Service System Design

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Abstract

This discusses the shift of design focus looking at innovation history, and points out the importance of research on designing a service system. The focus of innovation is shifting from seeds or needs oriented products to a service system creating values by the interactions of providers and receivers, and to open innovation. At the same time, the scope of design becomes wider including the whole system design. Because of these shifts, the new research on service system design is emerging. In this paper, a framework based on two viewpoints, such as systems with value sharing condition and scopes of system layers are proposed identifying technical and social difficulties of designing a service system.

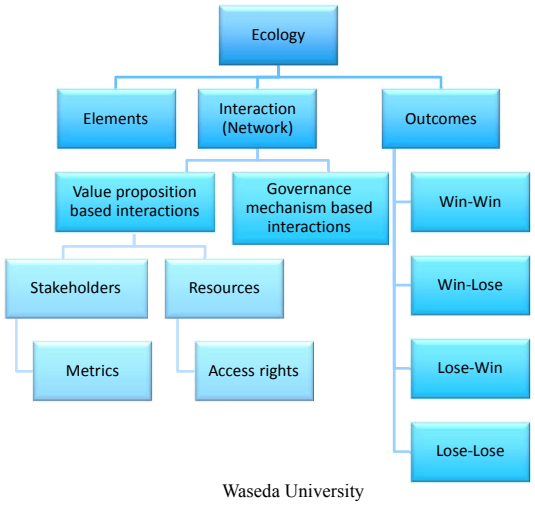
Agenda

- Introduction – Service System
- Service Design and Innovation
- Research designing a service system
- Discussions

Service science

Key concepts of service science

（Ref: Spohrer and Maglio 2009）



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Service system

- Service is the application of competences (knowledge and skills) by one entity for the benefit of another
- Service systems is value-creation configurations (an arrangement of resources connected to other systems by value propositions)
- Service science is the study of service systems and of the co-creation of value within complex constellations of integrated resources

Ref: “On Value and Value co-creation: A service systems and service logic perspective” by S. Vargo, P. Maglio, M. Akaka

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Design

Design activities since 1900

Emergence of Information technology
1876 Telephone
1914 IBM
1976 Apple

Integration of Design and IT
1991 IDEO
1999 Human interface society
2005 Stanford Univ. d.school
2008 Keio Univ. SDM

Expanding to service, service system
2004 Service Design Network
2011 Service system

Service Design and Innovation

		1950 -	1970 -	1980 -	1990 -	2000 -
Source of innovation	Technology	Technology push model (Bush 1945), Dosi 1982), Rothwell 1992,1994)	Chain-linked model (1970-Kline and Rosenberg 1986), Gate keeper (Allen 1977)		Mode 1 & Mode 2 (Gibbons, et al. 1994), Service innovation (Sundbo 1994, Edvardssin and Olsson 1996, Gallouj 1998)	Open Innovation (Chesbrough 2003), Service Science, Management, Engineering and Design (2004-)
	Non-technology (market)	Market pull model (Schmookler 1966, Scherer 1982)		User innovation von Hippel (1988)		
Design focus		Industrial products (William Morris, Bauhaus, Post modern, IDEO, d.school)				
					Service products (Shostack 1984, Bitner 1992, Erlhoff, Merger, Manzini 1997), Interaction (Holmlid 2007)	
						PSS (Morelli 2002), Service system (The Science of Service Systems 2011)

Service system viewpoints

Complexities

Systems	Simple/closed	Complex/open		Jackson (System of Systems Methodologies (SOSM))
Difficulties in synthesis	Class 1	Class 2	Class 3	Ueda, et al.

Interactions

Interactions	Value proposition based		Governance based	Spohrer, et al.
Value sharing condition	Unitary	Pluralist	Coercive	Jackson (System of Systems Methodologies (SOSM))

Scopes

System layer	Micro: People	Meso: Organization	Macro: Social systems	S3FIRE
Layer of design	Components, Products (Traditional designing)	Systems	Community (Political and social aspects)	Jones

Ref: Spohrer, J. C., Demirkan, H., and Krishna, V., 2011, Service and Science, In H. Demirkan, J.C. Sohrer and V. Krishna, Eds. The Science of Service Systems, Springer, pp.325-358.
Sawatani, Y., Arai, T., and Murakami, T., Creating Knowledge Structure for Service Science, 2013, PICMET
Jackson, Michael C., 2003, Systems Thinking: Creative Holism for Managers, John Wiley & Sons Ltd., UK
Ueda, K., Takenaka, T., Vancza, J., and Monostori, L., 2009, Value creation and decision-making in sustainable society, CIRP Annuals, Manufacturing Technology 58, pp.681-700
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Expanded research areas by service system design

		Systems with value sharing condition		
		Class 1	Class 2	Class 3
Scope	Micro: People	Service products		
	Meso: Organization	CBM SQALE products		
	Macro: Social systems			

Component Business Modeling: CBM

IBM CBM

The IBM Component Business Model (CBM) is a framework for analyzing and modeling a business for the purpose of organizing and grouping business activities into basic building blocks of a business called components. The result is a component business map, an example of which is shown in the figure below. As illustrated in the figure, activities are grouped along two coordinates, business competencies (columns) and accountability levels.

Ref: http://capitalideas.wordpress.com/ibm-cbm/

Services Quality Analysis & Learning Engine

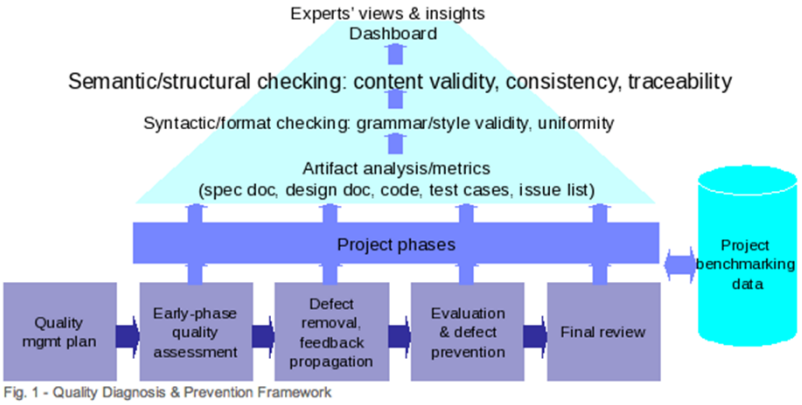

Fig. 1 - Quality Diagnosis & Prevention Framework

Ref: http://www.research.ibm.com/trl/projects/sse/sqale/index_e.htm

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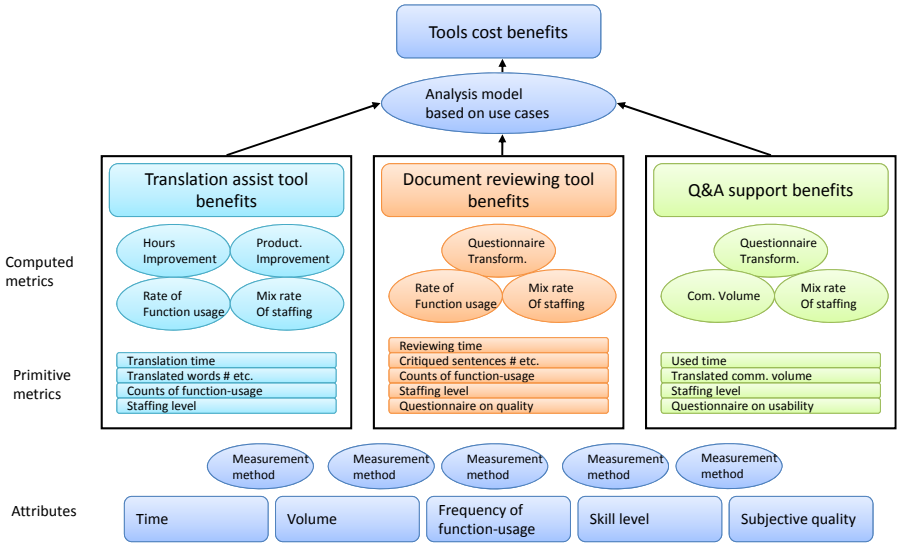
Productivity tools and Metrics



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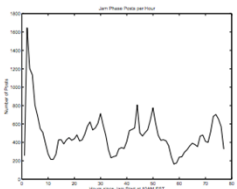
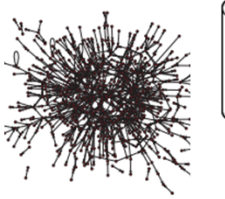
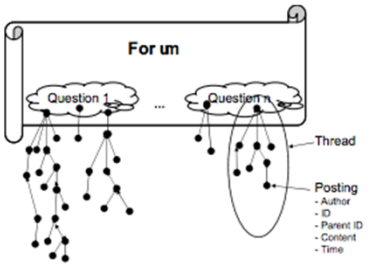
	Macro: Social systems	products		

Innovation Jam

- Real-time discussion analysis
- Facilitation support







Ref: http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/innovationjam/
"Looking for Great Ideas: Analyzing the Innovation Jam", Mary Helander, Rick Lawrence, Yan Liu,Claudia Perlich, Chandan Reddy, Saharon Rosset, IBM T.J. Watson Research Center

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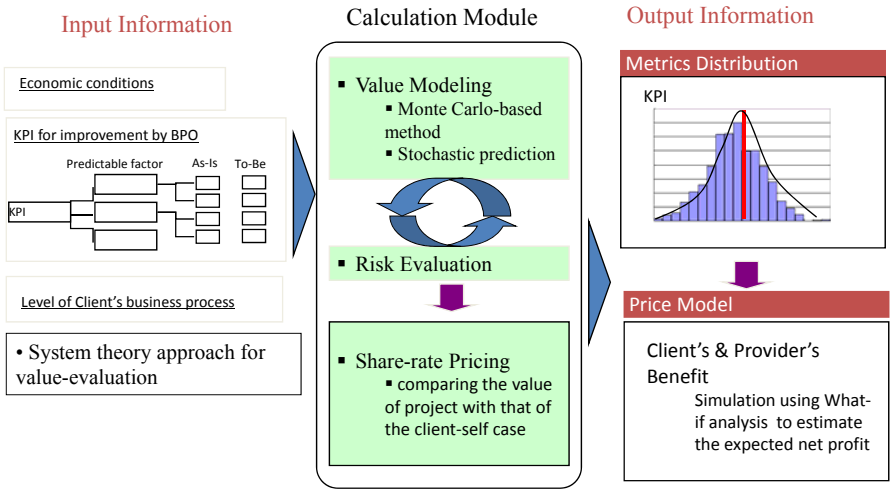
Value Pricing



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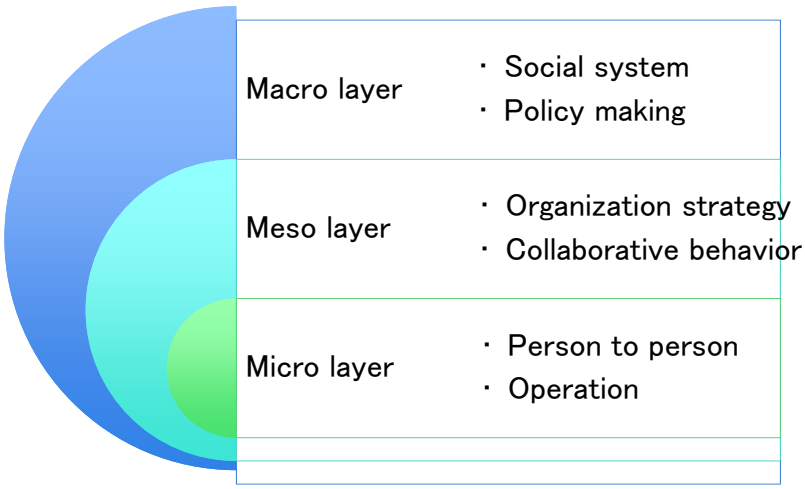
Service system layer



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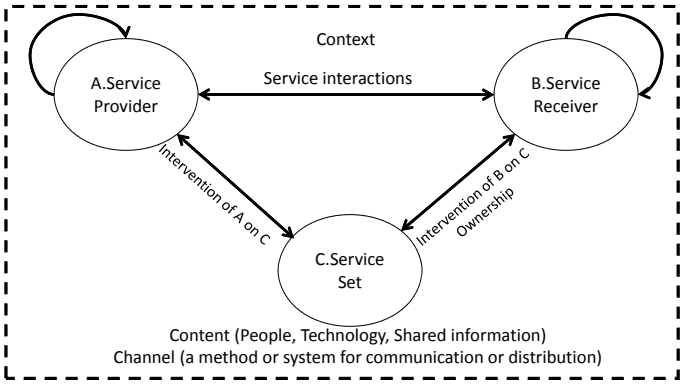
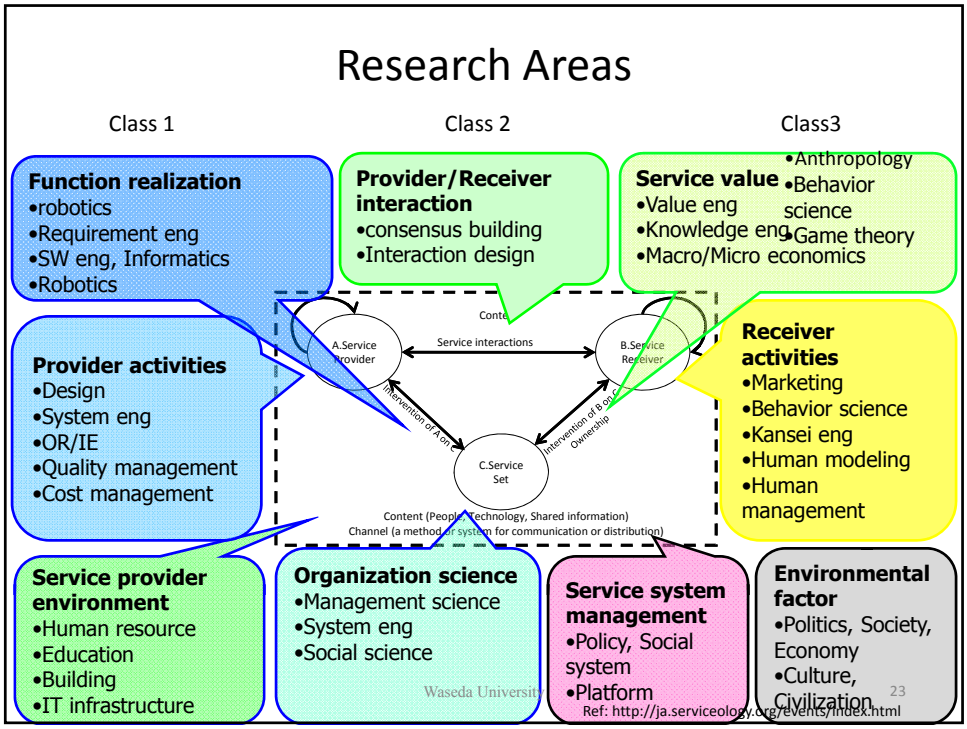
Ref: http://ja.serviceology.org/events/index.html

Basic service system model



Ref: Gadrey, J., 2002, The misuse of productivity concepts in services: Lessons from a comparison between France and the United States, In J. Gadrey and F. Gallouj, Eds. Productivity, Innovation and Knowledge in Services: New Economic and Socio-Economic Approaches, Edward Elgar Publisher, pp.26-53.
Maglio, Paul P., Srinivasan, S., Kreulen, Jeffrey T., and Spohrer, J., 2006, Service systems, service scientists, SSME, and innovation, Communications of the ACM, Vol 49 Issue 7, pp. 81-85.
Arai, T., Shimomura, Y., 2004, Proposal of Service CAD System - A Tool for Service Engineering, CIRP Annals, Vol. 53/1, PP.397-400.



Discussions

- Possibility to facilitate service science knowledge infrastructure applying these common frameworks
- Answering a how question, research methods and approaches, is also required
- There are risks to reduce the research scopes by introducing these common frameworks
- Understand research methods and approaches discussion for Service science research as the next step

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Thank you!


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