

# Services Engineering and Management, Value Coproduction, and Situated Practices

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## Introduction

Service businesses are not new. For many services businesses, however, the “world is flat” context (Friedman, 2005) of globalized scale and ubiquitous information and communication technologies (ICT) is new. The “world is flat” viewpoint sees global economics and politics as reshaped by three great flatteners: (a) new players (i.e. India, China and other developing countries rather than local competitors); on (b) a new playing field (i.e. global marketplaces and resources rather than regional) that are (c) coordinated through horizontal collaboration (i.e. inter-organizational alliances rather than vertically-integrated firms). The provision of services described in service-dominant logic (Vargo & Lusch, 2004) that are based on invisible and intangible resources – e.g. competences or processes – may be impacted more in this new context than the delivery of physical goods. Physical goods with distribution costs mean that local providers have a cost advantage over remote providers. Services that take advantage of ICT, however, can relocate work at flat or near-zero costs. The decision to assign many service production activities to another continent is practically as easy as assigning it across town. Value coproduction that does not require face-to-face coordination can be rethought in this new frame.

Thirty years ago, the idea of service from an automated banking machine (ABM) was new. Over the past five years, customers phoning a toll-free number are no longer surprised to be served by a pool of company representatives that are half a world away. If the more automated alternative of self-service over a secure connection on a web browser is chosen, the location of the originator and service provider is even less relevant. The research into management and engineering of customer experiences of this type is far from mature.

This paper proposes adding two additional contexts for consideration into the emerging framework for service engineering and management:

- value coproduction in a global business ecosystem adds dimensions of dynamic cooperation, competition and coexistence across companies, regional cultures and communities of practice; and

- situated practices, mediated in a “Web 2.0” infrastructure resurfaces the influence of background cultural habits and predispositions on the “right” way(s) of getting things done, both in asynchronous and synchronous person-to-person negotiations over ICT and in predefined interorganizational computer-to-computer protocols.

Engineering service businesses for a “world is flat” context requires designing business architectures in which networks of customers, suppliers and alliance partners maintain consistent levels of quality, while allowing for minor variances in ends and means. Resources managed through ICT mediation can instantaneously (re-)route the work of service delivery personnel, intelligent information infrastructures and distributed physical locations for handling. Computer-supported cooperative work (CSCW) introduces both benefits of and challenges to distributed expertise and their coordination. Principles of management and engineering that do not directly deal with the capability to electronically automate or relocate work may require revision for this new paradigm.

Offshore call centres have become an everyday way of doing business in the first decade of a new millennium. Examples of similar impacts in services across many other industries can be listed. In media and entertainment businesses, the production and distribution of digital content — in music, movies and video — is making physical media irrelevant. Retailing in product categories ranging from books to consumer electronics has drawn volume away from “bricks and mortar” infrastructure towards web portals on the Internet. Academic education and professional training, scheduled as e-learning conducted asynchronously and at a distance, reduces attendance at campus facilities. Health care no longer needs to be bounded by the memory of a local physician, as diagnoses and prescriptions can be digitized and distributed across a virtual team. All of these examples point to opportunities and challenges for service businesses, as leaders transform through their business models to leave laggards behind.

The next section discusses the impact of globalization on the way value is coproduced in services. The focus then turns to how mediation through ICT impacts situated practices. In closing, social and technical tensions in engineering and managing service worlds are explored with deeper conceptual and philosophical foundations.

## Coproducing Value in Services at a Globalized Scale

The traditional view of services as inseparable, heterogeneous, intangible, and perishable (IHIP) has already been challenged by researchers re-examining services in the contemporary context (Lovelock and Gummesson, 2004; Vargo and Lusch, 2004). The examples listed in the preceding introduction draw attention to services business operating at global scale. Global branding sets an expectation of service attributes and features to be delivered, with the varying amounts of accommodation happening behind the scenes. From the perspective of any global-scale companies — e.g. IBM, T-Mobile (Deutsche Telecom), Citibank, American Express, Hilton — delivering a service in an absolutely uniform way, at every encounter around the world, is neither practical nor desirable. Beyond the core resources of the brand, local business partners and franchisees assume

accountability to maintain high standards of quality in service, yet should be responsive to specific situations in local conditions. This enlarges the view of the visible customer-supplier interaction to the hidden (or translucent) network of organizations and workgroups dealing with service request interactively.

### Services are complicated when linear chains become networks

In a globalized business, it may be better to change the frame from one of standard operating practices to one of protocols. As an example, mobile phone services around the world provide similar basic functions, e.g. voice connection. As a mobile phone customer travels the world, he or she may be able to access different features, e.g. directory assistance. A standard operating practice based in local culture assumes that clients and business partners implicitly know the local procedure. The variability (or heterogeneity) of values for the service suggest that service details should be negotiated rather than rule-based (Parhankangas et. al, 2005). Protocols represent the first few steps in an engagement, which, when combined with knowledge and experienced service delivery personnel, are usually sufficient to ensure the customer is satisfied. Addressing protocols always opens question: how much of the service can and should be standardized, and how much should be left open for the situation?

Manufacturing businesses often operate like “make and sell buses”: drivers are able to execute on plans without consulting their passengers about routes or timetables. Service businesses operate mostly like “sense-and-respond taxis”, where drivers are unable to provide the service unless the passenger says where he or she wants to go (Haeckel 1999, 60). In an extended service business, the coproduction of outcomes involves not only the customer and service provider, but also auxiliary roles such as the dispatcher, the lessor of the vehicle and provider of GPS mapping.

In a shift from an industrial-centric view, technical breakthroughs and social innovations can be incorporated into an emerging co-productive view (Ramirez, 1999). Drawing from a longer list comparing views<sup>14</sup>, the service engineering and

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<sup>14</sup> Ramirez 1999 presents an exhaustive table of 12 points. The four points most relevant to an emerging Service Engineering and Management framework are points 1, 3, 5 and 6.

	Industrial view	Co-productive view
(row)		
(1)	Value creation is sequential, unidirectionally transitive, best described in "value chains"	Value creation is synchronic, interactive, best described in "value constellations"
(3)	Value is added	Values are co-invented, combined and reconciled
(5)	Values are "objective" (exchange) and "subjective" (utility)	Values are "contingent" and "actual" (established interactively)
(6)	Customers destroy value	Customers (co-)create values

management framework can put a spotlight on two ways in which “world is flat” service businesses operate:

- their form follows that less of value chains, and more of value constellations (with extension to “business ecosystems”); and
- production occurs less as value-added exchange or utility, and more as values co-created interactively.

The first point generalizes the linear direction of value chains into a broader view where service interactions are multidimensional. The second point leads to a systemic view of service co-creation, where the definition of synergy is more clearly articulated.

## Globalization enlarges chains to constellations and ecosystems

Over the span of the last half of the twentieth century, businesses were traditionally framed in the context of the theory of the firm (Coase 1937, Williamson 1975). The frame for these theories has roots in the industrial revolution, where manufacturing production was centered in factories, physically located near factors of production with access to transportation to markets.

The model of value chains<sup>15</sup> (Porter 1985) has been criticized as linear, unidirectional and sequential<sup>16</sup> (Normann and Ramirez 1994). As boundaries between customers and suppliers become blurred, the reconfiguration of activities results in shift from sequentiality to interactivity. Features not valued by the customer or more easily performed within its own organization can be rebalanced in the accountabilities of the supplier. In contemporary business operations, e.g. information systems functions, it's not uncommon to have teams blended of employees, a primary contractor and subsidiary alliance partners. “Customers” may be internal or external parties who provide requirements or set technologies directions. Employees may be assigned different categories of badges, and coordinated in project teams with leaders reporting up through chains different from those who sign the pay cheques.

The view of coproduction primarily oriented towards a single customer with a single supplier has been further opened up with that of value constellations. Both

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<sup>15</sup> In contrast to a value coproduction perspective, the value chain represents economics as analytical and focused on costs: "The value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation. A firm gains competitive advantage by performing these strategically important activities more cheaply or better than its competitors." (Porter 1985, 33-34)

<sup>16</sup> The criticism is direct: "Economic actors no longer relate to each other in the simple, unidirectional, sequential arrangement described by the value chain notion. The relationship between any two actors tends to be far more complex than can be conceptually captured by the unidirectional 'make/buy' model underlying the value chain." (Normann & Ramirez 1994, 29).

organizations and individuals are reconfigured according to current priorities and resource availabilities. Project teams and task forces are understood to be temporary in nature. As each member in the ongoing relationship becomes concerned as much with the outcome of the network of organizations, as well as his or her primary affiliation, the form can be reframed as a business ecosystem<sup>17</sup> (Iansiti & Levien 2004).

In today's globalized economy connected over Internet technologies, service businesses are especially impacted and are challenged to take advantage of a triple convergence: (a) free flows of information enabled by web-based technologies, (b) work converted to digital form so that it can be easily routed electronically, and (c) skilled business professionals in low-wage countries (Friedman 2005).

Service businesses least impacted by "world is flat" factors<sup>18</sup> are those in which little of the work content can be digitized. If services can be redesigned so that it's cheaper to "move bits" rather than "move atoms" (Negroponte 1995) — potentially shifting work to where the atoms operate in a lower cost environment — the form of the service business will be pressured to compete globally. The "Industrialized Information Chain" requires that service businesses realign strategy, redesign processes, and restructure the organization (Karmarkar 1994).

Service-oriented businesses tend to involve interactive value coproduction relationships. Value coproduction occurs not only between the customer and the service provider at the interface, but also between organizations, organizational units and/or alliance partners that form networks (either in short term or long term relationships) to design and deliver the service. When the "world is flat", the challenge of articulating customer wants and needs into requirements for delivery as product and/or service attributes becomes much more complicated.

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<sup>17</sup> Iansiti and Levien use the term "ecosystem" metaphorically, rather than in a scientific meaning that would be acceptable in ecosystem ecology. Still, their definition is useful for the non-rigorous reader. "Business ecosystems are loose networks – of suppliers, distributors, outsourcing firms, makers of related products or services, technology providers, and a host of other organizations – [that] affect, and are affected by, the creation and delivery of a company's own offerings. [... Unlike] companies that focus primarily on their internal capabilities – [they pursue] strategies that not only aggressively further their own interests but also promote their ecosystems' overall health. (Iansiti & Levien 2004).

<sup>18</sup> Friedman's ten flatteners are: (1) the fall of the Berlin Wall (rise of democracy); (2) the Netscape IPO (leading to funding of fibre optic cabling); (3) workflow software (enabling remote coordination); (4) open sourcing (a la Linux); (5) outsourcing (call centres to India); (6) offshoring (contract manufacturing to China); (7) supply chaining (a la Walmart); (8) insourcing (especially logistics a la FedEx); (9) in-forming (search a la Google); (10) wireless (for mobile coordination).

## Value coproduction as synergy means qualitative, not just quantitative features

In the service marketing literature, value is typically discussed in the context of heterogeneity in the value perceived by the customer (Vargo & Lusch 2004). In this discussion on service businesses in a “world is flat” context, the focus is not on defining value (or values) analytically (e.g. exchange value, value in use). The focus is on the new value that can be created, beyond simple exchanges, to collaborations in a value constellation or business ecosystem. Using systems language, the interest is in synergy — a feature in the whole different from that in the parts, not just more of features in the parts.

This perspective is reflected in open innovation (Chesebrough 2003) and open source software development (Weber 2004), but may be more generalized in creation nets<sup>19</sup> (Brown & Hagel 2006). In the world of global information systems, it's possible to offer “follow the sun” services, operating 24 hour per day and 7 days per week. Workers in high-wage countries are expected to have higher rates of innovation and fewer errors than counterparts in low-wage countries. Operating at a global level, however, presupposes that the delivery of services should be uniform, no matter where in the world from where the customer request originates, or from where the service is ultimately provided.

## Services with Situated Practices Mediated in ICT

In a “world is flat” service business, work teams are typically virtual. Although some intensive activities may be conducted in co-located conditions, most work is performed and coordinated at a distance and asynchronously. Even if formal methods are specified and highly standardized, variability in the outcomes is a normal expectation.<sup>20</sup> The challenge of managing effective teams is a primarily an organizational issue, and only secondarily a technical issue.

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<sup>19</sup> Creation nets have some compatibility with the ideas of value constellations as developed by Normann & Ramirez 1994, but have a particular emphasis on learning. "... "networks of creation" (or "creation nets") [are revealed], where hundreds and even thousands of participants from diverse institutional settings collaborate to create new knowledge, to learn from one another, and to appropriate and build on one another's work—all under the guidance of a network organizer. [...] But creation nets are also visible in more unexpected fields and places, from .. the world's big-wave surfing beaches ... and the places around the globe where thousands of amateur astronomers operate telescopes tied together by the Internet to find and monitor celestial events." (Brown & Hagel 2006)

<sup>20</sup> The challenge of asynchronous and remote development was encountered in the development of object-oriented designs and implementations. This led to the development of a method based on work products, where outcomes for modules of work were specified as clear inputs for subsequent modules. See Cameron 2002.



The term “situated practice” is presented here as a synthesis of concepts from two domains: computer-supported cooperative work (CSCW); and communities of practice (sometimes associated with knowledge management). Considerations for the service management and engineering framework include:

- designing the work environment as situated in physical, social and informatic spaces (Ing & Simmonds 2002); and
- viewing the work of service delivery from the perspective of social practices (over procedurally-dominant processes).

These are supported by foundations in theory of practice (Bourdieu 1992) and phenomenology (Dreyfus 1991). These conditions are central to “world is flat” work environments, where the coordination and content of activities can be digitized.

### An sense of place emerges from service work mediated by ICT

Service-oriented businesses can involve situated intelligence. Situational variations may be exhibited by a customer requesting slightly different types of services at different times and places, either due to changing tastes (e.g. sometime vanilla, sometimes chocolate) or different conditions (e.g. cold drinks in summer, hot drinks in winter). Situational variation may also be exhibited by a service provider who is balancing resources (e.g. sending the B-team for less challenging cases, reserving the A-team for more challenging cases) or pre-empting probable future customer satisfaction issues (e.g. customer X prefers more empathic service providers, while customer Y prefers more technical depth). Situated intelligence suggests that specific terms and conditions between any two parties may be better constructed socially, and negotiated intuitively as the service is requested and/or delivered. This is counter to an optimized analysis that is analytically engineered (e.g. pre-planning with contingencies for possibilities that have even the most minute probability of occurrence).

In a “world is flat” work environment, time and space impact the design and delivery of services. In situated action, Dourish addresses how *space* becomes a *place*, with three design implications:

- Activities take center stage, and the structure of the space falls away.
- Practice emerges over time in the space ... when it is occupied day-to-day.
- Place is relative to a community of practice. (Dourish 2001, 89-91)

The engineering of services need should challenge conventional wisdoms developed in the engineering of physical products. Services can be engineered to adapt to situations at hand, applying the judgement of experienced personnel. Services management can not presume that all personnel are equally experienced, and therefore should provide training and/or affordances that guide novices towards creating the “right outcomes” for clients.

Expertise in services is both local and distributed in mediated ICT

Engineering services means planning. However, plans have a way of not turning out in every situation. Plans should be seen as *resources for action*, rather than as procedures that are followed blindly.<sup>21</sup> Services are delivered – and can be unbundled and rebundled situationally – within the dimensions of time, space or location, and relationship between actors (Normann & Ramirez 1994).

In business, *process* is an often-used word. It has a general meaning, applicable across physical and social systems.<sup>22</sup> In domains where a large degree of human judgement and/or expertise is involved – such as Knowledge Intensive Services (Miles, 2003) – process as procedure is incomplete. There are two dimensions to business process: procedure, and accountability (Scherr 1983). An over-emphasis on the *how* – the procedure that produces an outcome -- sometimes overlooks the *who* – the party accountable for delivering that outcome. In reengineering efforts, the interplay between these two dimensions has sometimes been forgotten. Equipment can provide a function, but only human beings can fill a role and take accountability.<sup>23</sup>

Although the phrase “communities of practice” has entered the standard business vocabulary since Wenger (1998), the implications of the trajectory cast by the accompanying philosophical foundations have largely been overlooked. Since many services involve communities and practice, the engineering and management of their systems should be more cognizant of the philosophical impacts.

Service-oriented businesses generally involve human beings interacting in social practices, where they apply technologies and tools that are at hand in their world. Wenger (1998) describes the “C, F and J thing”, where insurance claims processors implicitly came to recognize applications eligible for approval, in contrast to applications where benefits were to be denied. These knowledge workers did not try to act as human calculators and understand the explicit rules by which claims should be processed. They instead chose to apply rules of thumb on fields on a Coordination of Benefits worksheet that had proven by the experienced members of their work community to be mostly correct. This behaviour is akin to a person using a shoe as a hammer when a real hammer is not handy. A real hammer is the correct instrument to be applied, but it may not be immediately available when a task is to be performed. This type of human behaviour is most frustrating to

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<sup>21</sup> Suchman (1987) explains it plans not in the context of situated action: "Rather than attempting to abstract action away from its circumstances and represent it as a rational plan, the approach is to study how people use their circumstances to achieve intelligent action. Rather than build a theory of action out of a theory of plans, the aim is to investigate how people produce and find evidence for plans in the course of situated action. More generally, rather than subsume the details of action under the study of plans, plans are subsumed by the larger problem of situated action."

<sup>22</sup> In a systems context: "Process explicitly defines the sequence of activities and the know-how required to produce the outcomes." (Gharajedaghi 1998, 110).

<sup>23</sup> A machine can be programmed to be purposive (i.e. goal-seeking), but only human beings can be purposeful (i.e. ideal-seeking). (Ackoff & Emery 1982, 30)



computer analysts and industrial engineers that create procedural models of how work is done. No matter how well workflows are predefined and tools are crafted, human beings will treat them as affordances, finding expedient ways to shortcut the most repetitive tasks and creative ways to handle exceptions.

This perspective is most prominent in the communities of practice literature, and challenges the design of services with the recognition that:

...practice is not the result of design but rather a response to it. As a consequence, the challenge of design is not a matter of getting rid of the emergent, but rather of including it and making it an opportunity. (Wenger 1998, 233).

The emergent includes unanticipated or poorly articulated customer requests, delivery environments that are not under control and/or additional expertise or skills possessed by the accountable service deliverer designated.

Services are centered on practices that are socially reproduced within work communities. Service delivery personnel are not robots that blindly follow procedures, but must be encouraged to naturally respond in practices that will result in a consistent and satisfying customer experience.

Although many procedures can be established as resources for action, service personnel still have to choose when it is appropriate to apply one procedure over another. They can develop *favoured* or *habitual* ways of responding. These predispositions are well described in a theory of practice developed by Pierre Bourdieu.<sup>24</sup> As part of social practice, predisposition (or habitus) can be re-enforced or subsumed in organizational learning. Lave and Wenger (1991) provide the linkage between social practice, participation in a community, and organizational learning.<sup>25</sup>

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<sup>24</sup> Since Bourdieu refuses to provide definitions in consistency with his own philosophy, DiMaggio (1979) provides a helpful description of "habitus" as: "A system of lasting, transposable dispositions which, integrating past experiences, functions at every moment as a matrix of perceptions, appreciations and actions and makes possible the achievement of infinitely diversified tasks, thanks to analogical transfers of schemes permitting the solution of similarly shaped problems. [...] The habitus is a kind of theoretical deus ex machina by means of which Bourdieu relates objective structure and individual activity". [DiMaggio (1979), p.1464].

<sup>25</sup> This theory of learning comes from a foundation of critical theory: "Briefly, a theory of social practice emphasizes the relational interdependency of agent and world, activity, meaning, cognition, learning and knowing. It emphasizes the inherently negotiated character of meaning and the interested, concerned character of the thought and action of persons-in-activity. This view also claims that learning, thinking and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world. This world is socially constituted; objective forms and systems of activity, on one hand, and agents' subjective and intersubjective understandings of them, on the other, mutually constitute both the

Both the engineering of services and management of services need to recognize the influence of communities – and not just individuals – in the design and delivery of service experiences. Human beings are not only likely to vary from the standard procedures codified in manuals and/or programmed tools, but customers receiving service may also not feel complete satisfaction if humanistic customer service cues are not exhibited.

## Engineering and Managing Evolving Service Worlds

When the “world is flat”, the services to be engineered and managed are global, and a new *virtual* place mediated by ICT becomes central. This new service world adds dimensions not in the physical world. As the medium moves from paper to paperless, the instantaneous replication of digital content impacts the way work happens. Up to the end of the 20<sup>th</sup> century, books have been conventionally thought of in the form of bound volumes of paper, as direct descendants of those first produced by Gutenberg on his printing press. Libraries, as regional and local destinations, place a volume in their collections, in one — and only one — physical place, on a shelf. Prior to electronic mediation, librarians would file duplicate index cards in cabinets, with cross-references to enable categorization by multiple subject headings. In the new world of ICT mediation, not only is a book in digital form virtually stored at multiple locations simultaneously, but logical indexing under multiple categories is simple (Bowker & Starr, 1999). As a trend away from pre-categorizing content by adding more keywords or subject descriptions, search engines (e.g. Google, Amazon) now index all of the text within a book so that patterns within the content are accessible.

In a parallel context, the multidimensionality and asynchronicity in the ICT-mediated world brings an underlying tension between the realities and tangibility of the physical world in the design and leadership of service worlds. The ways in which value is coproduced and work done can be changed by substituting a self-service web interface for human contact, or moving the point of service from the local neighbourhood to a cheaper location twelve times zones away. Reframing services in this way drives the redesign of collaborative work to take advantage of ICT mediated places, and the emergence of — and resistance to — a smaller class of workers: those as comfortable interacting over ICT as most people do face-to-face.

Two issues arise as a result of opening up these possibilities. Firstly, the scale and scope of services becomes a strategic choice for the global business, and a point of governance at the level of local delivery. At the global/uniform extreme is a standardized “world” offering. At the local/specific extreme is request-by-request situational customization. Secondly, since the nature of services capabilities are being altered — with many alterations happening at digital speeds — development of service capabilities will cycle (and recycle) through three states: (a) establishing

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world and its experienced forms. Knowledge of the socially constituted world is socially mediated and open ended.” [Lave & Wenger (1991), pp. 50-51]

protocols and practices through human negotiation; (b) routinizing the most mundane activities through programming of rules and algorithms; and (c) renewing service offerings and workflows as communities of practice — drawing in considerations in identities, professions and careers — uncover the most effective ways of getting things done. While these points, amongst others, can be handled phenomenologically, researchers may look beyond the arts of managing and engineering services, towards gradually developing a body of knowledge as a science of services.

### Scale and scope: global teleology versus situational variability

Issues of scale and scope in managing and engineering services come to the fore in global businesses. Should the business aim for a design point as essentially the same service to be offered worldwide, or does it make more sense for it to be localized? An over-standardization of service features risks simplifies the conditions of satisfaction between customers, the primary provider and its alliance partners, risking over-rationalization of exchanges to just economic optimization<sup>26</sup> (Flores 2000). Businesses as social systems have traditionally been approached from a teleological (i.e. ends-oriented) point of view<sup>27</sup> (Ackoff 1981), but “world is flat” business ecosystems see the ends of the whole as emergent, and only purposive behaviour from the parts (i.e. each participating party)<sup>28</sup> (Ackoff & Gharajedaghi 1996).

For services management, the “world is flat” context for services enlarges inquiries of economic value to a larger discussions on cultural values. Coproduction implies understanding the interests of the other parties involved in collaboration, which is more challenging when the communications are mediated. With digitalization reducing replication and transportation costs nearly to zero, interpretations of

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<sup>26</sup> Flores would argue that social systems include economic exchanges, but not just exclusively economic exchanges: "... theories of business have focused on exchange, and modern business has developed from the attempt to produce the greatest aggregate exchange value at the least cost. [...]

Because the exchange-centered account ignored what makes business activity fully worthwhile for us as human beings, it leads to an enormous amount of wasteful business behavior." [Flores 2000, 244]

<sup>27</sup> Idealized planning is a technique that approaches purposes and goals from the level of the whole system: "Systems-oriented investigators focus on teleological (goal seeking and purposeful) systems. ... [When] we focus on organizations, we are concerned with three levels of purpose: the purposes of the system, of its parts, and of the system of which it is a part, the suprasystem." [Ackoff, 1981, 22-23]

<sup>28</sup> Business ecosystems can be defined to have purpose only at the level of the participating organizations: "Ecological systems contain interacting mechanistic, organismic, and social systems, but unlike social systems, have no purpose of their own. However, they serve the purposes of the organisms and social systems that are their parts, and provide necessary inputs to the survival of the non-animate biological systems (plants) that it contains. Such service and support is their function." [Ackoff & Gharajedaghi 1996, 17]

intellectual property rights and jurisdictional support emerge. Western economics comes from a premise where tighter supply and reduced quantities results in monopoly profits. Socialist and communist countries, particularly in low-wage countries in Asia, may not share that premise until standards of living rise to those in developed countries.

For services engineering, it's obvious that practices vary across boundaries for businesses where the "world is flat". Although the Internet connects individuals from around the globe, culture is a lens that subjectively alters language and images read on computer monitors, filtered through a bias towards norms in predisposed actions evolved locally and regionally. Recognizing the potential for differences in practice, actively accommodating those differences, and making the *common practices* natural are three entirely different levels of operation. International service businesses can choose to serve different regions in different ways, or standardize on a single way globally.<sup>29</sup> There's no right or wrong in this decision, just a choice.

A good first step on this path is to observe what people – customers, coworkers, alliance partners – do, and to listen as they try to make sense of the new flat world. They have a choice to exit, by disengaging from the relationship; or voice their concerns in the interests of improving the relationship (Hirschman 1970). A services relationship is an ongoing engagement that can become more or less fruitful over time.

### Service development cycles: negotiation, routinization, renewal

ICT-mediated collaborative work, at a global level is a new phenomenon. Although some pioneers might espouse that "they have it figured out", it's more likely that we are still at the beginning of a post-industrial era. This has been called the "services revolution" by some (Karmarkar 2004), and the "information revolution" by others. Instead of being at a mature state where an extended body of experience can be mined and analyzed, "world is flat" services are learning situations where incremental improvements can be discovered every day.

The first period of Internet adoption at the end of the 20<sup>th</sup> century — named by some as Web 1.0 — focused on providing computer users with read access to data formerly trapped in "information archipelagos" of mutually inaccessible software protocols. In the current period, known as Web 2.0 (O'Reilly 2005), the average computer user is not only a recipient of information, but a co-creator of content. Person-to-person interactions have proliferated with content expressed as proliferations of personal commentary in blogs, collaborative sense-making in wikis, and shared images and video clips by amateur producers. Computer-to-computer interactions — across companies, workgroups and individuals — are moving

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<sup>29</sup> These would be described as polycentric and geocentric orientations, in Perlmutter 1969.

beyond simple transport (e.g. routing) and interoperability towards semantics, where vocabularies become standardized in Extensible Markup Language (XML)<sup>30</sup>.

The evolutionary way of stepping up to the new technologies is to look for patterns of collaborative work and “pave over cow paths” by “webifying” current practices. This simple path is complicated by the scale of ICT-mediated work as global. Most work practices are embedded in local customs and predispositions, so establishing common procedures in a rush to rationalize a standard infrastructure is likely to encounter some resistance somewhere within the global business. Programming routine workflows in software can improve consistency and productivity, but over-programming complex socially-intensive interactions workflows may result either in a decline of service performance, or workers bypassing the system to “get things done”<sup>31</sup>. The rationalist attitude of engineering prevalent in computer science may have to be downplayed, at least initially, in favour of establishing a collective understanding of practical action and everyday experience (Dourish 2001).

In the earliest stages of developing services in a new context, the governance of social interactions can be understood primarily as negotiated (Parhankangas, Ing, Hawk, Dane & Kosits 2005). In high-performance teams such as hospital emergency rooms, collaboration towards a purposeful ends can be counter to organization structure and job roles defined formally and enforced rigorously. Activities can instead be “worked out” by professionals negotiating tasks and roles, as they apply practical experience to learn about the situation at hand. In service environments such as this, situational intervention and variances are not just tolerated, but expected. Phenomenology, based primarily on human experience (Flores 2000) overrules rationality as the prevailing philosophy. The skills that human beings have for dealing with other human beings are distinct from those for dealing with machines. Few would advocate replacing trauma centre personnel with inexperienced physicians relying on computer logic.

As the service world becomes better understood, parts of the workflow can be routinized and automated. Engineering a service enables rationality and foresight. A corresponding view in management is to “plan your work and work your plan”. In the transition, however, the human social systems may not respond as well to changes in work systems designs as the mechanical or electronic systems. The motive of improved organizational productivity may have impacts on personal productivity, and challenges of translating organizational knowledge into action may surface as a “knowing-doing gap” (Pfeffer & Sutton 2000). For services

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<sup>30</sup> XML provides semantics to data, so that relationships between one field and another have meaning. See <http://www.w3.org/XML/>. Some common vocabularies include the Mathematical Markup Language (MathML) and Voice Extensible Markup Language (VoiceXML), as described at <http://www-128.ibm.com/developerworks/xml/library/x-stand3.html>. Domain-specific models include the Global Justice XML Data Model (Global JXDM) and Health Level 7 (HL7).

<sup>31</sup> The design of the MIT Media Lab and the Pompidou Centre are taken to task for implementing infrastructure at inappropriate layers of change (Brand 1994)

practitioners in direct interaction with customers, *working knowledge* is the most important part of knowledge management.

Just because a worker has potential doesn't mean that he or she will exercise it, either for personal benefit or towards fulfilling the goals of the organization. In a "world is flat" context, the essential issue is that knowledge is embedded in individuals. Within work groups, certain individuals will have greater facility with tools and/or working with people (or both). "Great companies get remarkable performance from ordinary people, by being able to convert knowledge into action" (Pfeffer & Sutton 2000, p. 6).

As services continue to evolve, improved tools and advanced practices will naturally emerge as the result of learning-by-doing. These may be actively developed in programs of renewal, or resisted through inertia and bureaucratization. In parallel with the development of service practices, workers will gain experiences that are valuable in company and industry-wide professions and careers. Knowledge is "sticky" to practitioners, who develop professional identities. Service personnel who consult are known as consultants. Developers writing computer programs are known as programmers. Financial services personnel who store and transfer money are known as bankers. In health care services, it is the skills and care of hospital personnel that defines nurses (Benner 2000). In nursing, the *knowing how* is not disembodied cognition, but instead the capability to take action in particular social situations, potentially with tools and advanced technologies.

Services engineering and services management need not fall into the trap of rationality. The movement towards communities of practice demonstrates a strong direction for reform, particular in Knowledge Intensive Business Services.

Researchers should reflect on the opportunity presented in services engineering and services management to not just carry over concepts and models from product-oriented businesses in the industrial age. They have an opportunity to catch up with the movements in philosophy and social theory in the 20<sup>th</sup> century to develop new views appropriate to a new science.

## Beyond the art of services, to a new science

If services engineering and management need to change for the new "world is flat" context, the opportunity for a underlying science presents itself (Chesbrough & Spohrer 2006). Just as computer science became a new discipline at universities worldwide in the 1960s (Asprey & Williams 1994), the next decade may see a new academic field related to services. Knowledge already developed on services marketing and service operations may be augmented by digitalization/algorithmicization (Zysman 2006) and ontology-based semantic modeling (Sheth, Verma, & Gomadam 2006). Some researchers are already on board with this thinking (Rust & Miu 2006), whereas others remain to be convinced

The debate over whether Service Science, Management and Engineering (SSME) is or is not a new field largely centers upon whether the services in question are or are not impacted by "world is flat" considerations. Certainly, it's possible to think of businesses that aren't globally mediated by ICT, but with the PC revolution of the 1980s and Internet revolution of the 1990s, businesses not connected to the web are often considered to be anachronisms. Students graduating from high school



and entering university have always had computers, and expect high-speed Internet access and mobile telephones as an ordinary everyday way of life. Researchers can choose to acknowledge these changes sooner or later, but entrepreneurial businesses are most certain to take advantage of such opportunities as soon as they appear viable.

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# Research Perspectives in Service Engineering and Management

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Volume 1

Editor: Saara A. Brax



HELSINKI UNIVERSITY OF TECHNOLOGY  
Department of Industrial Engineering and Management



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Innovation Management Institute IMI

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