

Reinterpreting information systems actability¹

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Abstract

The concept of actability has been used for developing theory and methods for information systems design and evaluation. The social action character of information systems is emphasised in this approach. Language action theory has been a main background theory. The paper pursues a critical examination of the actability concept. This concept is confronted with the concept of affordance (by Gibson). A refined concept of actability (emphasising informative and executable properties) is used as a basis for reformulating parts of information systems actability theory. A new typology for information systems usage situations is proposed together with a new definition of information systems actability.

1 Introduction

There is a great need for improved understanding of the social usages of information technology (IT). There are many failures of information systems (IS) and many such problems cannot be reduced to technical mistakes. There is great challenge to create an IS and the usage of it to be a human and social success. The actability approach to information systems seems to be promising in this concern. It emphasises the social action character of information systems and its social context. It aims at a socially and pragmatically sensitised approach to information systems. IS actability is defined in the following way: "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" (Cronholm et al, 1999). IS actability has proved to be fruitful for different practical purposes. It has been operationalised into requirements engineering (Ågerfalk, 1999), usability design (Cronholm & Goldkuhl, 2002b), IS evaluation (Ågerfalk et al, 2002a) and also used as an interpretation scheme for IS (Ågerfalk et al, 2002b).

Goldkuhl & Röstlinger (2002a) have performed an analysis of the IS actability approach and the actability notion. They question why the actability notion should be restricted to be a set of properties related to information systems. They suggest a widening of the applicability of the actability notion to other areas (workpractices, business interaction). This proposal for broadening the actability conception has also consequences for IS actability. I will follow the lines sketched by Goldkuhl & Röstlinger (ibid) and pursue a deepened analysis of the actability notion. What shall we mean by actability? Is it possible to give new meanings to IS actability?

¹ This is preliminary paper written to the VITS Pre-International Workshop WISC. Originally I planned to write a paper with another title (The actability of business processes and information systems) and with a broader scope. During my writing I became aware that the issues of IS actability demanded a more thorough treatment, so I let the paper be restricted to this. The treatment of business process actability must wait.

This stated purpose could be seen as theory-driven. It is driven by theoretical concerns, but I claim that it has practical implications of great significance. It is possible to restate the purpose of the paper from a practical view.

Information systems are to be parts of and support to workpractices in organisations. It is important that information systems fit into workpractices and that they contribute to the overall business objectives. The coherence between an information system and other parts of the organisation should be investigated during IS development. How can we link an information system to different actions within a workpractice? In what ways does an IS give support to the performance of work processes? What information of a workpractice should be contained in an IS? These are important practical issues to be handled in IS development. Actually this view means an emphasis of a co-design of workpractices and information systems. These practical design issues form a background for our theoretical concerns. What is written below in the paper should be interpreted through this frame of co-design of workpractices and information systems.

The actability concept has earlier been related mostly to language action theories (Austin, 1962; Searle, 1969; Habermas, 1984). Actability has also been studied from other pragmatic perspectives (e.g. Goldkuhl & Röstlinger, 2002a). I will in this paper continue such a broader pragmatic analysis of the actability concept. I will especially look into the affordance theory of Gibson (1979) and see how this can relate to actability¹. A refined definition of actability will emerge. This definition will be applied to information systems. The earlier definition of IS actability will be critically reviewed.

These conceptual analyses will inform a clarification of how information systems are to be seen as instruments for communication. An example of an information system supporting home care service will be used for illustration. I make a delineation in this paper to study only the IS actability approach. I will not look into other IS approaches. Such comparisons are of course important to perform and many such comparisons have been made in the IS actability literature. My inspiration from other literature in this paper comes from theoretical sources outside the IS area. I will concentrate on possible theoretical grounds for IS actability.

2 Investigating the meaning of actability

As said above the concept of actability has been defined in relation to information systems. Goldkuhl & Röstlinger (2002a) has proposed a widening of the applicability of the actability concept. They question why actability should be restricted to information systems. If one looks closer to the IS actability definition (quoted above from Cronholm et al, 1999) it says that actability is an information system's "ability to perform actions, and to permit, promote and facilitate the performance of actions by users" (ibid). This means that (IS) actability is a set of properties related to 1) an

¹ The affordance theory of Gibson (1979) is one theoretical cornerstone of Stamper's (1994) organisational semiotics based IS theory.

information system's own actions¹ and 2) the actions of its users being supported by the IS.

I state that actability is an attributive concept. It is not an entity of its own. There is nothing that is an actability of its own. The original concept is thus *actable* (as a property), and actability is substantival derivation from this original attributive concept. There is always something that has or has not actable properties².

When describing what actability is, one must give an account of what an action is. The action concept has been described by many scholars during history. The place is not here to make a thorough analysis of the action concept. I will give some brief, but important, delineations of this concept.

An action means the doing performed by someone. When we talk about actions we can designate doings as chopping wood, driving a car, walking, speaking, writing, listening and reading. Some of these actions are aiming at making changes in the external world (intervening) and some actions are aiming at make changes in the inner world of us as human beings (cf Goldkuhl, 2001, about these conceptual differences). Let us first look at intervening actions aiming at change in the external world.

Phases of an action

Mead (1938) has made a famous description of such actions. Mead divides an action into several phases³: A perceptual phase, a manipulatory phase and a consummatory phase. In the initial perceptual phase the actor tries to comprehend the situation and what possibilities to act it offers. In the second phase the actor intervenes and changes something. In the third phase the actor consumes the effects of the action, which involves an assessment of the action and its results and effects. I think it is appropriate to include the initial and concluding comprehension of the action situation as Mead does, and not only the active manipulation. However, it is important to acknowledge that it sometimes may be appropriate to see an initial assessment respectively a concluding assessment of the action situation as separate actions (Cronholm & Goldkuhl, 2002b). Such actions (investigating the world in order to make sense of it) may sometimes be of such a large extent, that it, for reasons of analysis, may be seen as separate actions. This last comment is important to recognise – what is “seen as separate actions”. The doing of a human is a constant stream of activity, and what we delineate as an action is something that we take out from this constant stream of doing and label as an action for reasons of description. For some purpose we can label the uttering of a single sentence an action. For another purpose it may be more adequate to label a whole speech (consisting of many single sentences) as an action.

In Mead's three phases of an action, the first one and the last one are explicitly stated to consist of perception. It is important to add that the active manipulatory phase also

¹ IS actability theory acknowledges the possibilities of information systems to perform actions. This view does not imply a reified IS conception. Confer Goldkuhl & Ågerfalk (2002) for further argumentation.

² This characterisation is based on the principles of linguistic determination of concepts described by Goldkuhl (2002) following Wittgenstein (1958).

³ Actually Mead (ibid) distinguishes between four phases. The first two (impulse and perception) have here been grouped together for reasons of simplification.

includes perception. Giddens (1984) talks about people's constant monitoring of the environment. During the manipulatory phase the actor monitors the world he acts upon and he is attentive to what happens so he can adapt his interventions in proper ways. Just think of driving a car. The driver must be watchful when regulating the speed and direction of the car.

In the analysis of the actability concept made by Goldkuhl & Röstlinger (2002a), the authors suggest a definition of actability: "a property of something which *enables* and/or *contributes* to the performance of actions" (ibid). The authors distinguish between *executable* and *informative* properties within actability. Executable properties are such properties, which enables the action to be performed. Informative properties are such properties, which guides the actor in his choice, performance and assessment of actions. The "informative properties can apply to questions concerning what to do, why doing or why not doing, how to perform, when to perform and where to perform and how to assess the outcome" (ibid). The relations to Mead's three phases are obvious. The executable properties apply to the manipulatory phase and the informative properties apply to the phases of perception and consummation and often also, through the constant monitoring in action, to the manipulatory phase.

Affordances and actability

The objects to act upon must thus be actable. The same goes for the objects supporting the action. Let me use the example of a man chopping wood. When doing this he uses an axe as an instrument. There are two main action objects in this situation: The wood to be chopped and the axe to wield. The actor must comprehend these two objects. Both of them must be actable, but of course in very different ways. The wood must be cleavable and the axe must be keen and possible to cleave the wood. In order to work with these two objects, the actor must assess their properties, i.e. to judge if the wood is cleavable by an axe, and if the axe is keen enough and possible to wield in ways to cleave the wood. There are properties of these objects that afford actions. Such properties are *affordances* for the actor and his actions. An affordance is a characteristic (or a set of characteristics) of an object, which offers a potential for action. The concept of affordance is articulated by Gibson (1979) in his ecological theory of perception.

Affordances are properties in relation to actors. They are not just physical properties of things. Gibson (ibid, p 127) describes the difference between affordances and pure physical properties. A floor is stand-on-able, walk-on-able and run-over-able when recognising what it affords. These affordances are of course based on certain physical properties (e.g. the floor being horizontal, flat, extended and rigid). On the other side affordances should not be seen as subjective or mental constructs as Gibson emphasises. The affordances are in the external objects – but these properties are relational properties, i.e. they exist only in relation to an observer/actor. "These positive and negative affordances are properties of things *taken with reference to an observer* but not properties of the *experiences of the observer*" (ibid, p 137). The terminology of Gibson ("a floor must be stand-on-able, walk-on-able and run-over-able") has great resonance with the concept of actability. Things should be act-able. The way a floor is actable is that it is stand-on-able, walk-on-able and run-over-able. Affordances of things are what make them actable.

Gibson (ibid) expresses the importance that affordances must be perceivable. “The central question for affordance theory is not whether affordances exist and are real but whether information is available in ambient light for perceiving them” (ibid, p 140). These remarks are congruent with what has been said earlier about actability: An object is actable if it has executable and informative properties. To clarify this further: In order to be an actable object, there should be adequate action possibilities and that these possibilities are visible, comprehensible and accessible. The action possibilities might be of different quality. The axe has an edge, but it can be more or less keen. An actor does not only demand the possibility for action. He demands easiness for action. The affordances should be appropriate in relation to comfort and other human values¹. To claim actability raises requirements for *existence, appropriateness, visibility, comprehensibility and accessibility of action possibilities*. The informative properties can partially be substituted by pre-knowledge of the observer. Many artefacts of today have a concealed functionality and to use them properly requires some pre-knowledge gained by instruction or experience.

Sometimes the informative properties are the sole properties of external objects. A written text (as an external object) can consist of an instruction for action. In the text there are no executable properties. There is pure information. The actor observes the text and transforms through his interpretation the text to knowledge for action. The text is used in a pre-perceptual stage of the manipulatory action. The actability of the text can be judged in relation to how informative it is concerning guidance for the actor to perform adequate actions in his situation.

Goldkuhl & Röstlinger (2002a) have also expanded the actability concept to internal knowledge states of actors. Actability should thus not be restricted to external objects as artefacts, documents and natural objects. Knowledge is actable when it guides action.

Defining actability

Actability can be defined in the following way: *Actability of something is properties that support and enable actions. These properties can have informative or executable functions.* Actability can, as said above, be properties of things or properties of humans or human attributes. The two functions of actability can be related to these different ontological realms (i.e. where they exist)². A matrix describing these relations is found in figure 1. This shows that material objects must have informative as well as executable properties. This follows directly from the discussion concerning affordances above. You do something in relation to things, but in order to perform these doings you must perceive that the things afford such performance to you. In contrast to material objects, signs do only have informative functions. We can, however, talk about as well informative as executable functions of humans. Human knowledge guides intervention and perception. Humans use motoric skills for intervention.

¹ Gibson (1979) explicitly states the value character of affordances: “The perceiving of an affordance is not a process of perceiving a value-free physical object to which meaning is somehow added in a way that no one has been able to agree upon; it is a process of perceiving a value-rich ecological object” (ibid, p 140).

² This division into realms follows the ontology of socio-instrumental pragmatism (Goldkuhl, 2002). Concerning relations (similarities and dissimilarities) between signs and material objects confer ibid.

| Actability functions Actability realms | <i>Informative function</i> | <i>Executable function</i> |
|--|--|---|
| <i>Human</i> | Human knowledge for action | Motoric skills |
| <i>Sign (oral or written communication)</i> | Codified informative base for action | --- |
| <i>Material object (artificial or natural object)</i> | Clues in the material showing possible use | Material properties which enable action |

Figure 1: Relations between actability functions and actability realms

Actability vs. usability

Actability has been contrasted with usability (e.g. Cronholm et al, 1999). These differences are important but should not be over-emphasised. When utilising an instrument, such an instrument must be usable. An instrument is always utilised within an action. Utilising is one aspect of an action, which means that utilisation always implies action. The actability perspective emphasises the action with results and effects¹. Utilisation is one aspect of the action, and it should be related clearly to the contents and purposes of the action. When talking about usability, these broader action aspects might be included, but there is no conceptual guarantee for this. The actability concept, founded on an articulated action concept (e.g. Goldkuhl, 2001; Goldkuhl & Röstlinger, 2002a), gives better guarantee for clear relations to these broader action aspects. To sum this up: To investigate usability of an artefact can be done with 1) a narrow instrumental perspective (“*how to use* the instrument”) or 2) a broader actability perspective (“for *what actions and purposes* this instrument is used”). A restricted instrumental investigation might not be wrong in certain inquiry situations. What is important is that the investigator is fully aware of its limitations.

3 Information systems usage situations

The discussion on actability in sec 2 above has consequences for the view on IS actability. The actability properties of an information system can be more clarified. The informative vs. executable properties of an IS have not yet been sufficiently distinguished within Information Systems Actability Theory (ISAT).

An information system is a complex phenomenon and to make a nuanced characterisation one must focus different functions of an IS. In ISAT there is a differentiation into three usage situations (e.g. Goldkuhl & Ågerfalk, 2002; see also figure 2 below):

- Interactive usage situation
- Automatic usage situation
- Consequential usage situation

¹ Concerning actions it is important to distinguish between performance, result and effects (von Wright, 1971; Ricoeur, 1991; Goldkuhl & Röstlinger, 2002a). Performance is the *doing*; result is what is *done* (i.e. within the range of the actor) and effects are what *follows* as consequences from the action and its results.

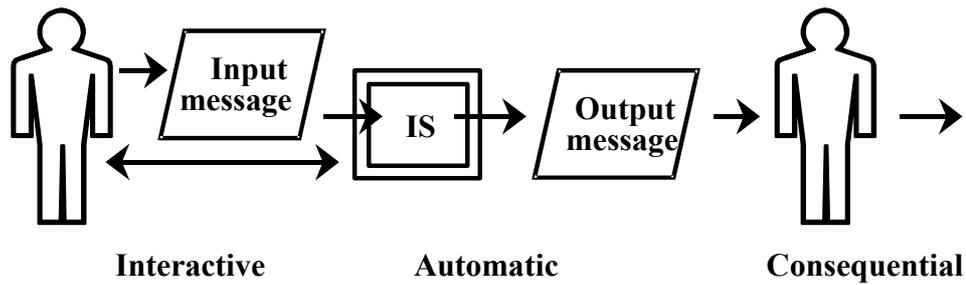


Figure 2: Types of actions related to three IS usage situations
(from Goldkuhl & Ågerfalk 2002)

There is a possibility to investigate and determine IS actability in relation to such situations. However, these situations must first be analysed from the refined actability perspective. Are these situations a proper divisions of IS usages? These situations have been challenged. A proposal for refinement is made by Sjöström & Goldkuhl (2002). These authors are emphasising communication and social action when studying information systems and the use of the actability concept. They have proposed a partial different view on IS usage situations (figure y). They emphasise that information systems are used for human-to-human communication. This communication situation is seen as the basic usage situation, which in turn is divided into the three early mentioned usage situations.

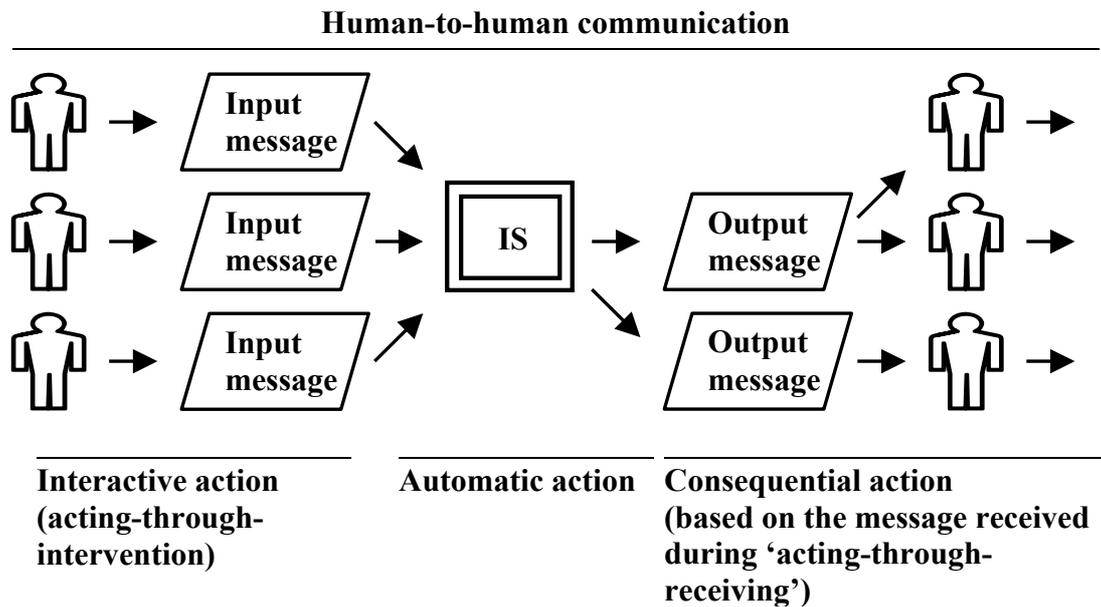


Figure 3: Types of actions related to three IS usage situations
(from Sjöström & Goldkuhl, 2002)

Sjöström & Goldkuhl (2002) make also an important characterisation of interactive and consequential situations following the concepts of intervening and receiving

actions¹, which have earlier been defined and related to IS actability by Goldkuhl (2001). An interactive action is seen as acting-through-intervention and consequential action is seen as acting-through-receiving (see figure 3).

Questioning the concept of interactive situation

An action characterisation of different situations seems to be a key to deeper understanding of IS actability. Therefore it is important to dig deeper into this subject matter. The appropriateness of the concepts of *interactive* and *consequential* needs to be challenged. The human-to-human communication perspective (of Sjöström & Goldkuhl, 2002) means that the “interactive” action is a kind of action providing messages to the communication instrument of IS. The “consequential” action is an action of receiving messages. But this not the whole picture. An interactive situation consists of actions performed by both the human user and the IS². It consists of 1) human intervening actions (e.g. writing) and 2) IS intervening actions (exposing messages) and also of 3) human receiving actions (e.g. reading messages from the IS) and 4) IS receiving actions (e.g. reading messages from the user). Taking these insights seriously, it might therefore not be appropriate to classify the “interactive” action³ as an intervening action. Anyhow, the principal direction of one human communicating with another human (as described by Sjöström & Goldkuhl) seems important to acknowledge. There are communicative actions of humans with the purpose to provide the IS (as a communication artefact) with messages to be kept, possibly transformed, and forwarded to other humans. Most often such providing action will be performed by an *interactive support* of the IS. The system will guide the user concerning what message to input and how to do it. The actions of the system are in such cases limited to guidance of the user in his message providing action. A user action of providing messages will in such cases be done in an *interactive mode*. This kind of interactive mode is very common when providing messages to an IS, but we should not take for granted that message provision always is done in an interactive mode. There may be other input techniques (as different automatic sensor equipments) where no real interaction takes place. In such cases there will be a *uni-directional* mode in contrast to the interactive mode in much message provision situations.

Following this kind of reasoning I suggest that the concept of interactive action (or situation) should be re-characterised and re-named to *providing action*. Providing actions can be performed in an interactive or uni-directional mode. The main purpose of such actions and situations is to provide messages to the IS for further treatment and communication to other humans. We can talk of both providing situation and providing action. A providing situation consists at least of 1) a user providing messages to the IS (i.e. a providing action) and 2) an IS receiving messages from the

¹ Human-to-human communication is described by Goldkuhl (2001) to consist of two related actions: One communicative action (i.e. an intervening action) performed by the locutor (sender) and one interpretive action (i.e. a receiving action) performed by the addressee (recipient).

² This is an important characterisation according to ISAT (e.g. Ågerfalk, 1999; Cronholm et al, 1999). Goldkuhl (2001) has made a detailed analysis of intervening and receiving actions of IS usage situations. This analysis is followed here.

³ Actually there is a differentiation between usage situations and actions in IS actability theory. A usage situation is seen to consist of actions. An interactive situation is seen to consist of actions of interactive character. This makes it possible to equate an interactive usage situation with a group of interactive actions.

user. If provision is performed in an interactive mode, these two principal and necessary actions may be supplemented by some other actions. There may be intervening actions by the IS informing the user of different action prerequisites and possibilities. As consequences of this, there may also be other actions of the user; reading information from the IS and also actions of “manoeuvring” the IS (e.g. giving search and navigation commands).

Questioning the concept of consequential situation

Let us continue with the output situation. In ISAT this has been called consequential situations or actions. The importance of this characterisation is that the communication from an IS will (or at least should) have action consequences. Users will base their actions outside IS on information from the IS. These “IS informed” user actions are called consequential actions. In the analysis made by Sjöström & Goldkuhl (2002) this is characterised as receiving actions (cf figure 3 above). This is not completely appropriate. Actually there is a series of three related actions. 1) The action of an IS presenting a message to the user (this is an intervening action), 2) the act of interpretation performed by the user when reading the message (this is a receiving action) and 3) the action of the user outside the IS where he acts making use of the information from the IS (this is the consequential action and will be an intervening action or sometimes only some internal reflection with no particular intervention).

Some further conclusions can be made from this analysis. First, the way of receiving messages from an IS can be done in different ways. The concepts of interactive and uni-directional mode discussed above concerning providing actions can be used also here. Many times an IS may offer possibilities to search for messages. Such message retrieval will then be performed interactively. Sometimes there are no such search possibilities. The messages are plainly furnished to the user. This is typically done if a paper document from an IS is distributed to the user. These two types of modes can be seen as different messaging strategies; a pull strategy (often performed in interactive mode) and a push strategy (often performed in a uni-directional mode).

It seems important to distinguish clearly between the receiving situation and the consequential situation following the receiving situation. This has not earlier been done properly in ISAT. The analysis of Sjöström & Goldkuhl (2002) points in this direction. I introduce the concept of receiving situation. This means the situation where a user gets information from the IS; he is informed through the IS. A receiving situation consists of at least two principal actions: 1) An IS distributing messages directed to a user (this is an IS intervention action) and 2) a user interpreting the information from the IS (this is a user receiving action). A receiving situation corresponds to the provision situation in the total “human-to-human communication through IT artefact situation” (cf figure y above).

Contextualising IS usages

The receiving situation may give rise to consequential actions. Such actions should be seen as an IS usage situation, as they already have been done in IS actability theory. The consequential situation is thus a IS usage situation outside a direct manipulatory use of an IS. It is a stage following the communication process. If one looks close to

the human-to-human communication process described by Sjöström & Goldkuhl (2002) – figure y – there seems to be a not fully symmetrical description. It starts with humans communicating a message. It ends with other humans acting based on messages. In the end of the described communication process there is a contextualisation (describing consequential actions). There is no such contextualisation in the beginning. I would like to include - with the purpose to give a more balanced view - such an initial contextualisation. Before communicating, i.e. providing messages to the IS, there will be a *preconditional situation* consisting of preconditional actions. I call them so since they are preconditional in relation to the communication through the IS. The consequential actions are, in a corresponding way, consequential in relation to the IS communication process. Preconditional actions are such actions, which give rise to the providing actions. It can be an observation made by a human, which he wants to inform others about. There can be a decision made by human, which he needs to communicate to others through the IS.

I have thus made a principal differentiation between *communication source* and *communication target* situations. The communication source situations consist of two subsequent situations: Preconditional situation and providing situation. The communication target situations consist of two subsequent situations: Receiving situation and consequential situation.

The differentiation of usage situations into providing situation and receiving situation implies recognition of IS as a communication instrument. The providing situation is an input situation. As said above there can be some guidance and feedback from IS to user but the main principal direction is from user to IS. The communication from the user is a “real business message”; the communication from IS to user is more to be seen as “communication support messages”. The information from IS can of course include “real business messages” (from the IS action memory); i.e. earlier produced business messages, but these messages will here be used as basis for the user to formulate an appropriate message. The receiving situation is an output situation. As said above there may be some communication from user searching for information, but the main principal direction is from IS to user.

These two situations are thus “pure” communication situations; either sending (providing) or receiving. There may of course be interactive situations with a clear message exchange character. This means a situation where business messages are communicated both ways. For example the user gets informed about some expected actions and he reacts to it through the IS. This means a situation consisting of both providing and receiving actions. Such a situation will be genuinely interactive. I will, however not call it an interactive situation in order to avoid mixing it up with the concept of interactive mode earlier introduced. Instead I will call it a *conversational situation*. A conversational situation will by definition be performed in an interactive mode. A conversational situation may be preceded by a preconditional situation and followed by a consequential situation.

A revised view on IS usage situations

This analysis has clarified different IS usage situations. In relation to earlier categorisations in ISAT new situations have been categorically identified. The automatic usage situation has not been explicitly commented. No need for this has

been experienced. In Ågerfalk (1999) the situation of regulation is also distinguished. The regulative situation is the situation of formulating the rules for the IS. These rules constitute the formal workpractice language that will (through its implementation in the software) govern the IS and its usages. “What can be talked about through the IS and in what ways such communication and message transformation can be performed”.

This analysis has revealed the following IS usage situations:

- Preconditional situation
- Regulative situation
- Providing situation
- Conversational situation
- Automatic situation
- Receiving situation
- Consequential situation

These actions/situations and their relations to the IS are depicted in figure 4. In figure 5 below the situations are clarified concerning performers and main direction of performer-to-performer action.

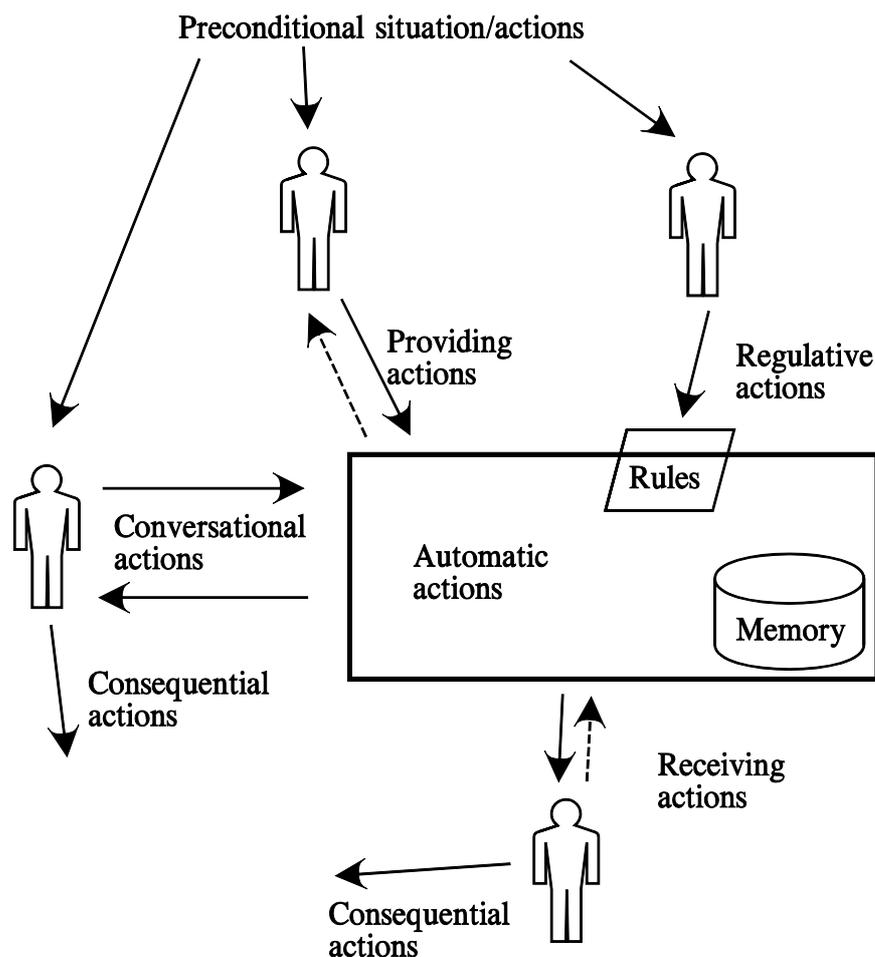


Figure 4: An information system and its usage situations

| IS usage situations | Performers, action direction |
|----------------------------|-------------------------------------|
| Preconditional situation | Human |
| Regulative situation | Human → IS |
| Providing situation | Human → IS |
| Conversational situation | Human → IS and IS → Human |
| Automatic situation | IS |
| Receiving situation | IS → Human |
| Consequential situation | Human |

Figure 5: Performers involved in different IS usage situations and the main action direction

4 An empirical illustration

The discussion above in sec 4 has been mainly theoretical. New categories have been proposed, partially replacing earlier ones. I will now confront this new usage situation typology with a simple empirical case. I will use a case where ISAT has been used as a design framework. It is an information system developed for home care service for elderly people. The design of this IS has been described in several papers earlier (e.g. Cronholm & Goldkuhl, 2002a,b; Goldkuhl, 2001; Goldkuhl & Röstlinger, 2002b).

A short introduction to the case study

A change project at a municipal home care service for elderly people has been performed. The purpose of the change project was to develop an IT system to support home care work and at the same time improve competencies and knowledge utilisation within the home care unit. The case study has been performed on an action research basis. Different qualitative research methods have been used: Interviewing managers and home care assistants, observation, collection and analysis of documents, participation in development seminars. A closeness to the empirical phenomena was necessary in order to gain reliable data. A participatory approach has been taken, including active cooperation with the personnel at the home care unit.

The major tasks of the home care are to help the elders with daily hygiene, simple medical tasks, cleaning, doing laundry, shopping etc. The personnel consist of two home care managers who are responsible for the home care unit and a number of home care assistants. The home care assistants are responsible for the daily work with the elders.

One main objective for the home care service is the individualisation of the home care. To perform home care is not a standardised service. The home care unit strives for maximum individualisation. The elder clients should live their lives in their own desired ways. The home care assistants should support the clients to live in their own ways. In order to do this there is great need for knowledge. The home care assistants must have a good understanding of every person, about their personal life history, their current social and medical situation and their habits and needs. This partially changing knowledge must be transferable to all members of the home care team since there is not one single assistant who takes care of a particular elder. One objective of

the IS, which has been developed, was to contribute to this knowledge sharing (Goldkuhl & Röstlinger, 2002b).

Using the case for classifying IS usage situations

The developed IS consists of several modules supporting different tasks for the home care assistants. I will look somewhat closer to the following IS usage situations (as a basis for classification):

1. Reporting incidents in journal notes
2. Reading journal notes
3. Planning home care tasks
4. Selecting an elder for home care visit
5. Reporting a performed visit

I will first look at the two journal notes situations (1, 2). If something outside normal circumstances has occurred during a home care visit, the home care assistant should report this to her colleagues through the IS. She should report this incident as a journal note in the IS (1). Journal notes can then be read by other home care assistants and also by other personnel categories. The reporting of incidents is a typical providing situation. The home care assistant formulates messages to be kept by the IS and then transferred to other members of the staff. The formulation of journal note is guided by a form and is thus performed in an interactive mode. The reporting of incidents is of course preceded by the incident. The incident is something that has occurred when the home care assistant has made a home care visit to an elder. This home care visit counts in this case as a preconditional situation.

Let us move over to the next situation “reading journal notes” (2). The home care assistants are obliged to read journal notes for those elders who will be visited. They do not need to read all notes, only those that have been reported since their last visits. This situation is a typical receiving situation. A home care assistant reads journal notes, guided by the IS. No business message from the home care assistant is provided to the IS. The home care assistant is informed by the journal notes. She will use this knowledge in the consequential situations when visiting the elders. If she is influenced by the journal notes to act differently during a visit this implies a consequential action.

The home care tasks are planned in advance. There is a module in the IS where a home care assistant can plan the future visits (i.e. describe tasks to be performed). This planning (3) is a typical providing situation. Information is provided by the home care assistant to the system in order to be forwarded to her colleagues.

When a home care assistant is going to perform home care visits, she first checks the information system. She interacts with a screen document “Performance of home care tasks” (4). She reads the tasks to be performed. She selects an elder to visit and marks that this visit will be pursued by her. This information is important to provide to the system. It will be communicated to other home care assistants (when they are using the same kind of screen document) so they do not select the same elder for a visit. When the home care assistant returns after her visit she provides the system with information that the visit has been completed (5).

The IS interaction, where an elder is selected for visit (4), is an example of a conversational situation. The system presents important information to the home care assistant about expected visits and tasks. The home care assistant receives information to be used for consequential actions (the visit). But this IS situation is not restricted to a receiving situation. The home care assistant must provide a message to the system that she has selected the particular elder for a visit. This means that an output message (“what elders to visit and what tasks to perform”) is followed by an input message (“a selected elder”). These communicative actions are not restricted to guidance and search (although there may be such actions in the human-computer dialogue going on). They are important business actions within the workpractice of home care service. Hence, these actions form together a conversational situation.

The subsequent reporting of the performed visit (actually using the same screen document) is to be seen as a providing situation (5). The visit is a preconditional situation to this reporting.

Comparing IS usage typologies

What can be learned from studying this case? The revised usage situations could be used to classify the situations in a proper way. How about the earlier defined usage situations (interactive, automatic, consequential)? Is it not possible to use these situations as a classification scheme? Let us look closer to these situations and see what happens if we use them for classification.

Probably all five would be classified as interactive situations, since there is some human-computer dialogue going on in all situations. The output situations (2, 4) could possibly be classified as consequential situations since they are intended to be followed by consequential actions. There is, however, an obscurity in ISAT about consequential situations, which has been criticised above (sec 3). If ‘consequential’ is to be interpreted as the intervening actions followed from the user obtaining new knowledge from the IS¹, then it would not be adequate to classify these situations (2, 4) as consequential. In such cases these situations should instead be classified as interactive. The situation 4 is definitely an interactive situation, since it involves both active output and input. Hence, my conclusion is that all situations should be classified as interactive according to the established ISAT typology. The proposed revised typology gives a much more differentiated classification. I have summarised and compared the classifications according to the two typologies in figure 6 below. I have there added the home care visit as a usage situation to be classified (6). In both typologies the home care visit is classified as consequential. In the new typology the home care visit is also classified as a preconditional situation, since it gives rise to the providing situations of 1 and 5.

As seen the new typology gives a more differentiated classification. I claim that the new typology gives a more adequate classification of the IS usage situations.

¹ This means that the interpretation (receiving) of messages from IS is not included in the consequential situation.

| Situations to be classified | Classification according to established typology | Classification according to proposed new typology |
|--|---|--|
| 1. Reporting incidents in journal notes | Interactive | Providing |
| 2. Reading journal notes | Interactive (consequential) | Receiving |
| 3. Planning home care tasks | Interactive | Providing |
| 4. Selecting an elder for home care visit | Interactive (consequential) | Conversational |
| 5. Reporting a performed visit | Interactive | Providing |
| 6. Home care visit | Consequential | Consequential, preconditional |

Figure 6: Classifications and comparison between different ISAT typologies for IS usage situations

5 Towards a revised information systems actability definition

In section 1 above I quoted the IS actability definition from Cronholm et al (1999). I will now try to revise this definition based on the analyses in section 2-4. In section 2 I clarified the concept of actability with support from the affordance concept and different phases of an action. In section 3-4 I clarified the IS usage situations. There are two main entrances into this clarification attempt: 1) the division of actable properties into informative and executable properties and 2) the revised categorisation of IS usage situations¹.

In what ways should an IS be informative and executable? With regard to the usage situations of providing, conversation and receiving an IS must inform (guide) the users concerning what action possibilities it affords (offers). In providing and conversational situations the user wants to communicate through the IS. The IS must thus inform about what kind of communicative actions are possible to perform. In conversational and receiving situations the user wants to be informed about some workpractice matter through the IS. The IS must thus inform about what kind of interpretative actions are possible to perform; i.e. what to be informed about. This ability can thus be seen as a meta-informative property; to inform about informing possibilities. These different properties of informing the users are related to the perceptual phase of Mead's action concept (cf also analysis in Cronholm & Goldkuhl, 2002b).

An IS involves usually an action space, i.e. many different action possibilities which is not always apparent. A user may need to move to other places (screen documents) in the IS in order to perform the desired actions. A user may need to elaborate search conditions in order to retrieve the desired information. There must executable properties of the IS for search and navigation. The IS must be searchable and

¹ I have left out the regulative situation from this analysis, since there are very specific demands concerning this situation. In the information systems development literature there are a lot of issues treated.

navigable. These kind of actions (and their corresponding actable properties) can be seen as preparatory in relation to the desired actions of providing, conversation and receiving (cf the division of navigation and performance in Cronholm & Goldkuhl, 2002b).

Desired communicative actions through the IS must be possible perform. This means that the system must have executable properties of this kind. It must be supportive in providing and conversational situations so the users can perform their communicative actions. These actions should the IS inform about as stated above. The offered action possibilities must be executable. After the execution the user should be able to judge the outcome. There should not be an uncertainty about the communicative actions performed. Appropriate feedback about action executions should be given. This relates to the consummatory action phase.

Demands concerning action possibilities can also be judged in relation to preconditional situations, which the author has suggested above to incorporate within IS usage situations. A preconditional situation can give rise to communication needs. Does the IS have an expressive power to let the user perform a communicative action corresponding to this need? This seems to be an important demand on IS actability.

I now turn to receiving situations (and such parts of conversational situations) and the subsequent consequential situations. Information systems have usually the ability to inform users about important matters related to their workpractice. When interpreting messages from the IS, users may be informed about action conditions, possibilities and demands in the workpractice. One main reason, for utilising an IS and messages from it, is that the users thereby may perform actions with greater quality. Information from the system should have the power to enable and improve user actions mediated by the enhanced user knowledge.

Based on the discussion above I give below a proposal for revised definition of information systems actability:

”An information system’s ability 1) to guide and inform users about its action possibilities and consequences for user’s potential communicative and interpretative actions, 2) to be searchable and navigable for users so they can arrive at communication situations, 3) to offer an expressive power for user’s communication needs, 4) to be executable for users in their performance of communicative actions through the IS, 5) to be informative about performed IS actions and their consequences, 6) to automatically perform actions considered as important for the performance of other IS usage situations/actions, 7) to be informative to users concerning action conditions, possibilities and demands in the workpractice in ways so users can act with quality and confidence.”

In section 2 above I raised requirements concerning actability for existence, appropriateness, visibility, comprehensibility and accessibility of action possibilities. These different properties can be related to the stated operationalisation of actability above. Visibility and comprehensibility are mainly concerned with property 1 and 5. Accessibility are mainly concerned with property 2. Properties 3, 4 and 6 are

concerned with existence and appropriateness. Property 7 can be said to be concerned with comprehensibility and appropriateness.

6 Conclusions

This paper has contributed with an in-depth analysis of the actability concept in relation to information systems. Originally¹ IS actability has mainly been related to and grounded in language action theories (Austin, 1962; Searle, 1969; Habermas, 1984). These theories are important, but there are other issues, which are important to acknowledge as well. There have been several tracks followed for refining ISAT. One track has been towards human-computer interaction and usability (e.g. Cronholm et al, 1999). Another track has been towards social action and human-to-human communication (e.g. Goldkuhl, 2001; Sjöström & Goldkuhl, 2002).

The point of departure for this paper was a recognition of the importance of information systems actability together with a need for further theorising concerning this concept. Following the lines of earlier analyses² of the actability concept I have tried to give a both deeper and broader theoretical ground for IS actability. The grounds for IS actability should not only come from language action theories. Other important theoretical grounds should be accounted for:

- The delimitation of actions recognising the distinction between performance, result and effects (e.g. von Wright, 1971).
- Different phases of an action: Perceptual, manipulatory and consummatory phases (Mead, 1938).
- The distinction between intervening and receiving actions (e.g. Goldkuhl, 2001; Schutz, 1970).
- A broad view on what counts as social actions (Weber, 1978; Goldkuhl, 2001).
- Affordances of action environments (Gibson, 1979).
- The mediating force of artefacts (tools) for human actions (e.g. Engeström, 1987; Norman, 1988)
- The ability of certain artefacts to perform actions (e.g. Latour, 1992).

Some of these broadened theoretical grounds have been explicitly treated in this paper; others only implicitly. In e.g. Goldkuhl (2001) these other theoretical grounds have been discussed in a more explicit way.

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¹ Confer e.g. Ågerfalk (1999).

² I have based my contribution mainly on the following earlier ISAT contributions: Goldkuhl (2001), Cronholm & Goldkuhl (2002b), Sjöström & Goldkuhl, (2002) and Goldkuhl & Röstlinger (2002a).

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