

On Rationality, Technology and Action in the Modern Organization

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Abstract

Modern management usually means highly controlled organizations, relying on sophisticated control measurements and tools, among them large integrated management information systems (MIS). Workflows, global business processes and network(ed) economies belong to this situation. Research and industries search for improved use of information technology (IT) for the integration in human practice through various kinds of coordinating mechanisms.

Opportunities to find socially satisfactory IT applications may be overshadowed by the contextual conditions and views on rationality, design, and organizing. IT artifacts can be consciously designed, applied ad hoc, or grow as a strategy for managing power, meaning and norms. Hidden or overt design contradictions may lead to costly implementation failures. In other words, several rationalities may be interwoven in both design decisions and subsequent operational actions. In order to establish a theoretically sound platform for both design and independent research, avoiding technology-driven business and research development, *control*, and within it *decisionmaking* has to be understood, possibly re-evaluated, and *put into context*. This context is modern high-risk society, its institutions and businesses, described by modern sociology.

The paper provides a theoretical background and findings from an ethnography, accounts from work design within military management and command work. This leads to a discussion about rationality, technology, action, and research options.

Introduction

The background to this paper (and to a thesis within media and communications, Sw. *informatik*, Persson, 2000) is a research enterprise aimed at Information Systems Design (ISD) principles for military command work, *informed by theory*. The research approach was an ethnography conducted as fieldwork within army command organizations during exercises, leading to a qualitative analysis of empirical data. There were a few research rationales. One was the lack of a proper theoretical foundation for the command work. In a broad sense, the dominating organizing principle has been a *rationalistic engineering and management strategy*. Theory often seems to be given less attention than robust and routines during the design of pragmatic work. The development during the latest decades has however demonstrated growing difficulties when designing command work and organizations, and coupled IT artifacts. There has been something of an 'end of the road' sentiment, augmented by the current combination of sharp reductions and transformation of the military institution.

Its responses are intensified control efforts, and design of new technologies as the supposed “silver bullets”. There has already been, in Sweden and abroad, a search for theory and a “command science” during several years. *New research approaches* are justified too, among them this one. Another and related rationale was to define principles for the design and implementation of IT artifacts allowing rationalization and multi-criteria efficiency, while controlling costs.

The title of the thesis (Persson, 2000), “*Bringing Power and Knowledge Together, Information Systems Design for Autonomy and Control in Command Work*”, captures the contents of both command work and research, both domains being affected by new technologies during a period of drastic changes in the military institution. Leaders cannot master all aspects of operations. In brief, power and knowledge, represented by formal leaders and experts, have to be brought together if the work shall be efficient. The prerequisite to achieve this is *one perspective* on knowledge and information and that information systems match the needs growing from within the work because work builds the organization. Wishful thinking may lead to irrelevant design solutions, a more thorough work is required in order to establish these conditions.

The Cultural Portrait and some Conclusions

The purpose of the ethnography was to produce a cultural portrait (Fig 1) of the domain and of the command work, what people say, do and use. They are experts in the modern military command organization, transforming the operational environment, controlling it through pragmatic and opportunistic control actions.

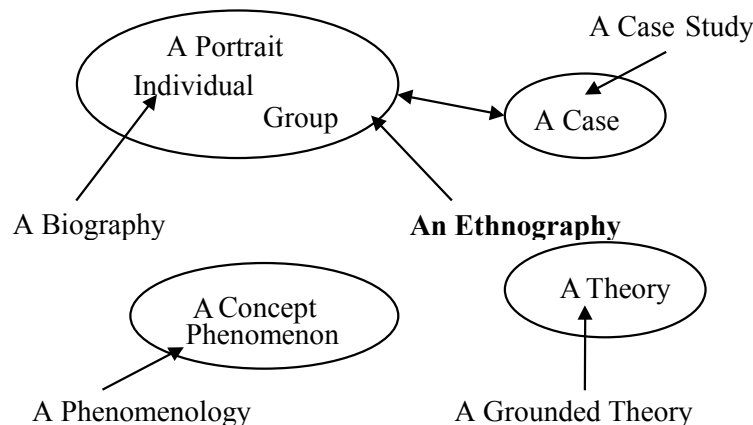


Figure 1. Ethnography within different qualitative research approaches (after Creswell, 1998, p. 37)

Command work is not ordinary managerial routine work but a kind of *design work*, dynamic and hard to define and control. It is knowledge-intensive, designs and produces signs, symbols used as representations on maps, in the work and in the field. These signs must be visible and credible, built from recognized components. Because the work is very flexible it involves interpretation and negotiation of both its content and its products, the signs. The study suggests that *social value* and not only rational control efficiency define what is the relevant and appreciated design, both in the IS development process and in the practice. I call this applying a *rationality of practice*. Referring to Berger and Luckman (1965), who analyzed social action within institutions, certain types of knowledge are reaffirmed through symbolic objects or symbolic actions. “All transmission of institutional meanings obviously implies control and legitimation procedures” (p. 88). I conclude that the military institution shares these concerns. It has to demonstrate reliability, legitimacy, and expertise.

Key concepts are social value, function and *visibility*: people must be visible in the command work, thus making work itself visible. Consequently, when designing control tools such as information systems, the design challenge is to reconcile dynamic and pragmatic demands for power, autonomy and control with demands for stability. Such an organization becomes a *viable system*, one that can survive, because there is no conflict between its ‘mind’ and physical resources, ‘matter’. In operational terms, this means to have *freedom of action*.

A conclusion growing during the work was that researchers have similar needs for autonomy and control when research work transforms impressions from fieldwork, data and ideas, and claim that it becomes knowledge. Management research can be conducted inside the managerial sphere as “intra-managerial”, or as “extra-managerial” by applying other perspectives. The former could rely on and be conducted within the classical scientific management and social research paradigms, its practices and interests and be focused at control efficiency, and prediction. Alternatively it could apply other means such as action research, varying between consulting and reflection. The latter strategy, still aimed at the provision of useful insights by discovering relations, generating theory and explanations, works with other approaches such as an ethnography or a critical perspective and related methods.

The externalized position may include a critical assessment of what is taken for granted in order not to be dependent on the internal concepts, power relations, politization. Someone who desires to measure and describe the world but only possesses a one meter stick, can measure with great precision only what is exactly one meter long. If successful, the researchers’ autonomy can lead to truly new insights and advantages unless suspicion grows between researchers and researched. I claim that research, in order to maintain credibility, should try to stay out of the internal management discourse. The setback is that there may be access thresholds to overcome. However, after decades of anthropological research and ethnographical work in organizations as a way to inform ISD, there should not be too severe obstacles (one such example is Hughes et al., 1994, studying control room design).

One way to achieve credibility is to work close to the standards of qualitative research, by displaying data, methods, and conclusions. The rest of the paper consequently is an analysis and a discussion of some theoretical key concepts. The purpose is to demonstrate what may negatively affect organising efforts, and the risks if certain conditions are taken for granted without considering contextual and theoretical aspects. In order to introduce this discussion, I present a closer view of the command work.

Military Management and Command Work

Background

The military institution as well as other institutions and businesses is confronted by the perceived avalanche of modern IT, growing business complexity and demands for efficient cost control in peace and reliable control mechanisms in case of war and in battle. Ongoing since centuries, but accelerating during the latest decades, there is a search for a science of command and control, superior control and command methods and technologies (Sorenson, 1989).

The military has used and continues to use a great variety of control mechanisms in order to achieve reliability in war conditions and to be understood as a potent, rational and trustworthy institution by nation state authorities, internally, and by potential enemies: discipline, leadership, bureaucracy, ethos, training, scientific management etc. Since the computer was introduced, its use for social control purposes has reflected both the long tradition of strategic management (Hoskin, Macve et al., 1997), computer history and conceptualizations of ‘information system’ (Cecez-Kecmanovic, 2000a).

Decisionmaking has been and continues to be a central concern within management. Often a ‘management and commander centered’ perspective is promoted in spite of the fact that anyone is a decision maker in his/her position and needs adequate tools. Promises from computer science and industry have been to provide decision support technologies, the latest being group decision support technologies or systems (GDSS) for distributed teams. The difficulties to establish a cause-effect relationship between technology and capability prevail. The military still searches for rational solutions, leading to superior control while at the same time promoting “leadership”. Often contradictions evolve around humans and their technology. Simultaneously, the control of the military institution is a first-hand issue for nations.

A Command Work Model

When forming and analyzing the portrait of the cultural military group (Figure 1) it became obvious that theoretical constructs like *power*, *autonomy*, and *rationality* could explain the social interaction during work. Autonomy, prerequisite to meet evolving events — frictions — and power became core issues, interchangeably goals and prerequisites for flexible social control. In theoretical terms, what was at hand in the heterogeneous organization and work groups (and most groups *are* heterogeneous), was that different competing rationalities were applied, indicated by change of strategies and reinterpretations of previous actions.

People had different goals and followed a diversity of rationales in what looked like a harmonious joint effort. Alternatively, transformations were made between different aspects of rationality, for example formal decisions versus informal contingent actions, later formalized. Accordingly, they rejected, designed, defined, or applied technologies to their needs. Even the formal bureaucracy was consciously used or circumvented in order to reach desired results. Ongoing evaluation guided continued action (Figure 2).

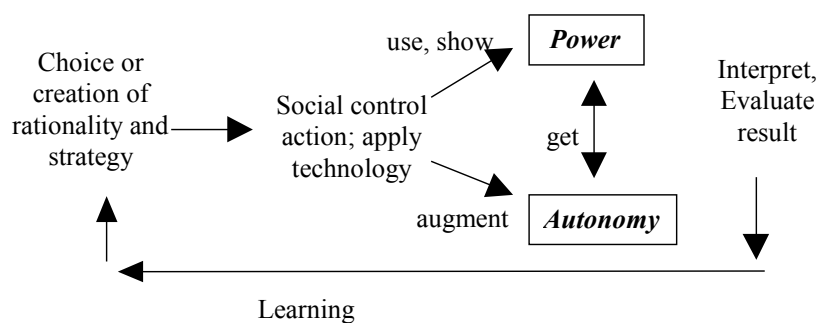


Figure 2. The pragmatic command work principles

When faced by new situations in the work, staff organized control actions as individual or cooperative efforts in order to achieve either *more autonomy to build power* or to *exploit existing power*, ultimately to better control the environment. The conclusion is that constraints, autonomy and power are central concerns and are handled according to social needs and resources at hand. If we compare with design theory, we see (in theoretical terms) the same kind of integration of rationalities (Holmström, 1995) when people do what is functional and possible, creating a kind of *rationality of practice*. Thus, when we look at failures to adapt ‘perfect technical systems’, sometimes implicit but not desirable controllers, it may be worthwhile to investigate issues such as autonomy and power, how rationalities interplay, and how various social actors are “rationality brokers”. But before we enter into a discussion about representations, let us look a little more at theory.

Concluding from the Model

Because of the research approach, certain concepts and factors appear as very important to trace and articulate, if further progress should be within reach. There are two aspects of progress, one being the knowledge level within and support for the empirical domain, the other being the research itself as regards methods and output. In order to understand the modern organization (its inner life, relationships toward its environment, design of its control mechanisms and among these, how technology is perceived and used) a widened perspective is required. *Contextual factors* are essential to consider, according to the qualitative approach. Then the probable gains from trying to achieve an extra-managerial (as opposed to intra-managerial) perspective thereby including a critical perspective (e.g. Cecez-Kecmanovic, 2000b) on the ISD and command work issues.

Further reflection of both context and on the model of rationality and technology interaction (Figure 2) led to other conclusions. Most important and basic is to apply a relevant *theoretical frame of reference* for future work which captures the contextual conditions around the military institution. The second grows from the social character of work which makes *rationality* a central concept when designing action and interaction, as for instance decision support technologies. By definition, decision making means the application of a belief system and coupled methods and techniques, often named “rational”. There is more hidden in this and I will present a look at the development of this concept. A purely *rationalistic* organising and design process seemed to fall short of the requirements in work. Then the meaning and roles of *technology* are considered because the relationship between the (Swedish) military and technology is complicated. Traditionally technology has been specified based on experience and common-sense practices, and then purchased from (the domestic) industry. Now experience is rare as is technical knowledge. New kinds of technologies appear which imply another ‘division of action’ between humans and technologies and its effects surprise people. Theoretical understanding of modern IT is sparse. This situation causes turbulence especially when it comes the so-called network-centric or -based defence. This is the object of much attention in the current discourse and transition of the military for future operations and requires close and critical investigation. I contend that too much is uncritically taken for granted.

A Theoretical Frame of Reference

One consequence of the results from the ethnography is that social issues are important, which justifies a look at modern sociology. The *sociology of the military* is quite new, being established during WWII (Caforio, 1998), from the beginning concerned with how to support the build-up of large armies for immediate deployment in the war. The links to the natural sciences were strong. Already in the 1950’s, questions were raised (Lowenthal, 1957) about the suitability of (the then modern) social science (as it was conducted) for cultural studies:

Empirical science has become a kind of applied ascetism. It stands free of any entanglements with foreign powers and thrives in an atmosphere of rigidly enforced neutrality. It refuses to enter the sphere of meaning [...] Social research takes the phenomena of modern life, including the mass media, at face value. It rejects the task of placing them in a historical and moral context. In the beginning of the modern era, sociology had theology as its model, but today the natural sciences have replaced theology...Theology aims at salvation, the natural sciences at manipulation; the one leads to heaven and hell, the other to technology and machinery. Social science is today defined as an analysis of painstakingly circumscribed, more or less artificially isolated social sectors.(p. 52)

Still, social science has a tendency to decontextualize or to position action within theoretical frameworks, especially when it comes to studies on or development of IS. Anthony Giddens’ theories about modern society, framing the military institution, provide a foundation against which action should be seen and interpreted. His modern social theory then leads to the look

at the relations between power, technology and action, central if one shall understand what goes on in a modern organization.

Giddens' view on modern society, within the globalized economy where state boundaries break down, is based (Bryant and Jary, 2001) *on capitalism, industrialism, surveillance and the industrialization of warfare*. Giddens introduced the concept of "risk society" where increased control is exploited in order to avoid "existential anxiety", preserving "ontological security". In this society sure foundations for knowledge no longer exist, not even in the natural sciences. Continuous rationalization transforms the familiar contours of industrial society:

High modernity involves the disembedding, or lifting out, of social relations, practices, mechanisms, and competencies from their specific, usually local, circumstances of time and space ('locales'), and their extension, thanks to the developments in communications, over much wide spans of time and space.(p. 22)

Local social relations are replaced by *abstract systems*, labeled expert systems and symbolic tokens, both depending on trust. Money is the prime example of symbolic tokens. Expert systems are extended to social relations (Giddens, 1991). Professionalism gets new values. Everybody is simultaneously expert and novice, whereby all in an organization tend to be indispensable, trustworthy, and closely controlled. It is clear that if this theory holds, contradictions arise while global operations technically become within reach for all, as for instance over the Internet.

Webster (1995) presents more about Giddens and modernity in his critique and analysis of the "Information Society" to which the military belong, sharing its attributes. Modern societies and thus urban societies are much more socially organised than previous 'communal-based modes of life', having to gather extremely detailed knowledge about their publics in order to function. The information gathered by its institutions is more detailed, precise and individual than anything garnered in a pre-industrial community. From their birth, nation states are information societies because they must know their members.

The modern world is constituted by nation states. A second key feature of the modern nation state, except from its economic, socio-economic, cultural organisation and identities, and important in order to understand the military, is that the majority of nation states have been created in conditions of war and all are sustained by possession of a credible defence. War and preparedness for war have been fundamental contributors to the nation state. Modern warfare has become much more decisively implicated with the modern society.

The surveillance machinery of the nation state is not directed only at external enemies. The frontiers are everywhere. Capitalist enterprises contribute to the surveillance trend. Modern management has advanced the development of surveillance since FW Taylor's days.

Market research, credit checking agencies, electronic footprints, contribute to the 'informatisation of society'. A surveillance society is also a disciplinary society. Therefore the exercise of power should be paid attention to. Actually, some thinkers claim that what we witness is a militarization of society. The 'industrialization of warfare' could as well be the opposite, industrialization *is* warfare as well. In this context, the ideas of the networked military organization means close surveillance and the networks are means for close surveillance and must be closely controlled themselves. However, it may be that "The Network" is primarily an *autonomy metaphor*, expressing the desire to achieve superior knowledge and control capacity in high modernity's risk society, while escaping from the paralyzing bureaucracy and its infrastructure. It is necessary to realize that this network belongs to the rational tradition.

Herbert Schiller, a critical thinker, claims that military and corporate interests coincide and that the major beneficiary of the "information revolution" is corporate capitalism. Information

and allied technologies are developed and put in place with the corporate market in mind, the corporations themselves having internal requirements of management technologies for global instant operations and surveillance. Thus, what we may perceive as rapid technical development, is an intense conscious launch of products searching for a market. 'Risk society' has no problems to find demands for security. Its conditions easily motivate the use of new technologies for surveillance. It becomes 'rational' to continue along the road.

The Development of Rationality and Three or Four Revolutions

When reading about the ongoing war (December 2001) in Afghanistan, it is worth reflecting on the probable different rationalities among the fighting parties, guiding actions such as the attacks on the World Trade Center in September 2001. Certainly the Westerners try to conduct the Western Way of War (Parker, 1995). One of its principles is the heavy reliance on superior technology, to compensate for inferior numbers. Others are discipline, the aggressive military tradition and the capacity to raise funds for war. Specifically, wars are nationally supported. Maybe the Taliban fighters or other domestic warriors, because they have not experienced or lived within the aftermath of the French Revolution, neither know about the Enlightenment, nor about the dominant rationality in the West. They utilize other mindsets. There is hardly a nation-state supporting them.

In order to understand the characteristics of military command work and on a general level, the rationality guiding organising "the Western Way" it is necessary to reach back to the late 1700's. There, subsequent revolutions were born, among them what is now by some called the current Information Revolution. The other related revolutions are the Control Revolution (late 1800's) and the latest, much discussed in the military, the so-called Military Technological Revolution (MTR). There is a relation between them and their effects. This relation has to do with how we perceive rationality, control, and what management is about.

During and after the French Revolution, state bureaucracy became the *reliable legal control mechanism* replacing earlier similar generations (Brown, 1995). Between 1792 and 1794 the transformation in France was from an armed nation to a nation in arms. Part of this transition was the establishment in 1794 of École Polytechnique in Paris. About 20 years after its foundation as an institution for the élite within the new republic-state, and its extensive use of rationalistic bureaucratic management practices with detailed supervision and precise calculation of progress, its principles were studied by and later introduced at US War College at West Point. The one who confirmed the spread of French management principles was the (later) General Sylvanus Thayer (Postman, 1993). Modern management was born, relying on the disciplinary capacity born from urgent requirements in late 18th century Europe. It became a power-knowledge regime, hierarchically controlled by one person in its top, informed about everything and everybody's actions with the help of a well-designed two-way chain of command.

From this starting point, modern management spread within the US military, industry, and transportation systems. Half a century later, control efforts and technologies were reliable enough to allow control/management of large organizations, rapid industrial processes, and centralized management because of communication technologies. What became known as *scientific management* was defined by primarily Francis W. Taylor around the year 1900. A certain rationality and discipline has dominated, later expressed in the Program Planning Budgetary System (PPBS) (Ways, 1969), now succeeded by Business Process Reengineering (BPR) and Total Quality Management (TQM) ideals. In principle, these management practices have dominated until late in the 20th century, when a belief in self-organizing grew out of principles applied in the market, which have gained some scientific credibility (Rosenhead, 1998). It is within them constructs such as leadership and decisionmaking have

evolved, sometimes following other rationales and social purposes, but mostly aimed at economic control (Selznick, 1969) and the use of abstract systems (Giddens, 1991).

In organizations, complementary aspects of rationality are however applicable. Most know about 'bounded rationality': we cannot learn everything or get all information in a choice/decision situation. Brunsson (1989) discusses *action rationality* and *decision rationality* respectively, and rational or *irrational* actions. I would say there are actions (decisions) of several rationalities at hand. Moreover, each rationality has a relation to superimposed constructs. One is "Information Society" itself, implying a certain rationality, a specific vision as regards our economic and social future, even an ideology distracting us from important issues (Garnham, 2000).

Rosenhead (1998) points at the relativism inherent in dominating theories and how opportunistic adaption and fashion flows to science and practice. It is often a political process of reaching agreement of what to do, a

heaving mass of power plays, rhetoric, self-interest, deals and ego-involvement all carried out in smoke-filled rooms - and of which he thoroughly approves as a mechanism far superior to central control for generating the decisions from which strategy emerges. In effect [Stacey] treats politics as essentially a no-go area for rational thought. Yet all the participants do have their own separate rationalities.

We see the similarities between the command work, where political, and not rationalistic actions were frequent, and decisions common ingredients.

The Role of Technology

In a general sense, technology has several social purposes and roles, some being linked to control actions. In the networked organization, we see certain purposes and applications like those mentioned above, contributing to the control efforts. During the field work period there were tensions between imposed technologies and traditional ones, and between informal and formal, often technically structured mechanisms. By and large, many efforts to implement IT ends in surprises where users become dissatisfied with what they are given.

Orlikowski (2001) presents some explanatory Giddens-influenced views on technology. The *interpretive flexibility of technology* means that many actions that constitute technology are often separated in time and space from the actions that are constituted by the technology. She distinguishes between the *design mode* and the *use mode* where technology is constructed technically and socially respectively. Many technologies are however perceived as fixed structures but practice shows that even the most "black box" technology has to be apprehended and activated by human agency to be effectual, in such interaction uses shape technology and its effects. IT is deceptive, sometimes provided with human-like qualities: the superior brain, Artificial Intelligence (AI), setting the standards for humans. We feel stupid.

The different ways of looking at technology are the *technical imperative school*, the *strategic choice school*, and the *structural view of technology* (see Bryant and Jary, p. 49). The structural model of technology has four components:

1. Technology as product of human action
2. Technology as a medium of human action
3. The institutional conditions of interaction with technology
4. The institutional consequences of interaction with technology

Its meaning is that when we create structures (technology, organizations), we become "stuck" within what is possible to express, measure, even see. Everything outside the structure merely become invisible. Conditions and consequences are hard to imagine or discover in advance.

Berg (1998) uses the term *technological determinism*: First, the view that technology develops autonomously and this development causes secondary transformations in the realm of the

social world. Then a second mode: The secondary transformations always take a certain form. It is in the nature of technology to affect the sphere of human life and work in a specific way.

a) technology has a clear-cut and predictable logic, progress and rationality follows its traces.

b) technological rationality deskills, controls, is authoritarian and overly mechanistic, emptying human life of meaning.

Technology may promise an increase in democracy and a decrease in centralised control, but requires discipline, which may be sufficient. *Decision support* implies certain rationality and mostly a certain context, an organisation.

Currently military action is said to be influenced by a new way of looking at and conducting warfare, Network Centric Warfare. Within this construct, one aspect is worth some attention, the common tactical picture, a new kind of technology. This concept is closely related to Giddens' view of the situation and technical options growing from the disembedding of social relations its replacement by abstract systems.

The Case of the Common Tactical Picture

Previously the military talked about the need to penetrate the 'fog of war' where frictions evolve. Now, real-time assessment, knowledge representation and resolution of uncertainty in the "system of systems data stream" are 'hot' command work topics, nourished by promises for relief with the help of technology. Basic is the discussion by Kahan et al. (1989) about the concept of the *commander's dynamic image* which is *not a depiction* but a *mental model* of the whole situation. This 'image' shall include the understanding of the history of the battlefield situation and projected futures. It helps the commander understand what action needs to be taken. The image must also be 'shared' by staff members. A lot of communication goes on in order to achieve this. Kahan et al. stated that commanders seek options and assessments appropriate to their image rather than data. When they request "data" they do so for reasons related to images and image sharing. "*Data*" here means something specific. *Information* is then given meaning by the image that frames it, working as a context.

There are some related constructs. Whitaker and Kuperman (1996) defined "Dominant Battlespace Knowledge" as the own system's capacities for integrating inputs from battlespace awareness into "extant knowledge of the (battle) theater", and subsequently to be able to understand and act decisively. Their term "*Shared information space*" connotes a medium that could be used dynamically to help people share their view of the world with others through joint manipulation of each person's model of the situation.

Now over to the more substantial part of this space or 'image'. In order to equalize access to critical information across the widely distributed set of military actors, and the sharing of critical data, all actors shall be able to orient themselves and their actions to a common 'picture' (ibid.). The shared 'information pool' is the Common Battlespace Picture (CBP) which should have these capacities (Table 1):

Table 1. The Common Battlespace Picture

Mutual accessibility	By all relevant actors
Mutual interpretability	An effective CBP must make provision for individual actors' frames of reference (differing knowledge schemas and terminology) with respect to the information delivered to them. (Does this mean automatic adaption to each and anyone, and the use of different media and formats?)
Mutual meaningfulness	"the right information in the right time"
Mutual manipulability	By the one who thinks there is something that everyone should know.

This artifact is complex. Rather than being a plain picture it is a fused depiction of battlefield status available to a given warfighter, without assuming it to denote a literal concentration of data at one physical site. Focus for this cognitive engineering is the usability for warfighters independent from its physical/technical implementation. During the last years huge efforts have been directed to produce these artifacts and make them the superior “silver bullets” against confusion, mental and force degradation.

In Sweden since 1998 (technical description, memo) the common statement is that a decisive precondition for command/control methods is that forces automatically and literally gets/produces a common image/picture of the current situation. This requirement shall be satisfied by the information systems infrastructure, a kind of Management Information System (MIS). Previously, this need was sometimes satisfied with the help of internal HQ televised picture.

The visible image is an electronic map onto which symbol layers representing additional information (terrain, planned action, enemy etc.) can be applied. The search for a suitable technical solution goes on. The army has a prototype construction where situation data (position and status) about units is automatically stored and when changed are distributed across a command structure. This implies very complex and distributed database management in scores of mobile computers and servers. Still, the individual operator/user, once the updating is complete, can chose how much (or little) of the “image data” should be visible on the screen as signs/symbols. Straight interpretation by comrades who have not created the image becomes tricky: how much more is there, present but not presented?

The image is supposed to support various instantiations of control and command work, distributed or in the same HQ (subsection). Operators communicate over the picture. They engage in drawing, outlining and sketching of planned actions, feeding in new information (symbols), measuring and calculating action. However, my impression is that it is very complicated to define down-to-earth substantial control operations and interaction with this artifact, except that mental processes and individual activities *are initiated and affected*. Still, it is designed for individual operators and commanders, operated by individuals.

Technically the production and real-time updating of an image requires much computer power and integrated reporting and position-generating subsystems. *Theoretically* it seems to rest on the conviction that it is possible to capture knowledge about a battlefield situation, pack into an image, then transmit it to viewers who get the intended knowledge once their attention is awakened.

Interpretations, Rationality, Control and Culture

What happens in the military organization is that a certain rationality guides the idea that the COP/commanders’ image is the most important item/application, relying on the conviction that it is technically possible. Because other needs are not satisfied, complementary initiatives are initiated, as in 1998 when self-help systems appeared, less appreciated by central army authorities. The basically positivistic rational management approaches (although practitioners do not use these concepts) probably stimulated the complementary design. Something had to be done when the MIS, itself a temporary substitute, did not provide support for resource management. Its COP fell short of requirements, if it was possible to instantiate technically.

The paradox is that the “economic” representations in traditional tables and spreadsheets allow social interaction, contribute to efficient work practices, and in some cases are the remedy against breakdowns. The applied top-down rationality and its products were however considered a less desirable deviation from mainstream ISD work, as are many similar initia-

tives. The conclusion is that control artifacts should be able to use across rationalities, as *boundary objects*.

Any representation of human actions must be meaningful, but there is no straight line between design and being meaningful, except that participation and local use facilitate meaning. In these cases, meaning, power, and norms were juxtaposed. The norms span both design ideals and control, each aspect linked to various power centres. Both leadership and more technology are rational solutions. If not “science” provides credibility, then “art” may be an argument, but might imply a shift in rationality.

Because the ethnography aimed at a portrait of a cultural group, let us consider what culture might be. Culture is not something standing between people, humans live in a multitude of relationships with each other and jointly manage to understand and manipulate the physical (and social) world. Culture, collective representations, exists in and through such relationships, and the significance of the collective representations cannot be separated from the relationships.

Collective representations have significance in their use by people in relation to other people and none apart from such use. (Carrithers, 1992, p. 36)

As long as our environments allow more sociality, the creation of more relations, survival is possible. When relations are no longer upheld, culture will no longer be possible to produce, and disintegration is threatening. Weick (1993) after having re-investigated the flow of events during a forest fire where several people were burned to death, concluded that when the communication in an organization is interrupted, it disintegrates. Therefore the best use of the common tactical image/picture is when it *promotes conversation and questions*, not when it *aspires to answer* all of them.

When people no longer can produce their culture through relations, or when “culture” as instantiated in/by ready-made representations, these are not by themselves meaningful, only when processed by people in relationship with other people. Culture as collective representations *served to individuals* will not be meaningful by itself however certainly instruments for control of the attention.

Future Work and Aspirations

In order to study how meaning, power, and norms are constantly created in organizations, researchers have to be close at hand.

When humans act in organizations, they create and recreate three fundamental elements of social interaction (Giddens, 1976:104): meaning, power and norms. (Orlikowski, 2001)

For researchers, it is imperative to study such interpretations and transformations. There is an ongoing balance act in the modern organization: These elements are highly interactive and not separable in practice, in work, much of which is involved in these efforts, especially in management and control efforts. Technology thereby constitutes tools, media, input and products. Research should try to get a good view of such human actions.

A qualitative approach is considered relevant to investigate also modern management control and accounting practices (Bourgignon, 2001). It may not be evident where the core business takes place: politics and rationalities may intervene. A research team must understand politics, managerial practices and accounting, cultural issues, and pragmatically form their own work.

One of Giddens’ contributions to work-oriented research, according to Bryant and Jary (2001) are

concepts which researchers can transfer to empirical settings and use in [...] first-order explanations. The double-hermeneutic, the dialectic of control and ontological security are obvious examples from Giddens’ works on the principles of structuration theory.(p. 56)

Batteau (2000) sees organization is an ongoing struggle to impose order, for strategic ends, seldom living up to the facade of order it projects. For him, “unorganized order” among local groups is a normal state, becoming disorganized only when contrasted to a rational organizational ideal order. In board-rooms “chaos and scrambling are only masked with smooth talk and polished manners, or delegated to the secretary” (p. 728). In this environment the “equivalence of command and rationality within an organization turns resistance into irrationality” (p. 731).

Ethnography, as the military cases demonstrate, can contribute to both understanding and to design. Difficulties may evolve because not everything in organizations, especially not in the military, is open for investigation. According to Suchman (1998), ethnography which was first used in the service of powerful actors wanting to manage others, has become a “militant source of radical interventions and critique on the part of post-colonial efforts” (p. 50). Whether this declaration opens business gates is debatable.

Current examples on the exploitation of rationality are when the not-invented-here (NIH) syndrome is recalled: it may denote a rational response to over-control, political resistance, or be a strategic counteraction. Another is Hells Angels Motorcycle Corporation (HAMC, Inc, source: official homepage), as a modern multinational organization protecting its trademarks, relying on established 19th century robust rational organizing principles as expressed in Robert’s Rule of Order¹, effectively guiding US public life and organizations. The HAMC also verifies Giddens’ theories about the role of abstract systems in society. There has been some massmedia articles (Sweden, 1990’s) when motorcyclists use medical expertise when trying to avoid the obligatory motorcycle helmet (according to law in some countries) when biking. We see the different use of rationality and technology in order to achieve autonomy and power, following the basic command work model (Figure 2). These examples demonstrate that cultures are produced and used with strategic intent, but, as Batteau (2000) states, “opposition and negation are necessary elements of the organizational landscape” (p. 737), necessary to consider together by researchers:

The moral *choice* that the anthropological profession must make is whether culture will be represented by those socialized into the ethos of instrumental rationality, or whether instrumental rationality will be interrogated by outside, critical voices (ibid.).

Now, because the value of morality can hardly be denied, researchers can hope for acceptance also of controversial approaches, at least win support from some actor in an empirical domain. The prerequisite is that researchers also, in the same way as people in the work, acknowledge that rationality can be “manufactured” without being immoral. Valuable lessons can be learned through studying their/our own and other organizational practices.

After all, all of us share the fate to be thrown into a boundary zone between rationalities, or between the research organization and practice and the empirical domain, joined in risk society, having to find ways to survive (or escape). Bryant and Jary (2001) see three alternatives for control in the “runaway world” (p 29). These are: recover or secure control, fix the big picture or resign oneself to loss, return to the private and personal, or finally, go for limited and local control: there is no big picture, fix bits and pieces as and when you can! Possibly some method, research perspective, or rationality can provide us with power and meaning and become normative, at least help us ‘fix the bits and pieces’.

¹ Robert, S. C., Ed. (1990). Robert's Rules of Order. Glenview, Illinois, and London, Scott, Foresman and Company. These rules specify, for example, that in any organizations there shall be a Sergeant of Arms, responsible for weapons.

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