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# TRANSFORMATION OF INFORMATION SYSTEMS: RELEVANCE OF EXPECTATIONS

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## Abstract

*The purpose of the paper is to highlight the influence of expectations of professionals towards a greater role in decision-taking at all levels. This includes an expectation of collaboration in the development of organizational information systems. To this end we drew upon Claudio Ciborra's Mood, represented by his discussion of bricolage, hacking and improvisation and their philosophical foundations in the work of Heidegger. Further, the paper explains how these relate to IS at the level of the organization. Our treatment of Ciborra's vision and concerns contributes towards the realisation of ideals closely relevant to a transformation to professionalisation of citizenship within organizations. Integration of these ideas into information systems development processes would help to develop more desirable systems, in line with changing professional values.*

*Keywords: Bricolage; Improvisation; Transformation in society; Emancipation; Responsibility.*

# 1 INTRODUCTION

Like all living societies, Mediterranean society continually changes and transforms itself. If change in the knowledge society is expected to move towards a greater emphasis on emancipation and professional responsibility of citizens (Giddens, 1998; Kaplan, 2005), then this would influence expectations and experiences of success. Could we detect here a characteristic presence of pathos, Claudio Ciborra's Mood? In a context of IS design, Ciborra (1992; 2002) himself wrote about ideas such as improvisation and the embedded nature of knowledge in a complex working environment.

*"... a new light is cast on questions related to what to do and how to operate in organizations and within technological platforms dominated by side-effects: in situations where, by definition, resources and people are not fully under control, and where any new system or method we apply in order to perfect our management capabilities is condemned to be yet a new source of unexpected consequences."* (Ciborra, 2002, p. 8)

Ciborra suggests that, when confronted with a problem space they experience as complex, people turn first to existing knowledge, seeking for a solution within familiar competences and gradually 'tinkering' and moving outwards from this base (Ciborra, 1992). Only if such a strategy proves insufficient to deal with the problem might a person then turn to wider sources of unfamiliar knowledge. Ciborra highlights two types of evidence we encounter when approaching organizational phenomena: formal ideas or models derived from organization theories; and evidence belonging to a space in which informal expression can surface, which 'host the unexpected aspects of organizational life' (Ciborra, 2002, pp 175-177). Such a space, he suggests, no model or theory could address. If researchers focus only on the first category of evidence, to the exclusion of the second, they miss the opportunity to encourage underlying phenomena to become 'unveiled' (ibid, p.178).

Realizing that the openness and the dynamics of problem spaces create a multi-dimensional complexity, Ciborra drew upon work by Heidegger to discuss responsibility and the importance of allowing individuals freedom to use their creativity and embedded knowledge in problem solving (Depaoli, 2006; Bednar and Welch, 2006a). Often, the emphasis in design is on systems professionals who develop systems for use by members of other professions. However, taking up Ciborra's theme of *bricolage*, we wish to shift this emphasis onto the users themselves (as professionals) as designers of their own systems (with the support of systems professionals). What is crucial here is the desire, the expectations and transformations in expectations of the actors involved in systems served by the design process. In participatory approaches (see Schuler and Namioka, 1993) we have seen the developer transformed from a technical specialist designing on behalf of others to a leader and visionary for an inclusive design process. The developer's purpose is to make possible designs which client actors had not, until then, understood that they wanted (Ehn, 1993). Client led approaches embrace the idea of a professional developer as a facilitator who helps organizational actors to realise their own dreams and wishes in a creative process owned and controlled by themselves (Greenbaum, 1993; Bednar and Welch, 2007b). This involves a shift from perception of a designer as a leader and visionary for the design process, towards perception of a designer as facilitator for a process of design owned and controlled by users themselves (Friis, 1991; Stowell and West, 1995). We do not refer to representative, 'expert' users sitting on a committee but detailed involvement in, and control over, development by end-users. For example, frequently the designer's role is to develop prototypes and show these to the users for review and testing (Schuler and Namioka, 1993). However, this is not the only way in which prototyping may be undertaken. We prefer an approach to prototyping based upon improvisation by the users themselves in order to develop a system for testing (see e.g. Friis, 1991). Once we recognize that designers must take account of individual uniqueness, we can also see that inquiry must take into account reflection over both 'heart' and 'mind' (Ciborra, 2006; for a discussion of similar concerns, see Nissen, 1989; Mathiassen et al, 2000). The contribution of this paper is to discuss a possible shift in role of users of information systems, and how this could influence expectations of design approaches and experiences of success/satisfaction with IS projects. This paper will discuss important role for hacking, improvisation and *bricolage* as a key to IS transformation. In the light of Claudio Ciborra's work, we claim that mood has an important role in design via its

influence on individual actors' perspectives on their experiences of organizational life, and how it is constituted through their expectations and desires. Ciborra's concept of Mood is a condition for effective improvisation.

In the next section, we discuss different European schools of practice in IS development. In the section which follows, we explore a perceived transformation in individual expectations in relation to IS design. We then go on to discuss some philosophical underpinnings within Ciborra's work which support his findings, before attempting to draw some conclusions.

## 2 BACKGROUND

Should you travel to Milan nowadays you may notice how individuals take care to extinguish their cigarettes in the proper ashtray on the street trash bin. Does this example illustrate a transformation to a culture of individual responsibility? As society is transformed, a Mediterranean perspective moves from an aspiration to embrace managerialism towards an expectation of inclusiveness. As changes in expectation arise, so facilitative approaches associated with Scandinavian/UK schools of practice become more relevant (Agner-Sigbo, 1993; Ingman, 1992; Stowell and West, 1995).

The nature of these expectations, together with structures and processes, are an important constituent of organizations and are crucial to analysis, e.g. participatory design approaches require individual engagement, tolerance, etc. which would not be facilitated in a 'managerialist' culture. (Managerialism is defined as 'belief in or reliance on the use of professional managers in administering or planning an activity,' Oxford Dictionary of English.) Further reflecting upon Claudio Ciborra's concept of mood, we can identify two relevant themes that have impacted on creation of organizational information systems. The first is managerialism, where individuals have an expectation that they will be managed, told what to do and/or how to do it. This theme we associate to some extent with Scientific Management in the traditions of F.W.Taylor (1911). In contrast is the theme of empowerment, where individuals have a desire, and an expectation, that they will be allowed to determine the direction of their own work within certain guidelines (see discussion on this by Mumford, 2003). Managers are expected to facilitate and support, rather than directing and controlling. This principle of empowerment underlies work of the schools of participatory and client led design (e.g. Friis, 1991; Ehn, 1993; Stowell and West, 1995) of Scandinavia and the United Kingdom, and the socio-technical movement (e.g. Mumford, 2003; Hirschheim and Klein, 1994). Transformation in understandings of information systems relates also to perceptions of success or failure in IS implementation. What is viewed as possible or impossible to achieve in organizational settings depends upon the desire of individuals to take responsibility for doing a good job and the extent to which they are empowered/enabled to do so.

If pathos can be detected as a distinctive characteristic of Mediterranean Information Systems (Jacucci and Monod, 2007), we can see this reflected in the work of Claudio Ciborra himself. Shoshana Zuboff, speaking of her friend at the commemorative workshop at the London School of Economics in spring of 2006, reminisced about her pleasurable expectations when meeting him in some new conference destination. The new centre of gravity which he proposed ('human existence in everyday life') in order to overcome the dominance of the natural science paradigm, does reflect an outlook based on a general mood that could be described as *joie de vivre*. This approach can be encountered in his work: a life affirming vision capable of including, and developing, concepts like *bricolage*, hacking and improvisation in his way of dealing with organizational complexity and IS design. Of course, this vision was closely knit by Ciborra, with a thorough research of the philosophical implications of both his critique and proposals. This will be demonstrated in the paragraph below concerning Heidegger's influence on Ciborra's work. The point is that, for Ciborra, individuals actively engage and take responsibility for problem solving. What Ciborra was recognizing here was the importance of the embedded knowledge of individual actors in the workplace, and the freedom they need to be given to use their creative abilities. We contrast this with a control perspective of managerialism or lack of empowerment. Claudio Ciborra's mood of *joie de vivre* can be seen as an appreciation of people's efforts to use improvisation as a problem solving strategy. This mood represents desire for a way of

*being*, including ‘muddling through’ in life and, to use Ciborra’s own words, a celebration of serendipity (Ciborra, 2002 p.178).

### 3 TRANSFORMATION

As discussed above, we perceive management style and its impact on the desires and capabilities of workers to be an important influence on systems design. Empowerment of individuals to carry through their desire to do a good job into participation in the processes of IS design reflects this, as is demonstrated in work of Mumford (2003), Friis (1991) and others. The way in which individuals are viewed in organizations can be directly related to work by Douglas McGregor, professor at MIT Sloan School of Management, who set out two potentially alternative approaches to management (McGregor, 1960). According to this classification, the first alternative (which he called the Theory X manager) considered that employees are inherently lazy and reluctant to work. They would rather avoid any responsibility and therefore the manager needs to structure the work himself and take steps to ensure that each staff member carries out his allotted tasks. In the alternative Theory Y, a manager assumes that employees *may be* ambitious and self-motivated. They are potentially willing to accept greater responsibility, and welcome opportunity for self-direction. There is an expectation that staff enjoy their work, and desire opportunities to be creative. Logically, therefore, productivity can be enhanced by giving employees greater freedom to develop their own work roles and participate in planning and problem-solving.

Where an organizational culture has been characterised by management practices resembling Theory X, it is likely that people within that organization have been socialised into corresponding expectations. They will expect to interact in working systems which have been designed by others on their behalf. They will expect detailed instructions, both on the tasks they must perform and the way in which they must tackle them. In contrast, where an organization exhibits more characteristics of Theory Y in its approach to management, there is likely to be a culture of shared responsibility. Staff are likely to expect a greater role in designing their own work roles and in shaping the systems and strategies the organization pursues.

We perceive a similar view in work by Amitai Etzioni (1961), on interactions within complex organizations. When people are regarded as professionals, they perceive themselves as members of a wider community of practice beyond the boundaries of the particular organization in which they are employed. For example, a medical practitioner may be employed in a particular hospital but his status as a doctor, as illustrated by taking of the Hippocratic Oath, transcends his loyalty to organizational concerns. Both the professional, and his employers, are likely to hold expectations that s/he will be competent to define appropriate work systems and carry out tasks without a necessity for micromanagement. The role of management in this case is to resource and facilitate these activities.

It is strange to reflect, therefore, that in relation to development of organizational information systems, people who would normally expect to participate in decision-taking as professionals have often exhibited instead expectations more characteristic of ‘Theory X’. Information technology has often been seen as something to be left to the technical experts and professionals, as users, have not sought opportunities to influence systems development. Unsurprisingly, the resultant systems have not always been well-received or useful. At a recent conference, Donald A. Marchand of IMD, Lausanne, Switzerland spoke about perceptions of success or failure in IS projects (Marchand and Hykes, 2006). He pointed to an example of a company whose IS project was completed on time and within budget. The IT team were congratulating themselves upon this when they were confronted by an auditors’ report condemning the project as a failure. The auditors had uncovered the fact that few people were actually using the new system – they did not find it useful in carrying out their work. When designed systems are not perceived as useful this may result from lack of analysis, or less-than-comprehensive analysis (Mitev, 2000). No analysis aimed at mere description of a problem space is likely to form a basis for creation of systems that will fully satisfy their users. Each individual who seeks to make use of an information system has reasons of her own for doing so, which are both unique and contextual. It is this that we refer to when we use the term ‘usefulness’ – *why* does the individual engage as a participant in the system? Unless designers reflect upon this, it is likely that their creative process may

focus upon a different problem space than that which is of genuine concern to problem owners, i.e. the intended 'users' (Bednar and Welch, 2007a).

If an expert analyst simply asks a person to describe the requirements of her job (a traditional approach to requirements analysis), this discovers those aspects of which the person is explicitly aware. Observation and questioning can then reveal some of her implicit knowledge of the way she performs certain tasks but resulting descriptions are still, at best, imperfect. However, if it is possible to use methods which go beyond this, to enable individuals to explore multiple experiences of dynamic roles, and tease out a range of shifting, reflective perspectives (requirements shaping), then they may go further (e.g. through improvisation as proposed by Ciborra, 2002). By exploring experiences, rather than describing a problem space, tacit as well as implicit knowledge may be supported to emerge. As Suchman points out (1987), all actions we take are ultimately situated and draw upon skills and knowledge we possess but cannot fully articulate. While people often speak of their actions as if they were planned, this is only a method of rationalising actions which were carried out on an *ad hoc* basis, drawing on different aspects of tacit knowledge which are embedded and transparent to the individual concerned.

Why would people surrender responsibility for IT to an 'expert' and treat IS as contained in a black box. If the radiator in your office goes wrong you send for a heating engineer and do not particularly expect to influence his work. In the past, people have seen IT in the same way – new systems are created 'for them' by experts. However, over the years, the embedded nature of knowledge work has meant that a transformation has occurred. It is possible, but not efficient, to treat IS in the same way as plumbing because what you do at work and the means by which you do it are inextricably conjoined. This discussion is not new; it has been going on since the 1960's. However, the direction of change in society towards professionalisation is now more pronounced. It has become a strategic part of political agendas (see Giddens, 1998 on 'the Third Way'). To ignore professionals becomes even more ineffective as their expectations to be included in decision-taking rise, and their tolerance for being ignored (i.e. managerialism) decreases. The user's view of how the system needs to be is a crucial input to the design process.

Hirschheim and Klein (1994) have commented that traditional functionalist approaches always recognized a key role for user participation in processes of IS development. Through participation, better specification of requirements, validation of designs and lowered resistance to change could be achieved. A neo-humanist perspective would go further and suggest a need for collaboration to promote 'social sense-making and shared understandings' in order to achieve an ethical deployment of IS in work arrangements within a democratic society. Thus, a critical reformulation of development methodologies would be required to meet the demands of emancipated and professionalized citizens for greater opportunities to collaborate. As Greenbaum recognized (1993 p34) "...users are increasingly knowledgeable about computer applications, and certainly more vocal about their likes and dislikes." She further comments, drawing on Bjerknes et al, 1987, "... participation helps users increase their skills and thereby increase the quality of the services they provide." We use the term 'professionalization' to indicate a transformation from a docile and unskilled workforce, whose expectation is to be told precisely what to do and how to do it, towards an educated citizenry whose expectation is for work roles which carry responsibility and skill, and who do not expect to be micromanaged in their professional roles. We see evidence for this in statements by IT professional bodies, e.g. Colin Thompson, Deputy Chief Executive of the British Computer Society, writes: "We recognize that (these) objectives will demand total professionalism not just of the IT practitioners but across all business functions. Professional people working for fully professional organizations are the key to improving the way we do things and the results that we achieve." (Thompson, 2006 p7). In this context, Claudio Ciborra's Mood, related to ideas of an increased role for *bricolage* and improvisation become important.

A need to focus on the individual was recognised as long ago as the 1960's, by Borje Langefors when he developed the 'infological equation' (Langefors 1966). This work highlighted the significance of interpretations made by unique individuals within specific organizational contexts (Langefors 1995). Many different aspects of contextual dependency in relation to information systems development have since been the focus of research. For example, during the early 1980's, a number of Scandinavian

researchers focused on areas such as organizational contingencies and contexts (e.g. Olerup 1982), and interpretations in local contexts of individuals and groups (e.g. Sandstrom 1985; Flensburg 1986). Contextual analysis in relation to individuals, groups and teams became even more pronounced in research on continuous development (e.g. Agner-Sigbo and Ingman, (1992) and Agner-Sigbo et al (1993)). A focus on individuals and groups is also visible in research on prototyping (e.g. Friis 1991), and on individual and team learning in participative design of Information Systems (Hagerfors 1994). In the UK, research focusing on contextual dependencies came through the socio-technical movement, associated with the Tavistock Institute, especially Enid Mumford's ETHICS (effective technical and human implementation of computer systems) methodology. Client-led Design (Stowell and West, 1995) is another example of research into approaches centering on participation by the end-users in developing their own work system. We can also point to Checkland's Soft Systems Methodology, with its emphasis on recognition of Weltanschauungen (Checkland, 1981), and the Multiview approach (Avison and Wood-Harper 1990).

Greenbaum (1993) suggests that design needs to be part of an integrated process, considering work organization, job content and the ways in which technology is used to support these activities. We consider that a further element, motivation, is also relevant. Desire by individuals for engagement in use of systems must inform processes of development in order for 'useful' systems to be created (Bednar and Welch, 2006 a. and b.). As Ciborra has expressed it:

*"Passion and improvisation; moods and bricolage; emotions and workaday chores; existence and procedures will become integral to systems design and use, casting new shadows and lights on the unfolding world of technology."* (2002, p9)

## 4 PHILOSOPHICAL ISSUES

Some of what has been said so far seems to be quite "obvious" or at least "reasonable": the influence of moods in personal interactions in the work place, the primacy of end users in IS design and implementation, the need to empower people to enable innovation, and so on. Yet such issues have not always been taken in due account within IS theory and practice (there are exceptions, see e.g. Hirschheim, Klein and Lyytinen (1995) on the conceptual and philosophical foundations of IS development and data modelling). What are then the reasons for this paradox? Ciborra in his work from the mid 1990's on (collected in his 'Labyrinths' (2002) found an answer in phenomenology, drawing on Husserl and, especially, on Heidegger. The former is mentioned by Ciborra in relation to his analysis of the crisis of sciences in the past century. These are attributed both to the forgetting of the "subjective origin of science [and] the foundational role of everyday life in the creation and development of any methodology..." (p. 15). Appendix X of his book (Husserl, 1970) is devoted to the origin of geometry from practice: e.g. carpenters' preference for smooth surfaces and straight lines. Nowadays, stresses Ciborra, the dominant paradigm overturns historical evolutions: models are mistaken for reality itself, and not seen only as useful representation of the 'real' world. The result is a clouding effect, a veiling that hides phenomena in fields related to organization and IS. The point here is that an approach that certainly had a driving effect on development of the natural sciences at the time of Galileo and Descartes is now applied by the IS discipline almost across the board to "socio-technical hybrids" (p. 15). Apparently then, the positivistic attitude still dominates the scene, while the 'obvious' is de facto relegated to the outskirts of IS research and practice. In order to discover it, we have, in Heidegger's words, "to loosen up" what seems to have become, again in Heidegger's words a "hardened tradition" (Heidegger 1962, p. 44). Of course, Heidegger was referring, in the passages just quoted, to the philosophical question of Being; yet, there are several other passages that can be quoted and that relate directly to our discussion. The following was written in 1959, one year after the term 'information systems' was first coined: "the essence of modern technology that holds sway everywhere, ordains for itself a formalized language – that kind of informing by virtue of which man is moulded and adjusted into the technical-calculative creature" (Heidegger 1993, p. 421). This idea of man as a technical-calculative creature was developed in preceding works and especially in his "The Question Concerning Technology". This deeply influenced Ciborra, who saw in the overarching and ever-expanding essence of technology strong similarities with the main characteristics of information

infrastructures (difficult to be handled through long lasting centralized projects destined to drift from the original hyper-planned outcomes). Therefore, on the one hand, the philosopher warned of the impoverishment of man's ability to think in terms other than "calculative" ones (so that man should be attentive and alert in grasping different ways "to" thinking) and, on the other hand, the researcher proposed - along with Heidegger - a "different tack ...[so that the world] presents itself in our everyday experience. We rely on evidence, intuition, and empathy...we do not confer any particular relevance on words like 'strategy', 'processes' ..., or 'structured methodology'" (Ciborra 2002, p25). Furthermore, in a different orientation of the IS management agenda (pp 77-78), "marginal practices" (such as bricolage) should be valued together with a "new sense of responsibility" towards the "unforeseen". It should be noted that Heidegger considers cause as 'to be responsible for' so that production can be considered as 'to be responsible for coming forth' of something that is not present in the world (since: pro=forth, ducere=to conduct, to bring). Moreover, there are other elements that Ciborra brings to our attention and which he believes to have been largely misunderstood in the literature: emotions and moods as a basis for improvisation within different situations. The importance of improvisation in business contexts, marked by uncertainty and continuous innovation, should be self-evident. However, cognitive approaches (according to Ciborra 2002, p154) consider this "just quick problem solving". If this were the case, a robot could perform the task and different human beings, if properly trained, could improvise just as effectively in the same given circumstances. Evidence shows that this is not the case: time flows in different ways for different individuals, in different circumstances and periods of their lives; emotions and moods affect the possibility of visualizing possible outcomes. Heidegger comes again into the picture: in anxiety the perception of death liberates man "from possibilities which 'count for nothing'... and lets him be free for those which are authentic" (Heidegger 1962, p395) Within this mood, all potentialities of the individual are there: past history and future developments coagulate so that a resolution can be grasped through the "moment of vision".

## CONCLUSIONS

In the industrial age, business organizations turned to Taylorist 'scientific management' in a search for growth and prosperity. However, as we in the developed world move towards an age in which knowledge is the chief source of sustainable competitive advantage in business (Davenport and Prusak, 1998), such an approach to managing people in the workplace will no longer serve. Business organizations depend on the possibility for people to harness their embedded knowledge - their professional capabilities - in order to carry out their work roles effectively and contribute to wealth creation. Embedded knowledge is not accessible to direct management in ways which F.W. Taylor would have envisaged. Instead, professional workers need to be empowered to act for themselves and motivated to wish to do so. Such empowerment, in turn, leads to changes of expectation among a professionalized workforce about work roles. The dynamics of organizational problem spaces lead to multidimensional complexities, and the expectations of people to lead and guide their own destinies at work extend to design of the systems which support them in carrying out their professional tasks. As workers become more professional and expert in their knowledge work roles, so the processes they use also become more complex. We note, with Greenbaum (1993 p34), that "... *more sophisticated software applications require more sophisticated users, making it in management's interest to work more closely with people who are using the new system.*" Thus, we can see that traditional methods for systems development will no longer meet the needs either of organizations or of individuals within them. In this paper, we draw on work by Claudio Ciborra to suggest a need for techniques in systems design which go beyond the traditional, linear approach to include approaches which help tacit, embedded understandings of individuals to inform systems development.

The review of the literature and the reference to Ciborra's work (together with the influence exerted on him especially by Heidegger) have shown that to consider an IS designer primarily as an *animal rationale* is not as effective as considering him (and the other actors, of course) endowed with moods. Of course, neither Ciborra nor Heidegger was against rationality *tout court*: Heidegger (1992) expressly said in *Gelassenheit* that "there are two ways of thinking, both necessary and justified, even though differently: calculative thinking and meditative thinking". It seems thus necessary to consider

more attentively the latter since the former seems to have dominated, in the IS discipline at least, the centre stage both in the theory and in the practice.

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