

扩展服务蓝图描述法：描述包含软件的服务^①

张 力^{1,2,3} 倪宇林^{3,4} 陈 钟^{1,2,3,4} 司华友^{1,2,3}

(1.北京大学 信息科学技术学院 北京 100871; 2.高可信软件技术教育部重点实验室 北京 100871;
3.北京大学 ACOM 金融信息化研究中心 北京 100080; 4.北京大学 软件与微电子学院 北京 102600)

Extending Service Blueprint to Describe Software-Included Services

Li Zhang^{1,2,3}, Yulin Ni^{3,4}, Zhong Chen^{1,2,3,4}, Huayou Si^{1,2,3}

- (1. School of Electronics Engineering and Computer Science, Peking University, Beijing 100871;
2. Key Laboratory of High Confidence Software Technologies, Beijing 100871;
3. PKU-ACOM Financial Information Research Center, Peking University, Beijing 100080;
4. School of Software and Microelectronics, Peking University, Beijing 102600)

Abstract: Since software has infiltrated in many services, designers need to consider service design and software design as a whole. This paper provides a novel service description method by adding a line of software in service blueprint method based on the discussion of software-included services.

Key words: service; service blueprint; service description; service design; SSME

1 Introduction

Since information technology (IT) vendors have rushed to position themselves as commodity suppliers or even as utilities^[1], computers and software have infiltrated in every corner of businesses including service businesses. In this situation, service providers should have concern with the software, which might be included in every stages of services production.

Presently, the use of software is existing in most service production. Software is becoming a critical part of many recent service systems. In order to apply software in an appropriate way, in harmony with other parts of service, we need try to find a way to solve these old business-IT alignment problems.

Since software is a part of service, software design should not be separated from the service design stage. Designers need to consider them as a whole, otherwise they will not get a seamless software-included service system, which may bring negative influences of customer's perception quality of the service.

Service blueprint (SB) method is the most widely used service delivery description method. By now, when designers blueprint the software-included services, they always describe the software activities under the line of internal interaction and treat the software processing as support processes of service deliveries, but in fact, the using of software could be appeared in the every stage of service delivery not only in providers' side but also in the

^① Supported by the National Natural Science Foundation of China under Grant No.60776163; the PKU-ACOM Financial Information Research Center(PAFIRC) Projects under Grant Nos.18-IC-037,18-IC-044

customers' side.

This paper provides a novel description method of software-included services by extending the recent SB method. In Section 2, we analysis the software-included services and separated them into four classes; and in Section 3, we extend the SB method by adding a line of software.

2 Software-Included Service Analysis

In recent service design research papers^[2-8], no software-included services have been ever discussed before. In this section, we analyze them based on the depth of software participating in the interaction between service providers and service customers. In our discussion, four categories of software-included service will be examined.

In Fig.1, squares are noted as a service system. In the square, customers and providers are separated by a dotted line, which is the line of visibility. Service customers cannot feel the artifacts that exist below the dotted line. We use rectangle to delegate a software system.

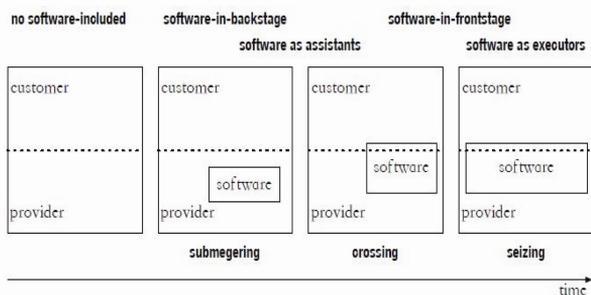


Fig.1 Software-included services and the trend of service evolution

The first square from the left side of Fig.1 shows the services with no software included, just like every traditional service.

The second one shows the software is in the backstage. It makes the information or data fluently flowing between staffs of the service company. Just think about a waitress who holds a personal digital assistant (PDA) and helps you order your dinner in a restaurant. Your orders will be transferred to the chef's working queue in a twinkle. Software in the backstage will increase the productivity of service preparation.

When software moves up and over the line of

visibility, it formally joins the service delivery. In this situation, providers should pay attention to their user experiences of software using, which is included in service consuming.

The third square from the left side of Fig.1 shows the software joins service as assistance. In this kind of service system, service provided by software is just a value-added service, and face-to-face services, or human provided services, are core services. For example, during the delivery of career planning consulting service, a customer always needs to fill a questionnaire with a computer in order to determine her or his personality and temperament before having a conversation with consultants. Another example is that you always need to register through the Internet firstly, and go to the dental clinic to check your teeth next. Software in such kind of services is used to provide convenience to both providers and customers. It could produce some beforehand information to help providers deliver the core services better.

The fourth square of Fig.1 shows the services, which are mostly delivered through software. Most of such services are information processing services. Companies, which provide such kind of services, do not deliver face-to-face services any more except for physical contacts or material objects exchanges. For example, in online book purchasing service of Amazon.com, face-to-face service only may appear in the hardcopy delivery. Even the publication delivery is just a little part of Amazon.com's service package, it is not directly provided by Amazon.com itself. Another example is information searching service of Google.com. The software is exposed as a service provider, and customers directly face it. The interaction between customers and Google's software form the delivery of service without staffs involved. Software in such kind of service work as main service executor.

There is a trend of service evolution, that is, software will take possession of service delivery gradually. The first stage is submerging. In this period, software starts to enter the traditional service system as an information management tool, and it could help the organization rapidly exchange information between staffs. The second stage is crossing. In this period, software will cross the line of visibility to expose its

existence, and it becomes value-added services. Software could help the information rapidly exchange between staffs and customers. The third stage is seizing. In this period, software will occupy most of the line of visibility and become the main medium of service delivery.

We will use the evolution of medical services as an example. In the traditional medical service, the patients get prescription from the doctor firstly, then pay for the bill according to the prescription, and finally take medicine from pharmacy with the checked bill. With the emergence and development of IT, software submerges into the medical service. Most hospitals have used billing and other software to make the information transfer rapidly among various departments, saving the time of medicine preparation, accordingly reduce the customer waiting time. After that, software crosses the line of visibility. The patients can book the doctor through the online register system. This software further provides convince and saves valuable time for both the patients and staffs. And now, software is going to occupy the line of visibility, just like the telemedicine service provided by Parle Hospital Telemedicine Center¹, the patients can interact with doctors through using telemedicine software and some other medical equipment.

One thing should be emphasized is that in seizing stage, software will not totally cover all interactions in services. And we do not argue all services will evolutes from submerging to seizing. A lot of services including physical contacts, like massage service, material object exchange, like food providing service, and so forth will stay in crossing stage and they could not be totally seized by software.

3 Service Blueprint Extending

3.1 Service blueprint

In 1984, Shostack firstly introduced the service blueprint^[9], which was expressed as a concept in 1982 in paper [10], to extend his molecular modeling approach. SB method gives a huge impetus of service design.

SB method displays the service process graphically, and divides the actions in service into customer actions, onstage/visible contact employee actions, backstage/invisible contact employee actions, and support process.

Customer actions refer to customers' activities in the process of consuming and evaluating services; onstage/visible contact employee actions refer to employee actions which customers can see and directly interact with; backstage/invisible contact employee actions refer to employee actions which support onstage actions and customers can't see; support process refer to internal services and the activities to support service employees to perform the service. Four kinds of actions are separated by the line of interaction, line of visibility, and the line of internal interaction. In addition, customers may receive physical evidences in service process, shown above customer actions level. SB method is the current general approach to descript services.

SB method describes customers, activities, organization internal and external employees' activities in the entire service process, helping service managers know, design, manage, and improve the service. It encourages creativity, preemptive problem solving, and controlled implementation.

By now, when designers use SB to describe software in service delivery, they always simply put them below the line of internal interaction and treat them as support processes, like in papers [5,7]. But in fact, based on above software-included service analysis, the in-computer software activities could be appeared below or above all the three lines in the service blueprinting. Additionally, there is no clearly distinction of in-computer software activities and out-computer human activities in the recent SB description, so it is time to change.

3.2 Software-included service blueprint

In order to express the differentiations between the software activities and human activities, and improve the expression ability of SB, in this section, we extend the recent SB method.

Software could produce physical evidences, and according to above discussions of software-included services, software may appear below and above the line of interaction, line of visibility, and the line of internal interaction. So, we extend service blueprinting by adding a line of software. As shown in the Fig.2, the line of software vertically crosses those three lines and even crosses the area of physical evidences. In such extended blueprinting, activities in the right side of the line of

software are processed by software in computers, and evidences, those are shown on screen, will also be expressed in the right side of the line.

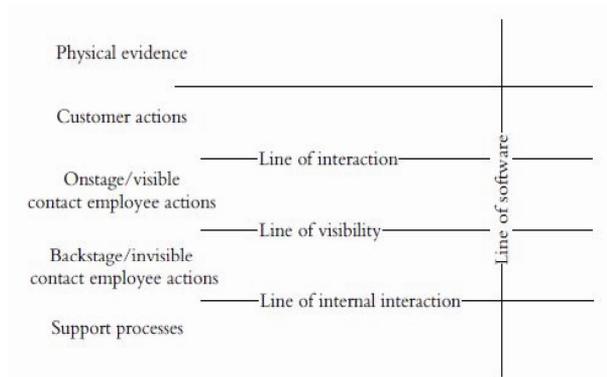


Fig.2 Extending service blueprint by adding a line of software

With the extended SB, one could describe all kinds of software-included services whether software act as assistants or as main executors. At the same time, line of software separates the human activities and software processing, it could help designers, including service designers and software designers, jointly design the software-included services.

4 Case Study

The leading micro-finance project of China is operated by China Development Bank (CDB) started in 2005. It provides operating loans to small enterprises, individuals and farmers. The credit arrange of micro-finance is from 1000 to 1,000,000 RMB and the time of it is not exceeded than 3 years. The technical assistance and credit funds of this project are provided by the World Bank and Kreditanstalt fuer Wiederaufbau (KfW).

Because of few branches, CDB needs to cooperate with partner banks (PB) to find the right micro or small enterprises (MSE) customers. So, CDB tries to provide loans and financial technical assistances to selected PBs and PBs operate the micro-finance practically. In such a case, CDB needs a direct and understandable way to transfer management concepts, processes, techniques and IT affairs of micro-finance service to PBs, and indubitably, the extended service blueprint (SB) method is a good choice to describe the business processes and IT affairs.

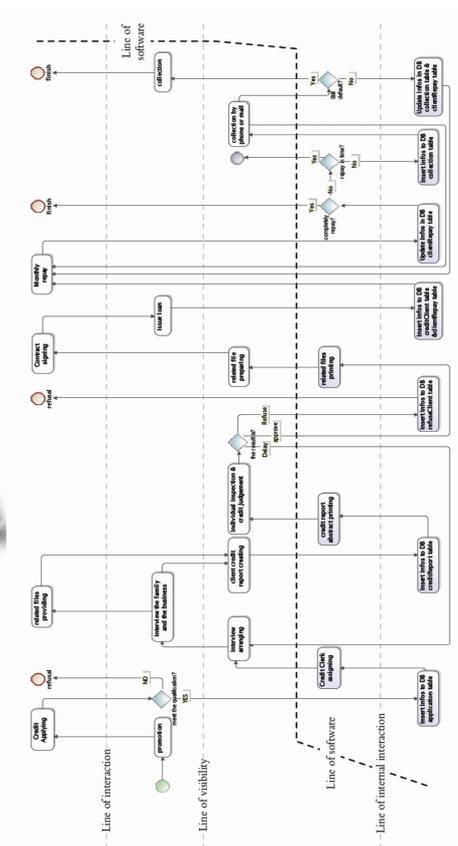


Fig.3 Marco view of extended service blueprinting of micro-finance service

By now, software in CDB's micro-credit financial service is in the stage of submerging, that is to say, service clients can not feel the existing of the software, which stays below the line of visibility. The use of software is in order to share and manage the customer information.

Software in micro-credit could be simply divided into business system, which focus on the customers and loans control, and management system, which focus on the internal affairs, such as, human resource management, credit clerks' performance management, finance management, etc. In our case, we focus on the business system.

We provide a macro view of business process of this software-included service with extended BP in Fig.3. In the blueprinting, procedures under the line of software are processed in computer. During the practice, we find that the line of software is not always a straight line. In order to maintain the neat of the blueprinting, we always need to split the procedures into two tiers, the upper is

human task and the lower is software processing, and put different procedures in the right tier, just like figures show. In the next step, we could extract the software requirements from the blueprinting.

5 Related Works

In 1982, Shostack proposed the first service design method, named molecular modeling approach^[10], which uses molecular structure to analogy the service structure. In the same paper, he introduced the service blueprint method, and in 1984, Shostack made a systematic exposition of service blueprint. In 1995, Congram and Epelman use activity model of structured analysis and design technique (SADT), later known as IDEF0, to describe and to design services^[11]. In their method, service is regarded as a set of activities. An activity is performed by mechanisms and transforms inputs to outputs under the controls. Mechanisms of an activity should be a human or a machine, and the controls should be policies or constrains. To connect inputs and outputs of activities will form service process. In 2001, Lovelock et al. used an extended flowcharting to design services and publish the method in their books^[12,13]. They extended the flowchart by indentifying the possible fail points, indicated with the letter F in boxes, and possible waiting points, indicated with the letter T on arrows. Those critical moments of truth will influence the customer's perception service quality. Same in 2001, Tomiyama propose a concept service modeling method inspired by function modeling^[14]. Shimomura et al. follow the concept in later years, and in-depth study the method and develop a software toolkit, named service explorer, to support the service modeling method and service design^[15-19]. They define three sub models named flow model, view model and scope model. A flow represents a stream of service; a view model represents the mutual influences of service elements' attributes; and a scope model represents the views of the whole service, it contains multiple view models. These service description methods are all focus on the service process itself. They should be improved to support the design of artifacts, which will be used during the service production.

6 Conclusions

According to the discussion in Ref.[21], a service

should be modeled as a quintuple, which are the service consumer, the service provider, the service medium, service contents and the service environment. With the development of information technology, software has soaked into services in different ways, sometimes it works as a service medium, which connects consumer and provider, and sometimes it works not so tight with customers, or customers even can not feel its existing. So, when we describe a modern service, we should take participating software into account.

In this paper, we extend the SB method by adding a line of software and the extended SB describes both human activities and software processing. It could combine service process design and software design. The extended SB provides a good communication platform for business personnel and IT staff. In software engineering, this method could help software engineering know the business quickly and help service designers to express the software requirements.

This novel method also contributes to software-included service management and innovation. It allows service managers to check their assumptions and find out possible shortcomings in advance. Managers could easily consider whether or not to have the software to replace staffs based on the analysis of extended service blueprint description. Based on our discussion of software-included service evolution, the software will gradually replace some human activities.

One limitation of this method is it increases the blueprint's complexity and needs participation of business personnel, IT personnel and manager and the completion of extended SB need well communication between them.

Besides, the increasing complexity makes the extended SB more complicated and less readable than before. In our case, we adopt hierarchical description to solve it. Top-level blueprint display the overall process of the microfinance service while different layers display different details. In the future, we will work on the service and software joint design methodology.

Acknowledgments We want to express our special thanks to Weimin Zhou, Ping Xia, Jin Pan and Lv Wang for their insightful comments and constructive suggestions. We also want to thank Dejiu Cai, Fei Wang,

Jiafeng Su and those who come from China Development Bank. Thanks for the cooperations in micro-credit financial service research project. This research is partly supported by National Natural Science Foundation of China under Grant 60773163 and PKU-ACOM Financial Information Research Center (PAFIRC) projects NO. 18-IC-037 and NO.18-IC-044.

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