

# The Rationality Potential of Information Systems: A Critical Approach

Dubravka Cecez-Kecmanovic<sup>1</sup>  
Marius Janson<sup>2</sup>

<sup>1</sup>Faculty of Management  
University of Western Sydney Hawkesbury  
Sydney, NSW, Australia  
E-mail: [Dubravka@uws.edu.au](mailto:Dubravka@uws.edu.au)

<sup>2</sup>Department of Information Systems  
University of Missouri-St. Louis  
St. Louis, Missouri, US  
E-mail: [mjanson@umslvma.umsl.edu](mailto:mjanson@umslvma.umsl.edu)

## Abstract

*In this paper we aim to situate social implications of information systems (IS) within a broader context of progressive rationalisation in modern organisations. More specifically, we examine what role IS play in increasing rationality of organisational processes and with what consequences. In order to do so we propose a conceptual framework by drawing on a wide range of rationality conceptions proposed by the critical theorists. This framework, which we call the rationality framework, enables a critical analysis of IS in organisational processes. By drawing on examples of information systems from two field studies, we illustrate how this framework may be applied as a descriptive and analytical tool.*

## Keywords

Organisational impacts of IS, Rationalisation of processes, Rationality potential of IS

## INTRODUCTION

The relationship between information systems (IS) and organisations has been a key theoretical issue since the early years of conceptual thinking about the organisational use of information technology (IT). In particular, understanding the role and impacts of IS in organisational processes has been a central focus of a wide range of quantitative and more recently interpretative and critical empirical studies. The role of IS evolved from process automation and optimisation, to supporting decision makers, and to enabling communication and cooperation driven by IT development. The impact of IS on organisational processes, consequently, was first assessed in terms of efficacy of control, cost minimisation and profit maximisation, then as improvements of efficiency and effectiveness of decision makers, and more recently in terms of organisational transformation, involving flattening of structure, increasing flexibility, empowering employees, downsizing, etc. In order to make sense of empirical data about organisational use of IS and to improve understanding of IS's role and impacts, researchers have adopted a variety of theories ranging from organisation theory, organisation behaviour and management, to sociology, anthropology and philosophy<sup>1</sup>. As a result we have witnessed gradual liberation of the IS field from its technical/technological

---

<sup>1</sup> See eg. Attewell and Rule, 1984; Orlikovski, 1991; Klain and Hirschheim, 1991; Coombs et al., 1992; DeSanctis and Poole, 1994; Ang and Pavry, 1994; Avison and Myers, 1995; Hirschheim et al., 1996; Galliers and Baets, 1998; Robey and Bourdeau, 1999.

cage (paradigm) and notable improvements in understanding of various aspects of IS as social and human systems.

This paper focuses on the relationship between IS and organisational processes from the perspective of *rationality* of actors and their actions. That actors in organisational processes are rational in the selection of the best (optimal) action to achieve their goals has long been a belief underlying transaction based IS with operation research models often embedded in these systems. For example, inventory control systems are implemented to minimise costs or stockouts; optimal production scheduling systems are used to maximise throughput or minimise waiting times. Given a particular criterion (e.g. minimise cost, maximise throughput), these systems automate generation of alternative actions and the selection of the best (optimal) action, thereby achieving optimal control and ultimate rationalisation of these processes.

On the other hand, systems such as Management Information Systems (MIS), Decision Support Systems (DSS) and Executive Information Systems (EIS) support rather than automate organisational processes. They are designed to assist managers and executives in undertaking complex and often ill-structured tasks and in making decisions efficiently and effectively. In other words, MIS, DSS and EIS are expected to contribute to rational decisions and to increase rationality of decision-making processes. This kind of DSS may contain assumptions about the behaviour of other actors under different conditions.

IS in these examples are employed to ensure rational actions and to increase rationality of organisational processes. The value of transaction based IS is measured by goal achievement such as cost savings or increased production with limited resources. Similarly, the value of DSS or EIS is measured by the increase of managers' efficiency and effectiveness in achieving their goals. In both cases processes are governed by goal rationality and the role of IS is perceived as increase in goal rationality. In both cases, however, goals themselves remain beyond the scope of rational determination. Moreover, goals are assumed to be given, inevitable and 'ethically neutral'. Is a particular goal worthy of pursuit? Is it consistent with accepted values? What are other implications of an IS, in particular on employees? – These are questions that cannot be answered by referring to goal rationality only. A broader view of substantive rationality is required to shed more light on the relationship between these IS and organisational processes.

In this paper we deconstruct the relationship between IS and rationalisation processes in modern organisations. We explore rationality potential of IS in a range of organisational processes and expected social and organisational consequences. We propose a rationality framework founded on a broad ranging concepts of rationality defined primarily by Weber and later redefined by critical theorists, including Habermas. The purpose of the proposed rationality framework, that necessarily reflects the contradictory and ambiguous nature of rationality, is to provide a categorial apparatus for critical analysis of social and organisational consequences of IS beyond the narrow view of instrumental rationality.

In order to be in a position to explore rationality aspects of IS, we first discuss different conceptions of rationality as they emerged in social sciences. We then synthesise a rationality framework by selecting and appropriating particular rationality dimensions relevant for social and organisational impacts of IS. More specifically, for each dimension of rationality we consider both the rationality potential of IS and some risks and dangers resulting from IS implementation. Following this session, two examples of IS employing different types of rationality are examined illustrating the use and contribution of this rationality framework.

## ON THE NOTION OF RATIONALITY

Modern business organisations are characterised by the rational (deliberate and systematic) pursuit of profit, through rationalised (calculable and efficient) systems of action, and through rational (systematic and effective) administrative and decision-making processes. *Rational* and *rationality* have been used both in theoretical writings and in everyday life to denote a multiplicity of meanings. The idea of reason has been connected with the disposition of actors to give a rational ground for or logical explanation of their beliefs and actions. Similarly, actions by which actors achieve desired ends are regarded as rational. Furthermore, organisational processes that embody rational actions are considered rational. More generally, an increase in rationality that characterise modern organisations and society is called *rationalisation*. It is this broad context within which we will explore the relationship between IS and organisational processes.

Our brief introduction to rationality begins with Max Weber's analysis of rational action and rationality as an organising principle in society and organisations. Max Weber's analysis of Western rationalism marks the break with 'optimistic faith [of the Enlightenment] in the theoretical and practical rationalisation of reality' (1958, p. 85). Namely, pre-Weberian thought of reason and rationality of actions and society, often naïvely celebrating progress, have long been regarded as empirically oversimplified and morally overoptimistic (Brubaker, 1987). In contrast, Weber's empirical and methodological investigations of rationality and the progressive rationalisation of social institutions and practices, as major determinants of modernity in Western societies, were profoundly critical, in a way we think relevant for the analysis of information systems in contemporary organisations.

More specifically, we draw on Weber's distinction between *formal rationality* and *substantive rationality* that is fundamental to his empirical analysis of modern bureaucratic organisations and society as well as for his moral response to it. For Weber, formal rationality is 'a matter of fact' and refers primarily to the calculability of means and procedures to achieve pre-defined, given ends. Substantive rationality, on the other hand, is 'a matter of value' and refers to relationship between an action and some substantive end, belief or value. Bureaucracies and administrative systems, as Weber's analysis demonstrated, are governed by purely formal rationality (1978). This is a result of processes of rationalisation characterised by increasing reliance on expert knowledge, especially technical, by objectification or depersonalisation of power structures and authority, and by more efficient control over organisational processes (including material and human components as means of production). Above all, Weber is concerned with technically enabled rationalisation through efficient calculation of means to achieve given ends, without considering the value or significance of these ends; through optimisation of functionality of organisations and industrial production that reduces individuals to material means of production. Formal rationality underpinned by technology thus resulted in organisations operating like "a technically rational machine" (Weber, 1978, p. 811).

Whether these formally rational actions, organisational processes and organisations are substantively rational depends on the ends, beliefs and values, that is, substantive purposes, as a standard of rationality. Weber claims that not only are modern bureaucratic organisations governed by formal rationality, but that they are 'substantially irrational' from the point of view of egalitarian, fraternal and caritative values (1964). Here Weber not only describes the rising tensions between formal rationality and substantive irrationality of modern organisations and society but also expresses his own position claiming that their "institutional foundations are morally and politically problematic" (Brubaker, 1987, p. 38).

Following Weber's critical analysis of rationality and processes of rationalisation, Adorno and Horkheimer (1944), renowned critical thinkers of the first generation of the Frankfurt School, viewed organisation processes and advanced capitalist societies governed and shaped by 'instrumental rationality'. Instrumental rationality<sup>2</sup>, derived from the concept of formal rationality, refers to the capacity to maximise efficiency and optimise control of organisational and societal processes through the application of technical knowledge. Predominant institutionalisation of instrumental rationality and progressive rationalisation of processes and society is linked with increased formalisation and bureaucratisation, increased coherence, calculability and control, with socially disastrous consequences. For Adorno and Horkheimer it leads to 'totally administered society' and 'closed, totalitarian systems'.

In contrast to Weber and critical theorists of the first generation, Habermas does not regard rationalisation as a process that inevitably leads to instrumentalisation, bureaucratisation, control and domination, but as an inherently ambivalent process that also entails a potential for human cooperation, emancipation and freedom. The basic thrust of Habermas's (1984) theoretical approach is his conceptual distinction between *instrumental* and *strategic rationality* (as a derivative of Weber's formal rationality) on one hand, and *communicative rationality* (as a new conception) on the other. This distinction reflects two opposing orientations of actors: towards success in the former, and towards understanding in the latter conception of rationality. Actors oriented primarily to success can be either instrumentally (calculate means to achieve ends) or strategically (achieve their ends by influencing others) rational. Both instrumentally and strategically rational actors intervene in the objective world in order to change its state of affairs, disregarding interests, values and norms of other fellow human beings affected by the intervention. In contrast, actors oriented to understanding are *communicatively* rational. While also aiming to achieve specific ends, they do so by developing intersubjective interpretation of a situation through interaction, leading to a rationally motivated agreement and coordination of their actions. Habermas calls such actions communicative actions (1984). The very nature of communicative actions implies that, unlike instrumental and strategic actions, they are essentially linguistic in nature. That is to say, the actors use language to effectively build mutual understanding and a common interpretation of a situation (White, 1994). Based on this common understanding the actors coordinate their actions, thereby achieving their ends (Koningsveld and Mertens, 1992).

Of particular importance for the analysis of IS roles is how the potential of communicative rationality can be achieved in social interaction. The key assumption here is that participants in communication understand the internal relationship between the raising of intersubjective *validity claims* and the commitment to give and be receptive to arguments. Communicative rationality in essence "signifies a mode of *dealing with* (raising and accepting) validity claims" (Wellmer, 1994, p. 53). Besides, no validity claim is exempt from critical examination. Communicative rationality could thus be said to express a reflexive conception of human speech, which means that all validity claims can only be redeemed in human discourse and can only be justified through argumentation. This further implies that participants should inhabit a pressure-free environment where the constitutive power of the better argument reigns. Habermas also explains that the validity claims are not limited to the objective world of facts (like in instrumental and strategic rationality) but can also refer to the social world of values and norms, as well as to the subjective world of individual experiences, desires and feelings (1984).

---

<sup>2</sup> Weber's concept of *Zweckrationalitat* is translated as instrumental rationality or purposive rationality (Weber, 1978).

The wide range of rationality conceptions briefly presented here as they developed historically, will be used to create a rationality framework to examine a rationality potential of IS in the next section.

## **THE RATIONALITY FRAMEWORK FOR CRITICAL ANALYSIS OF INFORMATION SYSTEMS**

We propose a rationality framework based on taxonomy derived primarily from Weber's and Habermas's rationality conceptions. In fact, we propose dimensions of rationality along which IS's roles and effects can be subjected to critical analysis. A taxonomy of rationality dimensions ranging from formal, to substantive, to communicative rationality is presented in Table 1. The first is formal rationality dimension that, according to Weber, refers to calculability of means and procedures to achieve given, pre-defined ends. Second is Weber's substantive dimension of rationality that denotes the degree to which an organisation or community provides for the needs, furthers the substantive ends or accords with the values of its employees or members. And the third is Habermas's communicative rationality defined as the degree to which actors achieve intersubjective understanding of a situation as a basis of an agreement on how to coordinate their actions.

The distinguishing condition of the three major rationality dimensions is actors' *orientation*. Actors *oriented to success*, that is actors interested only in intervening in the objective world to achieve given ends, are formally rational. We make further distinction here between instrumental and strategic rationality, following Habermas (1984). Instrumentally rational actors calculate means based on technical rules to achieve ends disregarding other human beings involved. Strategically rational actors follow rules of rational choice and achieve given ends by influencing one another as rational opponents.

An IS has a potential to increase instrumental rationality of a process or a system when it is equipped with (technical) knowledge about its operation, including algorithms for calculating alternative courses of action and selection of those that best achieve given ends. Many transaction-based IS with integrated operations research models and optimal control algorithms, have the potential to increase, and often maximise, instrumental rationality of processes. For example, production management IS are applied to minimise inventory or other costs, minimise delivery time, maximise productivity etc. On the other hand, if an IS calculates means to achieve ends based on decision-theoretic models and game theory, thus including additional knowledge about other actors and their likely counter actions, then such a system has a potential to increase strategic rationality of actors. A DSS, for instance, that supports a group of actors to make decisions based on simulation and modelling, including the assumptions about other actors, especially their opponents, would exhibit a potential for strategic rationality. The success of IS in both cases is measured by the increase in rationality, instrumental or strategic. These types of IS can bring huge benefits to an organisation, such as improved service to customers, increased profit and market share, decreased delivery times, costs, etc.

Dimensions of rationality	Characteristics in organisational contexts	IS rationality potential	Risks and challenges of IS deployment
<b>Formal rationality:</b>  * <i>Instrumental rationality</i>  * <i>Strategic rationality</i>	<p><b>Formal rationality</b> refers to the calculability of means and procedures to achieve pre-defined, given ends. Actors are oriented to success that is changing the state of affairs in the objective world to achieve given ends.</p> <p><b>Instrumentally rational</b> actors calculate means based on technical rules to achieve ends disregarding other human beings involved.</p> <p><b>Strategically rational</b> actors follow rules of rational choice and achieve given ends by influencing one another as rational opponents.</p>	<p>When an IS captures (technical) knowledge of a process to calculate alternative courses of action and choose those that best achieve given ends it then maximises instrumental rationality of the process (e.g., minimise production costs; minimise delivery time; maximise productivity by applying a variety of optimisation techniques and algorithms).</p> <p>If an IS calculates means to achieve ends based on decision-theoretic models and game theory, thus including knowledge about other actors and their likely counter actions, it then increases strategic rationality of a process.</p>	<p>IS provides an objectified, supra-individual technology that carries out processing and calculations for determining unambiguously the best (optimal) actions, ignoring substantive ends, beliefs and values of those affected by these actions.</p> <p>IS may provide a sophisticated technology and methods to extend technically rational control over both machines and workers, thus leading to efficient manipulation and domination of employees.</p> <p>Among the consequences of IS that increase formal rationality are: bureaucratisation and strict subordination, formalisation and depersonalisation of working relationships, increased control, alienation, etc.</p>
<b>Substantive rationality</b>	<p><b>Substantive rationality</b> denotes the degree to which an organisation provides for the needs, furthers the ends or accords with the values of its employees.</p> <p>Actors are substantively rational when they are oriented to some substantive ends, beliefs, or values, that are in principle explicit and justifiable.</p>	<p>Some IS (MIS, DSS, GDSS) provide means to explore consequences of potential actions not only from efficiency and effectiveness point of view (increasing productivity and profit, decreasing costs, efficient decision-making) but also from the perspective of employees' needs and values (cooperative working environment, job satisfaction, participation in decision-making).</p> <p>Similarly, these IS can help assess action consequences from the point of view of customers or clients and a wider community.</p>	<p>A dominant or more powerful interest group may impose their beliefs and values on the less powerful which can be reinforced by the use of IS. The use of an IS can also be manipulated by dishonest actors to argue for substantive rationality of actions with respect to some publicly acceptable ends or values while in fact acting to achieve their hidden ends or values (covert strategic rationality).</p> <p>In these cases IS are misused to impose more subtle control and manipulation disguised under apparently open, just, righteous and non-discriminatory decision-making process.</p>
<b>Communicative rationality</b>	<p>Actors are oriented to understanding achieved through an argumentation process in which any validity claim raised by actors is open to debate, criticism and justification; validity claims in this process can be contested, substantiated, accepted or rejected based on the force of the better argument. Actors are <b>communicatively rational</b> to the degree to which they achieve intersubjective understanding of a situation as a bases of an agreement on how to coordinate their actions.</p>	<p>IS such as groupware, CSCW and CMC can support and facilitate argumentation processes: raising validity claims and counter claims, providing arguments, criticism, acceptance or rejection of validity claims, thus increasing communicative rationality.</p> <p>The rationality potential of these IS is in enabling the development of mutual understanding about a situation among participants, and assisting them in building a rationally motivated agreement regarding the coordination of their actions.</p>	<p>An IS designed to support communicative rationality may be equally effectively used by actors that are strategically rational but only keeping up appearance of communicative rationality; The use of such an IS by an actor who conceals his strategic intent and pretends to act communicatively, enables his manipulation of and control over other actors who believe to be engaged in a communicatively rational process.</p> <p>The use of an IS by participants who are communicatively incompetent and therefore often unconsciously deceptive, leads to systematically distorted communication.</p>

Table 1: Dimensions of rationality and the rationality potential of IS

However, risks and dangers of such IS are numerous as well. First, such an IS is often perceived as providing an objectified, supra-individual technology that carries out processing and calculations for determining unambiguously the best (optimal) actions, ignoring substantive ends, beliefs and values of those affected by these actions. The actions are justified

by the very fact that they are calculated by the IS as optimal. By using such arguments, powerful actors present the aims built into the IS as given and politically and morally neutral. In more extreme cases IS may provide a sophisticated technology and methods to extend technically rational control over both machines and workers, thus leading to manipulation and domination of employees. Among the potentially harmful consequences of IS that support and increase formal rationality are strengthened bureaucratisation and subordination, increased formalisation and depersonalisation of working relationships, increased control, alienation, etc.

Some IS (MIS, DSS, GDSS) provide means to explore consequences of potential actions not only from efficiency and effectiveness point of view (increasing productivity and profit, decreasing costs, efficient decision-making) but also from the perspective of employees' needs and values (cooperative working environment, job satisfaction, participation in decision-making). Similarly, these systems can help actors to assess action consequences in terms of some substantive ends (eg. from the point of view of customers or clients, a wider community or environment). As a result these IS have the potential to increase substantive rationality of actors (second rationality dimension).

These IS, however, are not without risks. The problem is that usually different interest groups of actors have different ends and values. In organisations this is certainly the case with employees, executives, managers, union members, etc. To the extent that actors have different ends, beliefs and values their judgements of substantive rationality are different. Therefore, to agree on a substantively rational action, actors need to share some ends, beliefs or values to a certain degree. A dominant or more powerful interest group may impose its beliefs and values on the less powerful which in turn is reinforced by the use of an IS. In such cases the role of IS is not really to support substantive rationality of all involved but is in fact reduced to increase instrumental or strategic rationality instead. Similarly, the use of an IS can be manipulated by dishonest actors to argue for substantive rationality of actions with respect to some publicly acceptable ends or values while in fact acting to achieve their hidden ends or values (covert strategic rationality). In these cases IS are misused to impose more subtle control and manipulation disguised under apparently open, just, righteous and non-discriminatory decision-making process

More recent types of IS, such as groupware, CSCW and CMC, support communication in groups and organisations. The rationality potential of these IS is achieved when they enable and assist participants oriented to understanding to develop shared interpretation of a situation, and thereby build a rationally motivated agreement regarding the coordination of their actions. There are however some important conditions for this to happen. Participants have to be able to make intelligible statements, to ask questions and interpret other expressions, and to possess social interaction skills. In addition the argumentation process supported by the IS should be such that any validity claim raised is open to criticism and justification, free from coercion, and that participants feel obligated to respond to criticism and provide arguments. If these conditions are reasonably close to fulfilment then the IS increases communicative rationality (third dimension), thus contributing to emancipation and democratisation.

Note here that IS supporting communicative rationality can also be misused and misappropriated. An IS designed to support communicative rationality may be equally effectively used by actors who are strategically rational but only keeping up appearance of communicative rationality. The use of such an IS by an actor who conceals his/her strategic intent and pretends to act communicatively, enables his/her manipulation of and control over other actors who believe to be engaged in a communicatively rational process. The use of an IS by participants that are communicatively incompetent and therefore often unconsciously deceptive, leads to systematically distorted communication.

The rationality framework presented here suggests several lines of IS inquiry. First, it highlights the rationality potential of different types of IS along each of the rationality dimensions. Second, in each dimension, it exposes conditions for realisation of IS rationality potential. And third, it indicates what may happen when these conditions are not fulfilled, and what are potential risks and dangers involved in IS deployment. We will illustrate its use by two examples.

## **TWO CASE STUDIES**

### **An Information System for Building Energy Conservation**

Because of sharply rising oil prices during the 1970s policy makers considered ways energy use could be scaled back. Effective conservation policies can greatly reduce energy consumption (Rycroft, and Regens, 1981). This realization motivated a Midwestern state to install an energy IS for publicly owned buildings (IO, 1982). After evaluating commercially available software packages the energy agency purchased an off-the-shelf IS that had been successfully used at other locations. The system identified buildings that consumed excessive amounts of energy in comparison to buildings of a similar structure and use. It also calculated energy savings arising from building retrofits such as installing wall and roof insulation, and double-paned windows.

Next, the energy agency sent data collection forms to all publicly owned buildings. The state's legislature had passed a law mandating publicly owned operators to provide the requested data. The forms comprised about four hundred items including monthly consumption of electricity, natural gas, and heating oil, building height, length, and width, insulation information, etcetera. After arriving at the appropriate building the forms would most likely end up in the hands of the building operator. Yet, forcing one to provide data that he does not have creates an untenable situation. For example, as the building operator would not have data about annual electricity consumption he/she would use billings for the winter months to estimate annual electricity consumption, thus missing electricity use for air conditioning. By passing legislation the State ensured data reporting but it did not ensure their accuracy. Gross data errors caused the IS energy conservation project's failure.

The IS's failure, however, is not fully explained by carelessness of buildings operators who provided faulty data. The purpose of this IS – rationalisation of energy consumption – was a worthy cause and the energy agency rightly believed that it was acting in society's interest. But, this does not explain why building operators obstructed the conservation project. By examining the IS's failure within our rationality framework we can shed some light on the causes of its demise.

During the IS's planning phase the energy agency was motivated by substantive rationality, that is, conservation of scarce resources. However, agency personnel assumed that selecting the best course of action concerning energy conservation only required collecting relevant data from the objective or physical world. Moreover, the agency treated building operators simply as data collectors (i.e., objects in the physical world) and not as potential allies for reducing energy consumption. By assuming that energy conservation was primarily an objective concern, agency personnel did not consider building operators' understanding of the problem, their concerns and opinions. Hence, we conclude that the information system's deployment was guided by instrumental rationality.

We posit that the IS's failure arose primarily from its conceptualisation along the instrumental rationality dimension. This resulted from the agency's failure to grasp that energy conservation involves both physical and social factors. Had it recognized building employees as *social actors* whose actions impact energy consumption, the agency would have considered issues of



substantive rationality from the point of view of those employees. Agency personnel could have used strategic rationality to influence building employees' objectives regarding rationalisation of energy consumption in terms of common goals. That is to say, the agency should have conceptualised the overall scheme (including legislation) to motivate employees to cut consumption. To this end, the agency should have deployed an IS that assisted building operators in monitoring and assessing consumption (e.g., benchmarking), as well as selecting appropriate actions (e.g. installing insulation).

### **Interactive System for Information Dissemination**

The second example is from the study of information systems at a European retail company (Janson et al., 1997). Since the company's inception the CEO seriously debated with members of upper management a need for personal initiative by all company employees, and 'balancing human rationality with emotionality'. During the interview the CEO made the telling observation that employees and especially individuals in positions of leadership must make decisions while discharging their job responsibilities (Colruyt, April 1984). He and his management team introduced the following rules to govern decision-making process:

1. Anyone contemplating a decision notifies individuals whose job assignments are directly affected and supervisors, subordinates, or anyone who might potentially be impacted by the decision. Under practical circumstances this rule requires that each of the five thousand employees will be informed.
2. The decision maker revises his decision in accordance with feedback received from his colleagues, whereupon the revisions are communicated to all employees.
3. He then approaches his direct supervisor with the contemplated decision. After receiving his supervisor's approval he announces the decision to all employees including members of top management.
4. This process is repeated if the decision proves to be incorrect or when anyone reacts negatively to the decision.

As the CEO explained:

By using these rules one ensures decision making by those who do the work and in this way one furthers democracy in the workplace. Instead of power concentration at the top of the organization power will reside with individuals who do the work (Colruyt, April 1984).

They soon realised that such a decision-making process was not feasible without an effective information system. In early 1980s they developed an interactive system for information dissemination (ISID) to communicate documents, minutes of meetings, decisions, outbound and inbound mail, interoffice correspondence, etc., and to assist all employees to raise, explore and discuss relevant issues. In terms of its functions ISID can be seen as a predecessor of modern document management and groupware systems. After it was successfully implemented, ISID became an essential communication medium in the company.

Of special importance here is how ISID was used to support problem resolution and decision making guided by the above mentioned rules. Any employee can raise a problem and initiate a debate via ISID. Other employees respond (via ISID) with their views, relevant information or, perhaps, a proposal to resolve it. If the problem cannot be immediately resolved, a team of self-nominated individuals is formed to explore the problem further and to propose possible courses of action. The team chooses a moderator democratically, based on self-nominations or nominations by others. Team members usually meet face-to-face attempting to develop a shared understanding of the problem situation and propose one or more potential solutions to the problem. Their outcome--the problem definition and its potential solutions--is then publicly announced via ISID in order to obtain feedback from all company employees interested in the problem. Via ISID employees may ask questions, criticise a proposal or provide counter proposals. New inputs to the problem definition and its solution may trigger reassessment by

team members and this process continuous until, ideally, one solution all can agree with is reached. This, however, is not always feasible due to time limitations (usually a three-week period) or deep-seated personal differences. In this case, the team moderator weighs all arguments, comments, and counter proposals, and makes a final decision and communicates it to all employees via ISID. Unless there are sound objections, this decision is then implemented. This procedure avoids decisions for which no one feels responsible for but links decisions to specific individuals (Colruyt, May 1993). While all employees have the right and obligation to engage in the discussion, those directly affected by the problem get involved most likely. All comments, discussions or critiques related to a particular problem are easily available afterwards from ISID as threaded documents.

This brief description illustrates how the deployment of ISID enables wide employee participation in decision-making process and supports communicative rationality. First, ISID assists all employees to be effectively informed about important issues and thus become communicatively competent; Second, ISID enables employees to engage in a debate and express their views, desires, and proposals in a free, cooperative environment (enforced by the company culture). Chances are that through such a debate employees will increase their mutual understanding and develop an intersubjective interpretation of a problem situation; Third, increased mutual understanding leads to communicatively reached consensus about the solution and future actions; Fourth, the evidence available from ISID is used to reflect on past experiences and to facilitate company learning.

An example of company learning occurred when a manager misused ISID to collect information to compromise a particular employee. This prompted public debate in which such a practice was strongly criticised and declared unacceptable. This example, however, shows the risk of ISID to be misused for control and surveillance of employees, just the opposite of its intended role. It also illustrates how important it is to have explicit and widely discussed values and norms governing the use of the system.

This case exemplifies the potential of IS to enable and enhance communicative rationality of actors in organisational discourse and decision-making. ISID was successful primarily because its design and implementation corresponded to the actual intention of the company to democratise decision-making. The evidence from the past use of ISID indicates that had the intention been to increase strategic rationality, disguised behind communicative rationality, ISID would not have succeed.

## **CONCLUDING REMARKS**

We have presented here research results from our investigations of the rationality potential of information systems and their contribution to rationalisation in modern organisations. Informed by the work of Weber and the critical theorists, Habermas in particular, we examined theoretical conceptions of rationality in organisations that could provide deeper understanding of the use of IS, their actual roles, and social impacts. From this study we suggested a rationality framework involving three rationality dimensions--formal, substantive and communicative--for the analysis of information systems.

In order to illustrate how this framework can be applied we briefly presented two cases of IS, one that failed and the other that succeeded. We demonstrated that a rationality potential of IS is a relevant construct to examine failure in the first example and success in the second. Moreover, the rationality framework enabled us to analyse the assumptions behind the design of the IS for energy conservation and to explain why it failed despite its praiseworthy objective. In the case of ISID, we were able to analyse its essential contribution to the increase of communicative rationality in organisational decision-making and to explain why it

succeeded despite attempts to misuse it. This analysis revealed deeper social mechanisms that explain how ISID succeeded to gain currency and become broadly accepted in the company.

The purpose of this framework is to provide a categorical apparatus to explore the rationality potential of IS beyond the narrow view of instrumental rationality and to contribute to critical analysis of social and organisational consequences of rationalisation enabled and supported by IS. It may be used, for instance, to expose the indifference to substantive ends and values in the IS design, to question the assumed neutrality of goals an IS is proposed to serve, or to raise attentiveness of researchers and practitioners to concealed IS implications such as increased control over employees, more efficient manipulation and domination, etc. At the same time, such a framework may be used in a normative sense to investigate and understand the emancipatory potential of IS founded on the post-traditional concept of rationality, namely communicative rationality. This may help us consider how IS can contribute to the achievement of the ideals such as freedom, justice, emancipation, and democratisation.

## REFERENCES

- Adorno, T.W. and Horkheimer, M. (1944) *Dialectic of Enlightenment*, trans. J. Cumming, Herder and Herder, New York,
- Ang, J. and Pavry, F. (1994) A Survey and Critique of the Impacts of Information Technology, *International Journal of Information Management*, 14, 122-133.
- Attewell, P. and Rule, J. (1984) Computing and Organisations: What We Know and What We Don't Know, *Comm. ACM*, 27, 1184-1192.
- Avison, D.E. and Myers, M.D. (1995) Information Systems and Anthropology: An Anthropological Perspective on IT and Organisational Culture, *Information Technology and People*, 8, 43-56.
- Brubaker, R. (1987) *The Limits of Rationality – An Essay on the Social and Moral Thought of Max Weber*, Routledge, London.
- Colruyt, J. (May 1993) Interview, Halle.
- Colruyt, J. (April 1984) What is Different at Colruyt?, in T. Penneman (ed.) *There are no Gentlemen Here, Sir*, (in Flemish), Druco, Halle.
- Coombs, R., Knights, D., and Willmott, H.C. (1992) Culture, Control and Competition: Towards a Conceptual Framework for the Study of Information Technology in Organisations, *Organisational Studies*, 13, 51-72.
- DeSanctis, G. and Poole, M.S (1994) Capturing the Complexity of Advance Technology Use: Adaptive Stracturation Theory, *Organization Science*, 5, 2, 121-147.
- Galliers, R.D. and Baets, W.R.J. (1998) *Information Technology and Organisational Transformation*, John Wiley & Sons, Chichester.
- Habermas, J. (1984) *The Theory of Communicative Action – Reason and the Rationalisation of Society* (Vol I), Beacon Press, Boston, MA.
- Hirschheim, R., Klain, H. and Lyytinen, L. (1996) Exploring the Intellectual Structures of Information Systems Development: a Social Action Theoretic Analysis, *Accounting, Management and Information Technology*, 6,1/2, 1-64.
- IO (1982) Interview with Information Officer.
- Janson, M., Brown, A.P., and Taillieu, T. (1997) Colruyt: An Organization Committed to Communication, *Information Systems Journal*, 7, 175-199.
- Klain, H. and Hirschheim, R. (1991) Rationality Concepts in Information System Development, *Accounting, Management and Information Technology*, 1,2, 157-187.
- Koningsveld, H., and Mertens, J. (1992) *Communicatief and Strategisch Handelen*, Muiderberg, Coutinho, Netherlands (in Dutch).

- Orlikovski, W.J. (1991) Integrated Information Environment or Matrix of Control? The Contradictory Implications of Information Technology, *Accounting, Management and Information Technology*, 1, 9-42.
- Robey, D. and Bourdeau, M-C. (1999) Accounting for Contradictory Organisational Consequences of Information Technology: Theoretical Directions and Methodology Implications, *Information Systems Research*, 10, 2, 167-185
- Rycroft, R. W., and Regens, J. L. (1981) The Role of Public Participation in Energy End Use Management, in R. A. Fazzolare and C. B. Smith, (eds.), *Beyond the Energy Crises: Opportunity and Challenge*, 2 Volumes, Pergamon Press, Oxford, UK, 127-132.
- Weber, M. (1958) *The Protestant Ethic and the Spirit of Capitalism*, Trans. T. Parsons, Scribner's, New York.
- Weber, M. (1964) (Winckelmann, J. ed.) *Wirtschaft und Gesellschaft, Studienausgabe*, 4 Edition, German, 2 Vols., Kiepenheuer & Witsch, Koln.
- Weber, M. (1978) (Roth, G. and Wittich, C., eds.) *Economy and Society*, 2 Vols, University of California Press, Berkeley.
- Wellmer, A. (1994) Reason, Utopia, and the *Dialectic of Enlightenment*, in J. R. Bernstein (ed), *Habermas and Modernity*, The MIT Press, Cambridge, MA, 35-66.
- White, S. (1988) *The Recent Work of Jürgen Habermas: Reason, Justice, and Modernity*, Cambridge University Press, New York, NY.

## **COPYRIGHT**

Dubravka Cecez-Kecmanovic, and Marius Janson (c) 2000. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.