Train Station ATMs

Hideki Oosato　　　　Hirotaka Saitou
Mitsuhiro Ozaki

In Japan, the number of people getting on and off trains at train stations in metropolitan areas is prodigious. Furthermore, a certain bias is reflected in the age and occupations of the population which frequents train stations. Many train users are in the 15 to 65 year old range and most are employed persons. In our attempt to provide valuable services on train station premises, it is critical that we identify our target audience and provide functions and an image optimized for that audience.

This article describes an example of successful train station ATM introduction, our PatSat ATM system which is installed in Hankyu Railway train stations. PatSat was the first full-service train station ATM in Japan, and this article evaluates the historical context of its introduction, its concept and its achievements after two years of operation, and identifies the reasons for its success. In addition, this article uses a few case examples to describe future ATMs and customer-operated terminal services.

Background of the Hankyu Railway ATM installation

In the past, we had received questionnaire results indicating that "it would be great if there were ATMs in train stations." And, in the past, there have been cases of bank branch office ATMs and credit card company CDs (cash dispensers) installed as "ATM corners" within train stations.

The novelty of the PatSat system (the origin of the nickname will be explained later) lies in the idea of systematically installing in Hankyu Railway train stations ATMs having specifications specifically designed for the Hankyu Railway, and providing through those ATMs integrated services to users. This design gives users the sense that the PatSat system is not a service provided by a bank, but rather a financial service provided by the railway company.

We began researching the PatSat system at the time we phased in operation of convenience store ATMs, i.e. ATM systems run by corporate organizations other than financial institutions. This allowed us to begin investigating the feasibility of this idea. It was the fall of 1999.

(1) System overall configuration

In the setting in which we determined the system's overall configuration, the following two feature requirements were critical:

① **Providing financial services through multiple banks at our ATMs**

Hankyu Railway is an extensive railroad line, with many financial institutions in the surrounding area. Users would most likely desire to perform financial transactions with the bank that manages their accounts. Thus, what was desirable was an ATM that did not display the color of a specific bank, but rather employed a single, general method of operation in which the transaction destination was automatically determined by the user's card. With the installation of communication lines from the ATM to multiple financial institutions being impossible, the establishment of a relay center which could determine the destination was required.

② **The future provision of additional services beyond ATM transactions**

Our plan was to have the terminal used not only as an ATM, but also as a Kiosk service provider, providing services such as online shopping and bus ticket purchasing. This required an operation center that would connect the ATM to the Kiosk service content provider and total the transaction.

Based on the above requirements, the ATM system created was not directly linked to banks, but employed the following configuration: banks--a system operations and supervisory center--terminals. (See Fig. 1.)

Fig. 1   System block diagram

(2) ATM hardware specifications

The equipment model employed was the CP21V. The basic specifications are described below.

- Bills: 10,000 yen bill capacity = 2,500 bills, 1,000 yen bill capacity = 1,400 bills
- Coins: Not used
- Receipt slips: Two three-inch rolls of paper for about 800 transactions each
- Cards: JIS1 and JIS2 compliant
- Screen: 15-inch LCD, with touch panel
- Numeric keypad for password entry: In accordance with J-Debit specifications
- Without bankbook features

(3) Participating

From the initial stage, The Bank of Ikeda Ltd. was kind enough to participate in our system research and share with us a number of invaluable ideas. As we fleshed out the detailed specifications, Bank of Ikeda helped determine each specification based on ideals faithful to the project concept, discarding the kind of vendor proposals that often result in excessive specifications and understanding our policy that Bank of Ikeda would not necessarily receive any profit. Although each detail is not described in this article, the participation of Bank of Ikeda was instrumental in the success of our project.

(4) Establishment of Station Network Kansai, Inc.

In order to specialize in PatSat ATM system security, cash transport, maintenance and operation, Hankyu Railway and Bank of Ikeda partnered together in the establishment of Station Network Kansai, Inc. By having the railroad and financial institution work together, we were able to offer not just an ATM installed in a train station, but integrated services from the train station ATM as well.

(5) The PatSat concept: To be used "casually, on the fly, quickly, easily"

We envisioned the users to be businessmen, businesswomen and students; people who would consider ATMs located on the railroad line they used every morning a convenience; people who were busy.

While we thought it would be ideal for users if the PatSats were available at all times, i.e. from the first train to the last, taking into account various aspects of operation, we decided to make the PatSat hours 7:00 to 23:00 on weekdays and 7:00 to 21:00 on Saturdays and Sundays.

The method of use and the available transactions were established from the following considerations.

The ATM will be referred to as "PatSat" since users will approach the machine quickly (expressed as "patto" in Japanese) and use the machine swiftly (expressed as "satto" in Japanese). The provided services will be limited to card-based deposits, withdrawals, balance inquiries, transfers, cash advances and payments that do not involve bankbooks or coins. The design objective is to fulfill specified petty cash transaction requests of users through card insertion and minimal operation.

Conditions after service introduction

(1) Progress after service introduction

After we developed the PatSat system, we expanded the provided services and installation locations as described below:

March 2000	Launched development
September 2000	Began service in Umeda Station
October 2000	Began linkage with postal savings
March 2001	Began transfer service
October 2001	Began installations toward Kita-Osaka Express Railway
May 2002	Began deposit service using postal savings card
November 2002	Began linkage with Kyoto Shinkin Bank
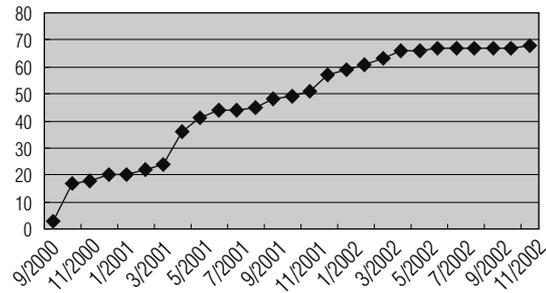
Fig. 2   Number of installations

Fig. 2 depicts a graph showing the increase in the number of installations.

Fig. 3 indicates the installation locations. Many of the stations have multiple units, such as one unit installed before and one unit installed beyond the ticket gate.
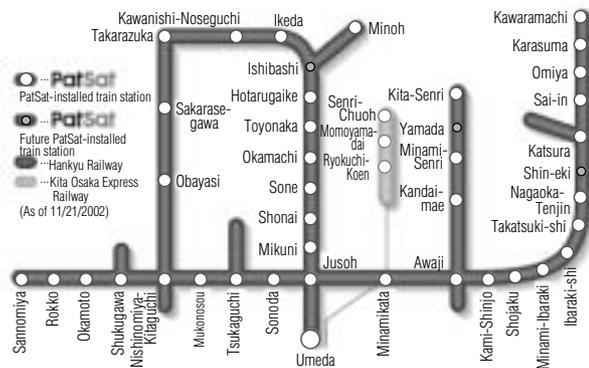
Fig. 3   Installation locations

(2) Increase in the number of transactions

Fig. 4 illustrates the increase in the total number of transactions per month from the time service began.
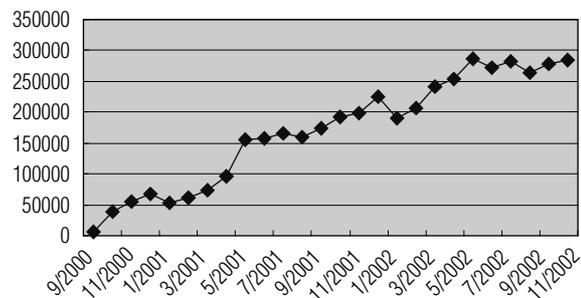
Fig. 4   Number of total transactions per month

Fig. 5 illustrates the increase in the number of transactions per day per unit.
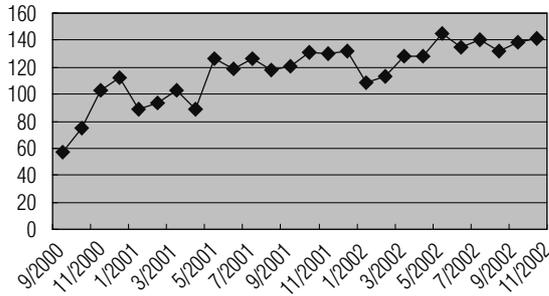
Fig. 5 Number of transactions per day per unit

In a recent six-month period, there were 140 transactions per unit per day. The location with the greatest number of transactions is Umeda Station, in the area before the ticket gate. Three units are installed in this area, and each one of the units handles 240 to 310 transactions per day. Even the location with the least number of transactions handles 70 transactions per day (Photo. 1).

Phot. 1 Umeda Station installation, beyond ticket gate

Just a few months after service began, the number of transactions handled per unit was on average 100 or greater per day. This number is higher than that of the ATM's at so-called "convenience stores." Our success results not only from the train station environment in which the units were installed, but also from the fact that units are installed in each station along the railroad line as PatSat ATMs and from the integrated announcement and advertising activities that were conducted.

(3) Consideration of technological aspects

This section addresses the technological challenges which confronted us and the manner in which they were resolved in the pursuit of viable train station ATM operation. The matters described below include some that were taken into account from the design stage as well as some that became problematic after service began and were resolved by quick corrective measures.

① **Crime prevention**

From its easy-to-use operability and inviting design and booth image, the PatSat ATMs can give the impression that they are lax in regard to crime prevention measures. We designed the machines, however, with enhanced features such as capturing the image of the user and confirmation of transaction details in the supervisory center.

② **Corrective actions for operation errors**

The PatSat ATM is sometimes mistaken for a fare-adjustment machine. In the early stages, train passengers would frequently insert train tickets into the PatSat card slot, causing temporary shutdown. To prevent this from occurring, we improved our firmware and incorporated a mechanism which ejects inserted tickets.

③ **Measures to reduce temporary shutdowns**

In those train stations that have fewer passengers, only one PatSat ATM is installed. Such locations illustrate the importance of minimizing to the extent possible the number of temporary shutdowns caused by jams from media and the like. We have continually implemented a great number of countermeasures since the start of operation and have now reached our target operating level.

④ **Measures to prevent forgotten money**

Perhaps because users approach the machine quickly and use the machine swiftly, we have had many cases in which the user has actually forgotten to take his/her money during payment transactions. Although we implemented a countermeasure which changed the audio, results have not been entirely satisfactory, and the problem still remains.

Kiosk services

From the initial stages of PatSat introduction planning, we looked into incorporating online shopping, bus ticket purchasing and various application/ordering services. Our vision was to employ CP21V extended hardware and use CP21V at the time of cash settlement after product selection and ordering operations were performed. However, we were unable to define exactly which specific services PatSat should provide, and thus full realization of the PatSat system in this regard was not initially achieved.

However, in 2002 we began a different experimental approach. We installed terminals that offered ticket sales and other application services. This section looks at Kiosk services, using the experience of this experiment.

(1) PatSat Electronic Ticket Consortium

In December 2001, a research proposal we submitted in response to an open call for proposals by the Ministry of Economy, Trade and Industry was accepted, and we established the "PatSat Electronic Ticket Consortium" of "Businesses Developing and Validating Advanced Smart Card Applications Based on the Research Projects of Cities Equipped with Information Technology" under the aegis of the (non-profit) New Media Development Association. The consortium members are Itami City Hall, Hankyu Railway Corporation, Station Network Kansai Inc., and Oki Electric Industry Company, Ltd. (representative).

Research pertaining to an electronic ticket service and electronic application service in a multi-application smart card environment was the focus of our study.

The terminal specifications and service details are described below.

① **Terminal specifications**

Equipped with a non-contact smart card reader/writer, magnetic card reader/writer, 3-inch receipt slip, 10.4-inch LCD (with touch panel), and J-Debit compliant numeric keypad for password entry.

② **Settlement method**

Credit settlement and J-Debit settlement

③ **Electronic ticket service**

• Itami Hall tickets

Akiko Yano Recital, Katsura Beicho Family-"Rakugo" Storytellers Performance, Yoichi Tajiri Talk & Piano, Akihiro Miwa Lecture Presentation

• Itami Aiphonic Hall tickets

Itami City Philharmonic Orchestra Concert, Myanmar Doll Puppet Show

• Takarazuka Grand Theater tickets

Moon Troupe Musical Romance "Nagai Haru no Hateni" ("At the End of a Long Spring"), Musical Revue "With a Song in My Heart"

④ **Electronic application service**

Hankyu Railway commuter pass reservations

⑤ **Installation locations**

Hankyu Railway: Umeda Station, 3F and 2F; Tsukaguchi Station; Itami Station

Itami City: Itami City Hall, Lustre Hall, Itami Sports Center

Phot. 2 Terminal installed in Umeda Station

Use of the services requires either a Tiki Card[1] issued by Itami City Hall, an O-Pass Card[2], or an O-Pass Internet Reservation Card[3]. Those who wish to use these services must apply at the locations which issue the above cards. The terminal locations are limited to the Umeda Station (Photo. 2) on Hankyu Railway, and two stations on the Itami Line, so it cannot be said that this has yet been deployed on a large scale. The test period runs until March 20, 2003. Although we cannot fully evaluate results at this time, we are considering certain noteworthy issues related to Kiosk services performed at train stations.

(2) Kiosk services at train stations

① **Recognizing customer wants and needs is first and foremost**

Convenience stores, bookstores, service centers, and copy and fax equipment are already provided within train stations that have many people getting on and off trains. In addition, simple online shopping and application services have already been implemented through cell phones. Thus, what we need to do is distribute questionnaires to train station users and conduct a study regarding what type of services train station users truly need.

② **The need for simplicity**

The operation of a Kiosk terminal can easily become complex and difficult to understand once a variety of service features has been incorporated. A Kiosk terminal installed in a train station should provide service to users with a specific purpose in mind. Consequently, using the PatSat concept in the same manner as we did with ATMs, our machines must provide services quickly, through simple operation and in an easy-to-understand manner.

The PatSat Electronic Ticket Consortium is a service based on smart cards issued by municipalities. While a service which employs resident registry smart cards would be expected to run into difficulties with regard to laws and security, we may find such a service convenient and effective if realized.

Conclusion

This article introduced case examples of PatSat train station ATMs operating on the Hankyu Railway. Two years have passed since operations began, and the case examples have now been assessed as a success. The reason for the success of our product lies in the fact that we recognized that a machine that can be used quickly, simply, casually, and in the same manner at any location along the railroad line was worth a lot to train station users, and we approached system research, design and operation based on a clear concept.

Kiosk terminals are also in operation experimentally. To offer full-scale service in the future, it is critical that we provide features that users want in the same manner as we did with PatSat ATMs: in an easy-to-understand manner following a clear concept.

● **Authors**

Hideki Oosato, Financial Solutions Company, Systems & Equipment Div., ATM Software Development Dept., Development Team-5

Hirotaka Saitou, System Solutions Company, Infrastructure Information Solutions Div., System Engineering Dept., SE Team-2

Mitsuhiro Ozaki, NetBusiness Solutions Company, Solutions Development Div., Solutions Development Team-4

*1) Tiki Card: A smart card introduced by the northern Osaka-Kobe region (Takarazuka City, Itami City, Kawanishi City, Inagawa City). The cardholder can receive community support services and automatic certificate granting services.
*2) OPAS Card: A card issued by the Osaka Prefecture Park Division. Smart cards were distributed to applicants in September 2002.
*3) OPAS Internet Reservation Card: A smart card issued by the Osaka Electronic Municipality Promotion Council).