1. Identification-interaction-innovation: a phenomenological basis for an information services view

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Abstract

In this chapter, we challenge the received view of design research in light of an information services view. We argue that, in relation to the work of Orlikowski and Iacono, an information services view describes a unique class of information systems (IS), in which users are able to identify, interact and innovate with information service systems. To better support this phenomenon, we propose a phenomenological approach to better understand participant interaction and redesign of recombinant services in the secondary design phase. We suggest four design metaphors that will shape our perception and design approach to this emerging class of cognitive- technical systems.

Introduction

As with many technical information systems advances, research in service-oriented information systems (IS) has examined individual factors and technical specifications that provide insight into a technology-oriented, practical perspective of complex socio-technical systems. This research philosophy is representative of the 'product view of design' (McKay and Marshall 2007)

that has come to dominate design-science research. Hevner et al. (2004:109) succinctly summarise this approach in the claim that the goal of design-science research is ‘the development and evaluation of technologies’.

In response, recent research has included development of design-science theory focused on Heideggerian environments (Germonprez et al. 2007) and interpretative epistemology in design theorising (Neihaves 2007). These approaches build on earlier conceptual research by Dourish (2001) and Winograd and Flores (1986) and this new perspective is well articulated by McKay and Marshall (2005:6), who state: ‘Design researchers are not merely designing an artefact to solve or ameliorate a problem: They are also charged with conducting research into some aspect or dimension of the design activity relevant to a particular problem solving space.’

Traditional information systems could be characterised as monolithic, rigid systems with crisp input/output interfaces, static ontological commitments, fixed functions and designer-controlled coupling of system goals and operators with the world. This has led to ‘brittleness in adapting systems to new purposes as practices develop and change’ (Dourish 2001:131). As information systems have evolved, there has been a shift towards tailorable systems in which users can align with their own tasks, goals, use patterns and metaphors (Germonprez et al. 2007).

The *information service view* (ISV) represents a coherent view of service-oriented socio-technical systems that make up a new class of information systems. This class defines a new problem space for the creation of information environments that are mutable, loosely coupled and emergent. Meta-category views of information technologies are presented in prior research (Orlikowski and Iacono 2001:130) and provide a set of conceptualisations that ‘challenge us to engage more seriously and more explicitly with the material and the information technology artefacts’. This research contributes a meta-category of service-oriented systems about which we can ‘theorize about the meanings, capabilities, and uses of IT artefacts, their multiple, emergent, and dynamic properties, as well as the recursive transformations occurring in the various social worlds in which they are embedded’ (Orlikowski and Iacono 2001:133). In constructing the ISV, we challenge the received view of IS design research and suggest that an interpretative epistemological stance (for example, phenomenology, hermeneutics) could be fruitful in design theorising regarding a new class of information systems.

Challenging the ‘received view’ of design

The emphasis on technical factors in the design of socio-technical systems has recently been criticised for neglecting the philosophical foundations of design research (McKay and Marshall 2007; Niehaves 2007). First, and perhaps foremost, the received view of design-science research is strongly positivist, with an emphasis on ‘artefacts’ (Hevner et al. 2004)—a ‘pervasive view that design science is about “things” and the things or artefacts of interest in IS are technical systems’ (McKay and Marshall 2005:2). The oft-stated goal of design research is to discover ‘knowledge that allows prediction of the behavior of some aspect of the phenomenon’ (Vaishnavi and Kuechler 2005) or to develop ‘predictive theory about the utility (effectiveness, efficacy, etc.) of applying the technological solution’ (Venable 2006:12). In addition, the accepted rationale for design evaluation is to rigorously demonstrate functional measures of utility, quality and efficacy (Hevner et al. 2004) of the artefact and reduce errors in the outcome measures.

One outcome of this rhetoric is a tendency to reify strong views of artefacts and outcome measures as concrete external structures. The rhetoric of the received view of design science contributes to the construction of facts by shaping our perception and our experiences (Brown 1976). This has the effect of reinforcing a Cartesian object–subject dualism that separates actor cognition from actor action and presents the artefact as an external object to be thought about and acted on (Introna and Whitaker 2002).

In the design-science literature, there is an emphasis on theories that ‘predict or explain phenomena that occur with respect to the artefact’s use (intention to use), perceived usefulness, and impact on individuals and organizations (net benefits) depending on system, service, and information quality’ (Hevner et al. 2004). Our knowledge of design is based on ‘an explanation of why an artefact is constructed as it is and why it works and explanations are usually regarded as a desirable part of a theory specification, assisting with their communicative purpose and the facilitation of human understanding’ (Gregor and Jones 2007). Very little research has, however, examined design from the *perspective of the user* to understand how the user interacts in the secondary design phase of the system, what goals are accomplished or what meanings are created through the recombinant design.

What faces us now is the reality that many of our information systems have multiple design states, including an initial design phase and multiple secondary phases, in an evolutionary trajectory of human-system-service interactions. Current design research has not addressed secondary design phases. We are still rhetorically constrained in a goal-oriented view of IT artefacts, hoping to

identify and specify successful and innovative systems that could be optimised for specific problem domains within an organisation. We model and evaluate these systems in accordance with important but limiting performance criteria that are not reflective of all current interactions.

The ISV recognises that there are, at minimum, two states of design: one state is where the service is distributed to users and another is where users discover the service, interact with the service and redesign the service system to fit their changing contexts. It is in the secondary design states that we have to consider movement away from attempting to: 1) model systems; 2) apply classic, goal-oriented outcome measures; and 3) reduce error. These three issues are invariably intertwined such that models allow us to identify outcomes in which error reduction can occur. This positivist approach to IS research—although valuable across numerous systems—breaks down in the secondary design phase. The speed with which tailorable systems and their available components are identified, interacted with and then disbanded or abandoned suggests the classic model-outcome-error approach is not well suited for design or evaluation of these systems. This research is intended to provide an alternative philosophical foundation to help researchers understand the secondary design phase and thus be better prepared to design the primary design state of these information environments.

The information services view

To define the ISV, we conducted field research at four organisations that were in the process of developing and implementing a service orientation. Our research reveals that the participants each have different conceptualisations regarding the definitions, functions and goals of IS ‘services’. The field studies were used to identify what designers considered critical issues in the initial design of service-oriented systems. Initial examination of the field research data indicates that this class of technologies represents a new view of the IT artefact—the *information services view*. This research summarises different views that make up the ISV with the goal of explicating the philosophical underpinnings that will allow for better understanding of this class of information system. In addition, we are able to serve both research and practice, speaking to the respective research and practice cycles, the knowledge transfer between the two and their associated outcomes.

The class of information systems in the ISV incorporates the distinction between the initial *design* and the *ways of doing design* and requires that attention be paid to the different experiences, perceptions, intentions and goals that the user will draw on to recombine services and redesign the system. An ISV emphasises

a phenomenological *potential for action* in which the user continually tailors information services to create meaning, as well as develops uses in new contexts or for new tasks (Germonprez et al. 2007). An ISV moves away from a predominant approach in systems design to over-engineer the IT artefact through a restricted set of data structures, interfaces and reporting systems, which can result in constraints on work practices. An ISV specifies that system users are function-oriented actors who envision desired goals and identify meaning and value through the action of creating and configuring recombinant information services. This suggests that designers of the initial state of service-oriented systems do not need to know how their services are going to be used, but instead should develop a reflective environment in which users' thinking, goal identification and the identification of meaning are supported. This view represents a shift in design from the provision of a fixed, designer-controlled service set to design of 'a space of potential for human concern and action' (Winograd and Flores 1986:37).

Prior research has generally conceived of services as enterprise legacy system and application integration (Lee et al. 2003), providing information (for example, about the weather) or affecting the world (for example, an e-commerce service) (Fensel and Busler 2002). In the ISV, services are defined by the function they fulfil for the user, not through prescriptive ways they are to be used. The ISV shifts the focus of services to action and recreation of meaning by the user, thereby allowing new services and functions to emerge. Table 1.1 summarises the key categories of differing views and their descriptions, in addition to specific component issues that are being addressed by practitioners at these organisations.

Table 1.1 Key category issues in the initial design of an ISV

Key category of an ISV	Description
Service identification, distribution and discovery	How services are built, managed, and discovered; how services are recombinant
Governance of services	How services are guaranteed, how services transcend business units/who pays for services; access control to services, internally and externally
Services as data	Creation and provision of meta-data; archiving of data. Commensurability and accuracy of data
Services as innovation	User-defined and structured information systems assembled from provided services for relevant domain of action

The nature of services and the continuous process of design and redesign require that we challenge the received 'product view' of design science and re-examine the philosophical foundations that will support the cognitive-interactive-technical components of emerging information service systems. The data summarised in Table 1.1 suggest the emergence of a new class of IS and require us to recognise the importance of secondary design. This suggests an

‘interactionist’ perspective of IS design that draws on Dourish (2001), Winograd and Flores (1986) and interpretative design epistemologies from Introna and Whittaker (2002), McKay and Marshall (2005, 2007) and Niehaves (2007). By examining the observed phenomenon of tailorable, mutable and recombinant computing practices through the interactionist perspective, we propose that design science would benefit from alternative epistemological and ontological commitments not provided in the ‘received view of design science’.

It is important to note that these issues are representative of technical developers and managers involved in the initial design of an ISV, not the participants in secondary states of what a technology could become once in use. Service-oriented technologies inherently have a dual design: the primary initial design as developed and provided to users and the secondary design, where users modify the technology in the context of use (Germonprez et al. 2007). We observe, however, that innovation, recombinant services, secondary design and commensurability of data are key issues. From these initial design observations, we suggest that the unique interactions of the information services orientation are characteristic of a new class of information systems and that an *information service view* will provide a coherent framework for research and development.

In seeking an expanded philosophical foundation, we build on this approach and explore the secondary states of an ISV. In particular, we propose three philosophical foundations, based on the field study findings regarding the initial design.

Seeking an expanded philosophical foundation

Much of the recent discussions regarding the philosophies underlying design science has focused on the relative merits of positivism versus interpretativism and the need for a broader philosophical base for design (McKay and Marshall 2005, 2007; Niehaves 2007). In addition, there is argument regarding the status of design science as a new ‘paradigm’ (Hevner et al. 2004; Niehaves 2007) and whether design theories are necessary or even possible (Venable 2006). These discussions follow in a long line of research into design theory for specific classes of systems, anatomy of design theory and history of design (Gregor and Jones 2007; Mumford 2006; Walls et al. 1992).

These philosophical discussions in IS retain, however, one common element: the subject/object dualism of the user and artefact. Recognition of the phenomenon that users interact with their information services and technology and engage in secondary design activities in the context of use has revealed a new problem space for researchers and designers. Recent work by Germonprez et al. (2007) on tailorable technologies and Gregor and Jones (2007) on mutable systems

has identified the need for an underlying design philosophy that will embrace the processes of interaction with their inherent creation and communication of meaning in the world. Many emerging services and technologies fulfil functions and are used in ways not predetermined by developers. In referring to behavioural science, Hevner et al. (2004:76) state that ‘it seeks to develop and justify theories (i.e., principles and laws) that explain or predict organizational and human phenomena surrounding the analysis, design, implementation, management, and use of information systems’. We contend that users of these systems can no longer be viewed as factors in an input-process-output model but must be considered as intentional actors capable of independent action. Technology has become highly embedded in our lives and users have become secondary and tertiary designers of systems that are intended to be modified in the context of use. We have to recognise that users are an integral part of the evolving states of a technology and, furthermore, how technology is continually specified, tailored or disposed of is often outside the realm of what designers can model, predict or optimise. Explanation and prediction (Gregor 2006) have been the emphasis in prior research in design science. Rather than relying on explaining and predicting outcomes or behaviour, we suggest that *understanding* the goals, action-as-meaning and behaviours of users of this new class of IS will better enable us to create the information environments with which they are interacting. Acceptance of this distinction will require a fundamental shift in the philosophical basis for our foray into design research, away from a positivist stance to a phenomenological approach to the discovery of meaning.

This research draws from four primary sources to develop a philosophical framework—all based around the findings regarding the initial design. The hope is that this framework will support understanding the secondary design phase and will inform the designers of the primary design state. The field data summarised above suggest three practice-based areas in which the ISV differs from prior conceptualisations of systems philosophically: identification, interaction and innovation.

Fundamental shift

In many areas of IS design, there has been a call for design of adaptable technology that can react to a volatile and changing world. The design research literature has only begun to explore the participant action required to interact with this class of technology or the design of information environments that support these actions. The implications for user behaviour and outcomes and the evaluation of the emerging ‘interactionist’ cognitive technological systems have also received minimal research attention. The fundamental philosophical basis for this research is an interpretative stance that emphasises understanding over explanation in design research. Interpretative research is based, in part, on the

idea that ‘because social theories are theories of intentional objects, they pose problems for analysis which cannot be grasped merely from an understanding of theories of physical things’ (Fay and Moon 1996:29). We suggest that for a researcher to gain his or her own comprehension of the observed human subjects’ understanding, the researcher should adopt a phenomenological stance to ‘understand participants’ perspectives and views of social realities’ (Introna and Whittaker 2002:57). Johann G. Droysen (1858) is credited with making the distinction between ‘explanation’, which is the task of natural sciences, and ‘understanding’, which is the task of the human sciences. Dilthey (1989:332) was instrumental in describing the distinction by defining understanding as ‘the process by which mental life comes to be known through an expression of it given to the senses’. From this perspective, one ‘understands the aims and purposes of an agent, the meaning of a sign or symbol and the significance of a social institution or religious rite’ (von Wright 1971:6). Phenomenology was identified early in the history of IS as a means of determining ‘the structures of meaning that give sense and significance to our immediate experience’ (Boland 1984:194) and has been used in recent IS (Introna and Whittaker 2002; Monod and Klein 2005) and human–computer interaction (Svanaes 2001) research. By utilising the ‘phenomenological reduction’ to ‘bracket out’ the researcher’s own theoretical attitudes, and by ‘supposing that something has to be “real” or “concretely existing” to be experienced’ (Husserl 1964:154), the researcher can come to *understand* the nexus of relationships that make up the essential, subjective meanings held by the human participants in the phenomenon that he or she is researching. This shift to understanding the experiences of the participants becomes more relevant as we recognise the actions that are occurring in the secondary design phase of tailorable services. In using semiotics to examine design, Purao (2002) states that the design researcher simultaneously arrives at an interpretation (understanding) of the phenomenon and the design of the artefact. But in the case of the secondary design phase in the ISV, the designer is the user and the user is the designer. It is the user-as-designer’s experience we are seeking to understand.

This shift to a phenomenological epistemology for design research leads to incorporation of the work of Martin Heidegger (1927), who proposes that meaning is embedded in the world and it is revealed through user interaction. Suchman’s (1987) work on situated action and recent writings of Dourish (2001) and Ciborra (2002) have argued that foundational philosophy adopted by computer science and IS researchers has proven inadequate when describing the ways that computers and people interact. In the majority of computer-based research, users are treated as surveyors of an external world and that meaning is constructed based on continual survey. The ‘embodied interaction’ perspective of Dourish (2001) and the recent literature on tailorable systems (Germonprez et.

al 2007; Mansfield 1997; Morch and Mehandjiev 2000) recognise, however, that as users interact with technology through reflection and action, users create, reveal and communicate meaning in the world.

Three important cognitive technical views of services are described below and demonstrate how epistemological commitments selected to produce understanding, rather than explanation, can avoid traditional model-outcomes-error design and instead focus on identification-interaction-innovation. It is from these new identified philosophical bases that we can support the secondary design phase. We no longer are constrained by IT as product/artefact, but instead we dissolve the user-artefact dualism to understand the secondary design phenomenon from an interactionist perspective.

Identification

The identification of services is a new design challenge for a participant that requires support in the realisation of an ISV. Discovery and identification of services and their accompanying meta-data can be accomplished through technical means in the form of directory services or portals. Detailed meta-data might be required so that users can determine the accuracy, validity and commensurability of different services. In addition, well-defined interface descriptors and documentation will permit transparent recombination of services. Identification was introduced as a critical component of contextual design—a design consideration that parallels the secondary design of tailorable technologies (Beyer and Holtzblatt 1997). Contextual design emphasises the importance of discovery and identification as precursors to system understanding. From understanding comes interaction and from interaction comes innovation and development of a system.

Furthermore, a goal of strong service identification lies in capturing services in the long tail (Anderson 2006). In the long-tail theory, services that hit a small market will remain unseen. Before an ISV, services that were determined to hit only a small segment of an organisation would remain hidden and unidentified to the whole. Interaction and innovation would occur only with services that had large organisational exposure. The long-tail theory suggests that in a market supported by emerging service-based technologies, the entire tail of all services should be explored—not merely those with the highest, predetermined potential impact. If we encourage individuals to interact and innovate in unknown and unforeseen ways, we need to open support to the entire spectrum of all available services. The entire tail of organisational services is critical in the realisation of an ISV and is critical for interaction and innovation.

Interaction

The primary focus of the concept of ‘embodied interaction’ is that ‘embodied phenomena are those that by their very nature occur in real time and real space’ (Dourish 2001:101), and that our phenomenological being-in-the-world ‘is found in the world in which we act’ (p. 116). Dourish integrates different phenomenological stances to argue for the importance of understanding ‘not just what the system *can do*, but rather, what it *really does do* for people...what decisions people make about when and how to use the system...what sort of information it contains’ (p. 133). In addition to shifting from explaining the features or form (and the accompanying performance measures) of a service system to understanding what function the system fulfils, we must also examine inter-subjective communication between participants through their action of using the services. The secondary design phase supports sharing of how ‘people develop and communicate shared ways of using software systems and the ways of doing their work with software systems’ (Dourish 2001:133).

From the same philosophical roots, Introna and Whittaker (2002) argue that researchers interested in participant experience should recognise that thinking or cognition is action. We are never separate from our thinking and our thinking is always situated in the world.

The concept of ‘possibilities for’ accompanies a phenomenological approach that means that every interaction with the system opens the horizon of possibilities for the next action. The desired state of interaction is one of *situated being-in-the-worldness* (Heidegger 1962; Introna and Whittaker 2002) and is when the artefact becomes present at hand and reflects the intentions of the user. Introna and Whittaker (2002:163) pose the following analogy regarding ‘the intentional arc’:

In leaving her office to go to a meeting in another building, she does not need to make a decision to exit her office, she does not need to visualize the door, the handle, and the movements required to open it, she does not need to determine the shortest route to the door; she does not need to coordinate them in a coherent set of thoughts and actions in order to leave her office...Thus she simply gets up and walks out to the meeting.

The ‘user’ does not withdraw from the (inter)action to think before engaging in the action; rather the situated use of recombinant information services is the cognition. Introna and Whittaker (2002) describe recalling how to use a tool as a non-random collection of actions or ‘fiddling’ thereby allowing re-emergence of meaningful use. This is the same type of discovery or creation of meaning that participants in services-related systems experience as they create mash-ups, tag-clouds or access services containing user-enhanced information.

Innovation

The ISV explicitly recognises that designers and service providers cannot articulate coupling of the system to the world by defining what it is intended to do and what the consequences of use will be. Rather users will create new structural couplings in alignment with their domain of action (Winograd and Flores 1986). From these real-world problem settings we can extract the areas of concern, which represent a broad set of categories that helps define an ISV. An ISV shifts the focus of services to action and recreation of meaning by the user, thereby allowing new services and functions to emerge. Intrinsic to an ISV is the idea that ‘the users and the designers do not, in fact, share the same model of the task domain’ (Dourish 2001:131) and that services ‘will often be used in ways that were not anticipated in their design’ (Winograd and Flores 1986:53). From an information services view, the user, rather than the designer, makes decisions about the relationships among services, types and relevancy of data and outputs and what things functionally go together as representations of the real world (Hovorka 2005).

Design metaphors for the information services view

Our thinking about service-oriented information, what constitutes services, how users really perceive the recombinant actions of service use and re-creation of service configurations must be greatly strengthened by further observation. It is clear, however, that the ISV represents a new class of ‘IT artefact’ in relation to the classes identified by Orlikowski and Iacono (2001) and that secondary design and interaction by participants are becoming crucial elements in the way systems are used to communicate and innovate. We propose that design researchers need to frame the initial design activities of these interactionist cognitive technical systems in different rhetorical terms and with different metaphors so that we can better understand how users interact with the ‘life world’ offered by the service-based systems. We also believe that metaphor can play an important role for users of service-oriented systems, making them more approachable and therefore more interacted with. By this interaction, empirical testing and evaluation can emerge through which refinement to the foundations of identification, interaction and innovation can be made.

Madsen (1989) argues that metaphor can be used to perceive a situation in a new way to provoke invention of future artefacts and that metaphors from our experience are used to understand new environments. Brown (1976:172) states that ‘metaphor allows each system to be perceived anew from the viewpoint of

the other'. As design inherently produces new environments, the metaphors by which designers and participants understand the systems are crucial. Introna and Whittaker (2002:166), in framing IS evaluation, suggest the notion of a 'conversation, as it includes the essential elements of situated directedness and ongoing dialectical movement (to and fro) as an exemplar of cognition and action'. In the secondary design state, this is an apt metaphor for the ISV, as the user is simultaneously *acting on* and *acting with* system components, engaging, distancing and reengaging, and communicating with components, other users and service designers/providers.

This research is not at a stage where principles for design, rules or guidelines are appropriate. Rather we lay out some comments regarding the secondary design phase that occur across a range of contextual and use settings that warrant consideration in the initial design phase.

Information services as a communication medium

An interactionist perspective emphasises the coupling and creation of meaning with the world and the sharing of that meaning with other participants. On the surface level, many of the service technologies (such as Web 2.0, RSS, wikis, cloud-tags, Twitter, and so on) provide inherent communication/collaboration in direct channels with other participants. At a deeper level, however, the services must supply feedback to the participant during the exploration of re-combinatorial characteristics of the service orientation. The service system must be initially designed to communicate to the participant what it *has done* and *might do*. Note this does not include what the system *can do*, as an explanatory communication, since this would require the design of the initial state to foresee all possible future actions. As the horizon of possibilities emerges, the participant must have clear signals about how to realise the desired structural coupling. This can be done through the principles of existing tools, recognisable conventions and components and established metaphors (Germonprez et al. 2007). In addition, we need to change the rhetoric from *design* to *disseminate*. In their lived action of secondary design, users are not experiencing a formal design action that they then describe to others. Rather, they are engaged in identification of goals and interaction with the services through selection, re-creation and dissemination of the resultant innovation through the action of creation. This subtly changes the design metaphor from product design to communicative action (Habermas 1987), which opens a new domain of applicable theory.

Information services as continual re-creation

The traditional rhetoric of the received design-science view shapes the perception of 'IT' and 'service' as fixed, finished objects that can be optimised. The research goal is to design, model, service and evaluate systems/services

in relation to a set of preconceived goals and operators. In this way, we can manipulate the system so that we explain the greatest variance in a specific selection of performance measures.

In contrast, the ISV and its interactionist perspective suggest that the secondary design states cannot be fully predicted, modelled or well explained. Standard organisational impact and traditional performance measures might not be the best means of evaluating services and systems. It is well recognised that systems ‘will often be used in ways that were not anticipated in their design’ (Winograd and Flores 1986:53). The creation of tailorable technologies, information environments and loosely coupled services are all attempts to support secondary design of services and systems so that participants do not experience breakdowns or mismatches where technologies require them to disengage from being-in-the-world. By re-creating systems in accordance with their own tasks, tools, use patterns and metaphors, participants maintain a ‘skilful conversation’ with the services, other participants and themselves.

Information services as evolution

The trajectory of services systems is driven by functional fit—that is, what things go together in the world (Hovorka 2005). Those services that are adaptable, mutable and that lend themselves easily to re-combinatorial process can mutate and evolve to fill functional niches for a wider, and longer, tail of participants. Unlike biological evolution, in which ‘mutations’ are random, information services and their supporting technologies are functionally oriented designs. Like biological evolution, the components that contribute to some goal can be inherited by future services and systems. The secondary design phase can be a powerful force for service evolution as ‘it can create new ways of being that did not previously exist and a framework for action that would not previously have made sense’ (Winograd and Flores 1986:177). As technologies and services proliferate, and as participants select, interact, disseminate and disengage from services, it is important to understand these processes in the larger scope of the participants’ entire information life world.

Information services as interaction

The interactionist perspective invites reflective evaluation along the lines suggested by Introna and Whittaker (2002). Reflection has long been an issue surrounding systems that engage and encourage the user to look, touch and work with parts in the creation of a larger whole. From Heidegger (1927) to Winograd and Flores (1986) and Dourish (2001), researchers have considered the reflective component critical if we are to interact with and ultimately innovate on component parts. Information services adhere to this in that a single service is functional but a collection of services can be unique. To move from a single-

function service to a contextually oriented, unique and innovative set of services in the production of a new information system requires knowing what a service is, what it can do and how it can be combined. In short, it requires interaction.

Conclusion

This research outlines a preliminary philosophical foundation for a new class of information systems. In doing so, we challenge the conventional design-science approach by seeking to understand, rather than explain, what participants are really doing with service-oriented systems, from the user's own perspective. We suggest that an interpretative approach, based in phenomenology, will provide insight into the meaning of the creation in which users participate when they redesign service-oriented systems in a secondary design phase. Essential in this new understanding is the change from a subject/object dualism of user–artefact to an interactionist perspective in which participants are engaged in a 'conversation' with services and technologies. By clinging to, and reifying, the subject/artefact dualism, we could continue to design and evaluate information systems via techniques that satisfy our desire to explain variance and reduce error. In doing so, however, we would fail to see the ready-at-hand engagement observed in the continual creation, consumption and disengagement of service-oriented information systems. A coherent information services view allows us to describe the creative and reflective information environments in which the user is actively involved in a continuous process of separation, reflection and re-engagement.

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