

Train Delay Information Systems for Passengers in Japan

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Abstract: In Japan, trains are utilized daily by many people. Sometimes trains are delayed by accidents which delay people who must go to schools or work. People need traffic information at these times. This report examines the means that JR East uses to inform passengers of train delays and current smart device applications. Also, areas to be improved in regard to train delay information are mentioned. Finally, the idea of using passenger GPS data to improve train delay information sharing is proposed.

1. Introduction

Passengers get annoyed and confused when trains are delayed because they do not like to be late for school or work. For many Japanese people strict time management and promises are important. In addition, they are decisive. They must decide for themselves whether to continue to use the train services or to use another service. If they make a wrong decision, they will be delayed further. This report will examine the current situations and problems with how railway companies give train delay information to passengers.

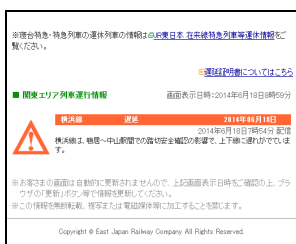
2. Methods

Data was gathered from the JR East website.^[1] Stations and trains in the Tokyo area were observed. The JR East Android phone application for transportation information was used.^[2] The Jorudan Android application for transportation information was used.^[3]

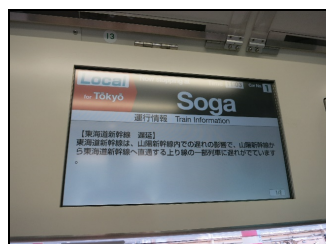
3. Results

Currently, train delay information is shared on home pages^[1], LCDs (Liquid Crystal Displays) on trains, electronic bulletin boards and displays at the stations for passengers of railway companies. As shown in Figures 1-4, not only words but also tables and route maps are used. Therefore, passengers are getting information from those systems regarding train delays. As the status and operating conditions of the trains may vary, passengers need more information because people must go to school or work. However, it was not possible to transmit it to them because railway companies could not transmit all train delay information all of the time.

As shown in Figure 5, JR East began a new service using smart devices like Android phones and iPhones.^[2,3] Therefore, passengers are able to get train information the delay times and the running positions of the trains. This service is very useful for passengers who are ride on a delayed train. As shown in Figure 6, navigation service companies have started new services such as “Jorudan Live”.^[3] This is a new service that collects information uploaded by passengers who are in stations or on trains. The information collected is not only regarding train delays but also about congestion situations. In addition, Twitter lately has train delay information from passengers. There are, however, three issues. First, it is very convenient for passengers that they can know the delay times, the running positions of the trains and the congestion situations. However, passengers have to make decisions using vast amounts of information as there is a lot of train delay information. Accordingly, they may become confused.



1. JR East Home Page^[1]



2. LCDs on a train



3. Electronic Bulletin Boards



4. Displays on the Station

Figures 1-4. Current Services

1: TRPT Student, CST., Nihon-U. 2: TRPT Asst. Prof., CST., Nihon-U. 3: Gen. Ed. Asst. Prof., CST., Nihon-U.

Second, new services are very useful. However, some passengers cannot use these services because they have to have smart devices such like Android phones and iPhones. In addition, they have to install applications on their phones.

Finally, passengers have to make the decision of whether or not to use trains when operations have been suspended. Passengers want to arrive quickly to their destinations. Other routes may also have been delayed and train operations may resume service soon. Passengers want more information to make decisions about these matters. For detour information and real-time information, there is a need to develop train delay information systems based on the new idea.



5. JR delay information table^[2]



6. Jorudan Live uses data uploaded by passengers^[3]

Figures 5-6. New Services: Smart Device Applications

4. The idea for delay information

New delay information systems will make it possible to share train delay and route information using the road traffic jam information methods. Google has started the delivery of the road traffic jam information which collects and shares GPS data of mobile devices such as smartphones. In the same way, by collecting the GPS data of train passenger mobile devices, it will be possible to obtain the operating information of the trains. Figure 7 shows the GPS data on the Keikyuu train. It will be possible to estimate in real time delay information of the train by comparing the train operation diagrams. The information of the various lines can be simultaneously compared and it will be possible to estimate delay information for the detour.



Figure 7. GPS data on the Keikyuu train between Yokohama and Kanazawa-Bunko stations

5. Conclusion

Current methods of sharing train delay information have been discussed. The idea using the big data that collected the GPS data to estimate train delay information system has been proposed. By adding the information from passengers and railway companies, a system can be developed and a wider range will be covered.

6. References

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