Developing Convenience Store ATMs as Social Infrastructure

OHTA Tomomi, MATSUDA Takashi, MURATA Noriyoshi, HINAGO Naotaka, FUJITA Shigeki

Abstract

The multi-function compact ATM (Automated Teller Machine) co-developed by the NEC Group in cooperation with Seven Bank, Ltd. is designed to function as an integral part of a new-style infrastructure that facilitates a variety of contemporary lifestyles. It provides people with access to ATMs in their neighborhood 24 hours a day, while offering a friendlier User Experience and enhanced ease of use for more people. This paper discusses our comprehensive commitment to social value design that ranges from the evolution of user interfaces (improved display content and interface, compliance with Color Universal Design, and improved receipt printouts, etc.) for convenience store ATMs and the provision of services without delay to the improvement of functions that support social values such as ecology and globalization.

Keywords

social experience, user experience, ecology, energy saving, universal design (UD), usability

1. Introduction

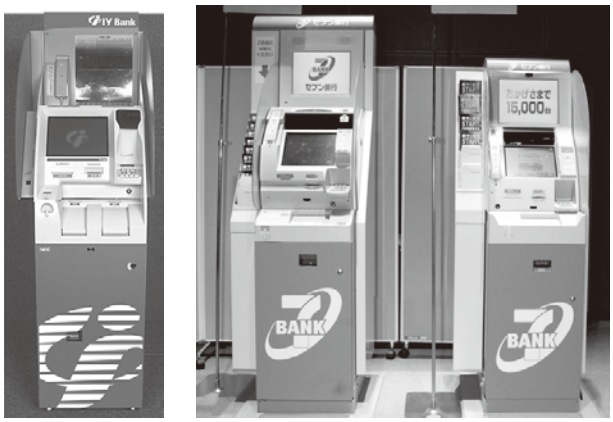
Over the past few decades, convenience stores have had an enormous impact on people's lives, making it possible for people to take advantage of many services at any time of day and night, while providing them with a sense of security. More recently, in addition to their commercial functions, they have begun to take on social functions, as well - for example, they often serve as a hub for community cooperation to prevent crime or as support providers in the event of a disaster.

As a result of the large-scale reorganization of the Japanese banking industry in the 1990s, branches were consolidated, reducing the number of ATMs available. Customers who no longer had an ATM in the neighborhood started demanding access to ATMs in more convenient locations. To meet this demand, ATM service became available in convenience stores in 1998. Today almost every convenience store boasts at least one ATM. In fact, you would be hard pressed to find one that doesn't.

This paper discusses a case example, in which NEC Group worked to improve the comprehensive values of multi-function compact ATMs (convenience store ATMs) through co-development with Seven Bank Ltd. (hereinafter referred to as Seven Bank).

2. Expanding Convenience Store ATMs as Social Infrastructure

The first-generation (1G) ATM service offered by Seven Bank started in 2001. As the industry leader, we continued our efforts to improve convenience and to pursue new services, introducing



1G ATM* 2G ATM 3G ATM

* Designed for IY Bank, the predecessor of Seven Bank

Photo The evolution of the Seven Bank ATM.

the second generation (2G) in 2005 and the third generation (3G) in 2010, which is the most current (**Photo**). As of 2013, more than 18,000 machines had been installed throughout Japan. For the most part, these ATMs have been installed in Seven-Eleven convenience stores, accounting for the largest share among the ATMs installed in convenience stores in Japan. The deployment of ATMs in familiar convenience stores that can be used anytime 24 hours a day, 365 days a year has effectively increased the social recognition of the convenience store ATM. Thanks to its ease of installation, convenience store ATMs are expanding its venue of activities to public spaces such as shopping centers, train stations, and airports, in addition to convenience stores.

3. Improving the Social Value of the Convenience Store ATM

3.1 To Be Used by More People

To ensure that the convenience store ATM continues to gain support and play an important role as a key component of social infrastructure, it is necessary to constantly adapt to the changing needs of convenience store users and their lifestyles.

In the past, the typical convenience store shopper was a young single. But as more and more people have come to recognize the convenience of these stores, in which food and other goods can be purchased in small amounts as needed, they have become especially appealing to the elderly and those who can't carry heavy, bulky packages. The strata of convenience store users has expanded, keeping pace with the times, and the number of foreigners and people with disabilities are increasing.

Foreign workers in Japan who wish to send money overseas often find it difficult to do so because they cannot leave work when the banks are open. To address the needs of these people, Seven Bank launched an overseas remittance service compatible with multiple languages in 2011, which is widely used today by foreigners in Japan. By providing this service at convenience stores, the ATM responds to the lifestyles and needs of the users who, for example, wish to send money to their families at the same time as shopping for food after getting off work at night. When first launched in 2011, this service was only available in Japanese and English, but it has since been enhanced, and as of January 2014, nine language versions of the screens were available.

In 2007, we introduced voice guidance services for the people with visual impairment, featuring a provided handset. This was the first time this service was made available at a convenience store ATM in Japan. Today this service is available for the people with visual impairment banking at more than 520 associated financial institutions.

3.2 Improved Safety and Security (Hardware Design)

Users of convenience store ATMs may worry that someone behind them in line may get a peep at the screen or that strangers may approach them while they are operating the machine. To alleviate these concerns, we have always taken measures to assure that our ATMs can be operated safely and reliably, starting with our very first 1G model (**Fig. 1**).

To eliminate users' concerns about being spied on or targeted, we made it our objective to design an ATM that would physically protect the user from prying eyes and make them feel safe while using it.

To conceal the screen and pinpad, the lines of sight from behind are blocked by large side partitions, an enclosure that conceals the pinpad, and a special film on the screen.

To further increase the user's sense of security when using the ATM, a crime prevention button is positioned in a conspicuous location and a mirror is provided that enables the user to see what is going on behind them.

With the 3G model, these measures have been further refined. The size of the area protected by the side partitions has been almost doubled, providing much more privacy and greatly enhancing the user's sense of security (**Fig. 2**).

3.3 Making Efficiency and Ecology Compatible with Each Other

Usually there is not much room in convenience stores for people waiting to use the ATM, so it is even more important than with conventional ATMs that users not be forced to wait for long. Our 3G ATM reduced disbursement time to two-

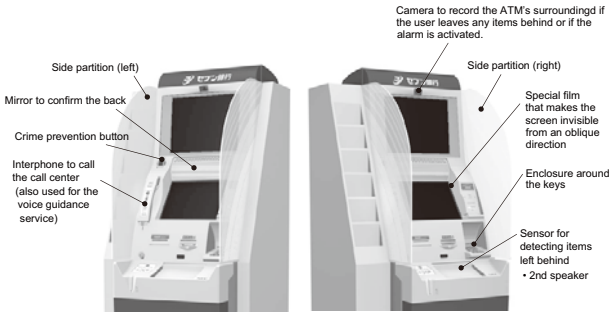


Fig. 1 Improvement measures for safety and security (3G ATM).

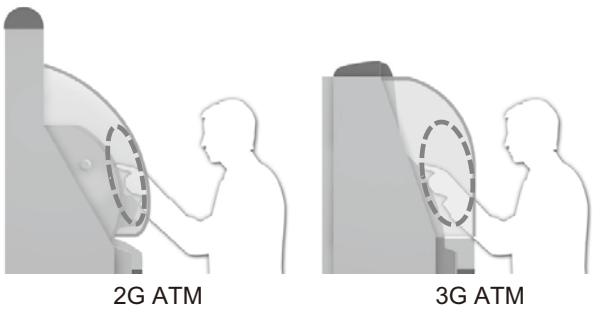


Fig. 2 Expanded space for increased security.

thirds; as a result, the usable number per hour increased from 80 to 100. Meanwhile, power consumption was reduced by 48% compared to conventional ATMs.

At first glance, increasing the usable number might be expected to make energy saving more difficult. However, we were able to successfully address the social demand for energy saving by meticulously working on each technical specification such as the LED-backlit display, switching to the power save mod during standby, and reducing start-up time from the power save mod to zero seconds.

Together, these efforts have led to a reduction in CO_2 emissions of 8,400 tons a year.[*1] Apart from that, CO_2 emissions have also been reduced by the decreased number of cash carrier operations thanks to the achievement of improved cash management efficiency.

4. Improved Usability (User Interface of the Operation Screen)

Seven Bank's ATMs have been developed to meet the needs of associated banks and to match the atmosphere of convenience stores. We have also improved the design in terms of usability, ease of viewing, security, and foreign language availability. Now, these features are incorporated in ATMs at other banks. By focusing on better understanding our users and by further improving usability, we have succeeded in implementing a superior ATM design that truly responds to customer needs.

Described here is the human-centered design (HCD) process for enhancement of ease of viewing and usability in the screen renewal in 2013.

4.1 Understand and specify the context of use

To better understand our target users, group interview surveys and user evaluations were conducted with respondents whose ages ranged from late middle-aged (over 50) to the elderly. In these examinations, concept screen prototypes based on the results of past user evaluations were shown to the respondents. We analyzed the respondents' receptivity to the concept proposals and shared the results with the engineers.

4.2 Clarify the goal

Based on the results from the interviews and evaluations, we set the design objectives for the demonstration prototype which would be next step. In 2010, the Seven Bank ATM user interface (UI) on the operation screen was updated with changes that included the introduction of universal design (UD) fonts that users with low vision can easily read and understand. Despite this improvement, the call center actually received even more complaints about characters being too small and hard to read, due to the overall increase in users of convenience store ATMs combined with a growing elderly population.

When upgrading the user interface, our priority objectives was to provide UI which gives first-time users smooth experience and gives repeat users better comfort than the last time. Another priority was to further improve character legibility. The project was implemented with the slogan "Friendly ATM." We created concept sheets, image maps, and scenarios to share the design objectives, and they were used in the investigations of UI images of the next demonstration prototypes.

4.3 Produce design solutions by Demonstration Proposals

While observing consideration in implementation conditions, we designed two demonstration prototypes. Both have the same screen transition as the UI of the current model: the first one replicates the button locations and overall layout; the second one puts a greater emphasis on friendliness by changing button locations and overall layout to better suit people unfamiliar with ATMs. The first prototype was designed to facilitate a smooth UI renewal for conventional users not to feel stress, while second prototype was designed to promote acquisition of more new users than before.

4.4 Evaluate the designs against requirements

We carried out comparative evaluations between the screens of the two demonstration models and those of the actual working UIs while providing a machine environment similar to actual experience. The participants in the evaluation were 8 users over 50 years old who were not good at ATM operation. All 8 participants rated the screens of the two demonstration prototypes as easier to use than the conventional UI.

4.5 Design and Development for Implementation

Based on the results from the user evaluations, we took concrete measures to reflect the suggested improvements in our design. For example, because of the inverse proportion between the size of characters and the volume of information on screen, the instruction text needed to be as simple as possible. We proceeded with the investigation and adjustment while confirming the screen images, animations, and sounds in the same environment as they would be used in practice by running them on an actual ATM machine.

4.6 Improvements

Expansion of the font sizes (up to 1.5x) and simplification

[*1] Once all 18,000 ATMs have transitioned from the 2G to the 3G

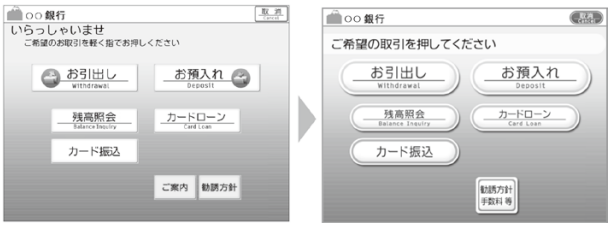


Fig. 3 Expansion of type sizes on screen and simplification of information.

Fig. 4 Improvement of screen by using easier-to-read colors.

of text information (**Fig. 3**) improved readability and reduced comprehension time.

The colors used on the screen were also changed (**Fig. 4**). The design was based on the principles established by color universal design (CUD) to make the screen readable for colorblind people. Transaction displays for financial institutions handling deposits and savings such as banks, as well as for securities companies (except information about service hours and handling fees) have been endowed with the CUD certification from the Color Universal Design Organization (non-profit organization: CUDO).

This upgrade was not confined to the improvement of the screen; the printed receipts were also made more readable. The printed text sizes were made larger, and the layout of the printed information was reviewed. We looked at every detail in both hardware and software in order to optimize ease of use in every aspect.

5. Conclusion

Convenience store ATMs are fast becoming a crucial component of social infrastructure. By connecting with and learning from the various stakeholders who make up our society, we will maintain our commitment to providing services to our diverse range of customers that embody the values most important to our ever-changing society.

Authors' Profiles

OHTA Tomomi
Creative Manager
Solution Design Department
Products Design Business Division
NEC Design & Promotion, Ltd.
Certified HCD Professional
Assistive Technology Coordinator

MATSUDA Takashi
Assistant Manager
Production Coordination Division
Certified HCD Professional
Assistive Technology Coordinator

MURATA Noriyoshi
Manager
2nd Solutions Department
1st Financial Solutions Division

HINAGO Naotaka
Project Director
1st Financial Solutions Division

FUJITA Shigeki
Manager
System Devices Division

* The stated titles and departments of the authors that appear in this paper are as of March, 2014.

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