

Problems with Using Smart Devices for Business and Efforts to Resolve Them

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In the current consumer market, new means of communication are rapidly becoming prevalent. They include smart devices such as smartphones and tablets, applications that operate on those smart devices, and high-speed wireless communications such as Long Term Evolution (LTE) and Worldwide Interoperability for Microwave Access (WiMAX). To address this trend, corporate users have started considering the possibility of increasing their sales and improving their business efficiency by making active use of smart devices in their business. However, challenges associated with introducing these devices have been revealed as well, such as concerns about security and the streamlined connection of such devices with existing systems. In this paper, we describe services that enable these devices to be used in the optimal way (mobile sales operation support service) in sites where sales take place. We also cover a method for vertical integration when introducing devices, networks, service platforms and services, as an approach to introducing this system into companies.

1. Introduction

In the Japanese market, the iPhone was launched in 2008, the first device running Android in 2009, and the iPad in 2010. Since then, smart devices have rapidly penetrated the domestic consumer market. The number of smartphones shipped in Japan exceeded 23 million in March 2012 and their number is estimated to exceed 35 million in 2016 (80% of the domestic sales market).¹⁾

With such a drastic penetration of these smart devices, network operators in various countries have accelerated their investment in infrastructure for high-speed wireless communication to leverage sales of high-speed communication services (e.g., Long Term Evolution [LTE], Worldwide Interoperability for Microwave Access [WiMAX]) and the corresponding devices. Through these movements of domestic and international device manufacturers and telecommunication carriers, significant innovation is being made and the environment surrounding smart devices is being improved rapidly. To address these trends, corporate users have started considering the possibility of introducing smart devices, high-speed wireless

communication and applications for smart devices (hereafter “applications”) to improve their business efficiency.

Therefore, Fujitsu considers offering a new solution for sites where sales take place, called “mobile sales operation support service.” This is because the advantages of smart devices such as their portability, continuous network connection and many hours of availability tend to be used most optimally in sites where sales occur. Further, as a means to connect this service with companies’ core systems, Fujitsu plans to offer a “vertical integration” service format, where devices, networks, service platforms and services are offered in a streamlined manner. We consider that this type of service system can be a solution to potential challenges such as security issues and accessibility associated with the introduction of new devices.

2. Increasing needs of corporate users

Ways to use smart devices have emerged in the following areas, considering their advanced features such as high-speed start-up, operability and portability. Typical examples are summarized in **Table 1**.

Table 1
Occasions to use smart devices.

	Distribution	Retail sales	Financial	Manufacturing	Communication	Clinical	Government/ Education
Sales/ Customer service	<ul style="list-style-type: none"> • Presentations to clients 	<ul style="list-style-type: none"> • Sales reinforcement • Weddings 	<ul style="list-style-type: none"> • Bank counter sales • Data sharing • Liaisons 	<ul style="list-style-type: none"> • Product introductions • Residential houses • Reforms 	<ul style="list-style-type: none"> • Presentations • Intra-company meetings 	<ul style="list-style-type: none"> • Medical representatives 	
Linkage with business	<ul style="list-style-type: none"> • Consolidated fleet deployment • Shipment records • Warehousing/ Shipping out • Inventory checks • Liaisons 	<ul style="list-style-type: none"> • Input of estimates • Shop reports • Sales reports • Order placement/ receipt • Inventory checks 	<ul style="list-style-type: none"> • Device for routine work 	<ul style="list-style-type: none"> • Reference of drawings • Recording on jobsites • Job reports • Maintenance • Construction work 	<ul style="list-style-type: none"> • Liaisons 	<ul style="list-style-type: none"> • E-medical records • Nursing care in wards • Care support • Drug administration management 	<ul style="list-style-type: none"> • Emergency notices • Service/ Inspections • Gauge reading • Construction work
Information/ Viewing		<ul style="list-style-type: none"> • Order placement/ receipt • Signage 	<ul style="list-style-type: none"> • Information display in the branch 	<ul style="list-style-type: none"> • Reference of drawings 	<ul style="list-style-type: none"> • B2B2C signage • Showroom displays 	<ul style="list-style-type: none"> • Bedside devices 	<ul style="list-style-type: none"> • Information signboards inside universities
Special purpose	<ul style="list-style-type: none"> • GPS devices 	<ul style="list-style-type: none"> • EOS devices • Simplified POS 		<ul style="list-style-type: none"> • On-site monitoring (image) • Management of farmyards 	<ul style="list-style-type: none"> • Linkage with public wireless LAN 	<ul style="list-style-type: none"> • Devices for patrol 	<ul style="list-style-type: none"> • Future schools

1) Presentation in sites where sales take place

Sales representatives can bring smart devices (tablets among others) when giving details to their clients and use them to make effective presentations. Compared to PCs, smart devices have many advantages such as high-speed start-up, power saving features, and excellent operability on the user interface. Hence, there are hopes they will help improve the quality of presentations to clients and reduce meeting times.

2) Viewing of drawings and design data at job sites

Smart devices can be effectively used to view design drawings and work procedures at job sites for construction and maintenance work. Advantages of smart devices include network accessibility at any place, immediate start-up whenever necessary and portability (i.e., reduced weight). These are highly evaluated by users in this area.

3) Recording and viewing of data in clinical bedside/ nursing

In clinical situations, there has been significant progress in introducing electronic data systems such as electronic medical systems to handle data created by

physicians and nurses. Smart devices are considered to be promising as devices for inputting and reviewing data. Particularly, they are actively used to record information on-site thanks to their excellent portability, or to give detailed explanations to patients or to display data in operating rooms based on their high visibility.

3. Challenges in use for business process

As described in the previous section, companies have examined making positive use of smart devices in various sectors and under various business conditions. The use of smart devices by corporate users is predicted to accelerate in future.

However, while their area of use is expanding to cover various business scenes, some challenges are highlighted that are necessary to overcome when introducing smart devices into a corporate environment.

3.1 Security concern

The issue that companies most frequently cite when introducing smart devices is security. Particularly,

these two points could be reasons for serious concern:

- 1) Risk of information leakage caused by malware
 A diverse range of applications offered by device OS vendors (Apple, Google, etc.) are made available to smart device users. But this also means there are high risks of being infected with malware through the market. Meanwhile, the security of applications registered in the market largely depends on the countermeasures implemented by OS vendors. Therefore, many users are voicing concerns about malware that comes from the market and infects devices, makes unauthorized access to business systems and leaks information from the devices.
- 2) Concerns about entire system security including devices
 Little time has passed since smart devices came to penetrate the market and there are only a few examples in which they are connected to corporate core systems. Therefore, many users are concerned about being able to guarantee complete security from each device to the application layer, when these devices are

connected to business systems.

3.2 Affinity with business systems

In most business systems currently used by corporate users, Windows is assumed to be the OS used by devices. Because of this, the great majority of business applications run a Windows OS (**Figure 1**). Considering this situation, some failures associated with differences in OSes and browsers could occur among each layer, such as application layers, service platforms and networks, when connecting smart devices to existing business systems. Further, because the OS for smart devices tends to be updated quickly, intensive work is needed to verify the variance of functions between OS versions, to revise device applications, and to reflect revisions in business systems and service platforms at every update.

3.3 Complicated system introduction

When connecting smart devices to a business system, procurement and deployment work for system

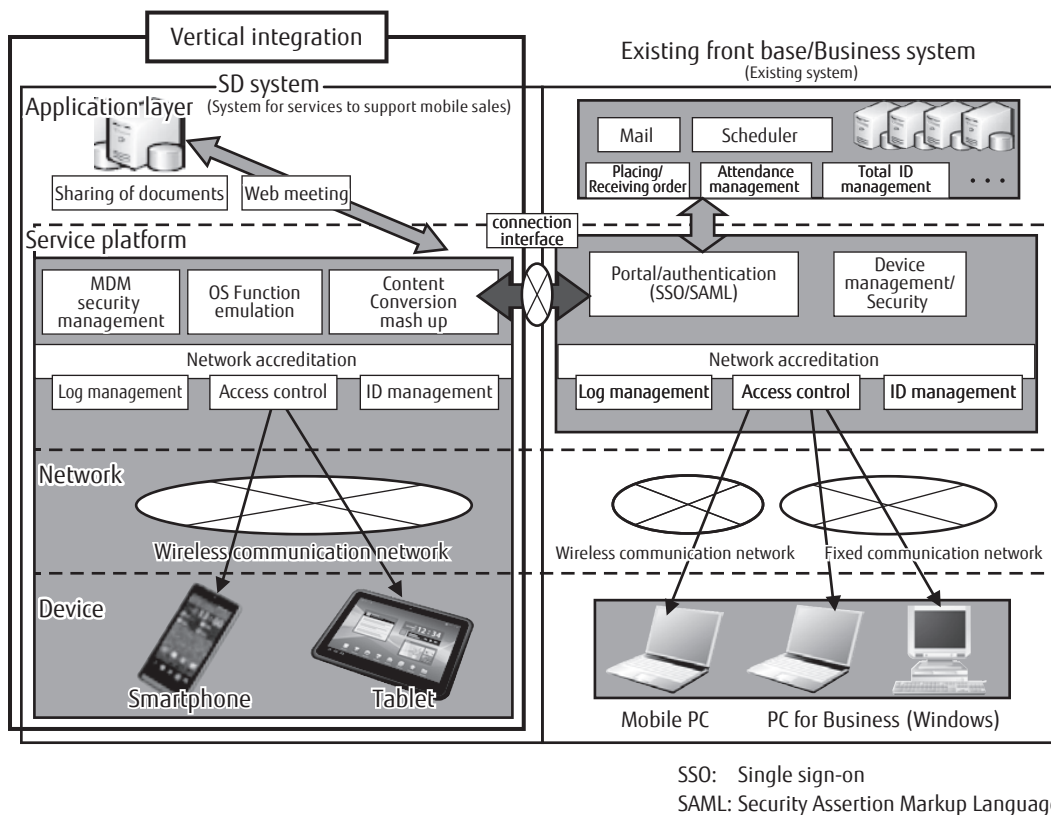


Figure 1
Existing business system (right) and system for smart device (SD) (left).

introduction are necessary in each component of the service platform, network and device (smart device). Therefore, when a corporate user tries to purchase each component, such user must enter into a license contract with individual service providers for service platforms, networks and devices, respectively. This situation applies also to the validation work accompanying system modifications.

4. Approach for solution

We consider that the following approach will allow smart devices to be seamlessly connected to a corporate business system while addressing the issues cited in the previous section.

Figure 2 shows a schematic image of the entire concept of the introduction format based on vertical integration. This concept is characterized by a streamlined configuration centered on a common service platform from the device to be introduced through the

network and service platform to the application layer to be used. This system is linked with the existing corporate business system via a connection interface.

This introduction format based on vertical integration brings great advantages including simplified countermeasures against the issues cited in the previous section, and the provision of a one-stop solution (or possibility of early resolution) to these issues.

Details of the system are described below.

4.1 Security countermeasures

Applications installed on devices are monitored by Mobile Device Management (MDM) arranged on a system dedicated to smart devices (hereafter "SD system") as shown in Figure 1. Further, user logs on the connection interface are monitored at the same time as the application is monitored. Through this mechanism, it is possible to prevent devices from being infected by malware, while unauthorized access to the existing

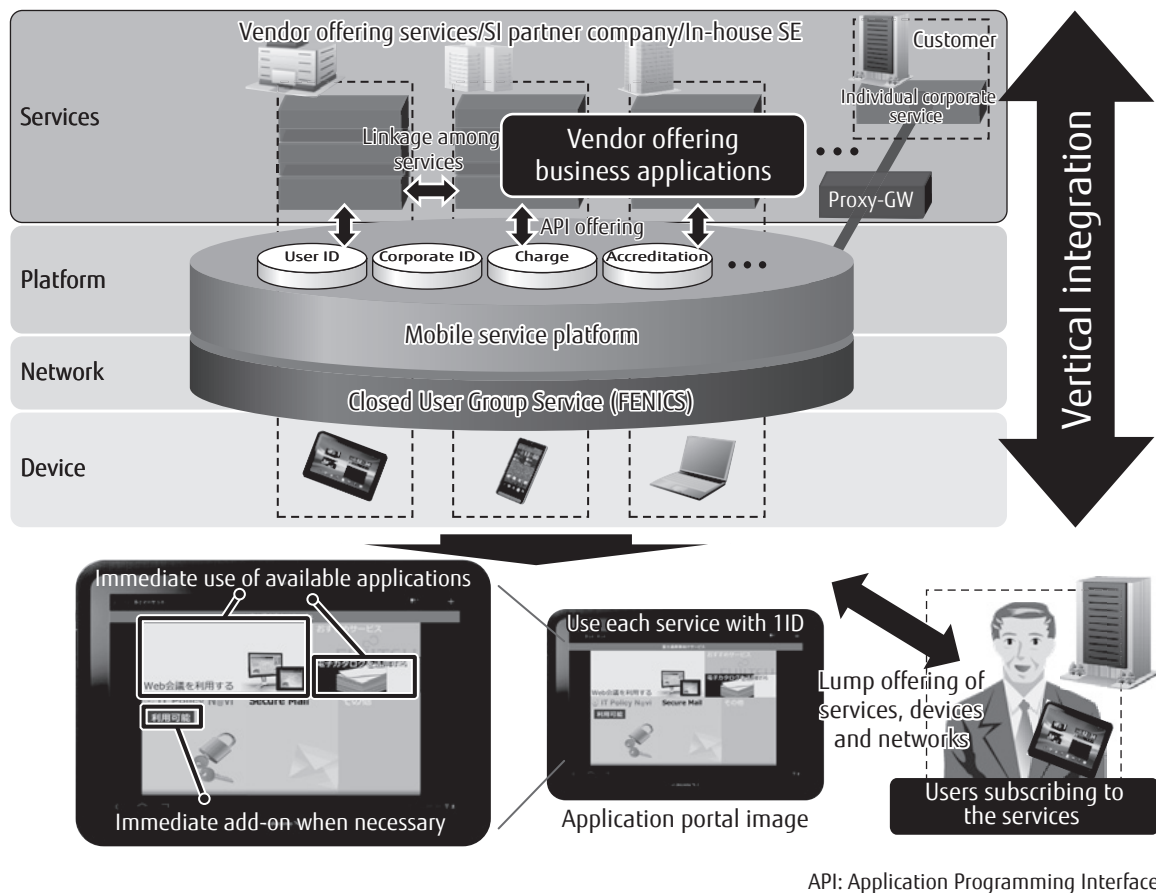


Figure 2 Offering of service in vertical integration.

system can be blocked by restricting access with the API once malware has intruded. Besides, the security of the entire system can be guaranteed by monitoring the whole system including the device, network and service platform using malware detection software on the service platform. To enhance the security of devices, a function to adapt each device to operation policies remotely actuated by an MDM administrator is offered, such as a function to erase unnecessary applications or change device settings.

4.2 Guarantee of connectivity with business systems

The challenges associated with connecting to business systems can be roughly divided into guaranteeing accessibility that could be affected by devices that have different OS functions, and the issue of the intensive work necessary to assess validity when a countermeasure based on system development is taken to address the foregoing issue, as already mentioned in the previous section.

With regard to the countermeasure to address the different OS functions that devices have, a function could be deployed on the service platform to convert or handle variances in OS (and browser) functions. This configuration should ensure that devices can access each corporate business system after converting the functions specific to smart devices. With this configuration, it is possible to negate difference among OS versions at the service platform upon updating a device OS. This reduces the labor necessary to modify corporate business systems whenever an OS is upgraded.

With regard to the work necessary to assess validity, the area susceptible to modification is limited to the connection interface on the service platform in existing systems. Therefore, it is sufficient to assess and validate the connection interface in the existing system. Further, in constructing an SD system, it is possible to guarantee that the system is stable by introducing a device, network and service platform with guaranteed connectivity as vertical integration. As a consequence, the amount of system development necessary to construct each system can be reduced and the amount of validation work can be minimized.

4.3 Reduction of time necessary for system introduction

In introducing an SD system (left-hand side of Figure 1), one-stop procurement of all the components is offered instead of individually purchasing each component (service platform, network and device). For corporate users, connectivity of components is guaranteed by accepting this one-stop offering and it is possible to reduce the workload associated with entering contracts for individual procurement.

The system introduction approach based on this vertical integration format makes it easier to resolve various technical issues to be considered at system introduction in the conventional approach. Further, by introducing a system with a SaaS format via the cloud environment, corporate users can connect smart devices to their systems only by paying the costs depending on the amount of access and traffic they actually use. Thus, companies can use smart devices for business at an earlier stage and at far more affordable costs compared to using a system that they construct themselves.

Another advantage of vertical integration is the ability to promptly plan solutions and take actions in the event of any system disturbance in the system operation process. This is because the causes of any failure can be identified and verified across the entire system in a streamlined manner.

5. Introduction of individual services

In the previous section, we described the effects and advantages that corporate users can obtain by introducing smart devices based on a vertical integration format including network and services. Fujitsu is engaged in developing and improving products and offering methods suitable for various business sectors and business conditions. It is doing so as one of the small number of Japanese ICT vendors that can offer a whole range of items from devices through networks to services and solutions in a vertical integration format by making positive use of its strengths.

Some of the specific services that Fujitsu plans to offer are introduced below (Figure 3).

This service is called mobile sales operation support service, and it merges multiple business processes in corporate users. To be specific, a series of operations such as outlining details of products at sites where



Figure 3
Mobile sales operation support service.

sales take place, viewing reference data in a paperless way at meetings, distributing intra-company data (documents, files, etc.) in a timely way, and using an E-brochure function mainly for sharing data are combined with a secure closed-circuit network connections and linked with business systems.

With this system, sales representatives can be freed from the need to carry around a large amount of data. They can use a Web-meeting function to allow backroom members to remotely support meetings. Further, by connecting a company's ordering system with smart devices, they can conduct inventory checks and place or receive orders on the spot. Above all, the system means that they can overcome the traditional issues, and not miss business opportunities and improve business efficiency and cut sales costs.

6. Conclusion

Since the inauguration of the smart device market in 2009, smart devices have been accepted by consumers at a rapid pace. Along with this trend, smart

devices are expected to be further used in business. Companies need to integrate smart devices into their existing business systems at an early phase. The vertical integration approach described in this paper is considered to be a very effective method to overcome a series of issues associated with this service in terms of ensuring security, guaranteeing connectivity with existing systems, and rapidly constructing systems.

Fujitsu plans to further reinforce its product and service portfolio for vertical integration in future so that corporate users can introduce smart devices more smoothly and easily.

We hope that the mechanism and approach explained in this paper will be of some assistance to corporate users who are interested in introducing smart devices.

References

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