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CHALLENGES TO SUCCESSFUL ERP USE [RESEARCH IN PROGRESS]

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ABSTRACT

Enterprise Resource Planning (ERP) packages have, in the last five years, transformed the way organisations go about the process of providing Information Systems. Instead of crafting each new Information System locally, organisations are able to install well-integrated, internationally sourced packages which seek to incorporate best practice from IT systems world-wide. These packages also provide very rich choice in features and functions so that the adopting organisation can tailor the package implementation to meet their very specific needs. However, the enormous growth rate in ERP adoption has slowed. It is apparent that some adopters are not yet realising the benefits that they had anticipated. Efforts to make ERP packages successful in small to medium enterprises, in particular, are facing challenges. This paper reports on case study research involving some adopters of the ERP package, SAP. The research uses an ERP Success Model based on a framework developed to explain success in the adoption of CASE packages. Results to date support the value of this model. In particular, it points to the usefulness of the Task-Technology Fit (TTF) construct as an indicator of ERP success.

1. PURPOSE OF THE RESEARCH

1.1. The ERP Concept

Enterprise Resource Planning (ERP) has its origins in the concepts associated with Manufacturing Resource Planning (MRP) packages and their antecedents from the 1970s, Materials Requirement Planning packages. Some argue (Davenport, 2000) that the evolution of ERP software has been such as to make the analogy with MRP inappropriate. In this spirit, there have been moves to replace the term ERP with EWS (Enterprise Wide Systems) or just ES (Enterprise Systems). Although there is some difficulty in agreeing upon a definition of ERP (Klaus et al, 2000), there are certain features that can be seen to characterise ERP packages. These key features (Bancroft et al., 1998) are present in the German package, SAP R/3, the package installed by the organisations investigated in this study.

A fundamental feature of the package is a high level of integration, with all applications sharing a single corporate database. The system is designed for an on-line client/server environment. A high level of

application functionality, richly configurable to the needs of the individual customer is an important objective embedded in the package. The package is also intended to provide best practice, in a global sense, through a range of standardised business processes.

1.2. Obstacles to Further Expansion

The commercial penetration of ERP is incontrovertible. It was recently claimed (Klaus et al., 2000) that "most very large organisations world-wide have already adopted ERP, and increasingly small- and medium-sized enterprises (SMEs) too are finding it cost effective and a competitive necessity to follow suit." Certainly, the statistics and projections would support statements of this sort. Gartner Group (Gartner Group, 1999) forecast that the ERP market would grow by 2002 to more than US$20 billion, about half of this from license revenue and the other half from service revenue.

However, this global success is facing challenges. Some implementers of ERP have failed to achieve the expected benefits while others have abandoned ERP implementations or reduced their scale (Al-Mashari et al., 2000; Scott, 1999). In large part, these disappointments have been attributed to the great size and complexity of the packages and the associated problems in customisation and organisational change.

Others have noted (Soh et al., 2000) that ERP implementers outside Europe and North America can also experience problems arising from what have been called "cultural misfits". These cultural misfits relate to the inability of the global packages, in spite of their enormous functional flexibility, to readily address specific functional needs associated with the local laws and local practices. In such cases, workarounds in the form of add-on modules have been more common than changes to the package source code, presumably because these less populous counties do not justify suppliers changing the packages. A by-product of this approach is increased maintenance costs for the organisations involved, since upgrades of an ERP package may not interface properly with the add-on module and, worse still, the mismatches may not be detected until after the package has been customised and put into operation. Again, the risk of introducing software bugs is increased by this "bolt on" approach.

1.3. Objectives Sought

The theoretical advantages in the ERP concept are strong. There are many examples of organisations that appear to have gained substantial benefit from the rich functionality, the strong integration of application data and the opportunity to incorporate best practice models to improve business processes. However, the picture is spoiled by reports of organisations failing to achieve any of these benefits from ERP. This research, then, seeks to understand and explain ERP success through a process of empirical fact finding and analysis, supported by critical evaluation of established theory in related areas. In particular, it draws on a framework found useful in explaining success in the implementation and use of Computer Aided Software Engineering (CASE) packages. This framework, in turn, had its foundations in established theory from information system implementation and innovation adoption.

2. THE RESEARCH METHOD

This research is being conducted using the case study approach. The case study is valued as a research method for its capacity to examine a phenomenon in its real-life context (Benbasat et al, 1987). A great strength of this method is its facility for retaining and exploiting the "richness" of a situation. Because of the suitability of the case study to deal with poorly structured, lightly researched problem domains, it has been judged as well suited to the exploratory phase of an investigation. However, the case study can be shown (Yin, 1994) to be well suited to descriptive and explanatory research as well. In this investigation of ERP success, the case study method is used for exploration, for description, and for the testing of theory.

The study sites are, or have been, users of the ERP package, SAP R/3. SAP is, world-wide, the most widely installed ERP package. Apart from SAP, the other main vendors in the world market are Baan, J. D.

Edwards, Oracle and PeopleSoft. By restricting case study sites to acquirers of a single ERP package, it is intended to limit one of the major potential sources of variances in ERP success across organisations, the ERP software itself.

The first case study has been conducted at the Corporate Administration Agency (CAA) of the Queensland State Government, in Brisbane, Australia. CAA was established in 1997 to provide a range of corporate services for several small- to medium-sized government agencies within the Arts portfolio. These agencies were bodies such as the Queensland Museum, the Art Gallery and the State Library. This "shared services model" is also applied elsewhere within the state government. The CAA site was selected as an instance of the ERP package failing to achieve success. In an environment where use of SAP R/3 had been made mandatory for all Queensland state government departments and agencies, CAA senior staff had successfully mounted a business case arguing that they be permitted to abandon SAP use in favour of a smaller, cheaper locally developed package.

At the time of writing, data about the CAA implementation has been gathered from a number of sources. Interviews have been carried out with the CAA IT staff most closely involved in the decision to replace the SAP package. Documentation has been accessed describing the original justification for implementing SAP at CAA as well as the business case for abandoning it in favour of an alternative package. Other documentation and archival material from CAA has been acquired to assist in data triangulation. Further interviews will be conducted.

In the absence of established theory to explain ERP success factors, this research has started with a framework that had been developed, from foundations in established IS implementation theory and innovation adoption, to explain CASE success factors. The ERP Success Model has been used to guide data gathering, in particular. Yet, the nature of case study research is such that employing a guide to data gathering can provide a focus without inhibiting unnecessarily the discovery of unexpected phenomena.

A second, comparative, case study is to be carried out. This will involve another Queensland State Government agency but, this time, one that has continued to use SAP R/3, apparently successfully, for its clients. This second study will take advantage of refinement of the initial model from the study at CAA. It will also seek, through a process of pattern matching and reference to existing IS theory, to extend understanding of ERP success factors.

3. FRAMEWORK GUIDING THE STUDY

To assist in the development of a data gathering protocol, a preliminary ERP Model has been proposed, as indicated earlier in this paper. The model, shown in Figure 1, incorporates an adaptation of the Task-Technology Fit (TTF) construct described by Goodhue and Thompson (1995). Here, it describes the extent of match between the facilities provided by the ERP package, the tasks undertaken by the users of that package, and the skills and attitudes of the individual users. Goodhue (1995) has shown that user evaluation of TTF is an accurate representation of TTF. Goodhue and Thompson demonstrate that TTF is a useful indicator of IS implementation success. Perceived usefulness, what Ives and Olson (1984) call "aggregate organizational benefit", is another accepted success indicator from IS implementation theory. DeLone and McLean (1992) report user satisfaction as a further important indicator of IS implementation success. In the proposed ERP Success Model, consistent with the findings from IS implementation research, TTF, perceived usefulness and user satisfaction are shown as the three constructs that most satisfactorily indicate ERP success in an organisation. Another important aspect of the preliminary framework is the potential impact on perceived usefulness and user satisfaction of a range of organisational factors. These may include top management support, the presence of an ERP champion, organisational culture, and organisational politics. Again, there is support from IS implementation theory (e.g. Robey, 1995) for this view of the influence of a range of organisation-specific organisational factors. A major benefit of the model proposed is its capacity, in a parsimonious fashion, to incorporate coverage of a diversity of specific individual factors such as breadth of ERP implementation scope and variability of ERP implementation objectives (Bancroft et al., 1998).

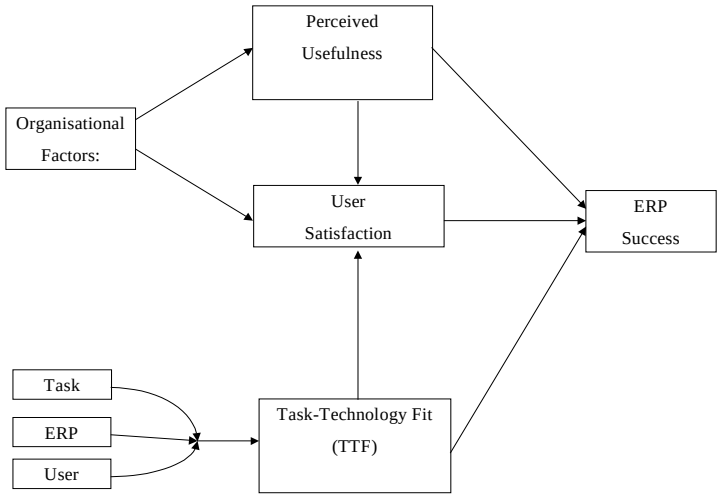

Figure 1: *ERP Success Model*

4. PRELIMINARY RESULTS

The observations drawn from the CAA case study broadly support the proposed ERP Success Model. In particular, the Task-Technology Fit concept was useful in highlighting challenges to ERP success. At CAA, TTF had been poor. Although the potential functionality of SAP had been great, CAA clients indicated that the system available to them did not meet their needs well. In part, this was attributed to the simple but distinctive needs of the agencies being poorly matched by the very large, complex package that required great skill and considerable time to configure and customise. To minimise the overhead costs in individual customisation, a decision had been made to use a single subset of the Financial module for each of the agencies. The irony is that the very richness of the ERP package was the source of the complexity that led to impoverished functionality experienced by the users. Again, the backgrounds of the users, accustomed to working with small, simple packages, also contributed to their dissatisfaction with the reporting features of SAP, which they found difficult to use. Aspects of what Soh (2000) called “cultural misfits” were also evident. Some features of the government cash accounting could not be accommodated. The belief of CAA was that the insignificance of these local needs relative to the global focus of the ERP meant that there was negligible likelihood that these purely local requirements would be added to the package. By contrast, the vendors of the smaller local package selected to replace SAP at CAA had been very responsive to incorporating these local requirements.

Clearly, the poor TTF contributed to a low level of User Satisfaction, while the poor TTF and low user satisfaction each contributed to the lack of success of the ERP package. The gross measure of lack of success was the abandonment of its use at CAA.

A significant organisational factor impacting perceived usefulness and user satisfaction was the externally imposed system for billing agencies for regular SAP processing. Based on a bureau approach using the government computer centre, CAA and its client agencies felt that the heavy overheads in using a large, expensive package for relatively simple applications and small volumes of transactions made a potentially expensive solution even more expensive for them. So, these factors also can be seen to have contributed to the decision to abandon SAP use at CAA.

5. IMPLICATIONS FOR RESEARCH AND PRACTICE

For Information Systems Managers, the research in progress has important implications. Because the ERP Success Model that results at the end of the research project will be developed out of real-world empirical

data, it should be generalisable to other real-world situations. The IS Manager can, for instance, apply Task-Technology Fit concepts to consider a "panel" approach to packages in large and diverse organisations where there are variations in size of entities in the organisation, features of users and processing needs. In such instances, the ERP package could be available to those entities where the fit is good, and a smaller, local package for others.

For ERP vendors eager to move into the SME market, the study also has implications. The overwhelming challenge for the vendors is to be able to offer software incorporating the best from around the world, yet minimise the complexity that can result in bad fit with the experiences and attitudes of users from smaller enterprises. Likewise, means need to be found to be responsive to local requirements associated with customs and practices in the less populous markets.

For other researchers, the rigour of the comparative case study method applied and the influence on the model of sound theory from related fields should make the ERP Success Model worthy of further testing.

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