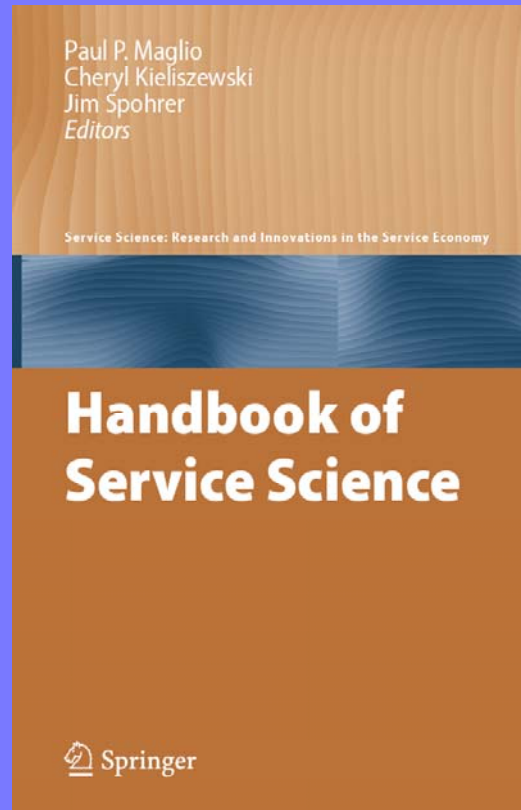


# Service Science, Management, and Engineering (and Design, and Art...)

## Challenges in Service Science

Paul P. Maglio  
IBM Research – Almaden

# Service science is the study of value cocreation



Maglio, P. P. Kieliszewski, C. A. & Spohrer, J. C. (2010). Why a handbook?. In P. P. Maglio, C. A. Kieliszewski & J. C. Spohrer (Eds.), *Handbook of Service Science*. New York: Springer.

Service science is an interdisciplinary approach to study, improve, create, and innovate in service.

Service is value cocreation – broadly speaking, useful change that results from communication, planning, or other purposeful and knowledge-intensive interactions between distinct entities.

Service science is the systematic search for principles and approaches that can help understand and improve all kinds of value cocreation.

# Resources are the building blocks of service systems

## First foundational premise of service science

Service system entities dynamically configure four types of resources

The named resource is **Physical** or **Not-Physical**  
*(physicists resolve disputes)*

The named resource has **Rights** or **No-Rights**  
*(judges resolve disputes within their jurisdictions)*

	Rights	No-Rights
Physical	1. People	2. Technology
Not-Physical	3. Organizations	4.. Shared Information

Formal service systems can contract  
 Informal service systems can promise/commit  
**Trends & Countertrends (Evolve and Balance):**  
 Informal <> Formal  
 Social <> Economic  
 Political <> Legal  
 Routine Cognitive Labor <> Computation  
 Routine Physical Labor <> Technology  
 Transportation (Atoms) <> Communication (Bits)  
 Qualitative (Tacit) <> Quantitative (Explicit)

# Value propositions are the building blocks of service system networks

## Second foundational premise of service science

**Service system entities calculate value from multiple stakeholder perspectives**

A value propositions can be viewed as a request from one service system to another to run an algorithm (the value proposition) from the perspectives of multiple stakeholders according to culturally determined value principles.

The four primary stakeholder perspectives are: customer, provider, authority, and competitor

## Value propositions coordinate & motivate resource access

Stakeholder Perspective (the players)	Measure Impacted	Pricing Decision	Basic Questions	Value Proposition Reasoning
1.Customer	Quality (Revenue)	Value Based	Should we? (offer it)	Model of customer: Do customers want it? Is there a market? How large? Growth rate?
2.Provider	Productivity (Profit)	Cost Plus	Can we? (deliver it)	Model of self: Does it play to our strengths? Can we deliver it profitably to customers? Can we continue to improve?
3.Authority	Compliance (Taxes and Fines)	Regulated	May we? (offer and deliver it)	Model of authority: Is it legal? Does it compromise our integrity in any way? Does it create a moral hazard?
4.Competitor (Substitute)	Sustainable Innovation (Market share)	Strategic	Will we? (invest to make it so)	Model of competitor: Does it put us ahead? Can we stay ahead? Does it differentiate us from the competition?

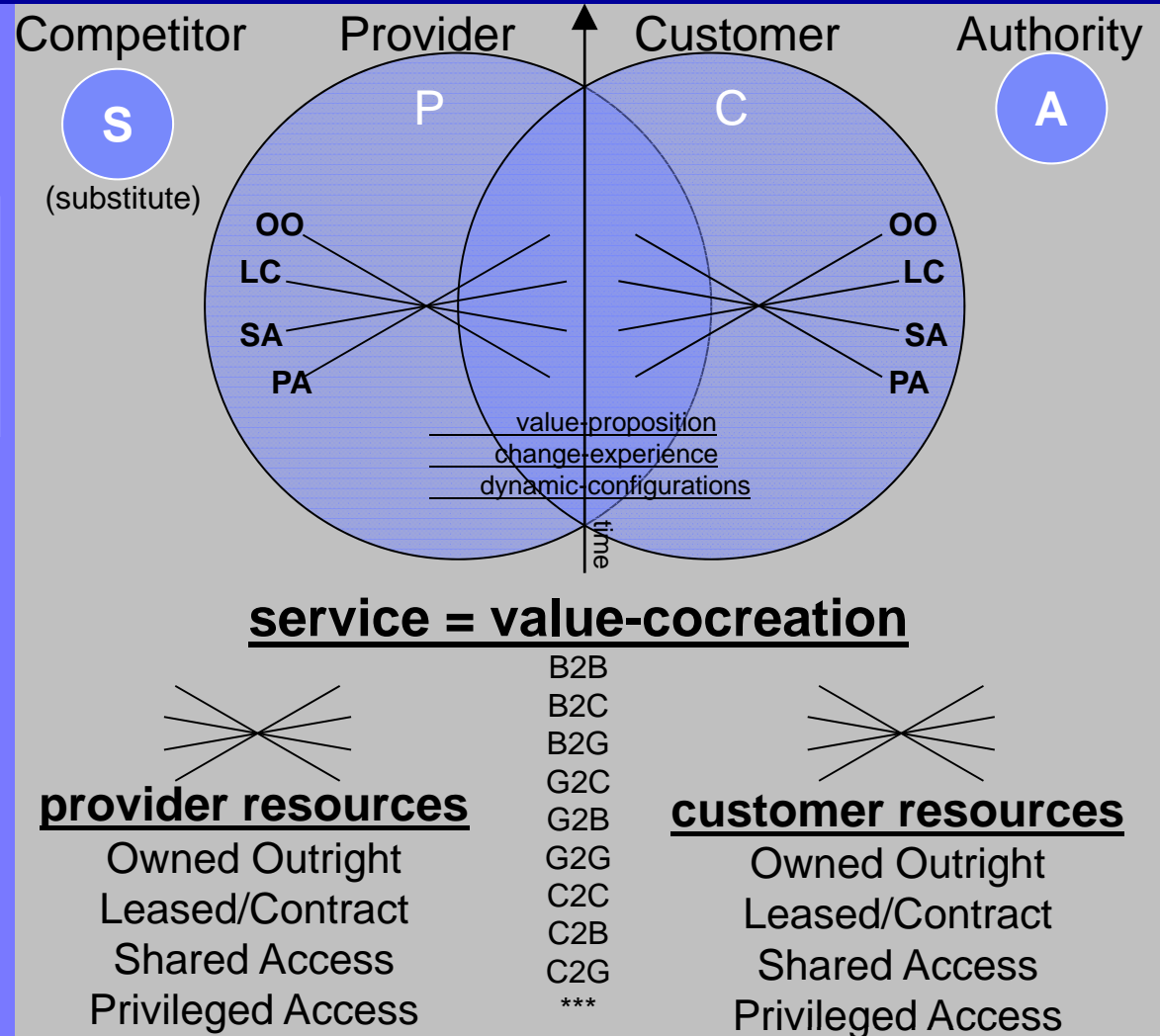
# Access rights are the building blocks of service system ecology

## Third foundational premise of service science

The access rights associated with entity resources are reconfigured by mutually agreed to value propositions

### Access rights

- Access to resources that are owned outright (i.e., property)
- Access to resource that are leased/contracted for (i.e., rental car, home ownership via mortgage, insurance policies, etc.)
- Shared access (i.e., roads, web information, air, etc.)
- Privileged access (i.e., personal thoughts, inalienable kinship relationships, etc.)



# Symbols are the building blocks of value cocreation

## Fourth foundational premise of service science

Service system entities compute and coordinate actions with others through symbolic processes of valuing and symbolic processes of communicating.

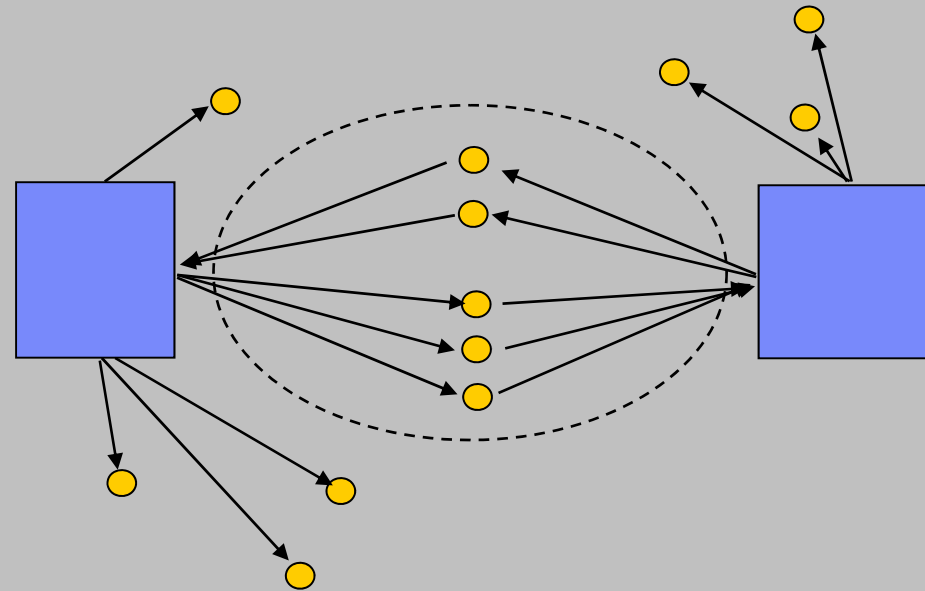
Service is value cocreation.

Service system entities reason about value.

Value cocreation is a kind of joint activity.

Joint activity depends on communication.

Reasoning about value and communication are (often) effective symbolic processes.



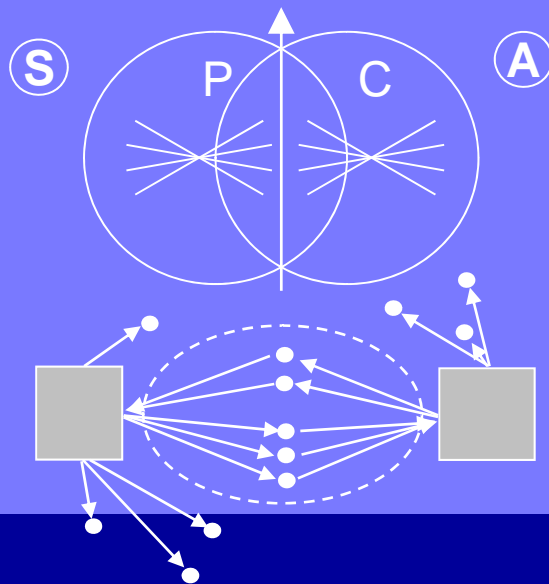
- Symbols guide both internal behavior and mediate interactions.
- Service system entities often rely on symbolic reasoning about value.
- Value cocreation depends on coordination of activities across individuals, organizations, and firms – often intimate relationships that involve sharing resources, risks, and rewards.
- Coordination of action across a network depends on information flow.
- Improvements in **processes of valuing** are symbolic processes that can be **shared and agreed to** by service system entities.

# Premises of service science

		Rights	No-Rights
Physical		1. People	2. Technology
Not-Physical		3. Organizations	4. Shared Information

Stakeholder Perspective	Measure Impacted	Pricing	Questions	Reasoning
1.Customer	Quality	Value Based	Should we?	Model of customer: Do customers want it?
2.Provider	Productivity	Cost Plus	Can we?	Model of self: Does it play to our strengths?
3.Authority	Compliance	Regulated	May we?	Model of authority: Is it legal?
4.Competitor	Sustainable Innovation	Strategic	Will we?	Model of competitor: Does it put us ahead?



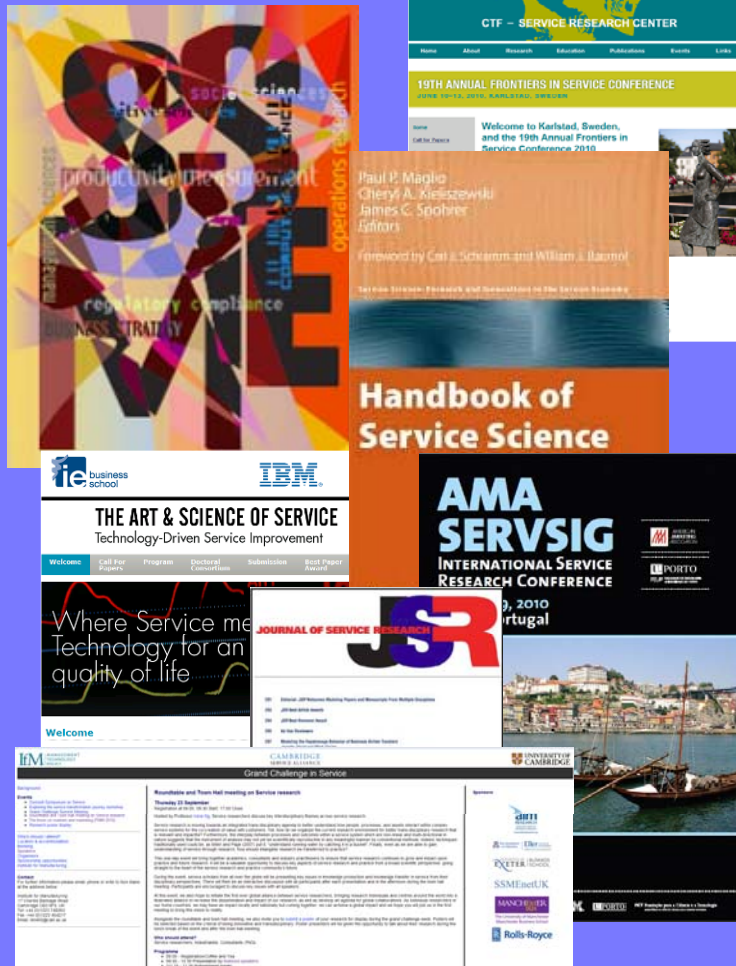
Service system entities dynamically configure four types of resources

Service system entities calculate value from multiple stakeholder perspectives

The access rights associated with entity resources are reconfigured by mutually agreed to value propositions

Service system entities compute and coordinate actions with others through symbolic processes of valuing and symbolic processes of communicating.

# Some hot problem areas in service science



- Service system design
  - methods and representations
- Service systems as complex systems
  - modeling and simulation
- Relation of co-production and value cocreation
  - interactions and outcomes

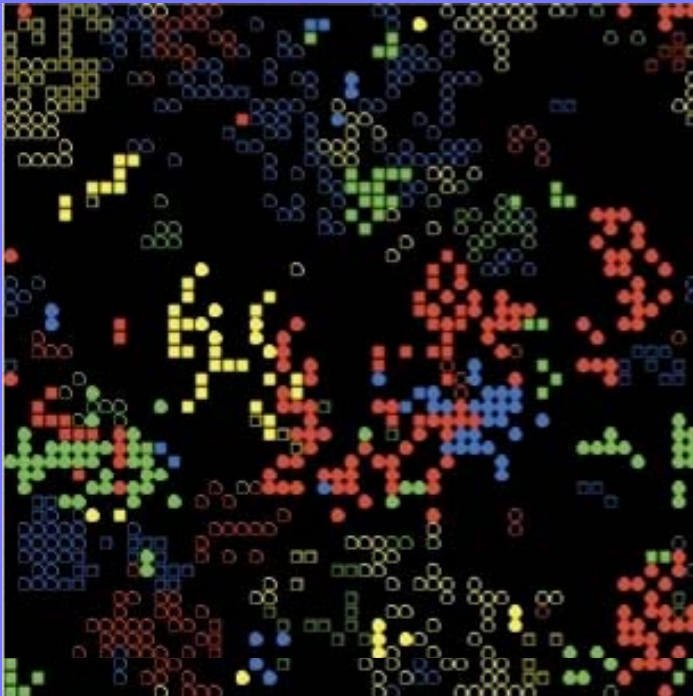
# Service system design approach



based on R. J. Glushko, (2010). Seven contexts for service system design. In P. P. Maglio, C. Kieliszewski, & J. C. Spohrer (Eds.), *Handbook of service science*. New York: Springer.

- Service encounters
  - ▶ Interpersonal, physical, information interactions
- Role of technology
  - ▶ Information can augment, replace
- Service design patterns
  - ▶ Adjust amounts of interaction
  - ▶ Adjust line of visibility
  - ▶ Substitute information for interaction
- **What is the full range of design patterns in the context of complex service systems?**

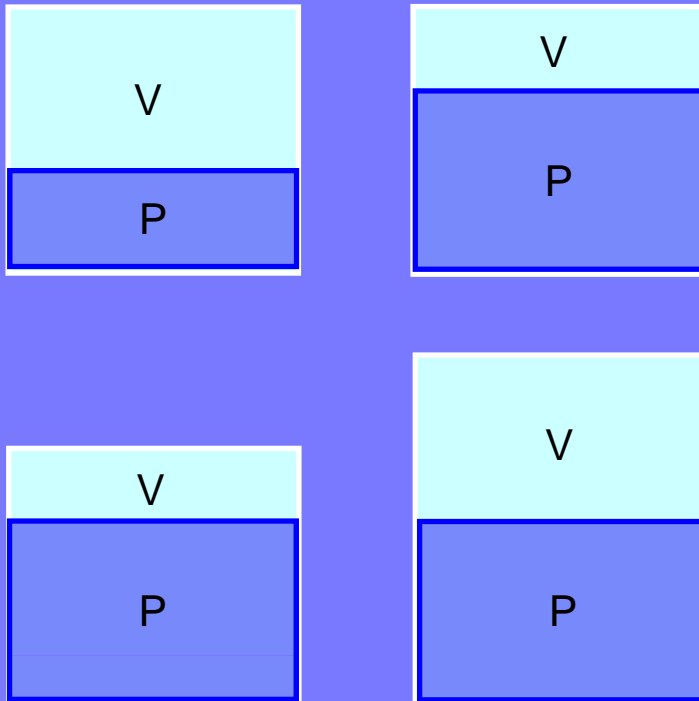
# Service systems are complex systems



based on W. Rand and J. Healy, "Analyzing servicescapes using agent-based modeling." Presentation at Frontiers in Service, Karlstad, Sweden, June 2010.

- Entities (people, technology, organizations, information) interact to cocreate value
- Complex interactions mean that analytical modeling may not be effective
- Simulation may be the basic tool for understanding complex service system behavior
- **What is the toolkit for service system simulation?**

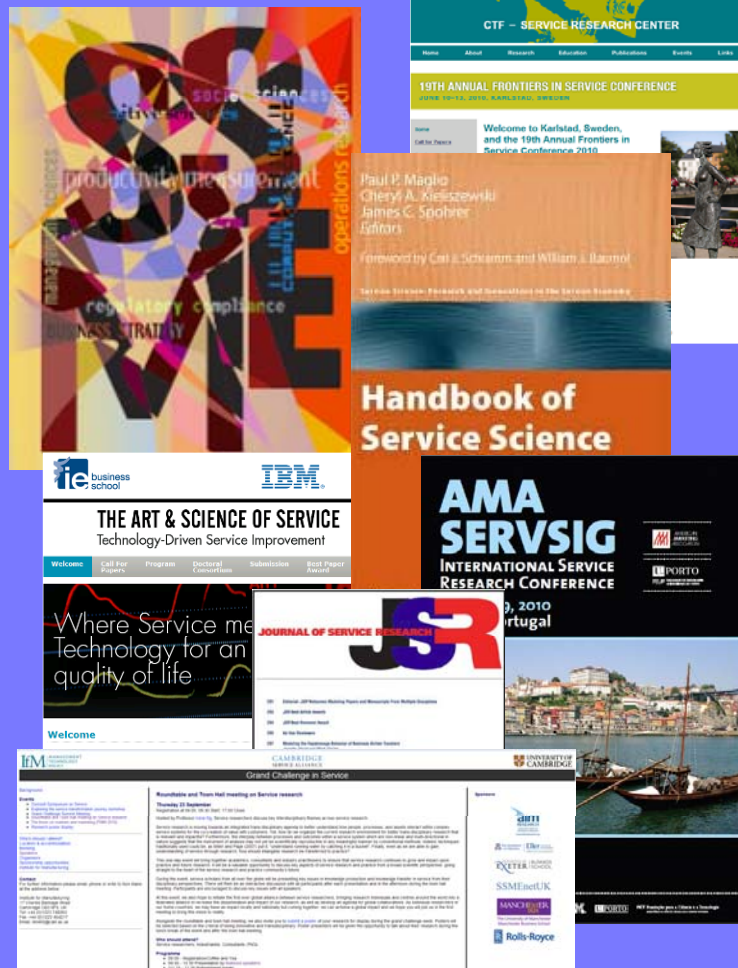
# On the relation of co-production and value cocreation



based on A. Ordanini, L. Zarantonello and A. Parasuraman, "The link between customer co-production and value cocreation: A theory-based framework." Presentation at Frontiers in Service, Karlstad, Sweden, June 2010.

- Interaction is where co-production happens
- Co-production is necessary for value cocreation
- Co-production is a kind of joint activity
- **What is the relation between entity interaction and value cocreation?**

# Challenges in service science



## ■ Premises

- ▶ Service system entities dynamically configure four types of resources
- ▶ Service system entities calculate value from multiple stakeholder perspectives
- ▶ The access rights associated with entity resources are reconfigured by mutually agreed to value propositions
- ▶ Service system entities compute and coordinate actions with others through symbolic processes of valuing and symbolic processes of communicating.

## ■ Challenges

- ▶ What is the full range of design patterns in the context of complex service systems?
- ▶ What is the toolkit for service system simulation?
- ▶ What is the relation between entity interaction and value cocreation?