

Factors that Influence the Decision to Buy or Build Software: A Preliminary Investigation of Decision-making in NZ Firms

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ABSTRACT

While most systems analysis textbooks present an overview of the need to consider the 'buy-build' decision when planning a systems development project, little information is given about the factors that firms facing this decision should consider. This study reports a preliminary investigation into how some businesses determine whether it is more beneficial to buy software or build it themselves. A case study approach was used, and semi-structured interviews were conducted with six NZ businesses that had recently made a buy-build decision for an information systems project.

The preliminary results suggest that New Zealand businesses adopt a pragmatic approach to the buy-build decision, opting to buy if a suitable package is available, even though they have the capability for in-house development. Other factors taken into account in the decision process include cost, timeliness, and level of expertise of in-house staff. Of particular interest is that the buy-build decision is made very early

in the planning stages of the project, before detailed requirements analysis has been carried out. At this stage, an organisation can not be certain that a package exists which will fully meet its requirements. Neither has it done the in-depth analysis needed to determine the feasibility of an in-house development. This raises the question of whether some NZ firms may be making buy-build decisions that are not fully informed, or whether these decisions may be made more for strategic or political considerations than solely on cost-benefit evidence.

1. INTRODUCTION

The buy-build decision is one faced by many firms undertaking an information systems project. For some firms, the decision is easy since they don't have the in-house capability to develop an information system. But those firms that do have systems developers on staff face the dilemma of whether to use their existing staff to develop a new system, or to buy an already developed software package.

Three questions arise in the software solution dilemma (Janson & Subramanian, 1995; Kent, 1996).

Should the organisation buy a packaged solution and customise it to fit; buy a packaged solution and change the organisation to fit the package; or build a new system from scratch? Those in favour of the first alternative of customising a packaged solution generally base their argument on minimising cost and risk, with an underlying assumption that the package will be a close fit to the firm's requirements. However, this can be a risky approach, as the 'perfect fit' package is rare (Sherer, 1993). The cost of addressing the gaps between the package and the organisation's requirements can be difficult to predict and may be very expensive (Saarinen & Vepsalainen, 1994; Sherer, 1993).

The second alternative of making the organisation fit the chosen package, is supported by the argument that the package represents industry best practice, and therefore it will be advantageous to the firm to change and adopt these best practices. However, there is often no clear empirical support for the best practice claim, and changing the firm to suit may not be the best option for that business in its own particular business environment (Janson & Subramanian, 1995).

The third option of developing a purpose-built solution can be attractive if there are major gaps between available packages and the firm's requirements. Yet this is often seen as the most risky and time-consuming option of all, particularly if the organisation has experienced problems with previous software development projects. (Fields, 1995).

2. HOW DO FIRMS CHOOSE ? MAKING THE BUY-BUILD DE- CISION

While most systems development textbooks present an overview of the need to consider the 'buy-build' decision when planning a systems development project, little information is given about the factors that firms facing this decision should consider. Typically, textbooks suggest that the buy-build decision should be made at the end of the detailed analysis phase of the system development life cycle (Whitten, Bentley, & Barlow, 1994). At this stage, the firm has the in-depth information needed to evaluate any packages and can do a detailed feasibility study of the buy and

build options.

But is this what actually happens? There is limited research into the selection and implementation of generic software packages (Davis, 1998; Gable, 1998), and most research to date has focused on implementation issues such as the 'fit' between the package and the business (Gable, 1998; Lucas Jr., Walton, & Ginzberg, 1988). Little attention has been paid to the process of making the decision of whether to buy such software in the first place. This study reports a preliminary investigation into how New Zealand businesses determine whether it is more beneficial to buy software or build it.

3. THE STUDY

A case study approach was used, and interviews were conducted with project or IT managers from six New Zealand businesses that had recently made a buy-build decision for an information systems project.

The interviews were semi-structured, to ensure consistency of broad categories of information gathered, but also open-ended, in order to obtain a rich set of data appropriate for an exploratory study. The questions covered the areas of type and scope of project; buy-build decision made; the stage the decision was made at; the criteria used to make the decision; and the final outcome of the project.

The organisations included a small retail business, a private training provider, an urban utility, a tertiary institute, a rural service industry, and a medium sized manufacturing company, as shown in table 1. The information systems projects included a rental stock management system, a truancy monitoring system, a human resource system, a sales system, and two enterprise resource planning systems.

Five of the six interviews were tape-recorded, and the sixth was conducted using detailed note-taking. In all cases the interviews were transcribed, and the transcripts checked with the interviewee to confirm accuracy. The interviews were analysed with a content analysis approach, to determine common themes.

Organisation	Project Type	Decision
Retail business	Stock management system	Build
Private training provider	Truancy monitoring system	Build
Tertiary institute	Human resource system	Buy/outsource
Rural service industry	Sales system	Buy
Urban utility	Enterprise resource planning system	Build and buy
Manufacturing company	Enterprise resource planning system	Buy

Table 1:
Organisations, Project Type, and Buy-Build Decision

4. FINDINGS

4.1 The Buy-Build Decision

The organisations covered the range of options in the buy-build decision. Two of the firms decided to buy packages, two chose to build in-house systems, and the final two firms developed approaches that spanned both types of development (see Table 1). One of these last two firms, the educational institute, joined a group of three other institutes all looking for a human resource system and commissioned the development of a package. This approach enable these four institutes to acquire a human resource package that met the specific requirements of their industry, and also allowed the developer to fund the cost of developing the package which could be subsequently marketed to other organisations. The other organisation to adopt both approaches, the urban utility, chose what they called a ‘best of breed’ approach, where the intention was to integrate a collection of the best packages available and build what could not be bought.

4.2 Stage of Decision

In all cases investigated the buy-build decision was made very early in the planning stages of the project. The firms conducted initial research on the availability of ‘off-the-shelf’ package solutions, and if potentially suitable packages were available, the buy option was chosen. The manufacturing firm chose the buy route at the outset because its in-house software development team was small with insufficient experience to do a major development.

However, this organisation did not appear to consider the option of expanding the in-house team in order to take on an in-house project. In one case, that of the retail business, it appears that the initial research on available packages was very cursory. This business decided to build its own stock management system, but shortly after implementation of the in-house system it discovered a package with greater functionality at a much lower price than the cost of the in-house system. In this case, the in-house system was abandoned and the package purchased and installed.

Surprisingly, none of the firms interviewed had completed an in-depth analysis of their requirements at the stage when the buy-build decision was taken.

4.3 Criteria Used

For all the firms interviewed, the main criterion for the decision to buy or build was availability of a suitable package. A secondary consideration was the level of skills and resources available in-house. The manufacturing firm, for example, was aware of packages that met its general requirements, and also knew that an in-house development would require a significant increase in numbers of developers, and a need to up-skill the developers already on staff. None of the firms conducted an in-depth comparison of the total costs of a package implementation against the costs of adding additional skills and resources to do the development in-house. There seemed to be a

tacit assumption that the latter option would be too costly, too risky, and likely to run over time and over budget. Surprisingly, none of the firms mentioned having done any form of risk analysis prior to making their decision.

Once the package route was chosen, considerations such as time-frame, cost, performance, functionality and reference sites were used to evaluate the competing packages. Typically, a 'gap' analysis was used to identify the package with the best fit, and, with the exception of the manufacturing firm, the businesses customised the package, rather than changing their organisation to fit the package. However, one objective of the manufacturing firm was to use the package to introduce 'best practice', and so it changed its business to conform to the 'best practice' solutions provided by the package.

The two firms that chose to develop their own solutions did so because no suitable packages were identified in their initial research. At that stage, both firms made the decision to develop their own systems on the basis that the systems were needed to improve business efficiency. Development costs appeared to be a secondary consideration and were given little weight. One of these firms used a prototyping approach for the development project; the other pursued a typical development life cycle.

4.4 Final Outcome

Five of the six firms successfully implemented their new systems, with the urban utility's integrated system still under development. The urban utility encountered difficulties with some of its integration requirements, and as already noted the retail firm found a better package shortly after completing its in-house development.

5. DISCUSSION

This paper reports the results of a preliminary investigation into the buy-build decisions made by New Zealand businesses considering an information systems project. The results suggest that these New Zealand organisations followed an ad-hoc and pragmatic approach to the buy-build decision, somewhat at variance with traditional textbook

wisdom.

The buy-build decision was taken very early in the planning stages of the project, and was based mainly on the availability of a suitable package. One firm's review of available packages was somewhat cursory, and resulted in a decision to build a system when a similar and more functional package was in fact available. The second of the two firms taking the build option did so because its requirement for a truancy monitoring system was highly specialised and none of the available packages could be customised to fit the project specifications.

While price was certainly a factor in choosing *between* packages, those firms that opted to buy appeared to assume, without in-depth analysis, that in-house development would be more costly than an off-the-shelf solution, even if the package required substantial customisation. Of particular interest is that none of the firms had completed full in-depth analysis of requirements prior to making the buy-build choice. Thus in all cases the 'buy-build' decision was made without a detailed cost-benefit analysis of both buy and build options and before the organisation could be sure of the likely degree of customisation required for the buy option. Even more surprising was the apparent lack of attention to assessing the risk of failure, particularly where the buy decision was made.

6. CONCLUSION

It is not surprising that an initial exploratory study such as this should raise more questions than it answers. However, there is clearly a need for further in-depth investigation into the factors influencing firms' decision-making processes related to buying or building software. One area in particular that this investigation did not address was the extent of underlying strategic or political considerations that may have influenced the decision-making process, and in-depth case studies are planned to explore this area further.

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