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Clarifying and improving the digitization of practices – The research agenda of socio-instrumental practice knowledge

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1 General purpose

This is a description of a long-term research project. In a traditional sense the term “project” might be misleading here, since the discussed activities do not have any fixation in time, which is usual for a research project. There is neither a strict delimitation of project activities, rather a sketch of a research orientation that might include several possible (not yet stated) research activities. In this sense the term “research program” might be more adequate, with a meaning of something broader (and not fully defined) including different possible research activities. However, the term “project” is preferred based on its etymological meaning: from Latin *proiectum* “something thrown forth”. This description of research made by me is something *thrown forward* with the intent to be followed in the coming years.

I started my research career in 1973, which is more than 44 years ago. I have been a professor since 1996, which is more than 20 years. In 2016 I altered to emeritus professor. In a sense it is “business as usual”, since I plan to continue my research work, but it is also a change since I will now work more dedicated with some demarcated (but broad) research topics. Less time will (hopefully) be spent on educational and administrative matters and I intend to work more concentrated with some research tasks. I have realized that it is now time to reflect on what to do in this part of my research career. I have felt it urgent to avoid jumping around on interesting but possibly very diverse activities. My intention is to address research issues that I consider as important and fun. There are thus certain things I want to address and it is important to state such research orientations in order to act in a more purposeful way. I have therefore formulated two broad emeritus projects that I plan to work with on a long-term basis:

- Clarifying and improving the digitization of practices – The research agenda of socio-instrumental practice knowledge
- Relevance and clarity in information systems research – The pragmatist agenda of multi-grounded practice research

The first of these two projects is described in this account. The second project description can be found in Goldkuhl (2017a).

My purpose is here to present and outline this long-term research project. This is however not something suddenly thrown forth. It is definitely a continuation of research orientations previously pursued. In section 2 below I will put this research project in a historical context describing issues that I have been working on, partially on my own but often in collaboration with research colleagues. In section 2 I have also described parts of the knowledge base for the project. I have in section 3 tried give a focused account of research issues that should be addressed within the project. This is however an open list that will be refined in coming years. In section 4 I present what has been done in the recent past and what I work on at the moment. This is continued in section 5 where I describe plans for 2017-2018.

This research project description should be seen and regarded as communicative actions as both a **declarative** and an **invitation**. It is a declarative since I make clear to myself and others what I intend to work with during the coming years. This involves personal commitments and clarification of scope and content of this long-term research project. However, it should also be interpreted as an invitation to other scholars to join me in these endeavors. This research orientation might work as an inspiration for the reader to engage in.

Joint work including the writing of joint publications might be one possible outcome. I welcome initiatives for collaborations on stated research issues and concerns.

2 Theoretical orientation and historical achievements

The key words of this research agenda are “*digitization of practices*”. It is a fairly modern way of expression to talk about digitization. Well established notions since long ago are information systems and IT artifacts. These labels can of course be used and will also be used in the historical description below. The perspective behind the wording “digitization of practices” is that social workpractices of today is often pervaded by digital technology and that the performance of such workpractices is accomplished through complex entanglements of human and digital behavior. From this follows, that inquiries of digital artifacts need to be pursued, together with a study of the social practice context of such artifacts. A continual shift between a digital artifact focus and a workpractice focus is desired in studies of this kind.

The wording “digitization of practices” is carefully chosen. As said above, it denotes how workpractices are when they are digitized. It denotes also the process of how they become digitized the way they are, i.e. the process of development and change. Cf figure 1.

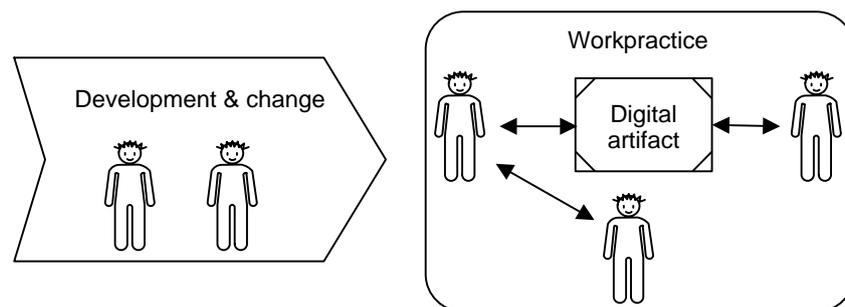


Figure 1. Focus areas for digitization of practices

2.1 Language action perspective and communication analysis

During my Ph D work on methods and models for information analysis (Goldkuhl, 1980a) I felt a deep need to clarify notions of information systems (IS) and information. I started this work from the infological and systems-theoretical works of Börje Langefors (1966; 1993), who was my supervisor. I was inspired by these thoughts on information and IS, but felt a need to further develop them. I saw a need to more clearly relate them to human action and communication. In my Ph D dissertation I took steps to outline a modified framework that I started to call the human-infological framework (Goldkuhl, 1980a; 1982). Key ideas behind this human-infological view were that information systems are vehicles for communication between people (users) and in order to be such a vehicle an information system must hold a formalized professional language (Goldkuhl, 1980b). This communication view was inspired by theories on social interaction (such as Berger & Luckmann, 1966; Schutz, 1970) and classical semiotics (e.g. Ogden & Richards, 1923). The specific view that an IS holds a formal language for communication between people was inspired by Nissen (1976) and Klemola & Lyytinen (1978). In an early paper (Goldkuhl, 1980b) I started to articulate a view of IS development as a process of “establishing a formal language intersubjectivity among users”.

In this paper I summarized this evolving communication perspective on IS in the following five ontological statements:

- An information system is intentionally arranged by some people and the purpose of its usage is to inform some people about something as a support to their action
- A computerized information system is utilized for communication between users in a formal language about a specific topic
- Specification of such an information system is to develop and express a formal language (concepts, formal rules and terminology) among users
- Through the specification process different users' professional languages are transformed to one formal language
- Through the specification process intersubjectivity among the users about the formal language can be developed

Looking backwards, these five ontological statements have been central in my research since then and they have later been gradually refined.

The view on IS that was inspired by view of social action and language use was brought further in the articulation of a language action view of information system (Goldkuhl & Lyytinen, 1982a). This was defined as a perspective primarily based on speech act theory (Austin, 1962; Searle, 1969; Habermas, 1979; 1984), but also inspired by sociology of knowledge (Berger & Luckmann, 1966) and hermeneutics. The speech act idea to see communication not merely as information transfer but as social action was adapted to the context of IS. The division of speech acts made by Searle (1969) into different aspects (propositional, illocutionary, perlocutionary) was used to conceptually clarify an information system as a linguistic phenomenon.

The language action view of IS was further theorized in several papers (e.g. Goldkuhl, 1984ab; Goldkuhl & Lyytinen, 1984). It was also operationalized in a methodology for IS requirements analysis (Goldkuhl & Lyytinen, 1982b; Goldkuhl, 1984c). These contributions can be said to be fore-runners to the work on IS actability that was started during the 90'ies (section 2.5 below). The works on the language action view were also fore-runners of other later works, such as Business Action Theory (section 2.4) and socio-instrumental practice theory (section 2.6).

The articulation of this language action perspective on IS was far from mainstream IS. There were also other scholars who developed views on IS based on speech act theory, such as Flores & Ludlow (1980), Winograd (1980) and Winograd & Flores (1988). These works inspired later the modelling of business processes as communication and coordination in the Action Workflow approach (Medina-Mora et al, 1992) and the DEMO approach (Dietz, 1994). Based on this evolving tradition, the international workshop of the language action perspective (LAP) was initiated 1996 and a community of scholars was established through these annual workshops. I participated actively in these workshops together with my close research colleagues. LAP-based research on business interaction and IS actability was presented at these LAP workshops. These areas will, as mentioned, be presented below (2.4-2.5).

I used the LAP workshop to theorize on communication and language action. I made contributions on validity claims in communication (Goldkuhl, 2000), relations between communicative and material actions (Goldkuhl, 2001) and on relations between conversation analysis (Sacks, 1992; Linell, 1998) and communicative action theory (Goldkuhl, 2003a). These theoretical works have continued later. The language action approach emphasizes communication as social action. This view has been pushed further in articulation of communication as the establishing of social relations (Goldkuhl & Lind, 2007; Goldkuhl, 2017b). This view was already indicated in Goldkuhl & Lyytinen (1982a), but it was not until 35 years later that a more thorough articulation of this was made.

Speech act theory (Searle, 1969) has been one dominant element behind the language action perspective in IS. There have been comparative analyses of Searle's speech act theory and the communicative action theory by Habermas (1984); confer e.g. Dietz & Widdershoven (1991) and Schoop (1998). I made during the LAP workshops attempts to broaden the research agenda in different directions beyond this; e.g. bringing in practice theory (Goldkuhl & Röstlinger, 1999) and conversation analysis (Goldkuhl, 2003a). Later, I made a broadening of communicative analysis far beyond speech act theory. In Goldkuhl (2005a), I articulated a socio-pragmatic framework for analysis of communication and conversation¹. I brought in other theories than speech act theory, such as conversation analysis (Sacks, 1992), discourse analysis (Linell, 1998), semiotics (Bühler, 2011; Jakobson, 1960) and functional grammar (Halliday, 1994); and synthesized these in a framework consisting of nine communication functions. This socio-pragmatic framework has been applied in different empirical contexts; such as elderly care (Goldkuhl, 2005a), e-prescriptions (Öhlund & Goldkuhl, 2008), customer communication via telephone vs. e-mail (Larsson et al, 2009) and information security policies (Karlsson et al, 2017).

2.2 Change analysis: workpractice modelling and diagnosis

During my time as Ph D candidate at Stockholm University (1973-80), I also participated in the development of methods for change analysis; the so called ISAC² method (Lundeberg et al, 1981). Change analysis is defined as an initial and separate stage in workpractice development that comprises 1) a diagnosis of the workpractice and 2) a generation of possible change measures and based on this 3) an informed decision in what direction to proceed for the development of the studied workpractice. It is a way to avoid taking IT development for granted in workpractice change.

After I finished my Ph D work, I continued working with change analysis, but with a new direction. With some inspiration from the ISAC method, but partially in opposition to some of its methodological bases³, a new method for change analysis was developed; the SIMM method (Goldkuhl & Röstlinger, 1984; 1988; 2003a; 2005a). A new methodological thinking was developed. One of the cornerstones of this thinking was the method component concept (see section 2.3 below).

¹ One initial and provisional step in this direction was taken in Cronholm & Goldkuhl (2004).

² During this time I worked in the research group ISAC. Later I worked (as research director) in the research groups HUMOR and VITS. Knowledge development through these research environments is described in Goldkuhl (1992a; 2006).

³ My critique of what we achieved through the ISAC method is summarized in Goldkuhl (1984d).

We developed new method components for:

- Problem analysis/modelling (Röstlinger, 1982; Goldkuhl & Röstlinger, 1988; 2003a; 2009)
- Goal analysis/modelling (Goldkuhl & Röstlinger, 1988; 2009)
- Process/activity analysis/modelling (Goldkuhl, 1992b; Goldkuhl & Röstlinger, 1988; 2003a)

These were important instruments for evaluation of workpractices, when diagnosed whether ISD should be an appropriate change measure (Goldkuhl & Röstlinger, 2003a). Later other method components were added. The development of workpractice theory (section 2.6) gave rise to a new method component: Workpractice definition (ibid).

During the early 90'ies I participated in research on Design Rationale – DR (e.g. MacLean et al, 1989). This is an approach that has been used for designing and assessing user interfaces. It makes arguments (pro or con) behind different design alternatives explicit. I applied this type of approach in design and evaluation oriented research. As a result of this I made a conceptual analysis of DR in Goldkuhl (1991). It took some time before this thread was furthered. In Goldkuhl & Röstlinger (2009), we developed, based on DR thinking¹, an approach called argumentative design that comprised problem analysis, goal analysis and alternative generation and evaluation.

2.3 Theorizing methods

The development of change analysis/SIMM was accompanied by an evolving method-theoretical perspective. We developed a component view of methods (Röstlinger & Goldkuhl, 1994). The central part of a method was defined to be a method component. A method component consists of three integrated parts:

- Conceptualization
- Procedure
- Notation

The method component view influenced the development of a method engineering approach (Goldkuhl & Fristedt, 1994). This was used for analyzing, describing and integration of methods (e.g. Goldkuhl et al, 1998). Confer also Cronholm & Ågerfalk (1999) and Karlsson & Ågerfalk (2007).

Recently, a summary paper has been produced (primarily for education purposes) describing origins and uses of methods and their roles in production and use of models in workpractice and IS development (Goldkuhl & Röstlinger, 2017a).

2.4 Business action theory: business processes and business interaction

Based on the earlier works on language action (section 2.1), I started to work, in mid 90'ies, on conceptualizations of business interaction. Based on works by Winograd & Flores (1986), the Action Workflow approach had been presented (Medina-Mora et al, 1992). This was a

¹ Design Rationale thinking has been used in several design methods. A comprehensive account of motivation and application is given by Conklin (2006).

loop model describing how the two roles 'performer' and 'customer' coordinates the performance (made by the performer) for the sake of the customer. Four generic communicative actions were identified and described in this loop model: 1) request (by customer), 2) an agreement (by the two parties) on performance, 3) a declaration (by performer) that the performance had been effected, 4) a declaration of acceptance (made by the customer).

As a reaction to this workflow loop, I presented an alternative model for business interaction (Goldkuhl, 1995; 1996). I narrowed down the scope to be about business interaction between supplier and customer. In Action Workflow, there could be any "performer". I criticized Action Workflow to leave out several actions from the loop model. Material actions (of delivery and payment) were excluded in the Action Workflow. I also objected to the loop idea (from customer to performer and back to customer). I advocated for exchanges between the two parties in each phase. The first business interaction that I presented was fairly complex. Later I made the model more essential by crystallizing it to six phases and the exchange between the parties in each phase (Goldkuhl, 1998). The model was coined "the BAT model" (after Business Action Theory). This name was chosen to allude to speech act theory.

Some years earlier, the business process reengineering wave had started (Hammer & Champy, 1993; Davenport, 1993). There was a growing interest for how to redesign business processes through information technology. The interest in business processes had an origin in quality management and the improvement of industrial processes (Rao et al, 1996). The Action Workflow approach could be seen as a reaction to an industrial focus in business process redesign, i.e. how to improve production and delivery processes. Keen & Knapp (1996) have identified two contrasting views on business process improvements: a process as workflow view vs. a view of processes as the coordination of work. The latter view emphasizes coordination, agreements and commitments as in LAP approaches. These two approaches can be labelled as transformative vs. coordinative views.

The coordinative LAP view was the basic theoretical foundation for the BAT development. However, important theoretical inspiration came also from theories on business interaction and business relations (Håkansson & Snehota, 1995; Gummesson, 1999; Normann & Ramirez, 1993; Glynn & Lehtinen, 1995). It is also important to add that the BAT development, although well founded in LAP, always has acknowledged the transformative aspect of business processes. An integrative view of transformation and coordination was elaborated in Lind & Goldkuhl (2006a) and Goldkuhl & Lind (2008). See also section 2.6 below.

The BAT model inspired much research on business interaction and business process development; e.g. Lind & Goldkuhl (1997; 2003; 2006ab), Christiansson (1998), Axelsson et al (2000), Goldkuhl & Melin (2001), Axelsson (2003), Johansson & Axelsson (2005), Petersson & Lind (2005), Eriksson & Lind (2007), Goldkuhl & Lind (2007).

The BAT model was further developed. In 2004, different variants of BAT was introduced (Goldkuhl & Lind, 2004), in order to clarify different business interaction situations. In 2007, the BAT model was expanded into the Generic Exchange Model covering both business interaction (between suppliers and customers) and government – citizen exchange in governmental services (Goldkuhl & Röstlinger, 2007). This model (figure 2) makes a

distinction between dyadic exchange (consisting of four exchange phases) and a preceding forum level where producers/suppliers and clients/customers search for contact. The interaction is based on a material and immaterial infrastructure.

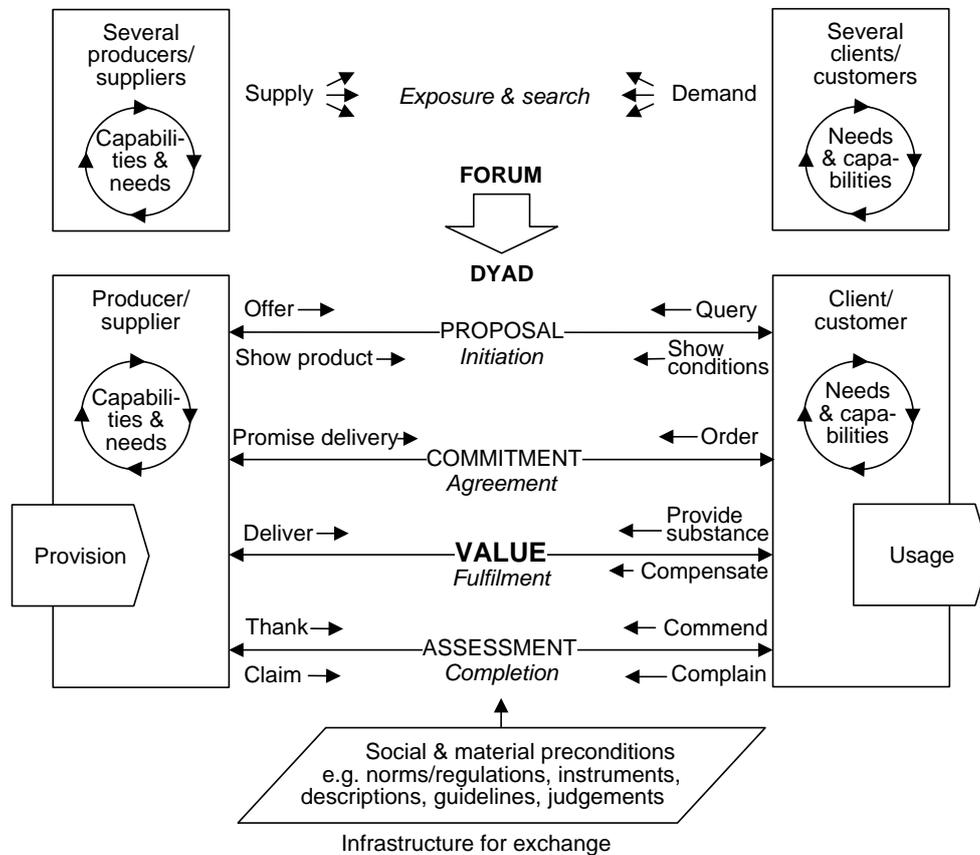


Figure 2. The generic Exchange Model – a further development from the BAT model (Goldkuhl & Röstlinger, 2007)

2.5 Information systems actability

As described in section 2.1 above, a development of a LAP-based IS theory (Goldkuhl, 1980b; Goldkuhl & Lyytinen, 1982a) was accompanied by development of methods for information requirements analysis (Goldkuhl & Lyytinen, 1982b; Goldkuhl, 1984c). This work continued and I published a book in Swedish (Goldkuhl, 1993) on a requirements analysis method (called VIBA/SIMM).

Further development was made together with some research colleagues under the label “*information systems actability*”. The language action perspective and speech act theory were main sources of inspiration, but there were also other kinds of influence. We applied a broader social action view (Mead, 1938; Berger & Luckmann, 1966; Weber, 1978; Giddens, 1984). Another source was usability as expressed within human-computer interaction (e.g. Norman, 1988; Nielsen, 1993). The label ‘actability’ was chosen with reference to ‘usability’. We did not only perceive IS as an instrument to *use*, but a vehicle for *social action*. We defined information systems actability “as an information system’s ability to perform actions, and to permit, promote and facilitate the performance of actions by users, both

through the system and based on information from the system, in some business context” (Goldkuhl & Ågerfalk, 2002).

Information systems actability was developed as conceptualization/theory, design method and evaluation method. Overviews of the basic information systems actability theory (and their relations to the above mentioned foundational theories) can be found in Goldkuhl & Ågerfalk (2002; 2005), Ågerfalk (2003), Goldkuhl (2009a), Cronholm & Goldkuhl (2010a) and Sjöström (2010). In actability theory, there are many relations to other theories and conceptual domains, which are treated in several publications:

- Infological theory (e-messages) of Langefors (1966; 1993); confer Goldkuhl (1995) and Ågerfalk (2002).
- Conceptual modeling; confer Ågerfalk & Eriksson (2004).
- Semiotic theory in IS (e.g. Stamper, 1994); confer Goldkuhl & Ågerfalk (2002), Sjöström & Goldkuhl (2004) and Sjöström (2010).
- Communication theory of Clark (1996); confer Ågerfalk (2004).
- Affordance theory of Gibson (1979); confer Goldkuhl (2008a; 2009a).
- Activity theory (e.g. Engeström, 1987); confer Broberg (2008).

The relations between actability and usability have been investigated in many publications; e.g. Cronholm et al (1999), Ågerfalk (2003), Sjöström & Goldkuhl (2004), Goldkuhl et al (2004), Ågerfalk & Eriksson (2006) and Sjöström (2010). We developed different generic models of user – IT interaction. We clarified our communicative view of the user interface (figure 3). We also developed a loop model of the user – IT interaction based on a theory of stages of the act (Mead, 1938); see figure 4. The interaction is conceptualized in four phases and the model is called the elementary interaction loop.

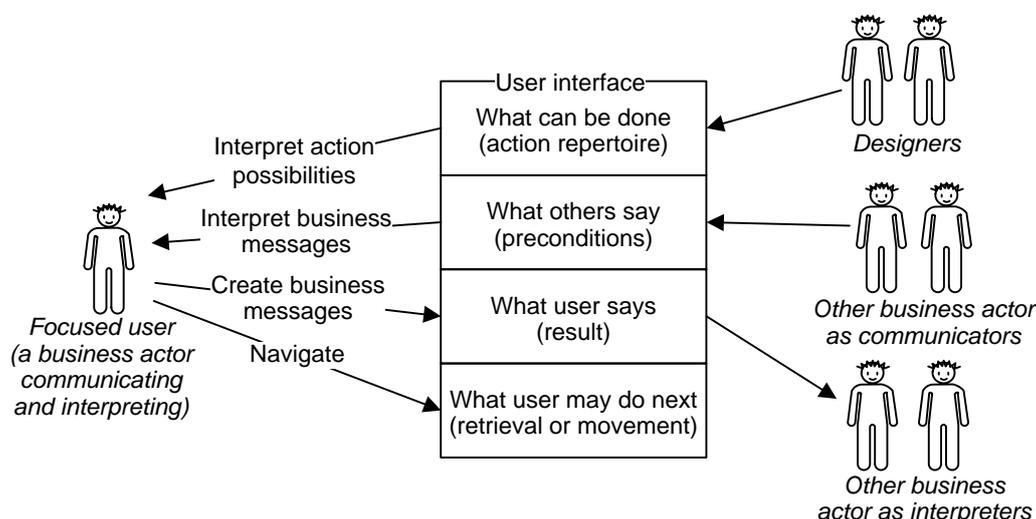
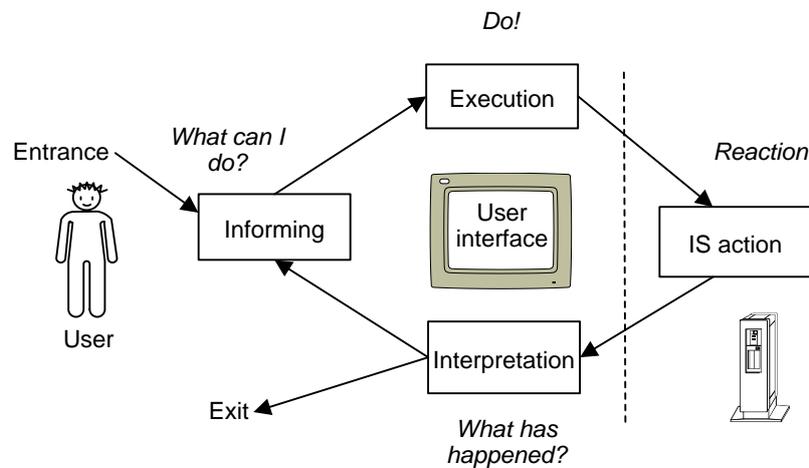


Figure 3. A communicative model of user interfaces
(based on Sjöström & Goldkuhl, 2004; Goldkuhl, 2009a)

The work with clarifying the user – IT interaction was accompanied by development of quality criteria for such interaction. Criteria for user-interfaces play a prominent role within the design method and evaluation method of IS actability. There exist many publications with such contributions: Ågerfalk et al (2002), Cronholm & Goldkuhl (2002), Sjöström &

Goldkuhl (2002), Ågerfalk (2003; 2004), Cronholm & Goldkuhl (2010a) and Goldkuhl (2011a).



*Figure 4. The Elementary InterAction Loop
(based on Goldkuhl et al, 2004; Goldkuhl, 2009a)*

Overviews and different aspects of the IS actability design method can be found in Goldkuhl & Ågerfalk (1998), Ågerfalk et al (1999), Ågerfalk & Goldkuhl G (2001), Ågerfalk (2003), Cronholm & Goldkuhl (2010a). Specific contributions concerning the actability evaluation method can be found in Ågerfalk et al (2002), Ågerfalk (2003), Cronholm & Goldkuhl (2003; 2005; 2010a), Sjöström (2010).

2.6 Socio-instrumental practice theory

Based on LAP and BAT development, a new practice-oriented theory started to evolve in the late 90'ies. This practice-theory development emerged from LAP, but expanded beyond this kind of theorizing. LAP approaches (mentioned in section 2.1 and 2.4), such as Action Workflow, BAT and DEMO are all two-role models. They describe coordination and interaction between two parties; a supplier and a customer (if a business setting). Such two-role models are however restricted; other actors are excluded; confer critique in Goldkuhl & Röstlinger (1999), Lind & Goldkuhl (2002) and Goldkuhl (2007a).

The ambition behind this emerging practice theory was to have a broader coverage than LAP approaches (Goldkuhl & Röstlinger, 1999). LAP was oriented to horizontal coordination between supplier and customer. The new practice theory included also vertical coordination within an organization and also influences from external sources other than customers. As with BAT, it also included transformative processes besides the horizontal coordination between customer and supplier. With inspiration from activity theory (Engeström, 1987; Wertsch, 1998), it emphasized the roles of tools for action. However, activity theory is mainly restricted to physical tools (Goldkuhl & Röstlinger, 2003a). In the spirit of LAP it was axiomatic to comprise language and descriptions as instruments for actions (ibid).

This theoretical development relates clearly to a practice turn in contemporary research (Gherardi, 2000; Schatzki et al, 2001; Reckwitz, 2002). The practice notion has been put in focus instead of fragmented elements of such a practice. A practice view is a way to transcend

and reconcile the oppositions between macro views and micro views in social research (Knorr-Cetina & Cicourel 1981). A practice is holistic and systemic concept (as such a macro concept), but it is at the same time micro-sensitive since it presupposes and comprises micro-elements of actors and actions (Goldkuhl & Röstlinger, 2002). According to Schatzki (2001) a practice is considered to be “embodied, materially mediated arrays of human activity centrally organized around shared practical understanding” (ibid p 2).

Our emerging practice theory was centered on basic concepts such as actor, action, object and relation. This means a micro-orientation. However, at the same time it acknowledged the institutional (macro) character of such practices with normative, regulatory, cognitive and linguistic elements (Berger & Luckmann, 1966; Giddens, 1984; Scott, 1995/2014). The knowledge base of a practice should not be seen as macro phenomena abstracted from ongoing activities. Instead, there is an emphasis of experiential learning and continual development and application of action capabilities (Berger & Luckmann, 1966; Kolb, 1984; Argyris & Schön, 1996)¹. It is also necessary to add that our practice theory was heavily influenced by business process thinking (as described above in section 2.4). A practice was considered to consist of related activities and the purpose was through production of goods and/or services to satisfy clients of that practice. After a while we started to use the term ‘workpractice’ instead of using the broader concept (Goldkuhl & Röstlinger, 2003a; 2006). We wanted to avoid a too broad focus that a practice could be any assemblage of activities. Our concern was practices in professional settings of commercial or governmental character. This orientation can be read in our definition of a workpractice: “A workpractice means that some actors make something in favor of some actors, and sometimes against some actors; this acting is initiated by assignments from some actors, and is performed at some time and place and in some manner, and is based on material, immaterial and financial conditions of transactional and infrastructural character and a workpractice capability which is established and can continuously be changed.” (Goldkuhl & Röstlinger, 2006).

Our evolving practice theory was crystallized in generic workpractice model. This model evolved through several steps (Goldkuhl & Röstlinger, 1999; 2002; 2003ab; 2005b; 2006; Goldkuhl et al, 2002; Goldkuhl, 2005b). The latest presented generic workpractice model can be found in Goldkuhl & Röstlinger (2006). It is reproduced in figure 5.

In this version of the workpractice model, we have emphasized a division of practices in transactional elements and infrastructural elements. Based on business process thinking we make a distinction between a process type and instances of such a type. An instance of a business process is considered a transaction. In a transaction we include both the agreement of doing something and the accomplishment of this doing (ibid). The meaning of infrastructure is “underlying supporting elements”. We take a broad perspective on the concept of infrastructure; not only including material elements, but also governing communication. Infrastructure of a practice is what is used for recurrent transactions, both for support and governance (ibid).

This broad interpretation of infrastructure makes it partially coincide with practice *institution*. In the above mentioned publications above on workpractice theory, we treated

¹ These aspects were especially elaborated in Goldkuhl & Braf (2001; 2002), Goldkuhl & Röstlinger (2002) and Cronholm & Goldkuhl (2010b).

the concept of institution in a fairly peripheral way¹, although we realized its significance for practice theorizing. A conceptual discussion of more depth appears in Goldkuhl (2003b). I used the concept of *institutional carrier* from Scott (1995/2014). However, I found Scott's application of this concept as inappropriate and as an alternative I sub-classed it into three variants of institutional carriers: intersubjective knowledge, documents and material artifacts (e.g. IT artifacts). This means that an institution (as something established in a practice) can be 1) part of the humans' shared knowledge, 2) linguistically codified in documents and 3) implemented in artifacts. This subdivision of different institutional carriers was further analyzed and applied in Goldkuhl & Nordström (2014).

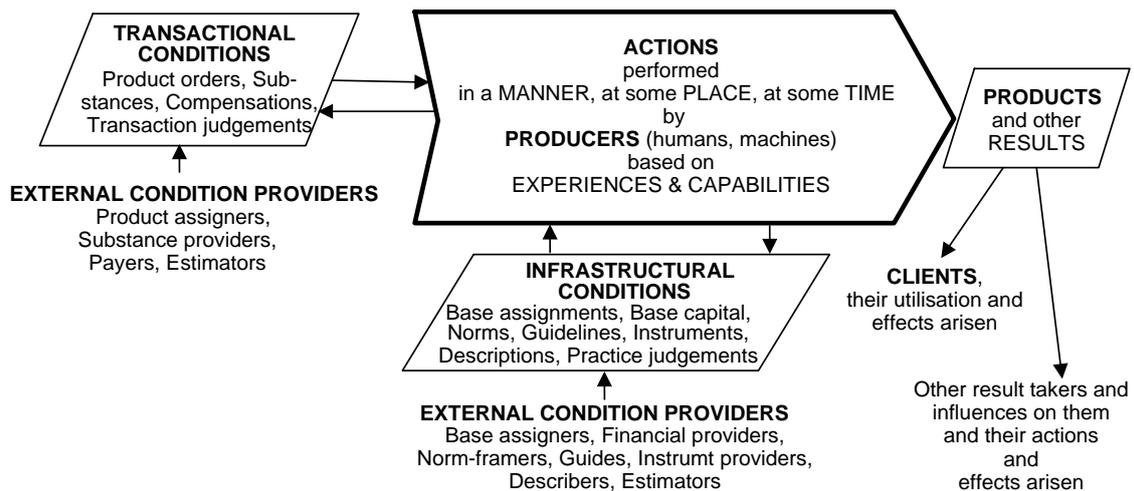


Figure 5. The generic workpractice model (Goldkuhl & Röstlinger, 2006)

Another elaboration of the workpractice thinking is a socio-pragmatic product theory (Röstlinger & Goldkuhl, 1999; Goldkuhl & Röstlinger, 2000). Partially inspired by and partially in opposition to service theory (Grönroos, 1990; Edvardsson & Gustafsson, 1999), a conceptualization and taxonomy of goods and services was developed as an extension to workpractice theory. This taxonomy was based on four use situations and eight product categories giving 27 product classes.

The workpractice theory has a socio-pragmatic foundation. This means that the notion a social action is conceived of as a fundamental for conceptualizing a practice. This foundation has been labelled "socio-instrumental pragmatism" (SIP). It has gradually evolved and been applied in many publications (e.g. Goldkuhl, 2001; 2002; 2004; 2005; 2007b; 2009; Goldkuhl & Ågerfalk, 2002; 2005; Goldkuhl & Röstlinger, 2003ab; 2014; Goldkuhl et al, 2004; Goldkuhl & Lind, 2007; Rittgen & Trejo, 2007; Sjöström & Goldkuhl, 2009). The concept of social action has been described and theorized in these publications and often visualized in models. A basic SIP model of social action is depicted in figure 6. Variants of this model can be found most of the above mentioned publications.

The SIP social action model applies to both communicative and material actions. The resulting object of an interventive action can be either a linguistic object (orally or written) or a modified material object. In all these cases, social relations between the intervening actor and the addressee occur as an effect. The addressee receives/interprets the object and based

¹ We discussed at some length in Goldkuhl & Röstlinger (1999; 2003b; 2006).

on this he/she can perform some subsequent action. This action model is a fundament for the workpractice model (figure 5).

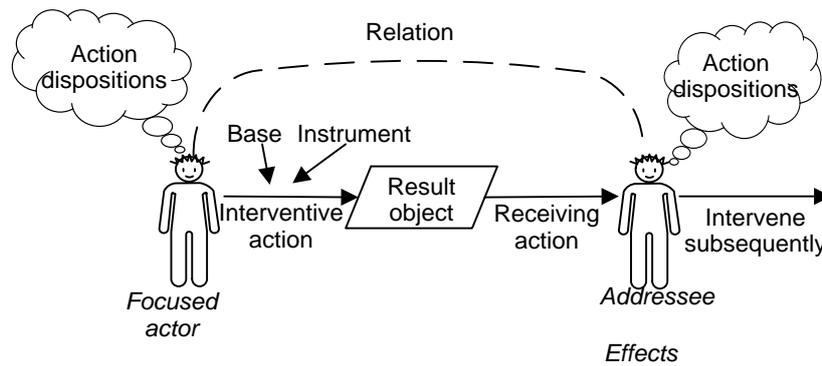


Figure 6. Social action (SIP basic action model)

Socio-instrumental pragmatism tries to go to the fundamentals of social interaction and social life. A SIP ontology (Goldkuhl, 2002) has been elaborated that consists of the following building blocks:

1. Humans
2. Human inner worlds (knowledge, intentions, emotions etc)
 - 2a. Intrasubjective part (individualized)
 - 2b. Intersubjective part (shared knowledge and social institutions)
3. Human actions
 - 3a. Intervention-as-action (communicative or material actions)
 - 3b. Interpretation-as-action
 - 3c. Reflection-as-action
4. Symbolic objects (signs)
5. Material artifacts (artificially made material objects and their processes)
6. Natural environment

Socio-instrumental practice theory (SIPT) including SIP action theory and ontology is the core of this research agenda. SIPT plays an integrative knowledge role for the other knowledge areas in this research agenda. Therefore, the presentation of SIPT could be placed first or perhaps last in this chapter. Now it is actually placed somewhere in the middle. The presentation of these different knowledge areas follows mainly a historical timeline. Development of many knowledge items in sections 2.1 – 2.5 preceded the initiation of SIPT in the later 90'ies.

A clarification of how SIPT works as an integrative knowledge force for the other knowledge areas in chapter is presented in table 1.

Knowledge area	Relation to socio-instrumental practice theory
Language action perspective & communication analysis	LAP is one theoretical basis for SIPT. The broader SIPT perspective has influenced development of socio-pragmatic communication analysis.
Change analysis	SIPT has been operationalized into one specific method component for change analysis, but it should also influence how inquirers think about the workpractice as an inquiry and change object.
Method theory	Methods can be conceived of as intersubjective and prescriptive knowledge from a SIPT perspective.
Business processes and business interaction (BAT)	SIPT (and especially generic workpractice model) is influenced by BAT. Later development of BAT model (its generalization into Generic Exchange Model) is influenced by SIPT. Further integration of SIPT and BAT is expected.
Information systems actability	IS conceptualization from actability has influenced how IT is treated in SIPT. IS actability and SIPT share fully socio-pragmatic foundations. Workpractice institutionalism can theoretically inform further sharpening of IS actability.
Organizational change and innovation	The role of organizational institutions is important for a proper understanding of organizational change and innovation.
E-government and e-services	Relations between producers and clients (as treated in SIPT) have influenced the emerging conceptualization of public e-services. There is a dialectical knowledge development occurring between SIPT and e-government theory; especially the policy and institutional character of public administration is triggering further development.
IT artifacts: multi-dimensional theorizing	SIPT has influenced the development of a multi-dimensional view of IT artifacts; especially concerning normative, regulatory, relational and performative aspects.

Table 1. Relations between socio-instrumental practice theory (SIPT) and other knowledge areas of this research agenda

2.7 Organizational change and innovation

Organizational change has been in my research focus through the long work on change methods (change analysis; section 2.2 above). Later, I developed a growing interest in theorizing different types of organizational changes. Through the advent of business process reengineering – BPR (Hammer & Champy, 1993; Davenport, 1993) during the early 90'ies, a general interest emerged concerning different types of changes. Radical change was contrasted to continuous improvement as in total quality management (Rao et al, 1996). Davenport (1993) presented a typology of change in three types: continuous improvement, project-based improvement and radical innovation (BPR). I brought this further in an analysis of change and action based on socio-pragmatic thinking (Goldkuhl, 2003b). Every overt action aims at some external change, but not all actions can be considered as organizational change. This seemingly paradox was analyzed and it was resolved through the use of concepts such “normal business action” and organizational institution (ibid). To transcend normal business action, there needs to be a change of organizational institution in some way or the other. A *typology* (slightly modified of Davenports’ typology mentioned above) was formulated and founded in this socio-pragmatic reasoning on institutional

change. There was a differentiation made between project-based change and change without a separate change organization. Project-based change was sub-divided into the two classes of partial improvement and radical renewal; the latter equated to typical BPR. Change without a separate change organization was sub-divided into the two classes of running adaptation and recurrent refinement; the latter equated to “continuous improvement”.

When participating in a research study on innovation in the public sector (Goldkuhl & Lagsten, 2014), I renewed the work on different types of changes and especially what differs between innovation and other types of change. Innovation has often been associated with radical and disruptive change. In the innovation literature, there is a differentiation into different types of innovations, such as product innovation, process innovation and organizational innovation (OECD, 2005; Tidd & Bessant, 2013). Such different innovations are not always disruptive, but can be of continuous kind with on-going changes for several years. In OECD (2005) there is a view that a specific innovation is of one separate innovation type (following those mentioned above). This divisional view is partially challenged by Tidd & Bessant (2013) that uses a concept of innovation space consisting of four innovation aspects; the 4Ps of innovation space (paradigm, process, product, position). Based on empirical studies of 13 innovation cases in the public sector, we would rather comply with multi-dimensional view of innovation. The *innovation space concept* (from Tidd & Bessant, 2013) was further developed (Goldkuhl & Lagsten, 2014). An innovation means something novel in at least one, but often in several of these different dimensions: 1) new in thought (perspective, objective), 2) new in process (activities, instruments), 3) new in organizing (competencies, roles, relations), 4) new in product and/or interaction with customers/clients. To be seen as an innovation, it is considered that there is some added value for customers/clients and sometimes also for other stakeholders.

2.8 E-government and e-services

After many years of work with business interaction and business process (section 2.4), I gradually turned my interest to e-government and especially the design and use of e-services. There was an evolution of digital solutions for public administration that comprised an increased direct interaction with citizens. *Public e-services* became top of the agenda both in practice development and in research. The evolution of public e-services was described in stage models such as Layne & Lee (2001). We found the conceptualization behind such stage models as obscure and started to develop an alternative model with three polarities instead of a linear stage model (Persson & Goldkuhl, 2005; Goldkuhl & Persson, 2006ab; Lind & Goldkuhl, 2008). This new model was called the *e-diamond model* and it comprises three polarities of e-services: 1) separate vs. coordinated e-services, 2) general vs. individualized e-services, 3) informative vs. performative e-services.

This work was continued through empirical studies and further theorizing. The previous work of the BAT model (section 2.4) influenced this work. The BAT model with its orientation to commercial settings was expanded and consequently re-structured into a new *Generic Exchange Model* (figure 2 above; Goldkuhl Röstlinger, 2007). The concept of e-service was further theorized and empirically studied with this explicit theoretical backdrop of government-to-citizen interaction (Goldkuhl, 2007b; 2009; 2011b). The communicative orientation from IS actability (section 2.5) influenced also this work.

The theoretical development was well integrated with empirical work; evaluative inquiries and sometimes also action research and design research. These inquiries stimulated development of approaches for *e-service design and modelling* (Goldkuhl, 2009b; Goldkuhl & Röstlinger, 2010; Goldkuhl & Perjons, 2014).

The research was not only directed towards single e-services, but also how citizens needed to interact with several e-services for different but related purposes. The notion of a *life-event* was important in this respect (Vintar et al, 2002). The citizen, when being in a special life event (or life situation) may need different kinds of governmental interaction. This was inquired based on notions of *joined-up e-government* and *integrated e-services* (Persson & Goldkuhl, 2010; Goldkuhl & Röstlinger, 2014; Goldkuhl et al, 2015).

Several of the above mentioned research studies had an implicit policy orientation; sometimes more in the fore. There exist several studies where *policy issues* (of *normative* and/or *regulatory* character) have a prominent role. One study inquires how laws and regulation can inhibit digital innovation (Goldkuhl, 2009c). The role of regulations in egov was addressed in a study on personal assistance for disabled persons (Sjöström & Goldkuhl, 2009). This work resulted in the development of a *Generic Regulation Model* (Goldkuhl, 2011b), which was theoretically informed by the Generic Exchange Model (figure 2 above; Goldkuhl & Röstlinger, 2007). Confer also Öhlund & Goldkuhl (2008) that is an application of this GRM model for e-prescription.

Normative issues were especially addressed in Persson & Goldkuhl (2010), which is a study comparing e-government with values of New Public Management and classical bureaucracy. How policy (normative and regulatory issues) may and should influence the design of egov artifacts is clarified in Goldkuhl (2012; 2016). This work has also resulted in a design science approach for e-government (Goldkuhl, 2016; Goldkuhl et al, 2015).

Interoperability is a great challenge in e-government. There are needs for IT artifacts in different public agencies to exchange information. Interoperability has often been conceptualized by a four layer model: legal, organizational, semantic, technical interoperability (EU, 2010). This type of model has been studied and challenged in several papers; Goldkuhl (2008b), Eriksson & Goldkuhl (2013), Goldkuhl et al (2014) and Goldkuhl & Röstlinger (2015). This work has led to the development of a multi-dimensional view of IT artifacts, their governance, use and interoperability (Goldkuhl et al 2014; Goldkuhl & Röstlinger, 2015; 2017b). This will be further discussed in section 2.9 below.

2.9 IT artifacts: multi-dimensional theorizing

Research on actability (section 2.4 above) has contributed with theorizing on IT artifacts, which is found as an important knowledge need of the IS research community (Orlikowski & Iacono, 2001; Benbasat & Zmud, 2003). Based on actability, LAP and other socio-pragmatic knowledge bases, further theorizing on the IT artifact has been conducted. The seminal article of Orlikowski & Iacono (2001) identified five views of the IT artifact based on an analysis of published research: ensemble view, tool view, computational view, proxy view and nominal view. In Goldkuhl (2013ab), I have analyzed these views with a special focus on the

ensemble view and the *tool view*¹. The ensemble view was characterized as emphasizing the following salient properties of IT artifact: 1) They are integral parts of social contexts (*embeddedness*), 2) they also hold inscriptions of parts of these social contexts (*contextual carriers*) and 3) they change through a *continual evolution*.

The tool view as described by Orlikowski & Iacono (2001) seems to be too restricted. These authors have disregarded linguistic and communicative aspects. An elaboration of the tool view was done in Goldkuhl (2013a) based on LAP and actability views which led to formulation of a *communicative tool view*. One conclusion in Goldkuhl (2013a) was that further theorizing could benefit from an integration of the ensemble view and the communicative tool view. In my recent work in egov (section 2.8 above) I have made a conceptualization of a *policy-ingrained IT artifact* (Goldkuhl, 2016). This means that the IT artifact is seen as a carrier of policy elements such as goals and regulations. The IT artifact is seen as a *normative and regulatory carrier*. This follows the ideas from the ensemble view of the IT artifact as a contextual carrier.

During a comparative and evaluative multi-case research on inter-organizational egov systems, a *multi-dimensional view of IT artifacts* evolved (Goldkuhl et al, 2014). Emanating from the four layers of interoperability (section 2.8 above), we arrived after several empirical and conceptual iterations to nine dimensions of IT artifacts and their governance (Goldkuhl Röstlinger, 2017b). These nine dimensions and corresponding quality aspects are summarized in table 2.

Dimension	Workpractice aspects	Quality aspect of IT artifact
Relational	Stakeholders, roles, social relations,	Target group clarity, availability/security for users
Performative	Work processes and procedures, digital functionality	Functional repertoire & quality, workpractice efficacy
Semantic	Information and language use (workpractice language)	Information quality
Interactive	Presentation and interaction through user-interfaces	Usability, availability
Normative	Goals and values	Normative compliance and clarity
Regulatory	Rules (laws/statutes, guidelines, standards)	Regulatory compliance and clarity
Economical	Financing/investments, assets, costs, benefits	Cost/benefit efficiency
Architectural	Relations and interplay between IT artifacts in digital landscapes	Interoperability
Technical	Technologies for software & hardware, technical realization	Robustness, technical efficiency & security

Table 2. Dimensions of IT artifacts and corresponding quality aspects (based on Goldkuhl & Röstlinger, 2017b)

¹ This analysis was initiated as a critical response to Sein et al (2011) for their use of the concept "ensemble artifact".

3 Issues to address: a long term orientation

The long term orientation of this research agenda is to develop *socio-pragmatic knowledge on digitization of practices*. This may comprise many different but related aspects as can be understood from the historical account above (sections 2.1 – 2.9). There is an interest both for the character of practices when being digitized and how the development of digital practices is and should be conducted. Socio-instrumental practice knowledge (as theories, frameworks and methods) is an integrative epistemic tool to hold diverse knowledge endeavors together.

The core of socio-instrumental practice knowledge needs further development. One important element is the integration of practice theory and business process thinking, which needs to be taken further. When reading contemporary IS publications, these two orientations seem to be two separated thought traditions. Practice theory is often described in a fairly philosophical fashion. I do not object to practice-theoretical philosophizing, but (in order to create more value and impact), there is a clear need to translate and relate this kind of theorizing to contemporary thinking on business processes, which has a pivotal place in both research and practice.

Another important aspect of socio-instrumental practice theory is to further develop and integrate its macro and micro aspects. This means a fusion of institutional theory and action/communication theory.

Further development of IT artifact theory is also needed. Important historical achievements have been done through LAP and actability developments. Recent work on a multi-dimensional conceptualization of the IT artifact is an important contribution. A long term goal is to further develop a theory of IT artifacts well founded in socio-instrumental practice theory.

Such theorizing should be a basis for methods; both methods for design and methods for evaluation. The fundamental of such methods should be the integrative view of workpractices and digital artifacts. We should aim for methods for co-design of workpractices and digital artifacts. In the same spirit, we should aim for methods for co-evaluation of workpractices and digital artifacts.

4 Recent and on-going work

The perspective of co-design and co-evaluation of workpractices and IT artifacts has been elaborated in two publications; Goldkuhl (2015) and Goldkuhl & Sjöström (2015).

Several empirical studies in e-government have been analyzed and reported (Goldkuhl et al, 2014; 2015; Jansen et al, 2016). This has contributed to theorizing e-services, joined-up government and interoperability. The way policy influences IT artifact in public administration (in terms of the policy-ingrained IT artifact) has been elaborated (Goldkuhl, 2016; Goldkuhl et al, 2015). These works have also implied the development of a design science approach in e-government.

The comprehensive empirical work with many case studies in e-government has also contributed to an outline of guidelines for inter-organizational IT governance in the public sector (not yet published). This work has also led to the development of the multi-dimensional view of IT artifacts (Goldkuhl & Röstlinger, 2015; 2017b). This work started with an egov focus (Goldkuhl & Röstlinger, 2015) but has now been generalized beyond the public sector (Goldkuhl & Röstlinger, 2017b).

An analysis of information security policies based on the socio-pragmatic communication theory has been published (Karlsson et al, 2017).

Recently an inquiry of LAP achievements has been published (Goldkuhl, 2017b). This work comprises an articulation of the view of information/communication as establishment of social relations.

An educational report has been presented on methods and their use for creating models during workpractice and IT development (Goldkuhl & Röstlinger, 2017a).

5 Plans for 2017-2018

There is a need for an updated description of our change analysis method (SIMM). This work has just been initiated. This work also includes an update of the generic workpractice model of SIPT. A new publication (primarily intended for educational purposes) will be written together with research colleague Annie Röstlinger. There is also a wish to write a separate paper on the new generic workpractice model.

The multi-dimensional view of IT artifacts will be taken further (Goldkuhl & Röstlinger, 2017b). A new version of this will be written together with Annie Röstlinger. We also plan to write a separate paper on digital services based on a communicative view developed in that publication (ibid).

There exist several workshop papers/working papers (e.g. Goldkuhl, 2005a; 2012; 2017b; Goldkuhl & Röstlinger, 2009; 2014) that need to be further refined and submitted to appropriate outlets.

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