to now, JR East has been providing operational information and the like through means such as websites, train station displays designed to provide information in times of service disruptions, and onboard displays, but those deliver uniform information to all passengers in the same way. Needs of individual passengers have thus been difficult to meet. As a result, JR East launched in June 2013 a service via a new “Train Operation Information Push Notification app”. That service delivers to smartphones, which have come into common use, operational information on selected lines according to the needs of individual passengers.

To further enhance provision of information, development subsequently started on the “JR East App” for smartphones. That will enable information to be provided according to the location and needs of individual passengers.

3 JR East App

The goal of the JR East App is to give timely support by smartphones providing information passengers need when using JR East. This is done under the motto of “leaving everything concerning trains to the app”.

To fulfill that goal, a mechanism for showing necessary information on the app’s top screen (Fig. 2) was created. Individualized information can that way be quickly and easily accessed.

Fig. 1 Fiscal 2013 Customers Satisfaction Level Survey Results

Fig. 2 Top Screen
Providing information according to location
Utilizing GPS-based location information from the smartphone, the information on the JR East station that is closest to the user's current location is automatically displayed on the top screen.

Easy access to information on desired lines and stations
Users can register up to 10 of their preferred lines. Operational information on those lines, such as delays and cancelations, can thus be seen at a glance on the top screen. Up to 10 preferred stations can also be registered to allow information on those stations to be obtained easily.

Easy-to-understand content names
In providing all sorts of content regarding JR East, each content grouping needs to be laid out on the top screen in an easy-to-understand and well-balanced manner. For that reason, phrases such as “ride train” and “use station” were employed based on passengers actual behavior so as to provide images of “when to view what information”.

4 Content Overview

This chapter gives an overview of major content provided by the JR East App.

4.1 Railway-related Content

Ride Train

(1) Operational Information List
This displays operational information for lines in the JR East area (broken down into greater Tokyo, Tohoku, and Shin'etsu areas as well as Shinkansen and conventional limited express lines) (Fig. 3). Information similar to that shown on train station displays designed to provide operational and alternative transportation information on the route map in times of service disruptions, which are set up at ticket gates of major stations in the greater Tokyo area, can also be viewed on smartphones.

This way, passengers can view operational information when they need it. For example, passengers can check for delays and other problems with the lines they commute on before leaving home, allowing them to decide for themselves whether to go to the station or opt to use a different means of transportation.

The service is intended for use with smartphones, so it is equipped with functions to make use of the abilities of those devices. Route maps can be zoomed in and out, and detailed operational information for registered lines can be set to be displayed from the start (as shown in the example for the Musashino Line in Fig. 3).

(2) Real-time Train Location Information
Sections in which individual trains are running and delay times can be shown in a list for lines where information is provided (currently only available for the Keihin-Tohoku Line) (Fig. 4). Data from JR East’s Autonomous Decentralized Transport Operation (ATOS) system is used when providing that information.

This way, passengers can see, for example, where the next train is currently located when train delays occur. They are thus able to decide whether to keep waiting on the platform for the next train or to use a different means of transportation.

The app was also built in a way where the station the user is viewing will be automatically centered, thus increasing legibility.

Future plans call for the function to also be deployed to other lines where operation control is done by ATOS.

(3) Real-time Departure Guidance
In “Real-time Departure Guidance”, information such as destination, type of train, departure time, and track number displayed on station train information boards can be viewed (Fig. 5). This is available for Tokyo, Shinagawa, Shinjuku and Ueno stations.
Thanks to this function, passengers can view train departure time on their smartphones without having to go to places such as the concourse or ticket gate. They can thus spend time where they want in the station until just before the time their train departs, allowing for more effective use of time.

The information displayed is periodically updated automatically. This prevents situations such as the user forgetting to press the update button and old information being left displayed. It is worth mentioning that the Narita Express airport access line is handled specially, such as displaying it as a single line due to the strong need for ability to check information on departure times and delays in real time for reasons such as making connections to flights.

(4) Yamanote Line Train Net Train Information
The Yamanote Line carries the most passengers of any of JR East's lines, and the “Yamanote Line Train Net Train Information” service was launched for the JR East App in light of the favorable opinions expressed in the two past proving tests for the Train Net information service¹. The service allows for passengers to view information on train stops (transfer lines, platform guidance maps, station maps) according to the on-train location of the passenger (car number) and section the train is traveling. Passengers can also view congestion level and cabin temperature of individual cars on the Yamanote Line. Stickers are affixed over the doors in trains where the service can be used (Fig. 6).

To provide the Yamanote Line Train Net service, devices that emit special sound waves (beacons) are installed in individual Yamanote Line cars. When a passenger's smartphone microphone detects the sound emitted by a beacon, information on the train (section travelling in, cabin temperature, congestion level, etc.) is delivered according to the specific train and car (Fig. 7).

Yamanote Line congestion level and cabin temperature can be viewed even from outside trains, so passengers can choose the train and car to ride according to that information. For example, one can check the congestion level and temperature of specific cars from “Yamanote Line Train Net Train Information” while waiting on the platform. That will enable the passenger to select a less crowded car if carrying much luggage or to select a warmer (or cooler) car or even to wait for the next train. Moreover, “Platform Guidance Map” shows the position where individual cars stop at each station to allow passengers to see at a glance where platform stairways and escalators are located and which stairway would be closer to the ticket gate or more convenient to use for transfers. For example, the passenger can check platform exit guidance in advance to select the car that stops closest to the escalator.

“Yamanote Line Train Net Train Information” has been available for all trains on the Yamanote line since 2014.

Fig. 6  Yamanote Line Train Net Train Information

Fig. 7  Mechanism of Yamanote Line Train Net

(1) Station Map
This allows users to view locations of platforms, stairways, escalators, elevators, and ticket counters at each JR East station. For the Yamanote Line, users can access the aforementioned platform guidance maps from the “Station Map” screen.

While limited to Tokyo Station, users can also view where empty coin-operated lockers are and shop information for the “Gransta” and “Keiyo Street” ekinaka in-station commercial spaces from the station map (Fig. 8). Users can also view where they are on the station map based on location information from Wi-Fi access points set up in Tokyo Station to help navigate the station without getting lost. That service to provide location...
information was started for Android devices, but considerations are being made regarding providing the service for iOS also.

4.2 Marketing and Entertainment Content

- Use Commercial Spaces Inside and Outside Stations
  This delivers shop and facility information such as that for JR East ekinaka in-station commercial spaces, commercial facilities attached to stations, hotels, and more. Coupons for use at NEWDAYS convenience stores are also delivered.

- Enjoy Open Time
  Passengers’ movement is restricted during the time they are riding trains, so this content has been created from a viewpoint of making that time more enjoyable. It is also provided from a wish to have passengers use the JR East App every day. A comic strip is being delivered as specific content at the time of the app’s launch.

4.3 Other Content

- Participate in Experiments
  This feature was implemented to prompt users to try the pilot version as part of proving tests for information services developed for smartphones by individual JR East divisions. At the time of the app’s launch, users were able to try services such as one developed by JR East’s Frontier Service Development Laboratory to show line occupation status based on ATOS information (for the Saikyo Line and Shonan-Shinjuku Line). This feature will be used as a venue to bring forth innovation within JR East.

- Notices
  “Notices from the App” provides information to users as needed on topics such as how to use the app and update information in areas such as “How to Check Operational Information”. “Questionnaire” allows users’ opinions on the app to be used to further improve service. By enabling users to voice their opinions, two-way communication can be achieved and continuous improvements made.

5 Conclusion

This paper has introduced the JR East App as an effort in “service quality reforms”. For JR East to continue to grow amidst changes to the business environment after the 2011 Tohoku earthquake and tsunami and the rapid aging of the population with a low birthrate, efforts need to be made to identify customer needs and continue to meet those needs. JR East will thus promote efforts to listen diligently to customers’ opinions as well as to institute service quality reforms in an aim to be “No. 1 in customer satisfaction in the railway industry”.

Reference: