Research Organization Servicelization Patterns

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ABSTRACT

Innovation in services has become a topic of interest to researchers due to the worldwide shift to "services" economics. This comes from the growth of services economies and the shift to services businesses by manufacturing industries, including IT-related industries. Innovations, in particular, service innovations are difficult to articulate their structures and mechanisms, due to intangibility coming from services characteristics, and a lack of languages to describe them. In the previous paper [1], we discuss the following two items for service innovation cases: 1. How can we capture the characteristics of innovations as patterns? 2. What are the categories of patterns for innovations? In this paper, I would like to focus on organizational and process aspect of research and service activities, which create service innovations.

Categories and Subject Descriptors

K.6 [Management of Computing and Information Systems], K.6.1 [Project and People Management]

General Terms

Management, Human Factors

Keywords

Servicelization, Service Innovation, Organization, Process

1. INTRODUCTION

Patterns and pattern languages are widely adapted not only technical area, but also social, organizational and management area. Fearless Change: Patterns for Introducing New Ideas" [2] provides patterns to introduce a new idea into an organization. The objective of those patterns is to build a community to discuss interesting ideas spreading the formal business organization. It includes the following pattern categories, Roles (Champion Skeptic, Connector, Corporate Angel, Early Adopter, Early Majority, Dedicated Champion, Evangelist, Innovator, Local Sponsor, Mentor, Respected Techie), Keeping the Idea Visible (e-Forum, Group Identity, In Your Space, Plant the Seeds, Stay in Touch, Treasure, Token), Dealing with Skeptics (Adopt a Skeptic, Champion Skeptic, Fear Less), etc. The structure of these patterns is Name, Context, Problem, Solution, Related patterns. James O. Coplien's "A Development Process Generative Pattern Language" [3] initially takes the structure of Name, Problem, Context, Forces, Solution, Resulting context, and Design Rationale. His book, "Organizational Patterns of Agile Software Development" [4], just follows the same structure of Alexander's pattern language. He developed four pattern languages, such as "Project Management Pattern Language", "Piecemeal Growth Pattern Language", "Organizational Style Pattern Language", and "People and Code Pattern Language", which have intersections of patterns each other.

Patterns and pattern language are widely adapted to software engineering areas, from an architecture level to a programming code level. Adding to the technical design areas, the pattern approach is used in organizations, processes and management areas. In this paper, I look into service delivery process which research organization is involved with to create service innovation. In service delivery projects, some level of involvement of the service receivers is necessary and inevitable. The involvement of the service receivers does not happen only at the beginning of the service delivery, but throughout of the service delivery process. The presence of service receivers creates strong functional interdependencies in a service delivery organization. This functional interdependence between service delivery and service research affects the research lifecycle and its management [5].

In the next section, I describe the following three key patterns of service delivery process.

2. Research Organization Servicelization Patterns

In service delivery, most of information is in intermediary project artifacts, which are hard to transfer, so I focus on the processes of the service delivery. To understand service research activities, I looked into ODIS projects as case studies. First I modeled traditional research activities as three steps: 1. Knowledge proposition, 2. Knowledge creation, 3. Knowledge repository, and the service activities are modeled as the following two steps: 1. Value proposition, and 2. Value co-creation. Knowledge Proposition (KP) is a planning step, when the initial idea of a research plan is developed. The following step Knowledge Creation (KC) is an execution step, which creates knowledge. After the knowledge is created, then it is described in papers and saved in repositories, such as research journals.
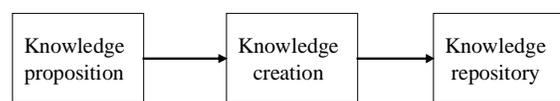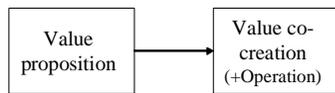

Figure 1. Research activities

Figure 2. Service activities

For service activities, Value Proposition (VP) is the step in which a proposal is presented to the receivers of the services. When the proposal has been accepted, then proposed value will be co-created by the service providers and the service receivers. The Value Co-creation (VC) step may include operations in which the service receivers use the created value in a value co-creation step.

Due to the interdependencies of the service delivery functions and the dynamic changes of the service project inputs from the service receivers, service research activities are not limited to traditional research activities, but include service activities in the research coverage. Based on the observed paths of the service research activities, ODIS, the following three patterns were found by focusing on the value co-creation step. An evaluation phase was excluded since it was the same in all cases.

- Closed pattern

- Interactive pattern

- Open pattern

1.1 Examples

The inputs and outputs of service research activities are considered as information processing for service systems. The service systems include people, such as service receivers and service providers. The outputs of the service systems are knowledge and knowledge embedded service systems, which are IT-based systems into which the created knowledge is embedded. The inputs of these service systems are mainly information from the service receivers, including end-users, who use the output of the service systems, such as knowledge embedded service systems. The inputs are based on intensity of the communications with the service receivers.

Using these two types of outputs (knowledge base and knowledge embedded service system), and inputs (high intensity and low intensity), we developed a conceptual framework of service systems, as showed in Table 1. Typical service projects are described in each quadrant of each pattern. Projects in the High intensity x Knowledge base quadrant are professional services. The open pattern of service research activities is mapped to this quadrant.

People involved process enhancement, such as CRM, and supported tools, such as Computer Aided Design (CAD), are typical projects in the High intensity x Knowledge embedded service system. These focus on the front stage of a service system, such as service receivers, referring to the theatre model of services by James Teboul. The interactive pattern of service

research activities is mapped to this quadrant. Optimization projects using standardized processes, such as SCM, are example of projects in the Low intensity x Knowledge embedded service system quadrant, which are mainly in the back stage of a service system. A part of the back stage service activities needs to be integrated with the front stage of the service system.

TABLE 1

SERVICE SYSTEMS FRAMEWORK: SERVICE PROJECTS CATEGORY

		Intensity of service receivers	
		High	Low
Produced value	Knowledge base	Professional services (Open pattern)	NA
	Knowledge embedded service system	IT supported front stage services (Interactive pattern)	IT supported back stage services (Closed pattern)

2.1 Closed Research Organization Servicelization Patterns

The traditional research activities for product innovation follow this pattern, so this may not have a problem to execute for research organization.
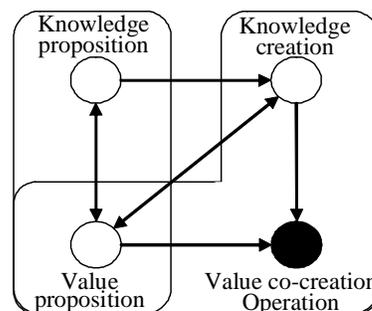
Example:

Figure 3 Closed Research Organization Servicelization Patterns

Context: The closed pattern in Figure 3 includes the patterns that end with the step of value co-creation (VC). This pattern is specifically used to solve the predefined problems in service systems. It tends to create knowledge without understanding the current service system. Output examples for this pattern are optimization of IT systems, which are IT-supported systems with enhanced logic created by automating standardized processes.

Problem: Requirements from service receivers are well defined. Research organization provides appreciate technology for the defined requirements from service receivers. If there is no

communication gap between service receivers and research, then this shows the similar process with the traditional research activities for product innovation.

Solution: Not so much difference than research activities for product innovation. When there is communication gap between service receivers and research organization, then it needs to have a translator role to have effective communication, such as consultants, science communicators, etc…

2.2 Interactive Research Organization Servicelization Patterns

In this pattern, knowledge are created after the value co-creation activities, which service receivers and providers (in this case, researchers) work together.
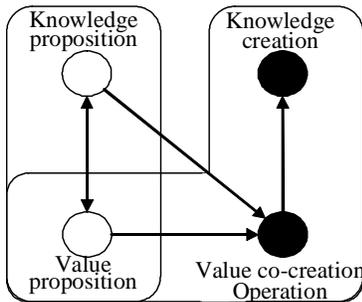
Example:

Figure 4 Interactive Research Organization Servicelization Patterns

Context: The interactive pattern in Figure 4 is for creating differentiated values for the current service system, so the researchers need to understand the current service system and do the activities for value co-creation. Output examples of this pattern are Customer Relationship Management (CRM) and Business Process Management (BPM), which are IT-supported systems to improve human-related processes by applying technologies, such as text analytics.

Actors are service receivers, and researchers. Service receivers are persons in service organization, who have request to improve the current situation. Researchers have research area and related technologies which might help a request of service receivers. The responsibility of service receivers is to describe the current issues and requests to solve the issues. The responsibility of researchers is to solve the issues and create service innovation to meet service receivers' requests.

Problem: Service receivers might not be able to express their request clearly. In addition, researchers do not understand their request or issues clearly due to a lack of local knowledge of service environment.

Researchers tend to stick to the current discipline area, and do not explore the issues from service receivers' point of views even though the issues might be solved by the technologies which research organization have or the extension of them.

Even if the key technology could be provided by researchers, but to realize requirements from service receivers, enabling technologies would be required to complete the solution. It would be necessary for researchers to keep interests to solve the entire solution.

Solution: Researchers need to learn local knowledge from service receivers by hearing and data analysis to understand issues and requirements of service receivers in the service system. Researchers work with service receivers to identify where research technologies could contribute.

Researchers need to recognize that research activities for service innovation could not be executed separately from service receivers.

2.3 Open Research Organization Servicelization Patterns

In this pattern, the initial step starts from understanding the issues of the service system which service receivers might not recognize.
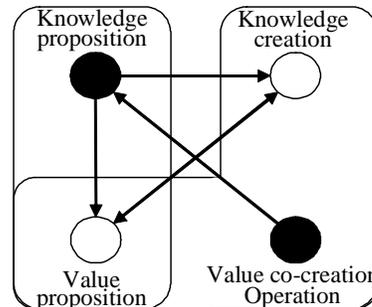
Example:

Figure 5 Open Research Organization Servicelization Patterns

Context: The open pattern in Figure 5 starts to understand the current operations by analyzing the service system, and the staring point of these service research activities is the VC. Output examples of this pattern are R & D management services, and innovation management services which mainly produce knowledge for service receivers.

Actors are service receivers, and researchers. Service receivers are persons in service organization, who have issues in the current service environment. Researchers have research area and related technologies which might help a request of service receivers, but mainly need to formalize the current service environment issues as research questions. The responsibility of service receivers is to describe the current issues. The

responsibility of researchers is to formalize and analyze the issues, create service innovation with service receivers (value co-creation).

Problem: Service receivers might not be able to come up with service innovation to solve the current issues. Researchers do not understand their issues clearly due to a lack of local knowledge of service environment.

Researchers tend to stick to the current discipline area, and do not explore the issues from service receivers' point of views even though the issues might create a new research area to explore.

In addition, service receivers do not know what service researchers could help and do not expect that their current problems could be solved.

Solution: Researchers need to learn local knowledge from service receivers by hearing and data analysis to understand issues and requirements of service receivers in the service system. Researchers work with service receivers to identify where research technologies could contribute.

Researchers need to recognize that research activities for service innovation could not be executed separately from service receiver. Researchers need to understand issues and requirements of service receivers in the service system of service receivers, where a new research area will be created, by learning local knowledge in the service environment.

Management of service research needs to support for researchers to explore are service research area.

Researchers and service receivers need to create a longer relationship to build trust for the future research activities.

3. REFERENCES

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