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# FOREFRONT OFFICE IN SERVICE SYSTEMS: CONCEPT AND DESIGN

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## Abstract

Conventionally, service systems have been considered to comprise two main offices: the front office and the back office. However, a new managerial office is needed to relate customers with technology as technology-based services play a critical role for customers prior to two main offices. Nevertheless, there is no attention to management of this new area. In this sense, this paper suggests a novel concept of the “forefront office” as the new area to represent service activities. The forefront office is defined as a service facility which allows customers to be provided with services by themselves using technology-based services prior to the front office. For design of the proposed forefront office, a modified service blueprint is proposed. Following on the design structure of the forefront office, three topologies of the forefront office are also proposed based on the modified service blueprint. The forefront office is expected to reduce labour costs and improve customer satisfaction in terms of mass customization.

**Keywords:** Forefront Office, Technology-based Services, Topologies, Modified Service Blueprint, Service System Design

## Introduction

Service system design has been considered as an important task in service management [1] [2]. In service systems, importance of a customers’ role has been increased since customers take an active role as a coproducer or partial employee [3] [4] [5] [6]. Conventionally, the service systems have been recognized to comprise two main offices based on the degree of customer contact with service providers: the front office and the back office [7] [8]. As technology has enhanced service systems, however, service systems are no more treated as the two offices. This is especially true of technology-based services which are service activities between customers and technology to provide services efficiently in service systems [9] [10]. Conventional offices have limitations to represent these activities. Service companies’ efforts to integrate technology-based services into service systems are increasingly high in the

practical fields due to social, operational, and economic issues [11] [12] [13]. As numerous studies have proved the positive performance of technology-based services for customers [12] [13] [14] [15], technology-based services play an important role to support processes for customers prior to interaction with service providers in the front office. Technology-based services have enabled customers to be provided with services by themselves ahead of the front office [11] [16]. In other words, this allows the delivery of services regardless of contact with service providers in the front office. It indicates that they help customers to be provided with services in a “fore” area of the front office regardless of service providers. Nevertheless, there is no consideration about this new area to design and manage technical support for customer actions ahead of the front office. So far, most studies on design of service systems have simply recognized this fore area to be parts of service activities rather than an essential area in service systems [17] [18]. Therefore, the study on an additional office remains as a void for holistic service systems.

In this sense, this research aims to suggest a novel concept of the “forefront office” in service systems to fill up the void. Prior to the outset of further research, the forefront office should be clearly defined. The forefront office is a fore service facility of the front office which enables the customers to deliver their required services by themselves regardless of interaction with service providers in the front office. Consequently, adding the forefront office is helpful to management of relationships between customers and technology in detail.

For management of the forefront office in service systems, it should be designed systematically. As means for design of the forefront office, a modified service blueprint is suggested in this paper. The service blueprint has been graphically useful and understandable [19] [20] [21]. Unlike previous research on the service system design, however, two main reasons the service blueprint cannot be a tool as design of the forefront office occurs. First, it views the customer actions as activities between customers and service providers whereas the forefront office focuses on customer actions as the new office which aims to represent interaction between customers and

technology. Second, it is difficult to draw different relationships between the forefront office and another office. Therefore, service blueprint will be modified by adding new layers and lines. It is expected to capture holistic service systems with the forefront office.

More importantly, it should be noted that the forefront office can have different characteristics and structures according to types of relationships between customers and technology. In this regard, this paper also shows topological types of the forefront office for identification of each characteristic and management of relationships. The topology can be useful for visual design of whole relationships easier to understand.

The remaining part of this study consists of four main sections: concept of the forefront office, design of the forefront office, topologies of the forefront office, and conclusion and future research. Firstly, following on from a literature review, the concept of the forefront office is introduced in service systems. Secondly, this paper focuses on designing the forefront office using the proposed approach, the modified service blueprint. Also, several topologies of the forefront office are suggested based on the modified service blueprint. Finally, this paper ends with conclusion and proposes future research.

## Concept of the Forefront Office

### Past Research on Service Systems

In general, three approaches to the service system design are considered [2]: a production-line approach, a customer as a coproducer approach, and a customer-contact approach. With these approaches, service systems are divided into the front office with high-contact operation and the back office with low-contact operation [7] [8]. Firstly, the production-line approach attempts to translate a successful manufacturing concept into the service sector. It gains a competitive advantage with standardization of repeated services in a controlled system to ensure consistency and efficiency. For the successful production-line approach, service systems are designed through the division of labours, the substitution of technology for people, and the service standardization [2] [22]. Secondly, the customer as a coproducer approach encourages active customer participation in the service process [3] [4] [5] [20]. This approach also enhances the competitive advantages of cost leadership by reduction of labour costs. For example, as customers are involved in service systems by self-services, customer participation increases the degree of customization.

Compared to the production-line approach and the customers as coproducers approach, the customer-contact approach refers service systems

to the perspective of both approaches to justify different customers' requirements and maximize the efficiency. According to a customer contact approach, the service systems are separated into high- and low-contact customer operation [7] [23]. The low-contact operation, which is also called as the back office, is run as manufacturing to increase efficiency. In this regard, the production-line approach is usually organized in the back office. In contrast, the high-contact operation, which is also defined as the front office, is based on customers as coproducers to achieve customization. Meanwhile, a concept of "mid-office" proposed to investigate a linkage as a platform between the front office and the back office in the financial institutions. The purpose of the mid-office is to operate different kinds of back offices [24].

Recently, performance of service systems have been enhanced as technology is being evolved towards a support to customer actions [12] [16] [25]. In addition, the characteristics of service systems have been changed since customers directly operated technology-based services in various service fields [2] [12] [15]. It allows customers to be provided with services regardless of contact with service providers. Customers can deliver services by themselves ahead of the front office. It is supporting the need to design a new service office based on customers and technology.

### Impact of Technology-based Services on Service Systems

As impact of advances in technology on service systems are increasingly high, a number of studies are conducted concerning classification of technology-based services for how to relate technology with customers and servers [2] [9] [10]. In practice, five types of technology-based services were suggested in terms of relationships among customers, service providers, and technology as shown in Figure 1 [9] [10].

Technology-free services have no relationships with technology as shown in Figure 1. In this case, technology does not play a direct role and customers have direct interaction with service providers. Most professional services such as law and consulting are involved in this type. Based on technology-free services, technology-assisted services have one more relationship between technology and service providers as shown in Figure 1(b). This provides the support systems or tools for service providers to deliver services efficiently. In technology-assisted services, technology is incorporated to streamline service processes by supporting the service providers. This mode has usually worked in the back office.

However, Figure 1(c), 1(d), and 1(e) have been developed as the interface to deliver services

for customers. The most significant distinction is the relationships between customers and technology compared to Figure 1(a) and 1(b). The virtual service area can be emerged from these relationships such as call centers and web sites. Technology-facilitated services relate customers with service providers by access to the technology. For example, the service provider shows seats available on a video monitor in a theatre. In contrast, technology-mediated services have no direct relationships between customers and service providers. The reservation system through call centers is one of the popular cases for this type. Finally, technology-generated services are characterized by direct relationships between customers and technology. In this case, the service providers are totally replaced with technology that allows customers to deliver services by themselves.

In summary, technology-based services are a support entity for either service providers or customers. However, it should be noted that this study is to design the forefront office to represent direct interaction between customers and technology. Therefore, the scope of this study includes the technology-based services which are related with customers, Figure 1(c), 1(d), and 1(e).

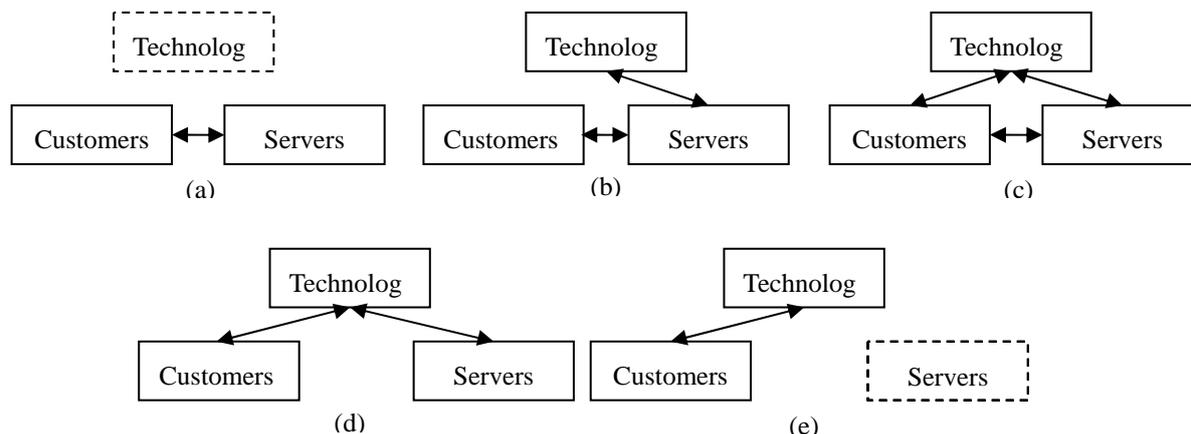
#### Proposed Concept: the Forefront Office

As reviewed above, the front office is the service facility which is designed from the customer's perspective due to the high degree of customer contact. In the front office, service providers have tried to satisfy various customer needs based on

back office to improve the efficiency and assist the service providers' work [7] [8]. Recently, however, technology also plays important roles for customer actions ahead of the front office.

Since technology has changed characteristics of service systems for customers, technology-based services are becoming one of the most challenging issues. Technology-based services can facilitate and mediate service activities between customers and service providers for both efficiency and customer satisfaction concurrently [12] [15] [16] [25]. Moreover, they allow the customers to self-serve as the producer, not the coproducer [2] [12]. It indicates that customers can be provided with their required services ahead of interaction with service providers.

In this sense, this paper suggests the forefront office which focuses on relationships between customers and technology ahead of the front office. Compared to the conventional two main offices, the forefront office has distinct characteristics in terms of the degree of customer contact, actors, strategy, purpose, and service areas, as summarized in Table 1. The forefront office can be used to substitute technology for service providers and assist directly customer actions using technology. Fundamentally, actors in the forefront office are the customers who operate technology-based services by themselves. Accordingly, although the degree of contact is high, technology-based services supports low costs and high customer satisfaction since the customers are less or not dependent on service providers. They can also satisfy various



**Figure 1.**

**Types of technology-based services: (a) technology-free services, (b) technology-assisted services, (c) technology-facilitated services, (d) technology-mediated services, and (e) technology-generated**

direct contact. On the other hand, the back office is operated in a factory-like environment to improve efficiency through standardization because the degree of customer contact is very low. In the back office, many support and management tools are being implemented for efficient service processes. Technology has been applied as support tools in the

requirements of customers with provision and delivery of customized services. It indicates that the forefront office can achieve improvement of both efficiency and customer satisfaction in terms of mass customization. Consequently, the forefront office is defined as the service area ahead of the front office where customers provide and deliver

services regardless of service providers in order to take full advantage of both the back office and the front office.

**Table 1.**  
Comparison of the forefront office between main offices in service systems

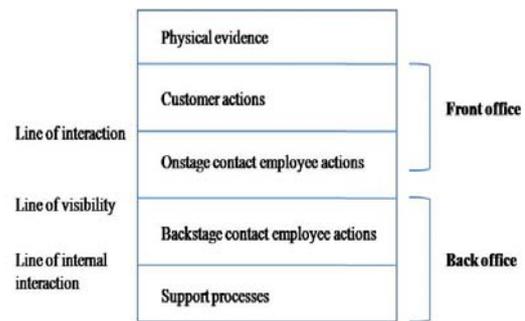
|                            | Back office       | Front office                 | Forefront office                  |
|----------------------------|-------------------|------------------------------|-----------------------------------|
| Degree of customer contact | Low               | High                         | High                              |
| Actor                      | Service employees | Service employees, customers | Customers                         |
| Strategy                   | Standardization   | Customization                | Mass customization                |
| Purpose                    | Efficiency        | Customer satisfaction        | Efficiency, customer satisfaction |

### Design of the Forefront Office

#### Conventional Design Tool: Service Blueprint

For strategic development and management of service systems, the service blueprint is one of the most useful and widely used methods. The service blueprint was initially developed to visualize service systems by Shostack [19] [21] and since then, extended further by Kingman-Brundage [26] who called the service blueprint as the service logic map. The service blueprint is defined as “a picture or map that accurately portrays the service systems so that the different people involved in providing it can understand and deal with it objectively.” [18] It has been utilized in many service industries such as a hotel, hospital, and airport industry for different purposes: process design, visualization, and diagnosis of service failures [1] [19] [21] [26]. Most cases have investigated service activities which relate the customers and service providers, and manage possible service failures during service processes.

The service blueprint consists of two dimensions. On the one hand, the horizontal axis takes account of activities and relationships during the service processes. It represents how service providers interact with customers for management of service systems. On the other hand, the vertical axis comprises five areas of actions: physical evidence, customer actions, service employees' actions in onstage, service employees' actions in backstage, and support processes for service providers. The lines which separate the areas of actions are identified for interaction of service processes between areas. The line of visibility especially divides service systems with the front office and the back office as shown in Figure 2.



**Figure 2.**  
Architecture of the conventional service blueprint

As a further study of the service blueprint, the service logic map was also proposed [26]. This design tool considered customers', employees', and technical logics of services in order to suggest the integrated system of service logic. In the perspectives of the service logic map, the bottom of the service blueprint was divided into the support zone and the management zone. Planning, managing, and controlling activities are described to supervise the service processes in the management zone. In general, technology-assisted services can be used in the support processes to control service processes for service providers efficiently and effectively. As a result, the service logic map has advantages on the design of the back office in detail for satisfying customers' needs.

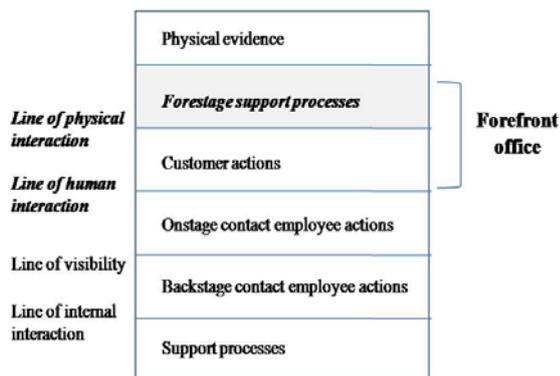
However, the design of the relationships between customers and technology for technology-based services still remains as a remarkable issue in order to structure and visualize more actual integrated service system. As reviewed above, none of the previously developed methods suffice the characteristics of the forefront office, further supporting the need to design a new design tool.

#### Proposed Design Tool: Modified Service Blueprint

Taking the issues faced through the previous service blueprint into consideration, the service blueprint for the forefront office is modified as shown in Figure 3. Compared to the conventional service blueprint, the modified service blueprint has two significant changes.

Firstly, forestage support processes is added on the front office. The forestage more focuses on the technology-based services with respect to customer actions regardless of service providers ahead of the front office. This change is helpful to representation for relationships between customers and technology. Also, it takes account of the relationships with another stage in holistic service

systems as the interface. Secondly, two line of



**Figure 3.**  
**Proposed architecture: modified service blueprint**

interaction are employed by as a result of the first change: the line of physical interaction and the line of human interaction. The line of interaction in the conventional service blueprint is divided into the physical interaction and the human interaction to represent customer–technology and customer–service providers relationships from the first change, respectively. These lines are provided to identify and portray the relationships among customers, technology, and service providers more specifically in the forefront office.

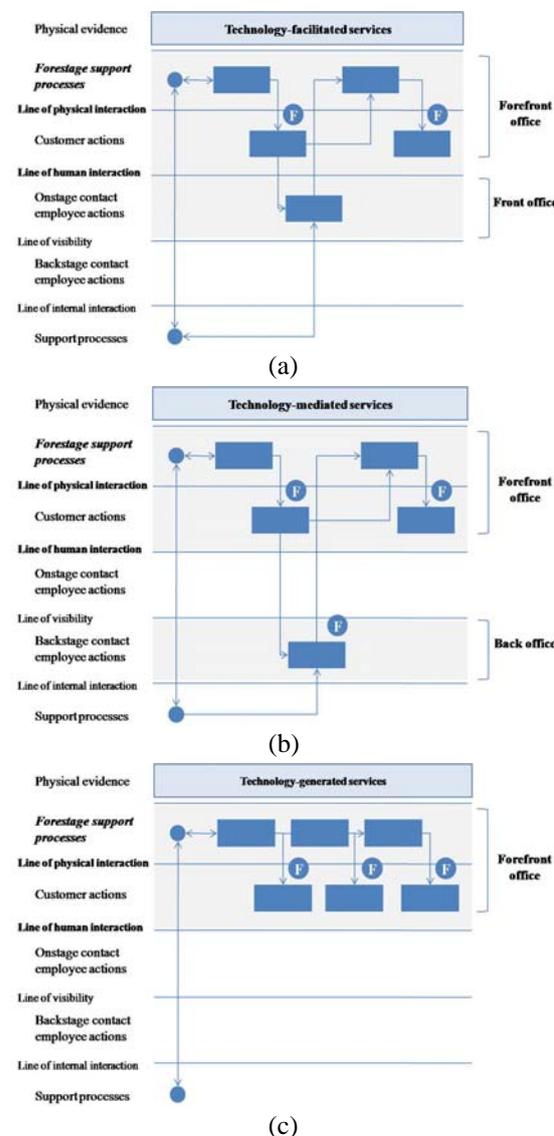
In summary, the forefront office consists of two areas, the forestage support processes and the customer actions. It also contains two interaction lines between the layers and the areas. These changes allow the holistic design of integrated service systems. In the next step, it is used for classification of the forefront office topologically linking customers with technology-based services and service providers.

**Topologies of the Forefront Office**

In this section, three types of the forefront office will be suggested with further attention to topological design for management of service systems. Overall, design of the forefront office is following on the forestage support processes and two lines of interaction. Based on the forestage support processes, the three topologies can be identified with different connections between the forefront office and another office using the modified service blueprint. Also, topologies indicate how customers interact with technology and service providers in terms of two line of interaction. It visually represents the service activities and relationships with the forefront office in an initial phase of service system design.

**Incorporating the Forefront Office into Modified Service Blueprint**

Figure 4 shows three topological structures of service systems regarding the forefront office: the forefront-to-front topology, the forefront-to-back topology, and the forefront-only topology. The



**Figure 4.**  
**Topological design of service systems based on the forefront office: (a) forefront-to-front topology, (b) forefront-to-back topology, and (c) the forefront-only topology**

topology visualizes how to relate the forefront office with another layers or offices. Moreover, it provides valuable information for building service systems with technology-based services. In the figure, a circle stands for the technology and a square means a service entity. Also, an arrow represents processes in service systems.

Firstly, the forefront-to-front topology is suggested to connect the forefront office with front

office as shown in Figure 4(a). This topology aims to assist service providers through connection with customers ahead of the front office. It is used to facilitate service delivery in case parts of service activities are delivered from service providers due to the security or difficulty in use. In the forstage, customers are provided with services by themselves which are delivered from service providers in the front office. Secondly, the forefront-to-back topology is proposed to link the forefront office to the back office as shown in Figure 4(b). It is still quite similar with Figure 4(a), but there is no direct contact with customers adopting technology. Therefore, this topology seeks to mediate service activities between customers in the forefront office and service providers in the back office without direct interaction. It is used to overcome the spatial limitation, and thus, it saves labour costs and transaction time. Finally, the forefront-only topology indicates that the customers and technology are strongly coupled as shown in Figure 4(c). This topology is designed for enabling customers to be provided with services by themselves in any situation. Using this topology, the forefront office can reduce labour costs and increase customer satisfaction.

Each topology can provide a useful guidance to picture three types of forefront office in terms of advantages and disadvantages of technology-based services. The topology plays a critical role to design service systems in developing the successful service systems. A service manager can design or redesign their service systems with different purposes such as the facilitator, mediator, or generator. This implies that topologies are significant in that it encourages effective decision making in adoption of relevant service systems, and ultimately it considers improvement of both efficiency and customer satisfaction.

### Conclusion and Future Research

Although interest in technology-based services for customers is increasing, yet, systematic design of the service office for relationships between customers and technology still has not been fully suggested. Therefore, this research suggested the forefront office in service systems. It defines a fore service office of the front office with technology-based services. Also, the modified service blueprint was also proposed to design the forefront office with the forstage support processes. This is not only to provide detail information visually, but also to design service systems easier to understand. Based on the modified service blueprint, three topologies of the forefront office are developed for the service manager to provide the useful guidance. According

to topologies, service managers can obtain an insight to design appropriate service systems regarding interdependent relationships.

Through this research, two major contributions can be found. Above all, concept of the forefront office is firstly suggested in this paper. The area which represents relationships between customers and technology has not been considered in the previous research although customers play a critical role to provide services with technology. In this regard, this paper proposed the necessity and characteristics of forefront office in service systems. Consequently, this allows a service manager to fill up the void for holistic design of service systems including the front and back offices. Next, topologies of the forefront office can be used to manage service systems with different purposes. The topology provides useful information for a service manager to design or redesign service systems with respect to resources and infrastructures. According to each topology, service systems have different performance in terms of efficiency and customer satisfaction.

Despite critical contribution, this study has also two limitations which should be overcome in the future research. First, as the degree of technology integration is higher, service failure can be increased. Therefore, evaluating the forefront office should be conducted for validation. Although this paper claimed that the forefront office improves the efficiency and the customer satisfaction in terms of mass customization, the performance has not been identified regarding the service failure. Second, a selection of the most appropriate topological design should be considered by as a result of the first limitation.

With these limitations, the case study is being currently carried out for evaluating performance of the forefront office and selecting the most appropriate topology. In order to verify usefulness of the forefront office, the simulation will be attempted as the future research.

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