Information systems as instruments for communication
- Refining the actability concept

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Abstract

The concept of IS actability refers to a perspective that considers different actors' work with (computerised) information systems as performance of actions towards other actors in some social context. The actions performed using the IS are considered as social actions, since they are directed to human beings – explicitly or implicitly. The theoretical foundations for IS actability are social action theories (e.g. Weber and Schutz) and language action theories (e.g. Searle and Habermas). The role of the information system is defined as an instrument for communication, hence action, between human actors. An actable IS should ideally support a human being performing actions in some social context. This paper presents and discusses the focus of previous publications on actability, and suggests that actability should emphasize the communicative and social aspects of action more. The argumentation is based on theoretical discussions and a case study.

1 Introduction

Research in information systems (IS) is a complex field, involving aspects from several reference disciplines. The study of people handling information, often using IT artefacts, within organisations is often based on theories from different fields such as organization theory, sociology and semiotics. When developing or

analysing development of organisations and information systems, or when analysing or evaluating information systems, some perspective on organisations, humans and IT artefacts is unavoidable (whether it is clearly expressed or not). Somehow, we must have a way of looking at reality and choosing units of analysis in research and in systems development in practice.

One such perspective on humans working with information systems is the actability perspective. The concept of IS actability refers to a perspective that considers different actors' work with (computerised) information systems as performance of actions towards other actors in some social context. The actions performed by humans using the IS are considered as social actions, since they are directed to human beings – explicitly or implicitly. The theoretical foundations for IS actability are social action theories (e.g. Weber, 1978 and Schutz, 1962) and language action theories (e.g. Searle, 1969 and Habermas, 1984). There are examples of influences from other fields, e.g. usability (Nielsen, 1993) and semiotics (Stamper 2001). The role of the information system is defined as an instrument for communication, hence action, between human actors. An actable IS should ideally support a human to perform actions in some social context.

IS actability has been discussed on several levels of granularity: 1) At the interaction level, interactions between humans and machines can be studied. 2) At the action level, different IS usage situations can be studied. The given information content of screen and paper documents can be analysed from the user's point of view, to determine whether the information supports the performance of action in a satisfactory way. This also raises questions about the illocutionary force[1] of a message. According to speech act theory (Searle, 1969 and Habermas, 1984), the propositional content[2] is only considered to be one dimension of a message. 3) At the communication level, further questions are raised. This is the level where an actor actually receives and interprets a message. At this level, the social (or organizational) effects of a speech act through the information system could be analysed.

Previous publications on IS actability have mainly focused on the interaction and action levels – the human to human communication level has not yet been thoroughly discussed. This is challenging, since the social action theories, one of the theoretical foundations for actability, were developed without considerations to mediators as complex as information systems. Since the communication level of action is most clearly related to social action theories, it should be further

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[1] The illocutionary force is what is done by the sender in relation to the recipient through communicating (Searle, 1969).
[2] The propositional content is what is talked about in an utterance (Searle, 1969).

researched – we believe it is the main link between the IT system and the business processes in organizations.

This paper discusses possible refinements of the IS actability concept on the communication level. It is an attempt to identify white spots on the actability map, to fill in some of these spots, and to provide suggestions on how to continue the research in the future in order to make the actability map trustworthy and navigable.

The research approach is a combined empirical and conceptual approach. A system used for scheduling at a Swedish university has been evaluated by support of the IS actability concept. One of the main reasons for performing this case study was a research interest to investigate the usefulness and applicability of the actability concept. Through this evaluation we have identified important aspects (of human to human communication), which have not been explicitly recognised in the actability concept earlier. Our discussion, based on this case study, focuses on the communication level, and illustrates the complexity of social action when it is performed using information technology as an instrument. The case study is thus used for two reasons: 1) It is the base for an evaluation of the current theoretical foundations of actability and 2) it plays an important role in a discussion on complementary theories and future development of the IS actability concept. The theoretical discussions are partly based on Max Weber's (1978) elaborations of the notion of social action – this is a way of illustrating that there are important aspects of social action that has been overlooked in the actability concept as it has been described earlier.

2 The concepts of action and actability

The concept of information systems actability has been researched for a few years and there are several publications (e.g. Ågerfalk, 1999, Ågerfalk et al, 2001, Goldkuhl, 2001, Goldkuhl & Röstlinger, 2002, Goldkuhl & Ågerfalk, 2002 and Ågerfalk et al, 2002). The aim of this chapter is to pursue a discussion on social action and IS actability, and to illustrate what has been emphasized in previous actability publications. By doing this, we will also illustrate some important aspects related to actability which have *not* been emphasized earlier. These aspects are presented to justify the need for a broadened theoretical discussion on the actability concept.

2.1 IS Actability and its relation to social action

IS Actability is defined 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).

The conception of *action* is very important within actability, since it is the crucial word in the definition of the concept. The information system should permit, promote and facilitate action – but how is action *defined* within actability? Action is considered to be *social action*, mainly based on the thoughts of Weber (1968), Searle (1969), Habermas (1984) and Austin (1962). The concept of social action has been further discussed as a part of the development of the actability concept, and the most recent contributions can be found in Goldkuhl (2001) and Goldkuhl & Röstlinger (2002), which present the following view on social action and the use of IT systems. When we use an IS, we communicate something to other actors within a business context with the intention of influencing them in some way. The communication is one form of social action, and the IS is the tool that helps us to communicate. The model below illustrates the view on social action within the actability concept.
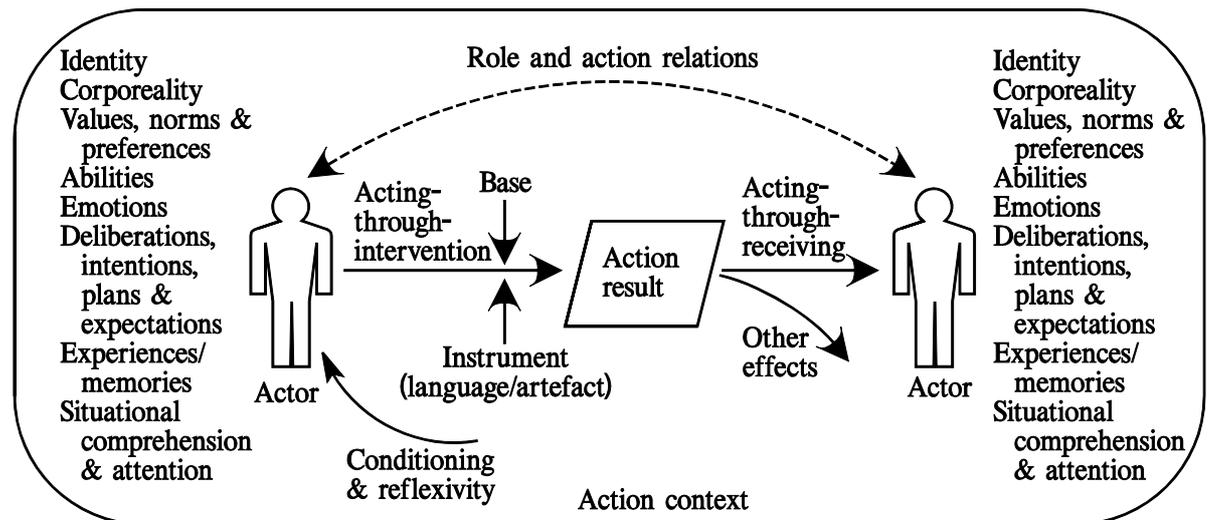

Figure 1 - A generic model of social action (Goldkuhl & Röstlinger 2002)

Figure 1 illustrates several aspects of social action. It clearly relates two actors to each other (the action relationship). It also indicates that we are referring to human actors by including keywords like "abilities", "emotions" et cetera. Furthermore, it defines that a social action situation requires active participation from both actors: Acting-through-intervention and acting-through-receiving. Intervening, as presented in figure 1, refers to the type of action that is intended to change the world in some way; either by a material change or by presenting signs in order to change the inner world of some other actor. The process of receiving is thus also

considered as action. Receiving can be an interpretation of some (external) sign or receiving some material object from the interventionist. The two basic types of actions are referred to as *intervening* actions (i-actions) and *receiving* actions (r-actions) (Goldkuhl 2001). To fully describe the action relation, the communication between the actors, both of them have to be included. The action result is a message (a set of signs) that is created by the intervening actor and interpreted by the receiving actor. Through these two combined acts, action relations between the two actors evolve.

The model presented in figure 1 will be used later on – different concepts that have been researched in actability will be discussed and related to figure 1, which will help us determine what has been focused within actability. Based on that, we will also be able to discuss parts of figure 1 that haven't been paid a lot of attention.

The concept of actability has been furthered defined by Goldkuhl & Röstlinger (2002) with a clear relation to the action concept. Actability is conceived to be a property of something; i.e. this property contributes to or enables the actor to perform an action. The authors (ibid) include both executable and informative properties into the notion of actability, and they designate actability to be properties of external objects (signs or artefacts) or internal (subjective) constructs.

2.2 The notion of social action according to Weber

Max Weber has profoundly discussed the term *social action*. Weber's perspective on social action will be used to discuss different aspects of the case study; hence we present parts of his thoughts here.

Weber (1978 p 4) defines social action in the following way: "That action will be called 'social' which in its meaning as intended by the actor or actors, takes account of the behaviour of others and is thereby oriented in its course". This means that he describes social action as action oriented towards other people's previous, current or anticipated future behaviour. "Others", in this case, refers to individuals known to the actor or a number of unknown individuals. Weber's notion of *social* action is that the performing actor takes other individuals into consideration, which affects the way he/she acts. The social aspect of action lies within the actor – this would mean that it cannot always be determined whether some performed action is social or not, without knowing what influenced the actor to perform the act in a certain way.

Weber (1978) discusses four different orientations of social action. These are goal rationality (instrumental rationality), value rationality, affectual orientation and traditional orientation. These are not a means for classifying actions, but a

sociological tool that can be useful to discuss social action. A social action can be oriented different ways with regards to its goals and the sociological or psychological circumstances that affect the way the actor performs the action. Table 1 is an attempt to give an overview of these orientations.

Table 1 - An overview of Weber's orientations on social action, derived from Weber (1978)

Orientation	Goals
Goal rationality	Clear goals; Affecting the world in some intentional sense (desired effects outside the action itself).
Value rationality	The goal lies within the action itself, e.g. religious, ethical or esthetical actions.
Affectual orientation	These actions are emotional, which means that they do not necessarily have meaningful goals, at least not reflected goals.
Traditional orientation	These actions are governed by habits, and traditions, which means that there are not necessarily conscious goals.

Weber (1978) also points out that a social action seldom can be said to belong to one of the orientations above. An action can, for instance, be goal rational to some degree and value rational to some degree. Weber (ibid) also points out that these orientations can contradict each other.

2.3 An overview of IS Actability

We have above described parts of the IS Actability theory. We will deepen our description of IS actability in this section as a basis for further analysis. In IS actability there is a differentiation between three usage situations of information systems (figure 2). There are interactive usage situations, where users interact with the IS. In this kind of situation, a user can perform a communicative action through and by support of the system. A user can perform some action (outside the IS) based on messages retrieved from the IS. This kind of action, related to IS, is called a consequential action. The IS itself can also perform actions according to this view: these actions are called automatic actions. A computer is an advanced artefact and has the ability to perform certain information processing in an independent way. This is of course not total a independence, since the automatic actions performed by the computer always is governed by rules defined by human actors.

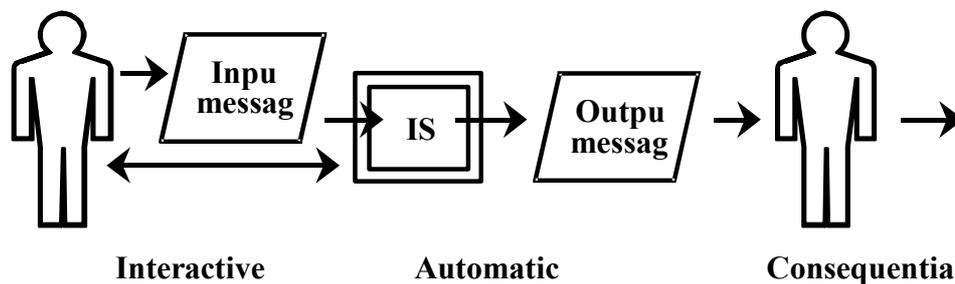**Interactive**   **Automatic**   **Consequential**

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

Messages play an important role in the actability concept. The pragmatic aspects of messages have been discussed (cf. Goldkuhl & Ågerfalk, 2002) as important within actability. Based on universal pragmatics (Habermas 1984) and speech act theory (Searle 1969), messages are considered to be products of speech acts, which contain not only a propositional content, but also an illocutionary force (this is referred to as 'action mode' within actability).

In Goldkuhl & Ågerfalk (2002) and Ågerfalk et al (2001) there are discussions concerning the relations between actability and the semiotic ladder of Stamper (2001). One important issue is that actability theory (following speech act theory) claims that there is an action aspect within the sign itself (the illocutionary force) and not only as effects arising from interpreting the sign. An actability claim is that pragmatic relationships are established through the sign between sender and recipient. For example, commanding or promising establishes different pragmatic relations between sender (the intervening actor) and recipient (the receiving actor). The sender of a message through an IS may not be the original communicator. He can be a 'performer', mediating a communication from the original communicator to the indented interpreters (recipients).

Actability as it looks today has paid a lot of attention to Habermas' (1984) universal pragmatics, and also to speech acts as defined by Searle (1969). One of the main reasons for the birth of IS actability was a reaction towards viewing information systems specification as only a matter of semantic analysis. By paying attention to the illucotionary force of speech acts during information systems specification, and even conceptual modelling, pragmatic aspects of communication could be taken into consideration (Goldkuhl & Ågerfalk, 2002).

One way to apply the pragmatic aspects of actability is to formulate concrete 'how to'-suggestions on IS design and/or evaluation. One part of the development of the actability concept is the formulation of a set of actability heuristics, or design ideals, which should guide an IS designer or evaluator to set focus on different actability properties of an IS. These are presented below, in table 2. The

eight first heuristics already existed, and they were used to perform the case study. Heuristics 9- 11 were developed as a result of the case study in this paper.

Table 2 – Actability heuristis as presented in Ågerfalk et al (2002)

1. Situational context awareness
Performers should ultimately always know what they are doing and what they are supposed to do, only by looking at the interactive screen documents available.

2. Good conditions for action in shown information
Information shown to performers should be adequate (necessary and sufficient) so that actions can be intuitively based on it. This accounts for both information from developer-to-user (labels, captions, help texts, *et cetera*) and information involved in user-to-user communication.

3. Good conditions for action in required information
Information that the system requires from performers shall be meaningful and easily provided to the system. That is, the performer shall understand why the information is required and the information shall be convenient to provide.

4. Easily accessible and adequate action memory
Information about previously performed actions and other action prerequisites shall be easy to access.

5. Action-legible IT-systems
Expressive interactive user interface components (icons, labels, *et cetera*) should be used. The language used should be in correspondence with users' professional language. Known and understandable consequences of possible actions. Propositional content, signifier of action mode and information about communicator should be visible and kept together. Separate messages should be kept separate (one thing at a time).

6. Legible and relevant feedback
Description and explanation of the system's performed and scheduled future action(s) should be readily available. Effects of these actions should be shown. Alternative future user actions should be visible and choice of course of action to take should be informed by the system.

7. Visible actors
Information about performer, communicator and intended interpreter(s) should be easily accessible – both role and person.

8. Restrictions and opportunities in navigation utilized
Admit focus and work task changes. Sometimes sequence restrictions are necessary and desirable.

9. Accurate timing
Messages should reach intended interpreters in due time. If not, resulting delays may cause problems for the organisation (such as additional actions for the performer).

10. Interpretation initiative
Receiving and interpretation of messages should be possible to perform at desired places and in desirable ways. This may be affected by technological solution in terms of, for example, transmission strategy (push or pull, synchronous or asynchronous, *et cetera*) and types of devices (mobile phones, PCs, PDAs, *et cetera*).

11. Distribution of actions
The performance of actions should be allocated to human actors and information systems so that users gain maximal support in terms of, for example, decision support *vs.* automated actions.

This attempt to develop design ideals could be compared to design ideals from the usability field, for instance Nielsen's (1993) usability heuristics, which can be used as guidelines when designing information systems. One noticeable difference is the theoretical background for the two sets of guidelines: Whereas the actability design ideals mainly are based on theories on speech acts, usability design ideals are based on other theories such as cognitive psychology. The design ideals within the actability concept are no replacement for Nielsen's heuristics, but rather an interesting alternative perspective on information systems. They focus somewhat different phenomena, but in some senses they are much alike. The actability design ideals will be further discussed in the theoretical discussion on the actability concept.

The concepts we have discussed is merely a subset of what has been said in previous actability papers, but we believe they give an overview of the core parts of IS actability.

2.4 Reflections on the scope of IS actability

So far, we have presented the view on social action within actability, and some central actability concepts. We will give some reflections on actability concepts, inspired by the generic model of social action (figure 1).

Much of the discussions concerning IS actability has been based on the division into three types of usage situations (see figure 2). This means that the IS usage can be reduced to these three situations. Following this model, there seems to be a risk that IS usage can be reduced to these usage situations. The focus on these parts can move the focus away from the human-human communication. The division leads to a strong focus on the parts (which are closer to human-computer interaction) and not on the wholeness (the interaction between humans and the resulting establishment of action relations). This can partially be seen in the actability heuristics in table 2. The heuristics are to a large extent formulated with a focus on usage of information systems as an action instrument.

Human-human communication aspects can be found in some of the heuristics (e.g. in heuristic 2, 5 and 7). Many of the heuristics seem to have a more narrow focus, being oriented towards one of one of the three types of usage situations, especially the interactive usage situation (see heuristics 1, 3, 5, 6, 8). The heuristics are mainly focused on analysis of screen documents, but they are not supposed to be used without knowledge about the users' work situations and the action the users wish to perform. An actability analysis should guide the evaluator to study and reconstruct the human-human communication. When screen documents are analysed separately, the interventionist's view and the recipient's view will be kept apart. We suggest that sets of screen documents related to the same communicative act should be studied in a comprehensive way. This will give the possibility to see aspects of communication which otherwise can be disregarded in an actability analysis, according to the original heuristics (1-8).

3 Discussions on a case study

This chapter will present parts of a case study that has been conducted. The case study consisted of an actability evaluation of an IT system used to book teachers, rooms and equipment within a university environment. The purpose of the study was to test and evaluate an actability evaluation method that is currently under development (Ågerfalk et al 2002), and the concept of IS actability. The aim was to use the results and conclusions from the case study to discuss further development of the actability concept.

The case study was supposed to be a heuristic evaluation of the booking system, based on the set of actability heuristics presented in chapter 2. That would have been an expert evaluation of the IT artefact. However, since the researcher who performed the evaluation has worked with the system for over two years, we see a possibility to discuss some user perspectives and organizational issues based on the case study. The value of the examples could of course be questioned, since there are no actual user observations or interviews. The examples in the case study are authentic though, and described as experienced by the researcher/teacher.

During the study, we noticed several signs indicating that important aspects of action were not emphasized in the actability concept. Below, we will present parts from the case study to support a discussion on these aspects of action. The case study will be discussed from different perspectives: A 'Weber' perspective and an actability perspective.

3.1 Description of the case study

This section includes an example from the case study. The example will be referred to as 'the last minute change'. The teacher will be called Adam, to simplify the references in the discussion.

We will start by describing certain (mostly social) aspects of the case study in plain text.

Adam is a university teacher who - due to sudden illness - wants to perform a last minute change in the schedule. The system supports the re-scheduling, however there are several things left to do to ensure that his students receive this information. This is especially important to Adam, since many of the students commute to the university. Adam wants to make sure that the students receive this information as soon as possible – otherwise they might travel a far distance to the university in vain. This affects the students in several ways. Their image of the school might change, their image of Adam might change and they might even loose their motivation to complete the course. Only Adam knows the exact reasons why it's so important to him to inform all the students. He takes several time consuming measures to notice them manually, since the IT system does not support these actions.

Another way of illustrating how Adam performs the re-scheduling would be to use some visual aid. In this case we use action diagrams (Goldkuhl, 1992), which gives the possibility to describes flows of action in organizations. When performing the case study, the 'last minute change' was discussed from both the intervening actor's (the teacher's) and the receiving actors' points of view. Therefore, we will present action diagram describing both these perspectives.

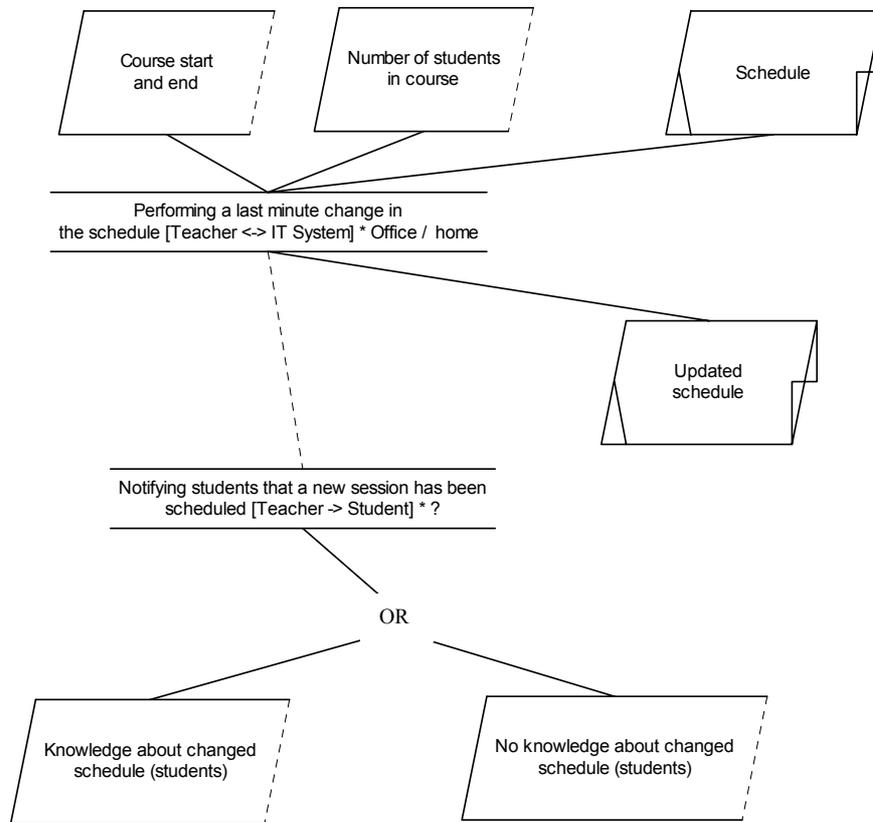The action diagram below describes Adam's action-through-intervention (the 'last minute change').

Figure 3 - Action diagram describing 'the last minute change'

The students can receive the message about the re-scheduling in different ways: Through the Internet, through the school's intranet or by watching TV-screens in different places at the school. The Internet site and the intranet site can be reached both from home and from school, and they look very much alike. The following action diagram illustrates how the student can check the schedule from the intranet.
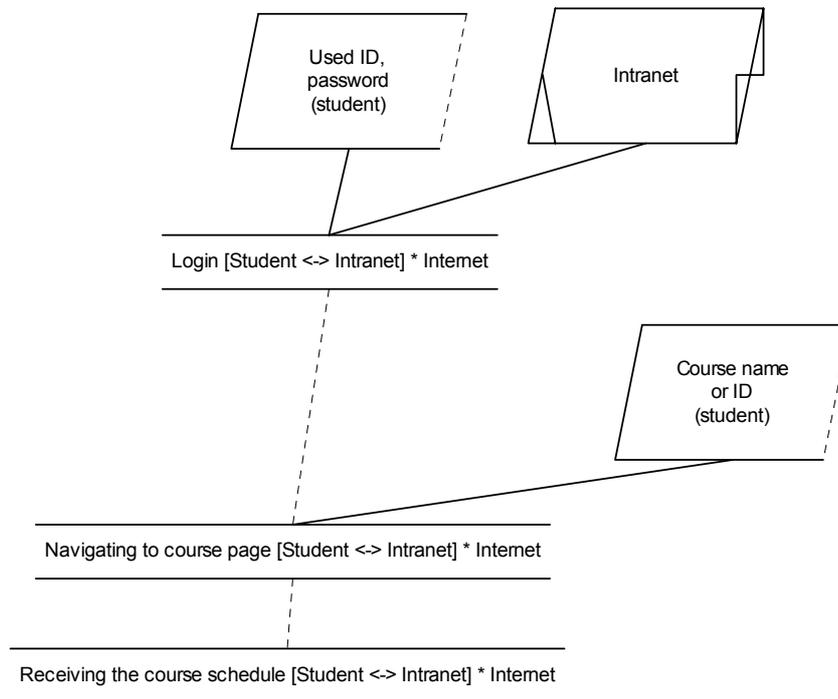
Figure 4 - Action diagram describing how the students receive the message

These diagrams illustrate which actions the actors have to perform. Together, they tell us something about the action relationship that's formed between the actors.

Unfortunately, the screen documents in the systems are in Swedish, which makes it inappropriate to present them as a part of this paper. However, it is possible to say something about the screen documents without presenting them – we can, for instance, discuss results of the actability evaluation without discussing the evaluation in detail.

3.2 Case study discussion based on Weber

By applying Weber's (1978) definition of social action, we can get guidance on how to study the action(s) that the lecturer performs. Obviously, there are social considerations taken. Only by looking at Weber's view on social action, and plain reasoning based upon the situation, we can discuss actability in this particular situation. We will base the discussion on three questions:

1) What does the actor want to achieve (what are his goals and values)?

2) Why does he want to achieve it? Why is it meaningful for the actor to achieve these goals and express these values?
3) To what extent does the booking system help him to achieve his goals and express his values?

It is not trivial, maybe not even possible, to 'answer' these questions, but Weber's view on social action at least constitutes a tool that helps us discuss them.

What the actor wants to achieve can be derived from the examples. He has made a last minute change in the schedule, and he wants to communicate this to his students. It also seems important for him to be sure that they actually receive his message – he needs confirmation that his message has actually been communicated. An interesting reflection at this stage is that different teachers performing this action probably would have different goals. One extreme could be that just changing the schedule satisfies a teacher, thinking that it's up to the students to check for changes periodically. The other extreme would be that the teacher isn't satisfied until every single student for sure has received and understood the message in due time. We argue that the goal varies with the individual; some shade of grey between the black and white extremes presented above. Sometimes the individual might be aware of his goals and sometimes they might be unconscious.

The question why he wants to achieve these goals is not easy to answer, however inspiration from Weber can help us to determine the orientation of this social action. Adam's wish to communicate the last minute change might have different reasons. If he wants to score high on the course evaluation, or if his goal is to maintain his favourable reputation among the students in general, his action would be characterized as goal rational. But if his only incentive to communicate his message were that he actually felt sympathy with the students that would have to commute to the university for nothing, his action would be value rational (it becomes an ethical issue). We could have a long discussion on this matter; how to describe Adam's action using other 'classes' of Weber's; the point is there can be many reflected or less reflected reasons that affect Adam when performing this action.

The third, and final, question is whether the system helps Adam to reach his goals - and express his values - when performing the last minute change in the schedule. In the case study, Adam can change the schedule in the system. But in order for him to fulfil his goals when performing this social action, he had to perform a number of additional tasks manually. A question that is interesting here is if the booking system at all should support Adam to achieve his goals completely – one could argue that it is not the intention that the system should

solve these problems. We believe that the argument is valid to some extent, but it could also be an organisational problem that a teacher has to spend a lot of time on tasks that could have been supported by the IT system.

The discussion so far has been fairly oriented towards the individual Adam; his goals and values. How about the organisation's goals? What is the corporate policy when it comes to last minute changes? There might be no explicit norms and values concerning these matters. In the IT system there is no advanced functionality supporting dissemination of last minute changes. This can be considered to be one sign that this issue is not reflected or treated on an organisational level. It is left to individual teachers to handle such matters in their own ways.

What is interesting here is that the concern about students from one single teacher (Adam), which should be seen as individual value rational actions, can be transformed to goal rational organisational action if the IT system is redesigned to include such functionality supporting quick dissemination. Think of the situation that Adam is very discontent about not being able to inform his students in ensured ways about last minutes changes. If Adam is bringing this concern to an open discourse with colleagues and managers, then this might lead to a change in the corporate policy followed by changes in the IT system. If the IT system now gives support to such actions (dissemination of last minute changes) this will be part of the organisation's goal rationality (agreed upon by different actor's within the university).

3.3 Case study discussion based on IS actability

During the evaluation of the scheduling system, we used the actability heuristics as a tool to set focus on different actability aspects of the system.

The actability heuristics helped us identify a set of weaknesses in the scheduling system. However, as discussed in chapter 2.4, there is a tendency to analyse different parts (screen documents) in the system, without regarding the actions to be performed as a whole. An overview of the results of the heuristic evaluation is presented below (each heuristic is discussed separately).

Situational context awareness
There are several screen documents in the system where it is hard to understand which actions you can perform. Labels and headlines are unclear.

Good conditions for action in shown information
A reflection is that a lot of knowledge about the organization is needed in order to perform a booking, e.g. information about parallel courses and the number of students taking different courses. The system does not give this kind of support, which results in high "cognitive load".

Good conditions for action in required information
Some of the information the user provides to the system has an unknown meaning For instance when the type of booking is chosen– there are options like 'preliminary', 'exam', 'locking' and others, but the actual meaning of these types is unclear.

At some points, the user has to provide information that probably could be automatically derived from the existing information in the system (e.g. connections between programs and courses).

Action legible IT systems
A big problem is that different course codes are used in different contexts. The scheduling system uses one set of course codes, and the system where the students' results are registered uses another set of course code. This is problematic for the teachers, who have to use both these during administration.

One thing that could confuse the user initially is that extra equipment (portable computers and projectors) is stored as rooms within the system. In order to book extra equipment, you would have to choose to book extra rooms.

Legible and relevant feedback
Error messages often have a technical character and they are hard to understand. Sometimes there is no direct feedback – when a booking has been performed, there is no sign whatsoever that this has happened. The user has to search through the bookings afterwards to make sure that the booking has been successfully performed.

Visible actors
There are visible actors in many parts of the system, at least to some extent. For instance, you can see who *last* changed a booking (who did it and when it was done). Since this is a scheduling system, actors like student groups and teachers

are visible for each booking. The intervening actor – the teacher – can see who he's communicating with.

Restrictions and opportunities in navigation utilized
A few screen documents in the scheduling system are *modal*, which means that no other screen document can be accessed without closing the current one. There is no obvious reason for this design, and it's hard to tell if this makes the system more or less actable. Some kind of evaluation involving the users of the system would probably be better to evaluate this.

Accurate timing
Time is an important aspect in the 'last minute change' example. During this study, we noticed that there was no heuristic that regards the time aspect, which led to the development of this new heuristic. The scheduling system does not give any indication to the teacher if the 'message' (that a lecture has been cancelled) has reached the intended interpreters (the students) in due time.

Interpretation initiative
This heuristic was also developed during the case study. The conclusion in this case was that the scheduling system could have been more actable if the information about the 'last minute change' had been pushed to the students (e.g. via e-mail, or via SMS). As it is now, the student must take interpretation initiative to check the schedule.

Distribution of actions
The third new heuristic concerns the distribution of actions – what should be done manually, and what should be supported by the system? In the evaluation of the scheduling system, there were several 'needs' that the teacher felt that, which led to a number of manual actions, that could have been supported by the system.

3.4 Summarizing reflections from the case discussions

In the short discussions about the case study, we can see that different things can be said about the scheduling system's actability depending on our perspective.

By applying a social action perspective (based on Weber), we emphasize the teacher's role and his goals when performing the 'last minute change'. The teacher has to perform a number of manual actions to achieve his goals (to make sure that none of the students commute to the university in vain).

By applying an actability perspective, based on the original actability heuristics, we set focus on other aspects of the 'last minute change'. The analysis is mainly an

analysis of screen documents and interactive use situations. Such an analysis points out a number of properties of the system that affect the system's ability to support action. Some of these properties are related to human-human communication, but we receive a scattered picture of the communication that takes place. The analysis has been performed from the interventionist's (the teacher's) point of view. We believe that the heuristics encourage an evaluation of screen documents, rather than an evaluation of the establishment of action relationships between actors.

4 Conclusions - refining the actability concept

This paper has presented the actability concept, and pointed that the constructs within actability focus too much on human-computer interaction and usage situations, and not enough on human-human communication.

The concept of actability favours the view that the use of information systems is performance of social action. The presentation of social action in previous actability publications states that communication involves several actions: Acting-through-intervention and acting-trough-receiving (see figure 1). These two action types are required to establish an action relationship between actors – they are both part of communication. This model seems to be a simplified description of reality, since the use of information systems make communication more complex. Information systems mediate and transform messages. This has to be regarded within the actability perspectives, and we suggest that (at least) these four scenarios should be taken into consideration when an IS is a mediator for human-human communication:

- A 'one to one' situation, where one person intervenes, produces a message which might be automatically transformed, and which is interpreted by another person (this which corresponds to the situation described in figure 1)

- A 'one to many' situation: One individual could intervene using the IS, and several individuals could receive the message, or an automatically transformed version of the message

- A 'many to one' situation: Several individuals could intervene by using the IS, and one individual could receive some view of the message

- A 'many to many' situation, where several individuals intervene and several individuals receive different views of the message

One suggestion on how to handle this would be to change the unit of analysis within IS actability – instead of focusing on usage situations and screen documents, the focus should be on social action and the action relationships between the involved actors. The model below presents a developed version of figure 2.
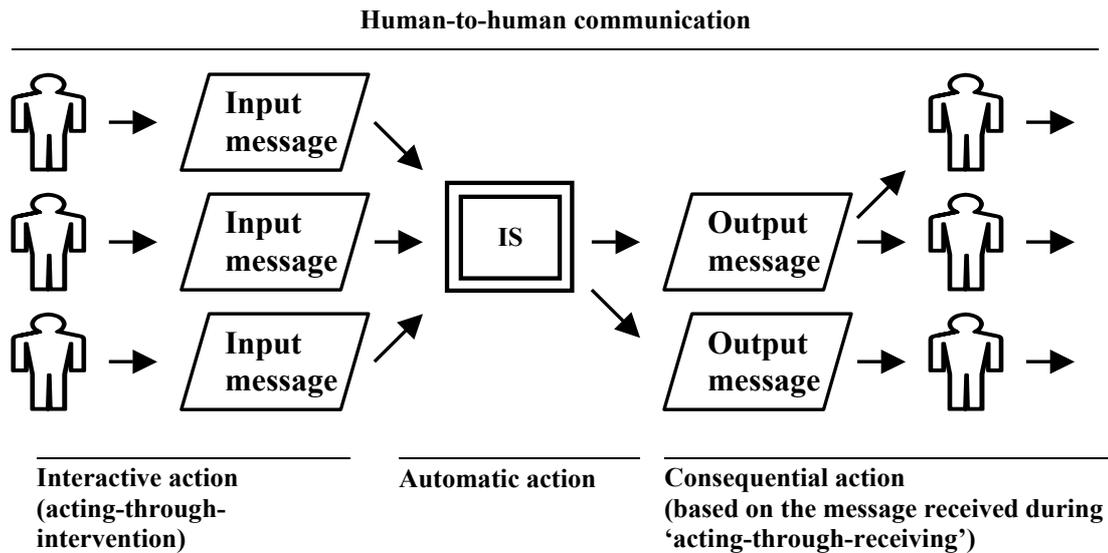
Human-to-human communication

| Interactive action (acting-through-intervention) | Automatic action | Consequential action (based on the message received during 'acting-through-receiving') |

Figure 5 - Types of actions related to three IS usage situations

In figure 5, we attempt to illustrate two aspects that were made implicit in figure 2: The human-human communication aspects, and the complexity of IT as an instrument for communication. In the booking system, for instance, the 'last minute change' of the schedule has been described as performance of social action. In order to study this fully within actability, we could look not only at the intervening action, but also at the related receiving actions. This way, the action relationship (the human-human communication) can be analysed.

As we have discussed, different views on action emphasize different aspects of actability. If the goal of actability is to build information systems that support their users' actions in the best way possible; we see an urge to focus more on either part of communication; or the sociality of action; or both. We think the previous work on actability has been slightly biased towards the artefact and especially in the role of an interactive tool, and that the human aspects and the focus on human-human communication should be emphasized more in the future development of the actability concept.

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