

Natural systems, service systems: Scientific perspectives on redesigning social-ecological systems

David Ing
President (2011-2012)
International Society for the Systems Sciences



The *International Society for the Systems Sciences* was founded in 1956 as the *Society for General Systems Research*

The initial purpose of the society was "**to encourage the development of theoretical systems which are applicable to more than one of the traditional departments of knowledge,**" with the following principal aims:

- to **investigate the isomorphy of concepts, laws, and models** in various fields, and to help in useful transfers from one field to another;
- to **encourage the development of adequate theoretical models** in areas which lack them;
- to **eliminate the duplication of theoretical efforts in different fields;** and
- to **promote the unity of science** through improving the communication among specialists.

In the intervening years, the ISSS has expanded its scope beyond purely theoretical and technical considerations to include the practical application of systems methodologies to problem solving. Even more importantly, it has provided a forum where scholars and practitioners from across the disciplinary spectrum, representing academic, business, government, and non-profit communities, can come together to share ideas and learn from one another.

Does your
natural system science
(of ecosystems)
include progress with
services (of human practices)?

Natural System perspectives

- Postnormal science (Ravetz)
- Social-ecological systems (Folke)
- Ecosystem services
- Panarchy (Gunderson and Holling)
 - Collapse (Tainter)
 - Resilience
- Ecological complexity (Allen)
 - Supply-side sustainability
 - Energy gain (high/low) regimes
- Polycentric relations (Ostrom)

Does your
service system science
(of human practices)
include progress with
nature (of ecosystems)?

Service Systems perspectives

- Science of service systems (Spohrer)
 - Unobservable → observable
 - Social media, open source
- Social ecology (Emery, Trist)
 - Coproducing outcomes, cocreating value (Normann, Ramirez)
- Negotiated order (Parhankangas, Hawk)
- Language action (Flores, Winograd)
- Model Driven Systems Dev
 - SysML (INCOSE)

Products:
17% of
Delivery
Form

Services:
83% of *Delivery Form*

Material:
37% of *End Product*

Material:
37% of *End Product*

11%
of GNP

(in 1997, ↓
from
19% of 1968
GNP)

27%
of GNP

(in 1997, ↓ from
35% of 1968 GNP)

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Uday M. Apte, Uday S. Karmarkar and Hiranya K Nath, "Information Services in the US Economy: Value, Jobs and Management", *Business and Information Technologies (BIT) Project*, Anderson School of Management at UCLA, June 2007

7%
of GNP

(in 1997, ↓
from
11% of 1968
GNP)

56%
of GNP

(in 1997, ↑ from
36% of 1968 GNP)

Information:
63% of *End Product*

Information:
63% of *End Product*

Products:
17% of
Delivery
Form

Services:
83% of *Delivery Form*

A **service system** can be defined as a dynamic configuration of **resources** (**people, technology, organisations and shared information**) that creates and delivers **value** between the provider and the customer through service.

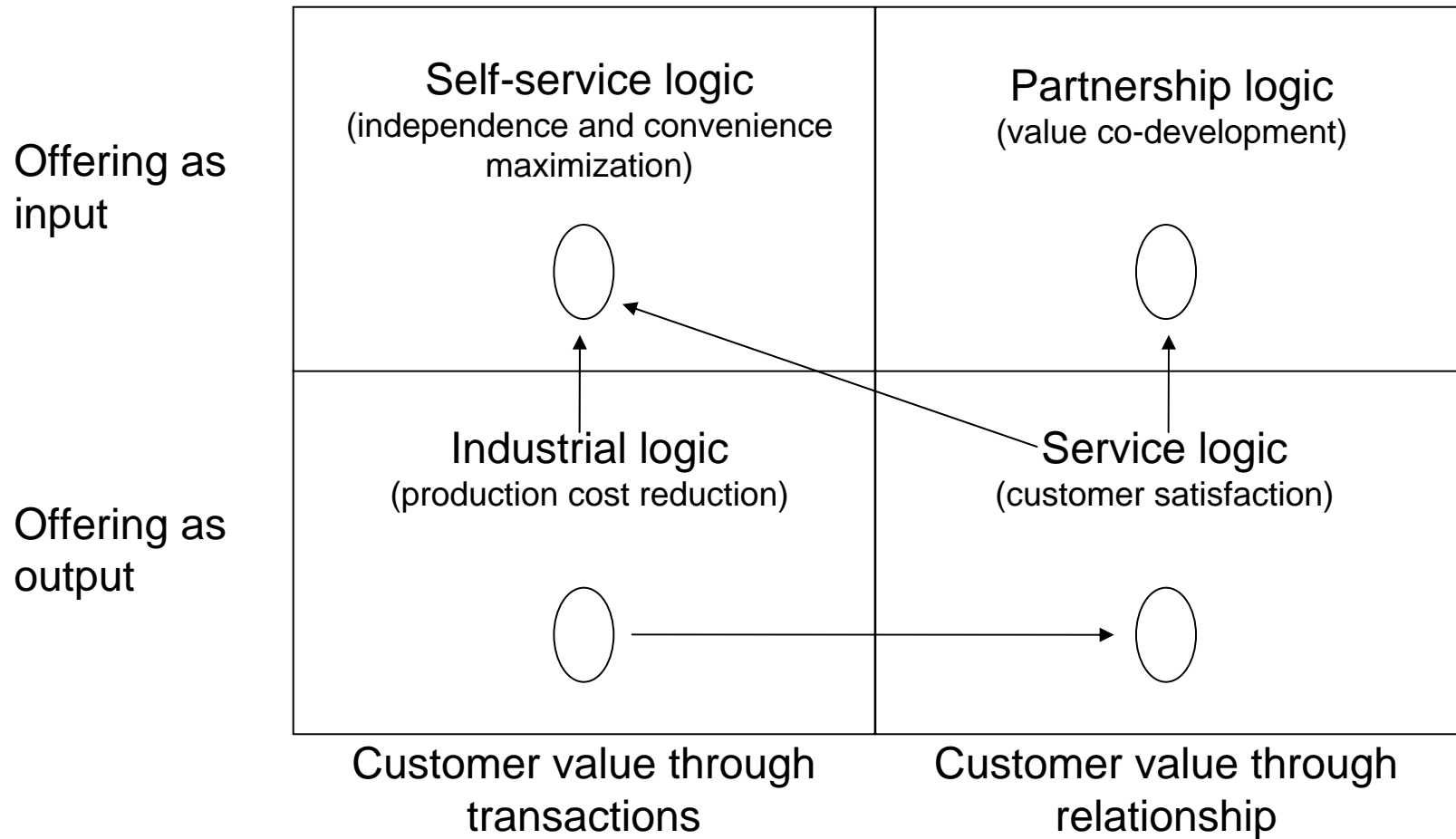
In many cases, a service system is a **complex system** in that configurations of resources interact in a non-linear way. Primary **interactions** take place at the interface between the provider and the customer.

However, with the advent of ICT, customer-to-customer and supplier-to-supplier interactions have also become prevalent.

These complex interactions create a system whose behaviour is difficult to explain and predict.

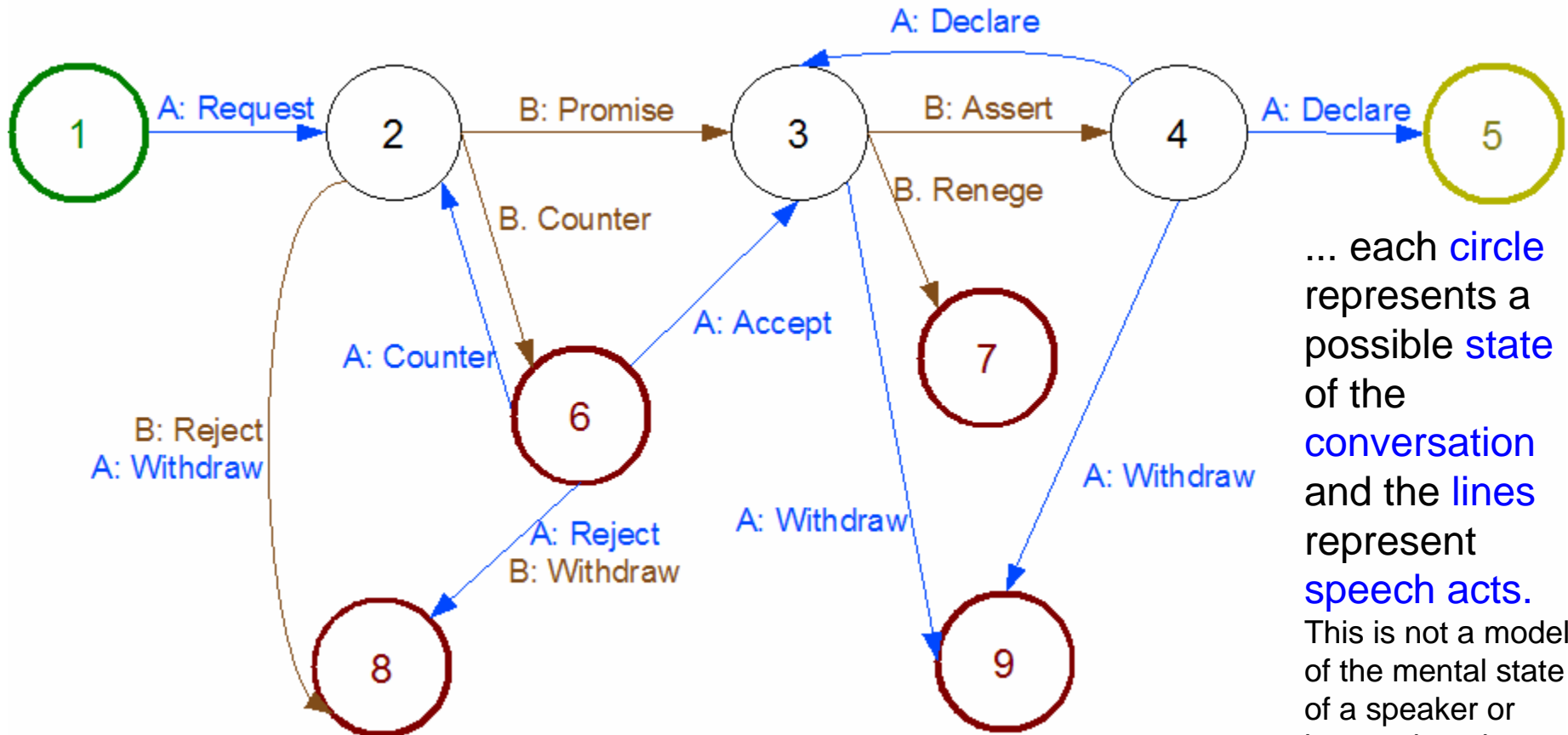
(IfM and IBM, 2008, p. 6)

An offering can either be an *output of coproduction*, or an *input to coproduction*



Rafael Ramirez and Johan Wallin. *Prime Movers: Define Your Business or Have Someone Define It Against You*, 2000, p. 141.

Conversations for action are interplays of requests and commissives towards explicit cooperative action

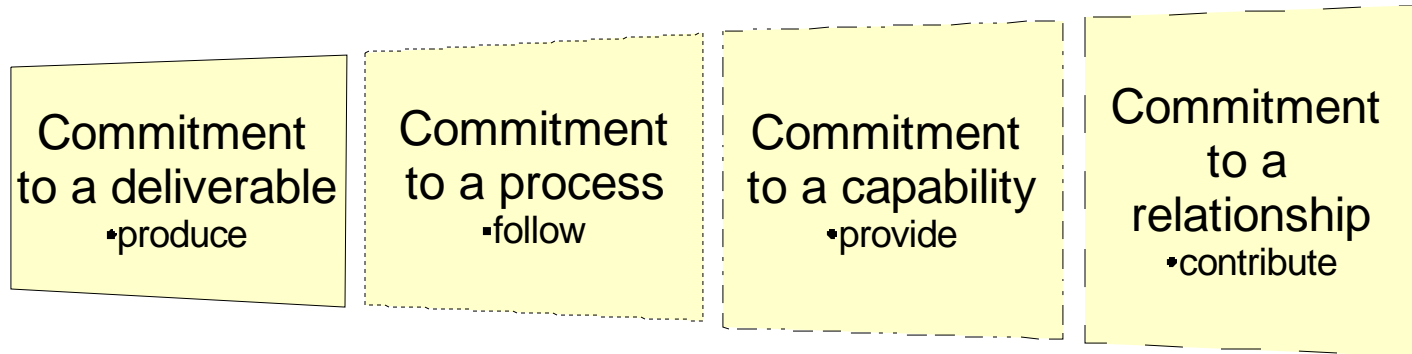


... each circle represents a possible state of the conversation and the lines represent speech acts.

This is not a model of the mental state of a speaker or hearer, but shows the conversation as a 'dance.'

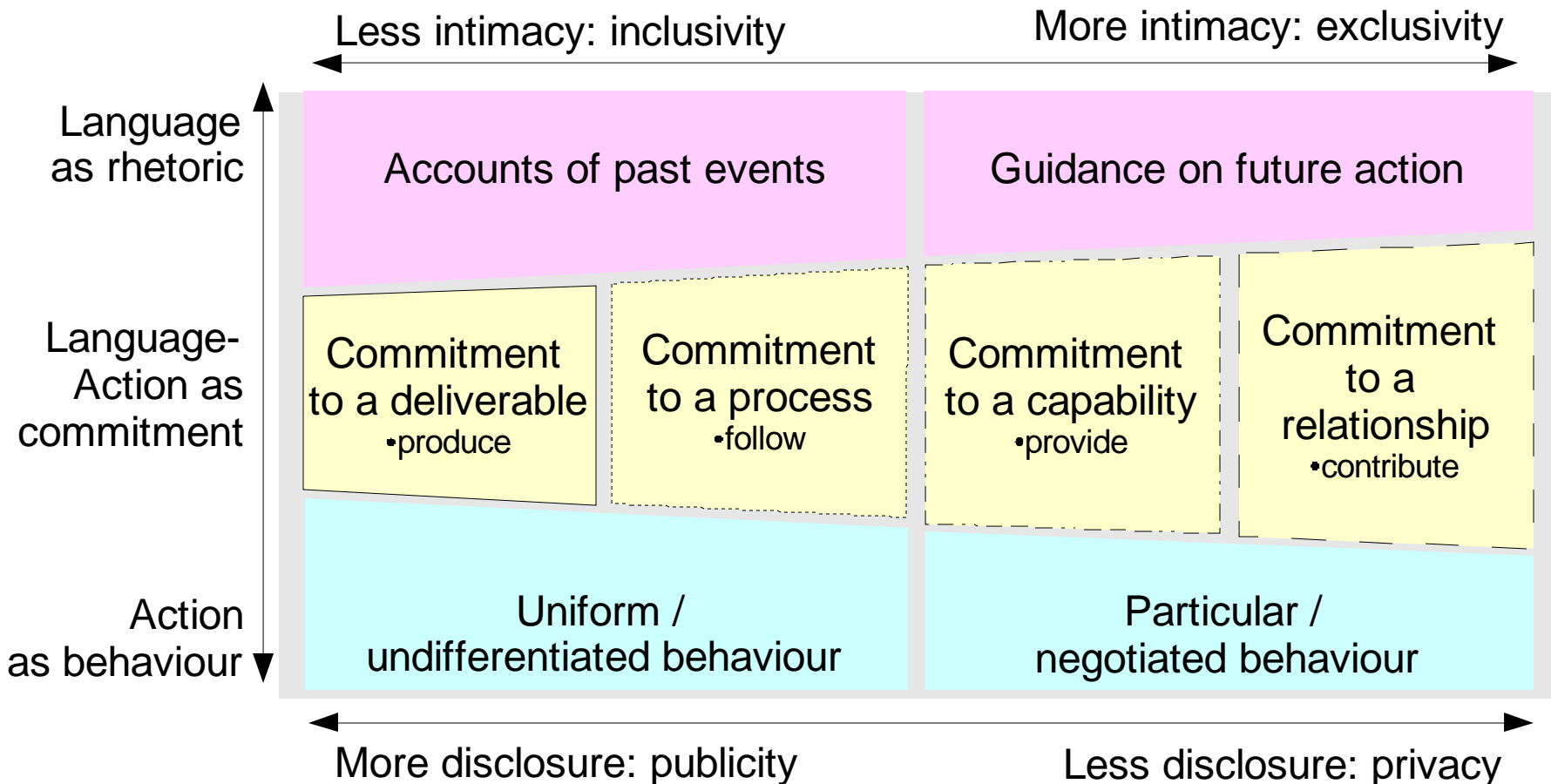
Terry Winograd, and Fernando Flores, 1986. *Understanding computers and cognition: A new foundation for design*. Ablex Pub. Corp, p. 64.

Conversations for action are interplays of requests and commissives towards explicit cooperative action



David Ing, "Offerings as Commitments and Context: Service Systems from a Language Action Perspective ", *Systemicist*, volume 30, number 2 (Christine Welch and Jennifer M. Wilby, editors), pp. 154-172, presented at the UK Systems Society International Conference, Oxford, 2008.

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See <http://issss.org> for annual meetings of the *International Society for the Systems Sciences*

ISSS 2011

- July 17-22, 2011
- Hull University Business School (UK)
- “All together now – working across disciplines:
People, principles and practice”

ISSS 2012 (tentative)

- July 15-20, 2012
- San Jose State University (California)
- “Service systems, natural systems”