

Business Development in IT-dependent organisations

Torbjörn Nordström^a, Mikael Söderström^b & Ole Hanseth^c
atn@informatik.umu.se^a, micke@informatik.umu.se^b and
ole.hanseth@ifi.uio.no^c
Umeå University^{a & b}
University of Oslo^c

Abstract

Yesterday we built databases to support business processes. Today we seek to build business processes from existing databases. This means that business processes become closely related to IT-use, and also that use of IT can be an important part of business development. Use is, however, not entirely determined by the design of IT-artefacts, occasionally IT-artefacts are used different than planned. We call this phenomenon IT-bricolage. Essential to business development then, becomes to exploit and diffuse the innovative ways of using IT that can be the outcome of IT-bricolage. Cultivation is suggested as a suitable metaphor for this process. To cultivate IT-use requires that organisations find ways to monitor use. That is, to create organisational forms that; first, are capable of discover innovative IT-use, furthermore, are capable of realising that this use can be exploited in developing business processes, and finally, are capable of diffusing the discovered innovative use throughout the organisation. We regard knowledge of such cultivation as a necessary complement to knowledge of the design of IT-artefacts. Which individual, organisational and technical conditions that make this possible is far from obvious. Hence, we need to design, test and evaluate different methods for developing this ability in organisations. This is an area in which there is very little research done up to now.

Keywords: IT-dependency, standardisation, enterprise systems, IT-bricolage, cultivation, business development

1. Introduction

Today all large organisations are dependent on IT. It is difficult to imagine a gas station, a supermarket, a bank, or an airport without support of IT. In the supermarket, for instance, we can imagine someone manually adding up the price of each item to a total sum, which the customer then pays in cash, like it was done years ago. However, today the prices can not always be read on each item, but only the EAN-code and many customers do not carry their money in cash. Instead, they use credit cards. In the case of the supermarket both the company and its customers depend on IT to perform the prime business transactions. The same goes for banks. It would be very difficult for them to maintain their operations without IT, even though it is possible in principle. Managing, for instance, bank accounts entirely manually would require a huge staff, making the handling costs rather high.

The far driven rationalisation of work originally performed manually, which IT contributes to in cases like the supermarket and the bank, makes it unrealistic to return to the state of affairs when IT was not around. However, IT-dependency seems to be of at least two different types. One that has to do with the potential of IT to rationalise as in the supermarket and the bank, and the other has to do with its enabling capabilities. In this paper we denote the first as IT-dependency of type-1 while the other, deeper kind of IT-dependency, is called IT-dependency of type-2.

A type-2 IT-dependency implies that organisations are dependent of IT in the sense that it enables new or enhanced business activities, that is, activities that are not possible without IT. Being type-2 dependent of IT therefore means that the technology has made what was impossible possible. In such cases there are no manual routines behind a certain IT-based product or service, as in the case of the type-1 dependency.

Because of the opportunities for business development IT-dependency of type-2 creates there seems to be a wish among many organisations today to become deeper dependent of IT. One very popular way to create this dependency, at least among large organisations, is by investing in enterprise systems. These systems are off-the-shelf solutions to the problem of having a systems archipelago with few and narrow bridges between the islands. In short, they promise the seamless integration of all information in the organisation in one system.

In organisations with an IT-dependency of type-2 business processes to a large extent consists of IT-use. This implies that use becomes an important part of business processes. However, during the last years research has shown that use of IT seems to be a much more complicated phenomenon than what was assumed. Among other things, the actual use of IT in many cases is different, in some cases even totally different, from the planned use. People sometimes use systems different than planned, by chance, by mistake or by purpose, and occasionally from such deviations in use, find new ways to utilise the technology. We denote these expressions of human creativity as IT-bricolage.

When the dependency on IT becomes deep enough, as in IT-dependent organisations of type-2, business development seems difficult to separate from IT-use in general, and IT-bricolage in particular. Many, or even most, ways to develop or enhance business processes in this kind of organisations demand changes in IT-use. Hence, the aim of this paper is to analyse the properties of IT-dependency and IT-bricolage in order to create an understanding of business development in type-2 IT-dependent organisations.

Our starting point is the concept IT-dependency. A closer look at it reveals that there are at least two types of IT-dependency – type-1 and type-2. While the type-1 dependency in essence means that IT is used to rationalise manual work, the type-2 dependency implies that IT becomes an essential asset in business processes in the sense that it is used to create new business processes or enhance existing ones. From this follows that ways of using and utilising IT becomes very important to organisations. Today many organisations seem to seek to become IT-dependent of type-2 through different means, for instance BPR, Datawarehousing and enterprise systems. Among these, and others, enterprise systems has been especially popular, at least with respect to large organisations. The integration offered by these systems gives opportunities for management to enhance their control over what is going on inside organisations, which in turn creates new possibilities for employing IT-use in business development. Hence, the IT-dependency of type-2 that enterprise systems, and also other types of systems, create implies a very close relation between business processes and IT-use.

However, taking advantage of the possibilities offered requires knowledge of both use and IT-bricolage. This implies that organisations need to find ways to monitor use. We suggest cultivation as an appropriate metaphor for managing IT in type-2 IT-dependent organisations. Essential to this cultivation is to identify, exploit and diffuse the innovative ways of using IT that can be the outcome of IT-bricolage. Thus, we need to create organisational forms that support organisations in creating and sustaining a beneficial relation between IT and business processes. Finally, we conclude that the general significance of the argument put forward in this paper is that it contributes to organisations' ability and preparedness to face the emerging challenges posed by a growing IT-dependency.

2. IT-Dependency

The SABRE system of American Airlines has become a standard example of a type of system expanding the scope of information systems design. The SABRE system, and a few other well-recognised systems, also brought about changes in the conception, both among system designers and business managers, of the relation between information systems and business activities. Before such an expansion of scope, and change of conception, information systems were generally thought of, and designed, as rationalisation tools, making existing business activities more efficient. That is, the comparative advantage of computers over humans in certain respects, such as routine calculations, making identical manipulations on thousands of similar customer records, etc. were exploited to gain efficiency. In this respect computerisation was successful to the extent that work has been organised and staffed around these systems in such a way that should the systems malfunction, normal business activity would be impossible to uphold. In this sense, most companies need IT to perform essential business activities.

The present level of rationalisation of earlier manual work, and the behavioural patterns and habits we all have become accustomed to, staff and managers at the supermarket as well as suppliers and customers, makes it virtually impossible to "go back" older manual ways of doing business. In this sense almost all organisations are dependent of IT today. We can call this an IT-dependency of type-1. In its extension dwells the automated factory, bank or supermarket. Even if they never actually come true, this is the direction in which such use of IT points.

2.1. IT-dependency of Type 2

SABRE is an early example of organisations dependent of information technology in a different way. In those organisations the business activities, or at least some of them, were not only supported by information technology, they were enabled by the technology. Such business activities are not founded on earlier manual work, as in the case of type 1-dependency. Rather, the products or services exchanged in business activities are extracted from a company's IT-use. The SABRE system originated as a response to a rather trivial, however difficult problem American Airlines had.

SABRE took shape in response to American's inability to monitor our inventory of available seats manually and to attach passenger names to booked seats. So SABRE began as a relatively simple inventory-management tool, although by the standards of the early 1960s, it was a major technical achievement. (Hopper, 1990, p. 122)

The system has effected American in a number of ways (Hopper, 1990), but we will only mention three outcomes here, to illustrate the kind of dependency sought. First, the accurate, and easily and quickly accessible, information about who took a flight where, and when, made possible services such as the frequent flyer program. Every air kilometre travelled in an American plane could easily be counted for every passenger and at certain intervals the passenger earned some discount, or even free flights. This service was impossible without the SABRE system.

Second, the SABRE system was sold to American's competitors.

We spent millions of dollars developing SABRE's yield-management software, and we considered it the best in the world. Indeed, we believe our pricing and seat-allocation decisions generate hundreds of millions of dollars of incremental annual revenue. For years we guarded that software jealously. Since 1986, however, we have sold SABRE's revenue-management expertise to any company that wanted to buy it. One of our subsidiaries ... is knocking on the doors of airlines, railroads and other potential customers. Why? Because we believe our analysts are better at using the software than anyone else in the world. Whatever "market power" we might enjoy by keeping our software and expertise to ourselves is not as great as the revenue we can generate by selling it. (Hopper, 1990, p. 121)

This opened up a whole new field of income for American, that is a direct result of the information systems developed.

Third, there is the halo effect. American installed SABRE terminals in travel agencies. At a travel agency the system handled not only American's, but all air carrier's flights. "The halo effect is a tendency to book more passengers on flights of the airline that supplies a travel agency's reservations system than would otherwise be the case" (Copeland, 1988, p. 361). Although the extent of the halo effect is disputed, when as much as 80% of the passenger tickets are sold by travel agents, even the slightest tendency to favour American have impact. In summary, the system enabled American to offer services that they could not deliver without the system, and, partly as a result of that but also for other reasons, American gained competitive advantages in its business activities.

In companies successfully utilising information systems of strategic value, the SABRE system is one of the standard models of such systems, the dependency of information technology is quite different from the type-1 dependency. These systems are way beyond automating of manual routines, and "create" organisations dependent of IT in a much deeper sense. "In the process these systems went from being useful to being essential assets, equal in importance to an airline's fleet" (Copeland, 1988, p. 353). We can call this a type-2 dependency.

Regarding IT-dependent organisations of type-2 (in this case American Airlines) Hopper (1990) is arguing that technology is not important, but how the business makes use of it. Sustaining a competitive advantage is less a problem of keeping technologically ahead in manipulating data, and more a problem of being smarter in transforming data to useful business information and new or enhanced business activities. This focuses the interest less to the composition and properties of the information system and more to its relation to the business activities.

3. The Idea of Seamless Integration of Information

Searching for new business opportunities in ones own databases, as American Airlines succeeded with, is a strong trend today. Several of the products and buzzwords in the IT-area that has received most attention during the 1990's seem to contribute to this movement, e.g. BPR, Datawarehousing, Data mining, ERP-systems and systems maintenance. All these concepts refer to actively searching for ways to utilise IT in organisations. They are focusing on rethinking or reconsidering the relation between business processes and IT-support, to significantly enhance existing business processes, or enable business processes not previously recognised. Companies succeeding in such an effort are on the road towards a deeper IT-dependency. In this paper we pay particular attention to ERP-systems and the idea of a totally integrated information processing in organisations. The importance of enterprise systems is emphasised by Davenport (1998) who claims that:

“While the rise of the Internet has received most of the media attention in recent years, the business world's embrace of enterprise systems may in fact be the most important development in the corporate use of information technology in the 1990s.” Davenport (1998, p. 22)

By integrating flight bookings from all travel agents and all airline ticket offices in the SABRE-system, American managed to launch their frequent flyer program. Integration seems to be an important part in inventing and enhancing business processes. Already back in the sixties researchers dreamt of building information systems that integrated all organisational activities in one system. In Scandinavia Börje Langefors was perhaps the most prominent advocate of this dream. His basic idea was to build systems that made what he called total steering of organisations possible. By building these systems he wanted to accomplish a rational, effective and detailed control of all activities in organisations. (Bansler, 1990).

Enterprise systems (or ERP-systems) seem to be the fulfilment of the sixties dream of total steering of organisations. Most often, they promise the seamless integration of all the information flowing through an organisation – from financial information to human resource information (Davenport, 1998). For managers who have struggled with an information systems structure resembling disconnected islands in an archipelago, it must be tempting to invest in a ready-made solution to the problem of integrating all the information, of the whole organisation in one system. Hence, today integration, at least when we talk about large organisations, usually means ERP-systems. The integration they provide enhances management's control over what is going on in the organisation, which in turn gives possibilities to monitor IT-use in search for new ways of developing business processes. Integration in itself, as in the American Airlines case, may unleash potential business improvements. Enterprise systems thus have the potential to generate an IT-dependency of type-2.

Implementing ERP-systems has become enormously popular among larger enterprises. Such systems promise to integrate large numbers of business processes, which then will boost organisational efficiency and productivity as well as management control over what is going on inside organisations. The integration is obtained mostly through a standardisation of data structures used throughout the different parts of an organisation. Systems based on similar ideas about integration are under development in sectors not covered by ERP-systems, ranging from Electronic Patient Record Systems in hospitals to integrated systems for international ship classification companies (Rolland, 1999).

Most ERP-systems, if not all, are standard-systems. They are generic solutions, and their design reflects a number of assumptions about the way organisations operate in general (Davenport, 1998). The standardisation of data structures that enterprise systems provide is preferably accompanied by a standardisation of business processes and work routines.

In an ERP project we studied implementing SAP R/3 into a large multinational company, SAP-consultants described what they thought was the proper way to implement such systems as the following: (1) Align the business processes throughout the company, (2) Design a core system, (3) Do a pilot implementation of the core system in one location of the company, (4) Make adjustments to the system if necessary, and, finally, (5) Roll-out the system in the other parts of the company. This way of working seems to be designed to make the implementation of the system as easy as possible and it is understandable that the consultants advocate such a way of working. Implementing this way also means that every salesman in the company should record the same data about their customers, process their order through the system the same way and give the same service to all customers, irrespective of for instance in what country or region they operate. Every order processed through the system should be controlled the same way, concerning credit limits, delivery terms, payment terms, etc., irrespective of where the order is registered and who the customer is. This is the sort of commitment a company should do, according to the philosophy of the SAP-consultants, to benefit most from a SAP R/3 implementation. (Söderström, Nordström & Hanseth, 2000)

The increased integration offered by these systems leads to improved efficiency and control in the same sense that standards in general do. Besides offering the standardisation of processes and routines, enterprise systems also makes the centralisation of control over information possible. In fact Davenport (1998) claims that some executives actually have used enterprise systems to inject more discipline in their organisations.

Although enterprise systems offer stability through standardisation, as products these systems usually are changing – rapidly. New versions are launched frequently. Old versions are supported only for a rather short period after new ones are launched, requiring user organisations to update quite often. This is of course costly, but these changes also affect the role enterprise systems are playing in organisations. In short we can say that they are changing for two reasons; their functionality change to better satisfy users' needs, and they change to better fit with other technologies – which also changes. Examples of the latter is SAP's integration with Microsoft products (Microsoft and SAP are strategic partners) and the Internet. All this implies that deciding to go for an enterprise system means that one is not only implementing a product supporting the work and business processes in the organisation. It is also decision to jump on a train which direction you cannot control. The train is controlled by others – and you do not know by who and in which direction they are heading.

4. IT-characteristics does not determine IT-use

As mentioned above, enterprise systems focus on integration and control. A large scale, tightly integrated system is very hard to change. Accordingly, these systems are, implicitly, based on the assumption that organisations are stable as far as they are concerned. This might, possibly, be true. But experiences so far indicate that enterprise systems may be in conflict with organisational dynamics crucial for survival (Davenport 1998). One such dynamics is the use of IT in organisations.

During the last years research has shown that use of IT seems to be a much more complicated phenomenon than what was assumed. Among other things, the actual use of IT in many cases is different, sometimes even totally different, from the planned use. Users seem to “play” with the technology in such a way that the role and function of IT in business processes shifts from what was planned to something else. This occurs without any physical changes of the technology. Users “playing” with IT may be beneficial to organisations, but might as well have negative consequences. Ciborra (1996) uses the concept bricolage to refer to the phenomenon, while we prefer the more precise denotation IT-bricolage. Research has shown the phenomenon in quite a few individual cases¹, but still knowledge of its scope and propagation, how and why it occurs and in which forms it can occur is lacking.

The concept bricolage originally stems from the writings of the French anthropologist Claude Lévi-Strauss. It becomes of interest in this context since the unforeseeable character of users' actions implies that use of IT-artefacts has a lot in common with the kind of being-in-the-world Lévi-Strauss (1966) calls bricolage.

[...] the engineer is always trying to make his way out of and go beyond the constraints imposed by a particular state of civilization while the 'bricoleur' by inclination or necessity always remains within them. (Lévi-Strauss 1966, p. 19)

The bricoleur remains inside whatever universe he is thrown out in. He (or she) has to use his set of means regardless of the task in front of him, because he has nothing else to his disposal. His creations therefore always consist of new arrangements of existing means. By changing the arrangement of his means different actions become possible for the bricoleur. He is, hence, involved in a continual reconstruction from the same means, and in this process of reconstruction earlier ends always play the part of means (Lévi-Strauss, 1966).

In the same way as the bricoleur is thrown out in a finite universe of means, the user is thrown out in a finite universe of existing IT-artefacts (an important part of the user's set of means). Unlike the designer, the ordinary user seldom has the competence and resources necessary to change his universe. In this way the user by necessity becomes a bricoleur. His dependence on the available artefacts leaves him with no other choice than to rely on them. There is no easy way for the user to question his universe of artefacts, and to go beyond the constraints they impose on him. But, although the IT-artefacts to his disposal are finite, the user still has some room to manoeuvre. What the user can do, and often does, is to arrange his means in new ways which allows him to take actions not possible before. By rearranging his artefacts the user explores the range of actions allowed by them.

One outcome of IT-bricolage is that information systems, as Ciborra (1996) calls it, drift. Ciborra uses the concept drifting to denote the shift of role and function of information systems in concrete situations of usage. As far as we know, Ciborra (1996) coined the concept drifting. In earlier writings, e.g. Ciborra & Lanzara (1990) and Ciborra & Lanzara (1994), he has also used the term shifting & drifting to denote the shift of role and function of systems during use. We regard these concepts as synonyms, but for the sake of clarity we will use drifting throughout this paper.

In the case of the SABRE-system, the original intention was to have an inventory system of the seats in all the different flights of the company, in which all the sales agents were

¹ See for instance Bowers et al. (1995), Ciborra & Lanzara (1990 and 1994), Ciborra (1996), Levén & Forsgren (1996), Orlikowski (1992), Cordella & Simon (1999) and

integrated. This was also what the SABRE-system was in the beginning. Then someone within the company realised that the inventory of chairs in their air fleet, with passenger names attached to all chairs, at the same time contained a detailed description of the travel habits of all American's passengers. This information had great business potential for American, and for other airlines as well as travel agents. Around this business potential American managed to develop new business processes based on IT-use, such as the frequent flyer program, earning hundreds of millions of dollars to the company. The original inventory system is now used in many different ways in many different business processes. Such deviations from originally intended IT-use is typical examples of IT-bricolage. In the case of American Airlines this generated lots of benefit to the company.

IT-bricolage seems to be an effect of human creativity. People sometimes use systems different than planned, by chance, by mistake or by purpose, and occasionally from such deviations in use, find new ways to utilise the technology. People also sometimes re-think, re-conceptualise, re-organise or question their more or less taken for granted views and opinions of IT-systems, of their function, their meaning, their purpose, their content, and occasionally discover new potential use and utilisation of IT-systems. Typical such occasions for re-considering are breakdowns, company mergers, change of C.E.O., or technical platform, or purchasing ERP-systems. In IT-dependent organisations of type-2, where business processes to a great extent consists of IT-use, business development seems difficult to separate from IT-use. Many, or even most, ways to develop or enhance business processes in type-2 dependent organisations demand changes in IT-use. IT-bricolage therefore, becomes closely connected to business development in IT-dependent organisations.

With respect to enterprise systems, standardisation and flexibility clearly is in conflict: What is standardised, like the global TCP/IP network, the meter and the difference between the rails of railroads just to mention a few well known examples, is hard to change. But standardisation and flexibility might also be in harmony: Standardisation on one level enables flexibility on another. This is the standard argument for standardisation of operating systems (OS), for instance. An OS standard increases the flexibility of users in terms of the number of different applications they can choose. These two sides of standardisation are also in play with regards to enterprise systems. A huge ERP installation may certainly be hard to change and as such it might resist organisational change. But we may also imagine the system as a rather generic and stable platform enabling a wide range of organisational processes to be run. This possibility is playing a major role in the marketing of ERP products as SAP R/3, but there is no research, as far as we know, that has investigated whether or not enterprise systems actually foster or "produce" this flexibility. That is, whether these systems leave any room for the creativity, imagination and initiative of individual users, or if the standard they impose forces all their users to follow the same way of working is not thoroughly investigated.

However, a preliminary study² of the adaptation, implementation and use of SAP R/3 in

² The "raw-material" for this study has mostly been collected through interviews. The interviews can be divided into three categories, the first consisting of senior managers in the company, the second consisting of SAP R/3 users at one of the company's mills, and the third consisting of members of the project implementing R/3 in the company. In total we conducted twenty-three interviews. We interviewed the then C.E.O., three other senior managers, thirteen R/3 users at the mill, and, finally, six members of the project. Each interview consisted of 30 to 45 questions divided into different areas. The areas used during interviews were not exactly the

a large multinational company did show that users could use their creativity, imagination and initiative to invent ways of working that was not prescribed by the project that adapted and implemented the system. This was especially evident in the interviews we did with the controllers at one of the company's mills. For instance, one of them had invented ways of using R/3 not anticipated in the user documentation. She had also taken upon herself to carefully update the online user documentation with these ways of using the system.

5. New opportunities for business development

In research enterprise systems and other types of systems that imply a deeper dependency of IT has got their "own" research field, Strategic Information Systems Planning (SISP). However, most research in this field does not discuss what we have spoken of as IT-dependency in organisations, but are instead focused on design of strategic systems.

A few researchers have taken interest in others than the design aspects of the development sketched above, see for instance Hanseth & Braa (1998) and Ciborra & Hanseth (1998a). An essential idea in this research is that the tool-metaphor of IT is not capable of giving us an accurate understanding of consequences and impacts of organisational use of IT (Ciborra & Hanseth, 1998b). The basic assumption of type-1 IT-dependency that IT is a tool which rationalises the production process by increasing the productivity of individual workers, does not give us an good enough understanding of type-2 IT-dependency. Since IT is an essential asset in organisations with a type-2 dependency, tool does not seem to be the most appropriate way to describe its role and function in these organisations.

IT-dependency of type-2 implies a very close relation between business processes and IT-systems. The way systems are used and utilised also, to a large extent, define business processes. Business development then, in this type of organisations, operates under different and partly novel conditions than was the case in organisations not depending on IT to perform important business processes. This is not to say that the traditional skills as, for instance, knowledge of markets, competitors, strategic alliances, careful planning etc. become unimportant. But other element seems to become increasingly important, such as knowledge of how IT is used and insights into the potential of that use for existing or new business processes.

The discussion up to now ends in a situation where there is research on design of strategic information systems and research on consequences and impacts of use of such systems. What is missing, though, is research on actual use of IT, and how knowledge of this use can help organisations to create and sustain a beneficial relation to IT. That is, a relation that gives opportunities to exploit IT-use in development of business processes.

We need to inquire into the question of how knowledge of innovative IT-use can be transferred and made use of, and thereby also change, the work of developing a business increasingly dependent of IT. Since the IT-use that follows IT-dependency of type-2 seems to be characterised as much of exploration and exploitation as of rationalisation, to improve the way of monitoring a business also becomes very important. Thoroughly worked out and implemented plans was a recipe for success in establishing type-1 IT-dependency. In

same for all three categories, and the interviewed persons were not given any questions in advance or in writing. The length of the interviews varied from one to two hours. All interviews were recorded on tape and then transcribed.

organisations with IT-dependency of type-2 this recipe does not necessarily imply success. Many success stories of strategic information systems instead show that the triggering factor of these systems was the creativity, imagination and initiative of individual actors, as it is expressed in IT-bricolage. Dahlbom & Janlert (1995) claim that the most important lesson of, at least, some of these stories are that it is use, not technology that gives the decisive competitive advantages.

Metaphorically speaking, exploration and exploitation of IT-use are most encouraged by a fertile "soil", that is, a "soil" that allows growth of use and work routines under freer forms. In the same way as a fertile soil favours the crops as well as the weed, a use situation that encourages experiments favours both successful and less successful use of IT. Therefore we argue that an appropriate metaphor for managing IT in type-2 IT-dependent organisations can be built on the concept cultivation. When American Airlines created their frequent flyer program they did it through cultivation of IT-use.

Essential to this cultivation is to identify, exploit and diffuse the innovative ways of using IT that can be the outcome of IT-bricolage. Hence use, individual users and user groups are of great importance in cultivation. To cultivate IT-use requires that organisations find ways to monitor use. That is, to create organisational forms that; first, are capable of discover innovative IT-use, furthermore, are capable of realising that this use can be exploited in developing business processes, and finally, are capable of diffusing the discovered innovative use throughout the organisation. We regard knowledge of such cultivation as a necessary complement to knowledge of the design of IT-artefacts (Söderström & Nordström, 1999).

By cultivating IT-use a beneficial relationship between IT and business processes can be created and sustained. To create this kind of relation of course implies that the organisation first of all must realise that it has a relation to IT. Essential to a beneficial relationship is to know how IT is used, and to be able to extract business advantages from this use. The ability of an organisation to know and sustain the relationship between IT and business processes appears to be an important success factor in companies with a type-2 IT-dependency. Which individual, organisational and technical conditions that make this possible in the best way is far from obvious. Hence, we need to design, test and evaluate different methods for developing this ability in organisations. This is an area in which there is very little research done up to now.

Besides, widespread use of standard systems as for instance enterprise systems will decrease the current focus on design of systems. Organisations does not design a standard system, they buy it. This means that many large organisations will be in possession of basically the same technology. Thus, IT-use will most probably become an important source in the development of business processes. It is through use organisations can gain competitive advantages (Dahlbom & Janlert, 1995).

6. Concluding Remarks

One of the basic arguments in this paper is that the relation between IT and business processes in IT-dependent organisations of type-2 is shaped by many, sometimes opposing, factors and forces. On the one hand the systems in themselves push towards unifying of use, but on the other hand IT-bricolage pushes towards unique abbreviations from standard use. Following that argument, it becomes of great interest to investigate to what extent a standardised way to use, and make use of, enterprise systems can be implemented (or perhaps evolve), and to what

extent deviations in the use of these systems occur.

We do not believe that it is possible to find a recipe resolving or removing conflicts between the different factors and forces. These conflicts are in some respects inherent in the relationship, and they are occasionally initial points in radical business improvements. Instead, we believe that what should be done is to generate knowledge that can be transformed into applicable organisational forms for managing the relation between IT and business processes. That is, ways of organising that support organisations in creating and sustaining a beneficial relation between IT and business processes. These forms will be based on knowledge of IT-use and IT-bricolage, and they should be of interest to all organisations with an IT-dependency of type-2. We also believe that organisational forms of this kind can offer new opportunities to conduct business development. The general significance of doing this is that it contributes to organisations' ability and preparedness to face the emerging challenges posed by growing IT-dependency.

7. Acknowledgements

We would like to thank NUTEK (The Governmental Board of Industrial and Technical Development) for financially supporting the research project discussed in this paper (project no. P12917-1).

8. References

- Bansler, J. (1990). *Systemutveckling: Teori och historia i skandinaviskt perspektiv*. Lund: Studentlitteratur.
- Bowers, J., Button, G. & Sharrock, W. (1995). Workflow from Within and Without: Technology and Cooperative Work on the Print Industry Shopfloor. In H. Marmolin, Y. Sundblad & K. Schmidt (Eds.), *Proceedings of the Fourth European Conference on Computer-Supported Cooperative Work* (pp.). Stockholm: The Royal Institute of Technology, Department of Numerical Analysis and Computing Science.
- Ciborra, C. (1996). Introduction: What does Groupware Mean for the Organizations Hosting it? In C. Ciborra (Ed.), *Groupware and Teamwork: Invisible Aid or Technical Hindrance?* (pp. 1-19). Chichester: John Wiley & Sons.
- Ciborra, C. (1997). De Profundis? Deconstructing the Concept of Strategic Alignment. *Scandinavian Journal of Information Systems*, 9 (1), 67-82.
- Ciborra, C. & Hanseth, O. (1998a). Towards a Contingency View of Infrastructure & Knowledge: An Exploratory Study. In R. Hirschheim, M. Newman, & J. I. DeGross (Eds.), *Proceedings from 19th Annual International Conference on Information Systems* (pp. 263-272). Helsinki: Finland.
- Ciborra, C. & Hanseth, O. (1998b). From Tools to Gestell. Agendas for Managing Information Infrastructures. *Information Technology & People*, 11 (4), 305 – 327.
- Ciborra, C. & Lanzara, G. (1990). Designing Dynamic Artifacts: Computer Systems as Formative Contexts. In P. Gagliardi (Ed.), *Symbols and Artifacts: Views of the Corporate Landscape* (pp. 147-165). Berlin: Walter de Gruyter.
- Ciborra, C. & Lanzara, G. (1994). Formative Contexts and Information Technology: Understanding the Dynamics of Innovation in Organisations. *Accounting, Management & Information Technology*, 4 (2), 61-86.
- Cordella, A. & Simon, K. A. (1999). *Infrastructure Deployment: Global Intent and Local*

- Adoption*. Göteborg: Victoria Research Institute.
- Copeland D.G. & McKenney, J.L. (1988). Airline Reservation Systems: Lessons From History, *MIS Quarterly*, September 1988, 353-370.
- Davenport, T. H. (1998). Putting the Enterprise into the Enterprise System, *Harvard Business Review*, July-August, 121-131.
- Hanseth, O. & Braa, K. (1998). Technology as Traitor. SAP infrastructures in Global Organizations. In R. Hirschheim, M. Newman, & J. I. DeGross (Eds.), *Proceedings from 19th Annual International Conference on Information Systems* (pp. 188-196). Helsinki: Finland.
- Hopper, M. D. (1990). Rattling SABRE – New Ways to Compete on Information, *Harvard Business Review*, May-June, 118-125.
- Levén, P., & Forsgren, O. (1996). MIT-mäthandbok. In L. Albinsson & O. Forsgren (Eds.), *MIT-boken: Hur lyckas med en marknadsorienterad IT* (pp. 88-121). Stockholm: NUTEK.
- Lévi-Strauss, C. (1966). *The Savage Mind*. Chicago: The University of Chicago Press.
- Orlikowski, W. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organisation Science*, 3 (3), 398-427.
- Rolland, K. (1999). Information Infrastructure Transition: Challenges with implementing standardised checklists. In T. Käkela (ed.), *Proceedings from the 22nd Information Systems Research in Scandinavia*. Jyväskylä: University of Jyväskylä, Department of Computer Science and Information Systems.
- Söderström, M. & Nordström, T. (1999). A Careful Cultivation of the IS Change Process. In J. Pries-Heje, C. Ciborra, K. Kautz, J. Valor, E. Christiaanse, D. Avison, & C. Heje (Eds.), *Proceedings of the Seventh European Conference on Information Systems* (pp. 679-691). Copenhagen: Copenhagen Business School, Department of Informatics.
- Söderström, M., Nordström, T. & Hanseth, O. (2000). *IT-dependency in Organisations – A Report from a Preliminary Study*. Umeå: Umeå University, Department of Informatics.