THE ONTOLOGY/EPISTEMOLOGY DICHOTOMY IN INFORMATION SYSTEMS DEVELOPMENT

An Ethnographic Contribution

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ABSTRACT

Contemporary development methodologies take a 'hard' reductionist view of 'the system' and are unable to model the rich gamut of human and organisational complexity adequately. Conversely 'soft' methodologies are unable to tackle technical problems satisfactorily. To date, attempts to join the 'hard' and 'soft' approaches have been largely unsuccessful, due to the seemingly mutually exclusive underpinning philosophies of the two approaches. This paper proposes a way of bridging the hard/soft dichotomy through incorporating organisational culture analysis into the systems development process. A cultural meta-model is proposed as a means of ensuring the delivered system is culturally acceptable to the organisation, thereby encouraging system ownership and use by stakeholders.

1. ONTOLOGICAL PERSPECTIVES OF INFORMATION SYSTEM

From an organisational perspective, 'systems thinking' dates back to the late 1950s or early 1960s, e.g. Churchman et al. (1957), Emery & Trist (1960), or Katz & Kahn (1966). This period also saw the dawn of the commercial use of computers. During this time, many different approaches were developed under the 'systems' umbrella. The three most influential variants, collectively known as 'hard' systems approaches, being:

1. Systems analysis
2. Systems engineering
3. Operational research
These three disciplines have a number of elements in common, not least of which is a mechanised approach to problem solving, i.e., the ‘system’ is treated from an ontological stance. The above ‘hard’ systems approaches possess another common element. In each case a systematic means of finding a solution to a problem is assumed. In fact, it is usually the case in organisations, and indeed in society in general, that problems are not soluble. In my opinion, at a fundamental level, a systematic approach to enquiring into systems is generally too restrictive. The word systematic is defined in the Concise Oxford Dictionary (1990, p. 1238) as:

“Methodical; done or conceived according to a plan or system.”

Thus, a systematic approach assumes we know what the system is. If indeed the system is clear, and the problem is obvious, then taking a hard systems approach to developing an IS may be appropriate. However, assuming that the system is clear and the problem is obvious is often a fundamental error and has led to many system failures. See, for example, Lyytinen & Hirschheim (1987) who report 50% of all IS as failures; Sauer (1993) who gives a similar figure; Höchstrasser & Griffiths (1991) who put the figure as high as 70%, or Willcocks & Lester (1993) who also suggest a 70% failure rate. Whilst not all of the preceding references necessarily relate to failure to meet the needs of stakeholders, or failure to achieve organisational goals, it is clear from reading these publications that many system failures are due to non-technical issues. Indeed, Doherty & King (1997) postulate that it is primarily organisational issues that lead to computer system failures. They cite several studies, even as early as Lucas (1975) in support of this argument.

Systems Analysis is first described by Hitch (1955), with the following elements:

1. An objective(s) to be accomplished
2. Alternative techniques for accomplishing the objective
3. The resources required by each system
4. A mathematical model(s) showing the interdependence of the objectives, resources and environment
5. A criterion for choosing the optimal or preferred alternative

Although the labels have changed and the sections have been expanded to incorporate new elements as the discipline of information systems (IS) has evolved, essentially the popular methodologies of the 1990s, e.g. Structured Systems Analysis & Design Methodology (SSADM), Information Engineering (IE), Jackson System Design (JSD), Yourdon, etc., are built in the same tradition as Hitch. For example, how often do we hear analysts say things like, “I’ve drawn the entity model of the system”? The problem with this approach is that it assumes the whole of the real world can be enquired into using tools only appropriate for the ‘hard’ sciences. It treats the system from an ontological perspective, and takes a reductionist approach to enquiring into the system, by breaking the situation down into smaller chunks. Jayaratna (1991, p. 61) suggests that:

“Information systems development can be thought of as a problem solving process, which can be considered to have a:

- Problem formulation phase
- Solution design phase
- Design implementation phase”

As Jayaratna points out, structured methodologies are strong in the solution design phase. But, surely this is not the most important phase. The problem formulation has to be the most important. For until an appreciation of the understanding of the situation exists,