

very detailed set of forms on the Web. The data are entered into a database which is searchable by employers.

Research on job matching needs to address the problem of poor quality query responses from standard databases. This arises when, for example, a prospective employee searches through a vacancy database, only to find that the large majority of the vacancies selected are not looking for a person with his or her profile. The reverse problem is that of an employer querying a candidate database who finds many people who would not be satisfied with the particular job on offer. Work in progress aims to create a matching system that radically improves the quality of query response in these cases, so that both sides of the labour market can execute more effective and efficient searches in less time.

3. THE MERSEY WORLD WEB SITE

The third major strand of CONNECT's role is more explicitly as a cybermediary in the sense identified above, as the host and co-ordinator of an integrated web site for the region. The MerseyWorld web site (<http://www.merseyworld.com/>) aims to provide a wide-ranging overview of activities in the Merseyside region, including cultural, social, educational and busi-

ness-related aspects. The part of MerseyWorld that relates most directly to electronic commerce is the "Business Park", within which more than 1000 locally-based businesses are currently represented. The majority of these are, at present, using the site principally as a medium to promote their businesses, sometimes, although not always, with an option to make contact or place orders via e-mail. A number of businesses go further in using the site as a direct trading medium. The latter, grouped under the heading "Merseymall" are provided with a framework to enable site visitors to browse a product catalogue, fill a shopping basket, and place an order, paying (if appropriate) by credit card.

As an intermediary in the electronic commerce business, MerseyWorld achieves three things:

- i. It provides an infrastructure to enable small businesses, which lack the physical, financial and human resources to run a web site of their own, to engage in Internet-based marketing. To a degree this is made possible by the existence of EU funding to promote this, but even without this subsidy, economies of scale are a factor here, and we expect the site to be financially viable even when grant-funding comes to an end.

- ii. It creates a critical mass for electronic commerce in the region. Individually, the SMEs concerned would find it difficult to establish a presence on the Internet; collectively, however, the site has a high profile (with accesses currently at a rate of 1.23M per month). This is supported by the site's mixture of business and other consumer-related information, which helps to encourage browsing of the site on a regular basis.
- iii. Through CONNECT, the site's value is augmented by a number of facilities, including placement of entries on searchable indexes, local catalogue listings, and usage statistics.

CONCLUDING REMARKS

The MerseyWorld site is, we believe, one of the most successful regional web sites with a business orientation to be found in Europe. A key aspect of its strategy for the promotion of electronic commerce is the combination of this "cybermediary" role with two other elements that we believe are essential for the development of the industry: the education and training of business personnel, and assistance in providing and placing skilled staff to enable the business to grow. A University-based centre is well-placed to provide this mixture.

SYSTEMS PLANNING IN AN ELECTRONIC COMMERCE ENVIRONMENT IN EUROPE: RETHINKING CURRENT APPROACHES

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ABSTRACT

Inter-organisational systems (IOS) to exchange structured data lie at the heart of any form of electronic commerce. Despite a number of years' experience and some well-publicised success stories, IOS remain somewhat under-researched. This has inhibited the development of planning guidelines to assist in their imple-

mentation. The research described here attempts to remedy this deficiency by investigating the nature and use of planning in IOS. Using a pluralist research method combining a survey and cases, this paper argues that IOS planning has requirements that cannot be met by pure intra-organisational systems planning processes. For more complex IOS projects

that involve greater business and technical change across a number of organisations, systems planning needs to evolve beyond a firm-centred approach to take a network perspective.

INTRODUCTION

Electronic commerce relies on inter-organisational systems (IOS). Despite realisations that inter-organisational systems are important, most research has concentrated on describing systems rather than determining how they can be successfully implemented (Swatman and Swatman, 1992). However, recent research has highlighted the importance of planning (Finnegan et al., 1997).

Planning for IOS is generally thought of as synonymous with information systems (IS) planning. Many researchers have advocated a move towards more externally-oriented IS planning processes in order to respond to the increasing importance of the external environment in systems activities (Galliers and Sutherland, 1991). Indeed, more emergent approaches to strategy formulation (e.g. Ciborra, 1994) place much emphasis on the consideration of external entities. However, the development of an inter-organisational system involves more than just heeding the external environment. As IOS become more complex and have a significant impact on organisations, it is clear that situations where one organisation develops a system and extends it to others will be unacceptable. This is especially true for systems that require alterations to business processes in order to achieve benefits from IOS. Classic inter-organisational systems, such as American Hospital Supplies (ASAP), were developed within a single organisation and extended to others. The success of such systems had as much to do with serendipity as with planning (Ciborra, 1991). Further, they tended to be simple systems that had little impact on organisational processes and technology. In order to deal with more complex systems that may have a much greater effect across a number of organisations, planning needs to be inter-organisational rather than intra-organisational. Current IS planning approaches fall short of this.

CURRENT PLANNING APPROACHES

Despite a need for IOS planning, the preferred approaches are not coherent and rather disjointed. While planning for individual technologies is somewhat documented, no coherent planning advice is available for inter-organisational systems in general. Planning guidelines for telecommunications (Premkumar and King, 1990) and EDI (Holland et al., 1990) follow IS planning approaches in recommending that partners are considered and chosen. However, the perspective is very much one of a planner in a single organisation looking outward. These recommendations as-

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sume that complexities arising on an inter-organisational basis can be reconciled within this examination. Such approaches neglect an inter-organisational perspective on systems design and development, technology management and systems integration, as well as data storage, manipulation, and sharing. In addition, explicit consideration is not given to non-technical factors such as project management and decision making which become more complex on an inter-organisational basis. This is not to say that IOS and IS planning have nothing in common. Rather, the evolution of systems on an inter-organisational basis requires a rethinking of systems planning guidelines to include an interorganisational perspective.

The IOS planning literature is largely not grounded in empirical research. This is probably due to the general immaturity of the IOS field, but empirical research is needed in the area of IOS planning. The absence of empirical data on IOS planning experiences is a problem in trying to formulate guidelines to deal with the issues identified. Evidence of the need for IOS planning is based on theoretical propositions that highlight differences between IS and IOS planning. The differences focus on structures, strategies, technical infrastructures and co-operative aspirations among IOS participants. Nevertheless, the available literature on IOS planning has a technology bias that appears to suggest that the major planning distinction between intra- and inter-organisational systems is centred around technology. Such approaches ignore planning issues unrelated to the technology. This basis for IOS planning is inappropriate as the major differences between intra- and inter-organisational systems are organisationally-based rather than technologically determined.

CURRENT RESEARCH

As argued, IOS lack solid planning foundations based on a coherent set of guidelines designed for an inter-organisational environment. The role of such guidelines is to set standards and determine a course

of action in relation to inter-organisational systems.

The current work has been ongoing since 1997, using pluralistic research methods due to its exploratory nature and the absence of previous rigorous research. The research consisted of a postal survey of 400 of the largest organisations in Ireland and the UK, followed by case studies of inter-organisational networks. The pluralistic approach is based on the argument of Pettigrew (1992), who proposes that context and action are interwoven in the study of strategy and that it is important to consider the past and present when looking to the future. Therefore, the postal survey was a 'mapping' device that would, according to Pettigrew, 'catch reality in flight', and thus contribute to the temporal interconnectedness of the process under study. The sample size allows contact with a wide variety of organisations across all industrial sectors. Larger organisations were chosen as they are more likely to have experience of inter-organisational technology and, perhaps, more advanced planning techniques. The response rate to the survey was 25%.

The second element of the pluralist method is case studies. Inter-organisational networks were chosen as case studies based on their characteristics and willingness to co-operate. Such characteristics relate to type and structure of network, type of planning experience, and technology and systems used. The study includes examination of the planning processes of partner/participant firms in the inter-organisational networks. Cases were chosen to give diversity in the nature of inter-organisational networks rather than any preconceived notion of best practice. The primary data collection methods used were interviews and document analysis.

DISCUSSION OF RESULTS

Many organisations are extending their IS capabilities externally, as shown in table 1. The importance of the technology is illustrated by 69% indicating that its unavailability for a week would cause

major disruption, while 37% indicate that they would have to cease trading if the technology was unavailable indefinitely. Planning for IOS is undertaken by 96% of those using such systems. However, the detail of this planning varies. Half conduct IOS planning as a component of IS planning, while 36% conduct it as a component of business planning. As expected, the degree to which IOS planning takes place is significantly related to the perceived importance of inter-organisational systems to the organisation, and to the extent to which business and IS planning takes place. IOS planning is generally conducted due to the co-operative nature of inter-organisational activity and the need to support this with co-operative systems. The importance of common platforms, systems, processes and information sharing is also recognised. IOS planning processes help these organisations with standardisation as well as with budgeting. Overall, the results verify the intuitive need for IOS planning that arises from inter-organisational co-operation.

Planning has a more important role to play than just identifying and prioritising systems projects. It contributes to the development of IOS systems by helping to establish co-operation as well as negotiating systems and other details within the confines of inter-organisational influence and objectives. Planning is in many ways a negotiation tool used by IOS participants to establish inter-organisational arrangements in addition to delineating systems products. Nevertheless, the study recognises that planning methods used for internal systems have much to contribute to inter-organisational efforts. However, there are several areas where these methods are inadequate and consequently, while many techniques used on an internal basis can be borrowed, it is necessary to extend them for use with inter-organisational systems.

It is clear from the study that IOS planning takes place within a planning framework that also encompasses business and IS planning. However, IOS planning is still

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in its infancy despite a mean of 5 years experience among those studied. This is evidenced by an over-reliance on traditional IS planning methods and guidelines, and the complete neglect of the development of processes explicitly designed to meet the needs of IOS planning. In essence, the existing approach to IOS planning is inappropriate as it is based on processes that are fundamentally different from those required. This can be, to some degree, explained by the relative unimportance placed on inter-organisational systems to date. However, this is rapidly changing and must lead to a re-examination of attitudes and practices for inter-organisational systems. The key lesson to be derived from the survey is that IOS planning is generally conducted as an external consideration within an IS or business planning framework. This approach is an inappropriate framework for complex inter-organisational systems.

There is general agreement among organisations surveyed as to the desired results from inter-organisational systems planning, and how they believe this should be conducted. However, the overlap between the benefits of IOS planning, and the problems experienced with the process and the resulting plan, indicates that the majority of organisations experience difficulties. The placing of IOS planning within an organisational planning culture as illustrated by the inter-relationships between business, IS, and IOS planning indicates the foundation of IOS planning. When IOS is seen as compulsory, as it is for 89% of those studied, it is to existing processes that planners look. This has resulted in IOS planning processes that are firmly based on IS planning. In fact, some organisations are using IS planning methods for IOS planning. This should cause concern as IOS planning concepts are fundamentally different from their internal counterparts, and the majority of organisations do not adapt IS techniques for the IOS domain.

The study illustrates that planning has more to do with spheres of influence

| IOS Technology Used | % |
|----------------------------|------|
| E-mail | 59.1 |
| EDI | 57.0 |
| A wide area network | 45.2 |
| The Internet | 43.0 |
| Conferencing calls | 35.5 |
| Shared databases | 26.9 |
| Shared information systems | 25.8 |
| Video conferencing | 21.5 |
| Other | 4.3 |

Table 1 IOS Technology Used

within inter-organisational networks than with technology or inter-organisational structures. The planning processes emerged from how this influence was leveraged rather than from a formulated structure. This analysis illustrates that the manner in which decisions are made and implemented is the result of an evolving set of IOS planning environments that can be characterised according to how power and influence are dispersed within them. The operational aspects of IOS planning differ within these. This is evident in how these planning environments influence the approaches that individual organisations take to IOS planning, the roles participant organisations adopt, the manner in which changes in organisational activity is handled, as well as how planners deal with issues of technology and systems planning.

The results indicate that planning frameworks are required in individual organisations and at the network level. This is necessary in order to provide participants with a mechanism to consider both internal organisational issues and those that affect the whole network. The development of the frameworks needs to result from an analysis of the role played by each participant in the network. Once planning frameworks have been established, it is necessary to determine which roles each participant organisation need to play, and who within the organisation is most suited to this role. This is not necessarily an issue of psychology, but rather the IOS planning process must provide an opportunity for such issues to be considered. IOS need

to be the result of an objective that contributes to business strategy or an organisational structure / activity need. Consequently, planning efforts must consider these issues in a thorough and complete manner. This is especially important as inter-organisational systems become more widespread and affect more of the value chain. Finally, IOS planners must deal with systems, data and technology issues. While IOS planners may borrow from internal approaches in this regard, it is necessary to realise that even these issues are complicated by their existence within an inter-organisational domain.

CONCLUSIONS

IOS, IS and business planning processes are obviously intertwined. Whether one argues for a formulated or an emergent approach, each process has its own set of tools, methods, and issues. The types of planning have to be distinguished in order to ensure that planners in each area get adequate support. However, it must be remembered that they are all part of an organisational planning effort. The argument for this study is that IOS planning has to deal with issues not encountered in intra-organisational settings. For many of these, a network perspective is more appropriate than an IS planning process that considers external entities. IOS planning has requirements that cannot be met by pure intra-organisational systems planning processes. Current IS planning approaches indicate a need to consider the external environment as part of the process. These approaches may identify opportunities for developing IOS, and could even be used for developing a system internally and extending it to other organisations. However, for more complex IOS projects that involve greater business and technical change across a number of organisations, systems planning needs to evolve beyond a firm-centred approach to take a network perspective. This is the next challenge in the evolution of systems planning. It must be undertaken in order to ensure that inter-organisational business relationships get appropriate systems support.