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# Developing a Framework for Examining Systems Development and its Environmental Context: The Relationship Between Giddens' Structuration Theory and Pettigrew's Contextualist Analysis

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## Abstract

*Giddens' structuration theory and Pettigrew's contextual analysis have both been influential frameworks for examining the close relationship between information systems initiatives and their organisational environment. Here the relationship between these two theories is examined and it will be argued that they are largely, but not wholly equitable. This comparison has important implications for how the process of systems development can and should be perceived.*

The process of systems development and implementation in organisations is an area of great concern but there are few good models of process (Walsham 1993, Saberwal and Robey 1995). Understanding this process of change requires a close examination of the relationship between the process, context and content of changes (Pettigrew 1985). The close and intertwined nature of the relationship between systems development projects and their organisational environment has been widely considered (eg Kling 1987, Orlikowski 1988, Truex 1993). Giddens' structuration theory and Pettigrew's contextual analysis both provide useful and sophisticated conceptual frameworks for examining these issues. Here the relationship between these two influential theories is examined. This comparison suggests an appropriate approach for developing a multi-level model of the process of systems development.

The normative literature on systems development emphasises the need to understand the "problem situation" before designing an information system. Analysis techniques to aid this, such as Checkland and Scholes' (1990) Soft Systems Methodology, can be sophisticated and well-suited to this purpose, but they do not indicate how the context not only influences systems development at the beginning of the process, but throughout it. Generally in systems development projects further changes required are managed through change control procedures and will result in a new systems development lifecycle when the system becomes obsolete and difficult to further "maintain".

Truex (1993) suggested that this approach is based on the assumption that the organisational context of systems development is made up of stable structures and criticises it for not recognising that organisations are emergent systems. That is, social systems do not follow fixed patterns, but are continually being recreated and never obtain a stable state. This emergent nature of change in organisations has been extensively addressed by authors such as Barley and Orlikowski. Focusing on the processes of institutionalisation and structuration, Barley and Tolbert (1997) examined the links between action and institutional elements. In essence, they illustrated structuration in action over time, as organisations change by describing the recursive relationship between these two elements. On the same topic at an empirical level, Orlikowski (1996, Orlikowski and Hofman 1997) illustrated how the implementation and improvement of groupware technology in a large software company involved a number of organisational transformations over time. These changes occurred at both the institutional level and the level of everyday actions and changes in each were influenced by and had an influence on the other. By describing the closely intertwined nature of the relationship between organisational structures, they have also illustrated the close relationship between the process and content of change. In Orlikowski's terms, the transformations were situated in their context.

These studies illustrate the very close relationship between the context and the content and process of change (Pettigrew 1985), and the intertwined nature of institutional elements and the actions of those involved (Giddens 1989). Walsham (1993) equates Pettigrew's definition of context with Giddens' concept of structure, and Pettigrew's process with Giddens' concept of human actions (p 69). Here we examine this in more detail and conclude that while context is equitable with structure broadly, human action is only partially equitable with process. This observation will have important implications for how the process of systems planning, development and implementation should be viewed.

The relationship between changes in information technology and the organisational structures in which such changes take place is widely considered to be a crucial issue and has been the focus for much research in this area (eg Borum and Christianssen 1993; Allen and Hauptman 1994). The inclusion of "structure" in both the MIT90's model and its predecessor, the Leavitt diamond (Keen 1981, Scott Morton 1991), and the popularity of such models reflects the perceived importance of the concept.

Unfortunately, though, the term "structure" is often not well defined and is open to multiple interpretations (Barley 1990). Here structure is defined as anything which structures human actions, recognising that structure exists in a dualistic relationship

with the human actions which create, enforce and transform it. This definition aligns with Giddens' conception of structure. For him, structure theoretically refers to the rules and resources which exist as memory traces only manifested when used in social action and interaction (Walsham 1993). In Giddens' own terms it is "...the rules and resources recursively drawn upon and reconstituted in processes of interaction" (Giddens 1989: p253).

...structure is what gives *form* and *shape* to social life, but is not in *itself* that form and shape - nor should 'give' be understood in an active sense here, because structures only exist in and through the activities of human agents (Giddens 1989: p 256).

For Giddens, structure both enables and constrains human actions, though not exhaustively due to the unintended consequences and unacknowledged conditions of actions.

As structure is a product of human interactions, and human interactions are highly variable, structures are correspondingly changeable as they are continually recreated. Reflections of formal structures, such as hierarchies, models of work processes or assessments of organisational culture are thus only manifestations of structures, interpreted at a given point in time. Yet human interactions are largely shaped by the structures in which they take place, and so there is some "sedimentation of institutional forms" (Giddens 1979). Giddens calls these sedimentations "systems", which he defines as "Reproduced relations between actors and collectivities, organised as regular social practices" (p 66).

Contextual issues are interrelated with the actions of the systems developers and users as they create the new system. These issues provide meaning and boundaries to their actions, in a sense providing a structure in which their actions could take place. At the same time, these contextual, or structural issues are partly reshaped via the actions of developing the new system. Thus the process of systems development can essentially be described as a process of structuration. Stated another way, the context of an organisation forms the structure for defining people's actions as systems developers have to create a system which is deeply embedded in their organisation. Yet at the same time, the actions of those creating the system helped change these contextual elements. This illustrates that the structure of organisations is created via the actions of those involved while these actions are largely shaped by the context, or structures in which they occur. Hence, information systems development provides a very good example of the duality of structure and action (Orlikowski and Robey 1991).

Hence the context of information systems development is equitable with the institutional properties which structure people's actions. The difference between context and structure is that the former impacts on the systems development process while structure shapes the actions of individuals. However, since systems development consists of human actions and the context of the process largely structures these actions, there is very little difference between the two concepts in practice, so illustrating the difficulty of using the concept of structure as an element of the organisational context.

Yet is the conception of process equitable with Giddens' conception of action as Walsham argues? For Walsham, process refers to social interactions occurring over time. However, Giddens argued there are three forms of temporality:

- the *durée* of activity, or the ongoing flow of everyday life;
- the *dasien*, or the lifecycle of the organism, and;
- the *longue durée*, or institutional time and the development of social institutions (Giddens 1979).

Walsham's conception of processes over time focuses on the first form of temporality particularly well by illustrating the importance of social interactions, a point often ignored by the literature on systems development. While systems development can be usefully viewed as a process of social interaction, Giddens' identification of the three forms of temporality suggests *only* focusing on this micro-level is not a full analysis of the process. As Pettigrew (1995) suggested, a contextualist analysis should include multiple levels of analysis. The same can be said of a process model — it should include multiple levels of analysis, such as the three levels of analysis suggested by Giddens.

This paper describes part of a larger study investigating these micro, macro and institutional processes through an ethnographic study of systems development and the close linkages between the different levels. This study focuses not only on what Giddens' terms the *durée* of micro-level everyday social activity, but the *dasien* and *longue durée* or macro and institutional processes of change in organisations. In less theoretical terms, this involves a focus on the macro models of process used in systems development, such as the systems development lifecycle model, rapid applications development and so forth, and the micro-social processes through which such macro processes are enacted on a day-to-day level, such as passive and active user involvement, the negotiation of meaning and interest, the creation and sustainment of coalitions of meaning and interest and the application of expertise and authority. At an institutional level, it is closely tied with Giddens' structuration theory.

## Conclusions

To recapitulate, many normative texts are criticised for not considering contextual factors. However, writers such as Kling (1992) have illustrated the importance of such issues and a consideration of the context models available suggests that how we perceive the context of systems development will significantly impact on how we view the process. Due to the emergent nature of the organisational context, there is an ongoing relationship of influence between the context, process and content of change. A comparison between Pettigrew and Walsham's concepts of context and process and Giddens' concepts of structure and action suggests, while context and structure are broadly equitable, the concepts of process and action are only partially so. Thus, while Walsham's process model usefully identifies the social interactions which make up systems development, it does not consider the broader processes of development operating according to Giddens' conceptions of *dasien* and *longue durée*. These different

levels and the relationships between them need to be examined if we are to gain an adequate insight into the process of systems development in organisations. This is achieved as part of the larger research project this paper introduces and further details can be obtained from the author.

There is overwhelming evidence that most information systems development failures are non-technical and there is a recognised need for models of the change process which both reflect the actual situation and are useful normatively (Hirschheim and Newman 1991, Buchanan and Boddy 1992, Clegg 1996). In essence, while system development projects have become associated with increasingly sophisticated technologies and organisational changes, the models underlying the process have not kept pace and are simplistic. This project adds to a growing body of literature providing a richer insight into an integral part of systems development.

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