

Biometrics-Based Approach to Improve Experience from Non-routine Lifestyle Fields

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Abstract

Recently, following the rapid increase of foreign visitors to Japan and of the enhancement of the value of their everyday activities, the demand for service industries such as hotels and theme parks has tended to increase. On the other hand, the increased labor market shortages has made it an urgent issue to reduce any burdensome effects on operations in those industries. To achieve the targets both of reducing the burden on service providers and of improving the customer satisfaction of users, a technology is sought that can recognize the identity of each user “quickly” and “accurately”. The face recognition technology of NEC enables simple registration and rapid and accurate personal identification by means of non-contact authentications. This paper introduces face-based solutions for use in hotels and at public attraction venues as well as supporting future plans for connecting customer journeys by universally applying face authentication IDs.

Keywords



face authentication, biometrics, hotel, stadium, theme park, attraction venue

1. Introduction

After exceeding 28 million people in 2017, the number of foreign visitors to Japan is still increasing and it is expected to be over 30 million in 2018 (**Fig. 1**). As the “Shift to events consumption” has become a fashionable topic, the trend of seeking value from unusual

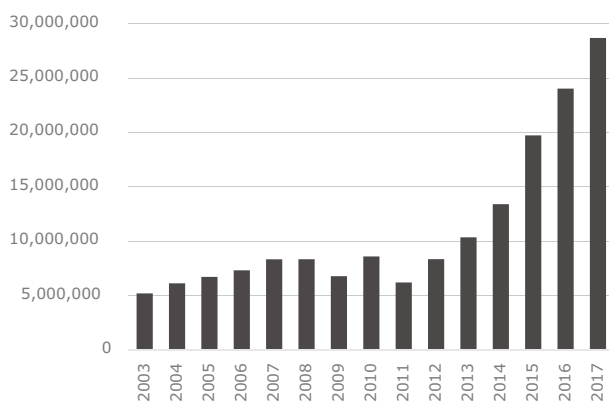


Fig. 1 Change in the number of foreign visitors to Japan (Japan National Tourism Organization (JNTO) data).

experiences tends to increase year on year. The result is the enhancement of consumer needs toward the service industries, including those for hotels and theme parks.

Meanwhile, the service industries are facing the effects of a worsening labor shortage. Hotels and theme parks are becoming incapable of achieving their important target of providing optimum services based on customer consideration in improving satisfaction and encouraging repeat visits.

This paper is intended to introduce a biometrics-based approach for solutions of the above described issues of the service industries, including those for hotels and theme parks.

2. The Introduction of Hotel Labor Saving Solutions

When observing the operations of the hotel front desk, acceptance of checking-in/out of customers and the entries of their names and addresses in the hotel register cause heavy burden for operation staff, especially during check-in/out peak time. There have many ways of attempting to reduce part of the check-out operations, e.g., by installing auto fare adjustment machines etc. Howev-

er, such procedures cannot offer the needed far-reaching solution. To solve this burdensome issue, NEC is planning to release a solution by which the required information in guest cards is pre-registered using smartphones. This procedure will make it possible for the check-in at the hotel to be completed easily, simply by checking identifications. Guestrooms may then be unlocked by recognizing the identity of the guest (Fig. 2). The key device for implementing this mechanism is the face recognition technology.

For the specific method of implementation, the smartphone app for smart check-in that can be used commonly by the member hotels reads the accommodation reservation information of the hotels in advance and inputs the information entered in the guest cards, such as the name, gender and address etc. (Fig. 3). Face images of the guests are also registered. When a guest checks in to a hotel, the face is oriented to a kiosk terminal or

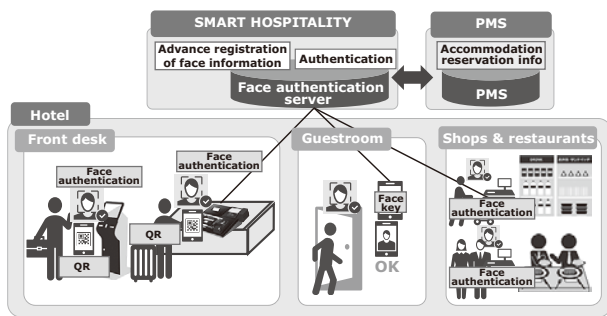


Fig. 2 Hotel labor saving solution.



* The screen images are under development.

Fig. 3 Smartphone application for smart check-in.

camera-equipped terminal installed on the front desk. This enables confirmation that the person is a guest scheduled to check in on that day. Check-in is usually accompanied with other operations such as the allocation of a room. By also providing a mechanism for automating such operations as far as possible, the burden on the front desk staff during check-in can be reduced.

After check-in, the guest goes directly to the room. When the guest shows his or her face to the camera installed on the room door, the face authentication is executed and the door is unlocked. This makes the guests free from the risk of leaving the room key in the room or losing the key, and also eliminates some tasks such as the handing of the key between the people sharing the same room, such as family members. For the hotel staff, this system can reduce the labor because handing of keys at the front desk becomes unnecessary.

When a guest uses the restaurant or shop during a stay, a charge to the room is possible by simply showing ones face at the time of payment. Instead of the traditional charge method by stating ones room number. The face authentication method enables guest identification more quickly and securely.

Linkage with an accommodation reservation management system called the PMS (Property Management System) is indispensable for the implementation of the mechanisms as described above. NEC has already started a PMS under the brand name of NEHOPS (NEC's hotel solution service) and has acquired more than a 60% market share in hotels located in cities nationally. The solution under discussion has interface with NEHOPS, so it can be installed easily by linking the accommodation information upon receiving the permission of the users.

The use of face authentication as a key device allows hotel managers to reduce their burden of operations. It also improves the convenience of guests by eliminating the burdensome check-in/out procedure and also of the need to carry keys. Such services may result in improved customer satisfaction and in an increase in guest repeat reservation rates.

3. Use of Face Authentication in the "Attraction Facility Value Improvement Solution"

NEC has already started the provision of the "Attraction facility value improvement solution" with the aim of improving the appeal of stadiums and theme parks (Fig. 4).

This solution provides users with various information such as: stamp rally events, fan voting and movie services in order to improve the value of visits to facilities. For the facility managers, it provides a dashboard visualizing the customers for use in project planning and pro-

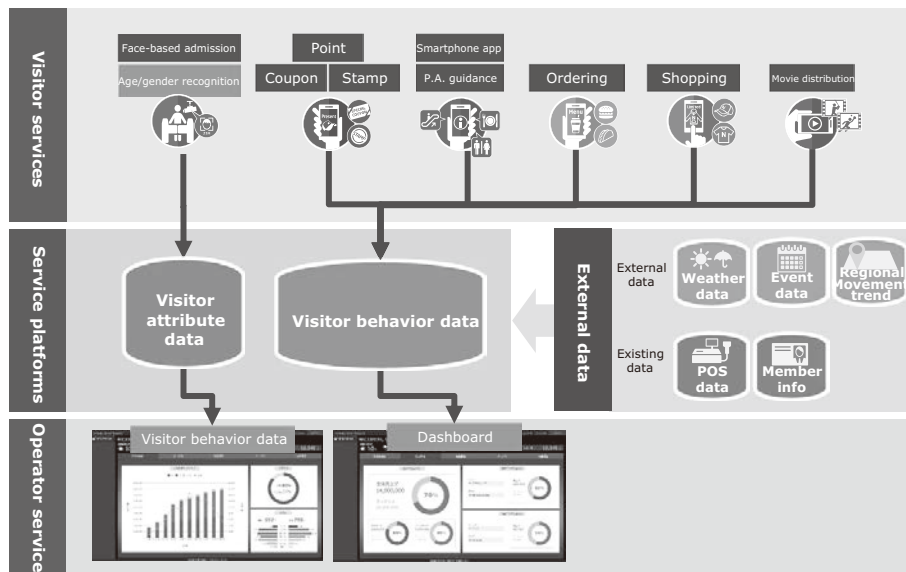


Fig. 4 “Attraction facility value improvement solution”.

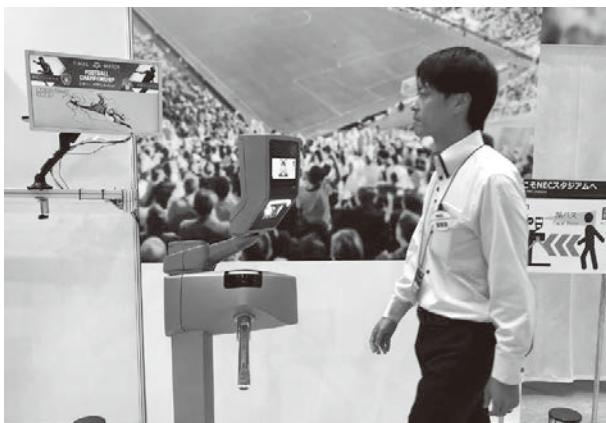


Photo “One-factor walkthrough face authentication service” (Reference exhibit at iEXPO).

motion activities. In addition to the above, it is planned to provide the “one-factor walkthrough face authentication service” that will enable face-based admissions to the facilities in order to improve the customer gathering efficiency (**Photo**).

Walkthrough face authentication has been used at attraction facilities and concert halls, but its accuracy is limited. The traditional method still remains in the stage of two-factor walkthrough face authentication combining the IC card or QR code with a face recognition technology. Its purpose is limited to the prevention of illegal use of annual passes for theme parks and the prevention of the resale of concert tickets. The “one-factor walkthrough face authentication service” enables personal identification

based on the face image without the need for a device such as a card or an IC chip. It thereby enables labour saving for the entrance operations staff while providing customers with the enhanced convenience and improved hospitality of expedient entrance admissions.

The sale of foods, drinks and goods is an important factor for stadiums and theme parks to increase the sales per visitor, which is as important as the sale of tickets. Therefore, payment based on face authentication is also under study, in order to reduce the burdensome procedure of payment transactions at the points of encounter between customers and shop staff.

4. A Customer Journey Map Implemented by the Face Recognition Technology

Face authentication may be used actively in hotels and at attraction facilities as described above but the hotels are not usually the sole purpose for the user journeys. Users stay in hotels to enjoy the available activities of a region, including sightseeing, sports events, thermal spas and/or delicious food. The users may wish that a series of personal identification actions in the flow of their non-routine experience is performed as a stress-free process. These may range from: transportations by aircraft or railroads to hotel check-ins, room entrance/exit procedures, payments for foods and entrances into leisure facilities (**Fig. 5**). The “face” used in the solution described herein is neither left behind or lost and can therefore be an ideal key device for enabling personal identification. NEC has started an approach for improv-



Fig. 5 Flow of unusual experiences based on the face as the common ID.

ing the customer satisfaction of an entire customer journey map by seamlessly connecting services that adopt the face authentication as a common ID procedure.

In addition to sharing a common ID among different services, the acquired data is utilized for example to propose hotel guests some local activities that might fit to their favor, or to propose activity attendees another hotel plan. Such proposals are implemented by acquiring the behavior data related to the common IDs of the hotels and activity users upon receiving their permissions, so that an appropriate approach may be also taken to activate the entire local regional data file.

As such projects that cross the barriers between businesses belong at an infrastructural level, they need to feature highly secure foundations. They will be implemented by gathering NEC’s know-how on their face recognition technology platforms and from their operations systems.

5. Conclusion

When we consider the essence of customer services in the real world, we might say that “face-to-face” is the invariable method to identify individual person, and that is essential for improvements in the values of customer experiences. Many of the past applications of the face recognition technology have been of solutions for individual service. However, we will promote in the future to employ the face recognition technology to improve the customer journeys map. Therefore, activating the regional economy can be achieved by enhancing the values of experiences in the various non-routine lifestyles, connecting people and places, and making people travel around. We will use the common ID as a tool and implement the mechanism to support regional economy.

* QR code is a registered trademark of DENSO WAVE INCORPORATED.

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