Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 1996 Proceedings

Americas Conference on Information Systems (AMCIS)

8-16-1996

Will Information Systems Continue To Disappoint?

Panagiotis Kanellis
Brunel University, panagiotis.kanellis@brunel.ac.uk

Ray J. Paul
Brunel University, ray.paul@brunel.ac.uk

Will Information Systems Continue To Disappoint?

Panagiotis Kanellis and Ray J. Paul

Centre for Living Information Systems Thinking

Department of Computer Science and Information Systems at St.John's

Brunel University

Uxbridge, Middlesex UB8 3PH

United Kingdom

Email: Panagiotis.Kanellis@brunel.ac.uk

Ray.Paul@brunel.ac.uk

Introduction

Having interviewed several senior managers considering major investments in systems development, Rockart & Hofman (1992) found the dominant perception regarding the future as one "...which ongoing change, both external and internal, will have to be managed to continually." Organizations are dynamic entities. Thus, it is conjectured in this abstract that as IS will be judged against not static but highly dynamic goals, our objective should be to find better ways of thinking about change and IS adaptation (Kanellis & Paul, 1995). In the first section, we argue as to why this is the case. Next, we consider the concept of 'fit' and its measurement, as the central theme of an epistemological approach towards the realization of the above objective. Its nature, possibilities, and limits are addressed, whilst the final two sections describe briefly its further development and practical application in an organization through action research.

A View On Information Systems Failure

Trying to explain IS failure is a formidable task, as is evidenced by the works of Lucas, (1975); Markus, (1983); DeLone & McLean, (1992); and Sauer, (1993). We adhere to Lyytinen & Hirschheim's (1987) conceptualization as one of perception - "...the embodiment of a perceived situation." IS are systems characterized by the fluidity and interpenetration of their social and technological contexts. At a micro level, the user is faced with a number of information sources (Land, 1992), namely the real world, the formal IS and the informal IS. The use of those depends upon a number of factors such as cognitive style, whilst their operations are often rooted in the user's education and experience in parallel with specific contextual factors. At a macro level, the complexity of the picture is augmented by circuits of power, meaning and design (Scarborough & Corbett, 1992) - forces that shape the technology-organization relationship at the nexus with the external environment. If we agree on the purpose of an IS as being to satisfy the

informational requirements of the user, the route to information is a function of perception and subsequent interpretation depending upon a 'pick and mix' of all the above. This is a dynamic process with the user's concerns changing constantly, affected by the environment. IS do have a pre-determined 'identity' because we impose it by stating the properties we think they should exhibit, and translating them into requirements definitions. The outcome is static artefacts designed to meet some informational requirements at a fixed point in time, thus failing to allow for any shifts in the business case. This results in 'misfit failure' - the inability to meet the information needs of an organization operating in a dynamic mode. As these needs dictate the system objectives - if the system is built to an exact 'identity' specification - the unavoidable inability to meet them as they will with no doubt change, results in 'internal failure'. Unless we address change and its implications, IS will continue to disappoint. IS should be developing their identities themselves, having been brought in existence as 'infants' with the ability to grow and adapt, rather than as 'set-in-their-views' adults. Systems however are already in place and we concentrate on those, proposing an approach that in a given context, induces awareness to the effects of change upon an IS, enables the practitioner to make connected statements that are epistemologically valid, and activate self-correcting action.

Measuring The Fit Of Information Systems

Positivism has dominated the IS field. Hirschheim (1992) notes that this 'value free' position exhibits naivety because knowledge cannot be developed independently of the social context that may hold it. Trying to establish meaning, we bring our own interpretive skills and some form of pre-understanding, emotion or prejudice. In order to understand, we differentiate and present facts in a sequence of importance and not rationally or laterally - a subjective process itself. No knowledge thus is absolute or infallible, and we adopt an interpretivistic position where it can only be judged as more or less 'useful', rather than true or false (Walsham, 1993). Not forgetting the applied nature of IS, we judge this 'usefulness' by its ability to generate expectations that are actually realized, and intersubjectively intelligible and acceptable [practical adequacy] (Sayer, 1984). Our focus, the concept of 'fit', almost single-handedly defines contingency theory which argues that "it all depends" (Mintzberg, 1991). Weill and Olson (1989) have rejected this approach and our attempt steers clear of their criticisms, based on the above epistemological position and on the premise that "..theories make their strongest claims at the abstract level about necessary or internal relations and about causal powers, or in other words about necessity in the world" [Sayer, (1984) - see reference for a full discussion]. Central to this is the concept of structures - sets of internally related objects or practices which can be said to be invariant under certain transformations. We determined the structure representing the relation between IS and environment by considering that (a) information is gradually becoming a production factor of more and more importance (Oei et al., 1994) and (b) information processing requirements are expanding (Child, 1987). The nature of such a relation is predicated by the prominence of information and its ability to keep its value and essence constant through time. Thus it is conjectured, that the fit of an IS should be measured along three dimensional anchors(processes) defined by and dependent on information - Decision Making (Huber & McDaniel (1986), Innovation, and Information Acquisition and Distribution (Huber,

1984). It should be remembered however, that any such attempt is bound very firmly to the measurement of perception. Because of this, fit is thought of here to best conform with consonance which is defined as agreement, harmony or accord. This is not seen as absolute (or right/correct), and is best conceptualized in terms of a bound of disappointment. Hence, consonance cannot be measured in absolute fashion, but rather by determining the perceived disagreement, disharmony or discord and plot the actual level of satisfaction against this.

From Conceptualization To Practical Application

To cover the criteria for practical adequacy, we opted for an approach where both the IS stakeholder and the researcher are involved in an interactive communication process projecting an interpretation of the situation and process within which they are involved. A large and devolved electricity generation company in the UK provided the setting for action research (Checkland, 1981; Gummesson, 1991) by one of the authors, involved actively in a project regarding IS adaptation as a member of the IT Strategy & Planning Unit. The company's IS were put in place six years ago. After considering the deregulation and subsequent privatization of the market since then, there was an anxiety to know how the systems fared and identify any possible misfit. In the initial phase, seventeen semi-structured interviews were conducted with senior unit managers to identify the prevalent perceptions regarding the systems and to find how they think and would approach an attempt to measure the fit. This phase culminated in a unanimous and unconditional acceptance of the dimensional anchors as determinants of the IS fit. It was decided that the factors requiring measurement be defined as (a) the perception of their validity by the users themselves and (b) the perception of pertinent aspects of each anchor upon which a bound of disappointment could be constructed. To elicit this information, a questionnaire was designed. The content was based on the works of Huber (1984), Huber & McDaniel (1986) and Hickson et al. (1986) for Decision Making and Information Acquisition and Distribution, and on Porter & Millar (1991) and Swanson (1994), for Innovation. For a particular IS, the questionnaire was administered to three company sites for the purpose of obtaining triangulated data (Jick, 1979; Patton, 1990), and distributed to the users by hand. Questions were prepared in the form of positive statements requiring agreement or disagreement in the form of a five point Likert type scale, each reinforced by a dichotomised question regarding the adequacy of the IS in that respect. The purpose of this was to ascertain if a relationship existed between these two variables - crucial to the construction of a bound of disappointment. Three items were established: (a) the current level of satisfaction - percentage of users who are totally satisfied with the IS ; (b) the relative level of disappointment - equates to the cut-off point whose lower range fails to satisfy most users; and (c) the absolute level of disappointment - a constant that equates to the minimum level of satisfaction level that an organization might expect an IS to provide.

The 'Map' Is Not The Territory'

Whereas initial reactions to the construct and results from unit managers and IS developers alike have been more than positive, the question "Now, tell me what to do

with them!' persisted. As researchers, let us offer our view of this, which in trying to offer an 'answer' begins by addressing what one could argue to be the construct's limitations. The first has to do with temporal dimensions, the other with accuracy. Their relationship is of importance. The bound of disappointment only tells us how respondents perceive an IS at a particular point in time - a static representation of a changing world. Present fit or misfit cannot be taken as evidence for a 'kept' or 'lost' identity as there may be a delayed reaction (Veryard, 1994). To claim accuracy, is to claim that one can define and project the complete reality sans any abstractions. This is not possible, as in our attempts to make sense of a chaotic world, we need clear definitions. To get to such, we reduce complexity by abstracting and isolating in thought partial aspects of the whole [see Hoebecke, 1990]. These arguments could render any measurement attempt in a socio-economic environment a perilous exercise. However, a consideration of Korzybski's (1958) famous epigram "The Map is not the Territory", can prove this to be a premature conclusion. Weick (1990) reminds us that we live in two worlds - the world of events and things (the territory) and the world of words about events and things (the map). Consider the bound of disappointment as a map. The question is 'How accurately does it depict the territory - the IS?' and if we assume it does - 'Can a snapshot in time possibly be dynamic?' By definition it cannot. So this abstraction of reality that the results project will not be the same tomorrow. Weick's argument is that the way things are done in the loosely-coupled organizational settings of today, overlayed by inertia, ambiguity, and overload, renders accuracy insignificant. Thus a map should not be judged by its level of accuracy but rather on its strength to help people differentiate, and make comparisons with what they already know. In other words, engage them in an adaptive process. Maps are tied with action which generates movement. It is this movement and continuous adaptation that results in the map becoming the territory. In order to facilitate such a process, so that the IS stakeholders will be consciously willing and elastic in altering this map to fit new realities as they emerge influencing the territory [the IS], we are using the measurement results to construct and administer Repertory Grids (Kelly, 1955; Stewart and Stewart, 1981). By picking two company sites where the IS is perceived as having a 'low fit' and a third site where it has a 'high fit', we probe the respondent to think of the ways and the reasons that the two are similar and thereby different from the third. Thus, we elicit the properties of the IS and the reasons that have played/are playing a role in averting/causing misfit failure. In essence, this is a learning process that enables the stakeholders to question their own ontologies and epistemologies regarding the design of IS and alter their maps accordingly.

Conclusion

We are aware of the methodological limitations of our approach, and of questions regarding its applicability to different environments or the validation of the measurement instrument itself. We are currently addressing those. However, we believe that its essence lies in fostering a proactiveness towards the design of future IS as artefacts designed to be adaptive at the first place. Initial results and observations are proving to be encouraging. As Weick (1990) stated: "You have to know something already in order to 'see' something different." We hope that we have set the necessary first steps in providing an archetype for doing so.

Acknowledgements

Many thanks are due to Mark Lycett for his contribution to this study as part of his MSc dissertation under the supervision of the authors.

References

This is a partial reference list. The full list is available upon request from Panagiotis Kanellis.

Hirschheim, R. (1992) Information Systems Epistemology: a Historical Perspective. In Information Systems Research: Issues, Methods and Practical Guidelines. Galliers, R.D., (Ed.). Blackwell Scientific, London.

Huber, G.P. (1984) The Nature and Design of Post-Industrial Organizations. Management Science 30, 8, pp. 928-951.

Huber, G.P. and McDaniel, R.R. (1986) The Decision Making Paradigm of Organizational Design. Management Science 32, 5, pp. 572-589.

Kanellis, P. and Paul, R.J. (1995) Towards an Epistemological Framework for Measuring the Fit of Information Systems Under Perpetual Change. In Proceedings of the Inaugural Americas Conference on Information Systems, Pittsburgh, PA, August 25-27, pp. 316-318.

Land, F.F. (1992) The Information Systems Domain. In Information Systems Research: Issues, Methods and Practical Guidelines. Galliers, R.D., (Ed.). Blackwell Scientific, Oxford.

Lyytinen, K. and Hirschheim, R. (1987) Information Systems Failures: a Survey and Classification of the Empirical Literature. Oxford Surveys in Information Technology 4, pp. 257-309.

Rockart, J.F. and Hofman, D.J. (1992) Systems Delivery: Evolving New Strategies. Sloan Management Review Summer, pp. 21-31.

Scarborough, H. and Corbett, J.M. (1992) Technology and Organization: Power, Meaning and Design. Routlege, London.

Sayer, A. (1984) Method in Social Science: A Realist Approach. Hutchinson & Co., London.

Stewart, V. and Stewart, A. (1981) Business Applications of the Repertory Grid. McGraw Hill, London.

Swanson, E.B. (1994) Information Systems Innovation Among Organizations. Management Science 40, 9, pp. 1069-1072.

Veryard, R.V. (1994) The Epistemology of Change. Working Paper, Texas Instruments Information Engineering, London.

Walsham, G. (1993) Interpreting Information Systems in Organizations. Wiley, Chichester, UK.

Weill, K.E. and Olson, M.H. (1989) An Assessment of the Contingency Theory of Management Information Systems. Journal of Management Information Systems 6, 1, pp. 59-85.

Weick, K.E. (1990) Cartographic Myths in Organizations. In Mapping Strategic Thought. Huff, A.S., (Ed.). Wiley, Chichester, UK.