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Research article

Factors affecting the buy *vs* build decision in large Australian organisations

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Abstract

When developing an information system, organisations are faced with a fundamental choice: to buy a pre-developed package (potentially customise it or redesign/reengineer the business processes of the company concerned to fit the package), or to build the system in-house. Past literature has indicated the importance of the buy *vs* build decision to the organisation even suggesting that correctly managing the choice could be the key to managing IT. This research aims to identify the factors that an organisation should consider when making an information systems buy *vs* build decision. Interviews were conducted with 10 organisations across a spread of industries, involving key strategic IT decision-making personnel at the senior IT executive level. By examining the operational approaches adopted in each of these organisations and the key drivers behind these approaches, we identify the core factors that affect real-world buy *vs* build decisions in large Australian organisations with a turnover in excess of $750 million. We found that a number of core factors – strategy, commodity and competitive advantage, maturity, cost and requirements fit – critically affect buy *vs* build, while peripheral factors – risk, time and timing, political factors, and ongoing support – are secondary considerations.

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Introduction

While historically a lack of pre-packaged software may have forced organisations to develop systems in-house, the prevalence of computing technology, commoditisation and maturity of packages and the rise of specialised package vendors has made package acquisition a realistic option (Rands, 1992). Managing buy *vs* build and balancing in-house development with purchased packages, allows 'the most effective and efficient use of a firm's resources' (Rands, 1993). Indeed, it is suggested that effectively managing buy *vs* build could be the key to managing IT.

Organisations are increasingly acquiring enterprise software packages rather than developing their own systems (Keil and Tiwana, 2006). Sources also suggest that over the last 10–15 years, the broadly accepted IT strategy towards an organisation's application portfolio has been founded on the principle that it is preferable to purchase software solutions rather than build in-house (Rosen, 2001). Previous research has made little attempt to investigate the characteristics of packaged software that will influence an MIS manager's recommendation for purchase (Keil and Tiwana, 2006). In fact, many organisations lack a rigorous software procurement process making it difficult to make effective purchasing decisions (Shang and Seddon, 2002).

This research aims to answer the following research questions by investigating buy *vs* build decisions at the strategic level in large organisations with a turnover greater than $750 million.

- What factors are considered in making a buy *vs* build decision or formulating buy *vs* build approaches?
- Which factors are most important to the buy *vs* build decision process?

While the paper focuses on the binary buy *vs* build scenario, the buy/build scenario could manifest with more complexity, for example buying systems components while building

others as in the case of Service Oriented Architectures and Web Services.

The paper is organised as follows: Firstly, we identify potential factors from the literature. We then discuss the methodology adopted by the research and examine the operational approaches adopted in each of the case organisations, identifying the key drivers behind the approaches. Lastly, we outline our major findings and future work.

Potential factors

Very little has been written about the buy *vs* build decision for information systems in academic journals.[1] Hence, we widened our search to practitioner journals and academic articles in fields other than information systems. After reviewing the literature, we looked for patterns about factors for which there was a degree of consensus. We also discussed our findings with two experienced senior practitioners in information systems to confirm and refine the factors we found from the literature.

Strategy and competitive advantage

The strategic importance of the buy *vs* build decision has been identified throughout the literature (e.g. Ford and Farmer, 1986; Buchowicz, 1991; Welch and Nayak, 1992; Rands, 1993; Kurokawa, 1997; McIvor *et al*., 1997; Padillo and Diaby, 1999; Probert, 1999; Cánez *et al*., 2000). Rands (1993) argues that 'taking the correct software make or buy decision could, in a growing number of situations, be the key to managing IT' (Rands, 1993).

Buy or build decision frameworks have often been based on the strategic importance of the information system, where less strategic applications should be bought and more strategic applications should be built (Kelley, 1992; Rands, 1993). Knowles (1997) suggests that organisations 'build business value, [and] buy the basics'. The buy *vs* build literature recognises the advantages of building components that form part of an organisation's core competencies while buying those that fall outside the organisation's core scope (e.g. Venkatesan, 1992; McIvor *et al*., 1997).

Cost (both implementation cost and ongoing costs)

Despite the declining importance of traditional cost factors in the make-or-buy decision, price is still a relevant buy *vs* build determinant, reflecting continued pressure on managers to enhance firm profitability through strategic cost management (McNally and Griffin, 2004).

Although a direct, generalised comparison of costs between in-house development and package implementation is not practical due to the atypical nature of individual projects, it is generally recognised that, all things being equal, a package will be less expensive than a comparable in-house developed system (Kelley, 1992). A bought package does, however, allow an organisation to offload a portion of design costs to the package vendor (Fowler, 2004). The cost of developing a system that closely matches the functionality of a package will also generally be higher since vendors have access to more competitive sources of labour and technical expertise, and greater economies of scale on which to amortise development costs (Nelson *et al*., 1996; Fowler, 2004).

While the lower relative cost of a package is generally accepted (Kelley, 1992), the hidden costs of both implementation and ongoing support and maintenance should also be considered (Davis, 1988; Rosen, 2001; Ulfeder, 2003).

Scale and complexity

The scale, size and scope of development affect the suitability of buy or build options. Straightforward applications that can quickly and effectively be brought into production will usually be built (Ceriello, 1984; Ulfeder, 2003). On the other hand, a clear limit exists on how large an application non-IT organisations can develop (Ulfeder, 2003). Larger, more intricate development projects may benefit from the expertise, maturity and economies of scale embodied in packages, even if used only as a foundation for further development or customisation.

The complexity of the problem should be considered in deciding whether to build or buy (Martin and McClure, 1983). In addition, systems that require specialised technologies are more likely to involve package implementation, as the costs of acquiring skilled technical expertise favours the economies of scale available to package vendors (Nelson *et al*., 1996).

Alternately, the complexity of the package may also limit the suitability of the buy option (McManus, 2003). Packages that are too large may suffer feature bloat, requiring more resources to maintain and operate, and greater cost to develop than a custom-built, requirements-driven in-house solution (Fowler, 2004).

Maturity, commoditisation, flexibility and change

The buy *vs* build literature recognises that the more unique the requirement, the greater the tendency to build (Stalker, 2003; Fowler, 2004). IT executives generally agree that there is little reason to develop commodity or utility systems such as payroll or general ledger (Davis, 1988; Anthes, 2004). In such situations, packages allow organisations to leverage scale economics (Gremillion and Pyburn, 1983). 'Buy' methodologies package 'best practice' (Ulfeder, 2003), allowing organisations to purchase expertise embodied within a package (Davis, 1988). A mature process with good market representation will entail a wide choice of available packages, and subsequent cost savings for the organisation (Davis, 1988). Package maturity, stabilisation and standardisation increase the tendency to buy (Buchowicz, 1991). Nelson *et al*. (1996) also found that common applications based on common technologies are more likely to be acquired as a package. In many cases the benefits of these packages, such as ERP systems, have been well documented (e.g. Seddon, 2005; Davenport *et al*., 2002).

Conversely, when the business requirements are unique or when a package fails to deliver on an essential feature, a build approach is more appropriate (Singleton, 1981; Hayes, 1995; Brooks, 1997; Novak and Eppinger, 2001; Rosen, 2001; Ulfeder, 2003; Anthes, 2004). Customising a package to meet unique requirements involves inherent risk and other considerations with many practitioners

recommending that customisation be kept to a minimum (Ulfeder, 2003). In an attempt to manage the viability of ongoing support, some vendors insist on a single package code base and do not allow customisation (Rosen, 2001).

An alternative to package customisation is organisational change to fit the package. Organisations should choose whether to implement the package as-is, change their business processes or tailor the package (Rosen, 2001; McManus, 2003). Build approaches, or highly tailored package implementations resulting in an acceptably high degree of requirements fit will necessitate less organisational change. Conversely, the less a package is customised, the more an organisation will have to adapt to the business processes embodied in the package. Changing the organisation requires significant process re-engineering and corporate culture change, but may result in achieving systems that reflect recognised best practices (Ulfeder, 2003). If a standard process or application that adds little value to the business is substantially different from that of an off-the-shelf package, the process may be a good candidate for change (Lyons, 1995).

Welch and Nayak (1992) suggest a strategic sourcing model determining make, marginal make/buy or buy outcomes based on the maturity of process technology across the industry, the organisation's relative process maturity relative to competitors, and the significance of the process technology for competitive advantage. Their sourcing model suggests that the more mature an organisation's processes are compared with that of the competition, the more advantageous it would be for the organisation to build. Probert (1999) similarly introduced an importance/competitiveness matrix to assess process technologies in approaching build or buy.

Time

A prevailing perception suggests that in-house development will be a longer process than buy-based solutions (Singleton, 1981; Ceriello, 1984; Brooks, 1997; Whiting, 2003). Thus, buy *vs* build decision processes tend more towards the buy approach as perceived urgency increases (Buchowicz, 1991). Indeed, shortened development time and hence low time-to-market are repeatedly listed as the core benefits of 'buy' development methodologies (Brooks, 1997; Kurokawa, 1997; Whiting, 2003). The package lifecycle approach is regarded as favouring a shortened conceptual design phase (Davis, 1988; Fowler, 2004), while packaged documentation and training aids yield more efficient and less time-consuming user education (Davis, 1988).

Real-world anecdotes contradict this assertion somewhat. The omnipresent need for customisation of bought packages often means that realistic development timeframes for 'buy' projects may be comparable to 'build' projects (Rosen, 2001; Ulfeder, 2003). In vendor-implemented or outsourced buy arrangements, additional management overhead generated by vendor oversight, negotiation and liaison can also increase overall development time (Ulfeder, 2003). On the other hand, in-house or in-house managed build projects afford management control, allowing an organisation to set, enforce and achieve aggressive development timelines (Ulfeder, 2003). Built solutions may also lend more organisational agility, as the familiarity, expertise and technical resources required to adapt the system will exist in-house while bought solutions may require vendor alteration (Rosen, 2001; Anthes, 2004).

The information system's life expectancy may also affect the decision to build or buy (Abetti, 1989; Kurokawa, 1997). Systems that require a long-term commitment but provide lasting value may be worth building (McManus, 2003).

In-house information systems expertise (incorporating resourcing)

Buchowicz (1991) suggests that in order for the build approach to be considered, the organisation's information systems competence should be sufficient to present a viable option to package implementation. Similar foundations can be found throughout the buy *vs* build literature for non-information systems goods and services. McIvor *et al.* (1997), for example, suggest that an activity should be produced in-house 'if the company can perform the activity uniquely well'. Higgins (1955) similarly suggests a build case when the knowledge or expertise exists in-house. When in-house expertise either matches or outweighs package maturity or outsourcer expertise, or when an organisation possesses deep subject matter expertise, it may be able to develop systems more cheaply and with more benefit through a build rather than buy approach (Anthes, 2004). The internal information systems function's familiarity or understanding of the application, be it the required application or the suggested package implementation itself, may also be an important factor (Buchowicz, 1991).

Build or buy decisions can be leveraged to switch key development staff to areas where they can maximise impact and business value (Rands, 1993). In-house build usually requires more skilled information systems resources than buy projects (Singleton, 1981, Ceriello, 1984). By adopting buy or outsourced methodologies when appropriate, an organisation can redeploy skilled information systems staff to focus on specialised, business-specific functions such as system integration or business analysis (Voutsakis and Kalt, 2004). Skilled developers may also be freed to work on other development projects. Valuable resources can therefore be redeployed to more mission-critical assignments with greater strategic impact (Lyons, 1995).

Risk

Packages can be used to manage risks (Davis, 1988; McManus, 2003) by changing several development risks such as completion risk, cost/budget risk, controls risk and performance risk. Davis (1988) refers to 'controls risk' as the risk that inadequate controls will be included in the design and implementation of a system, and 'performance risk' as the risk that the system performs inadequately compared with expectations.

Package-based 'buy' methodologies present a foundation from which an information system can be developed. Employing a package allows an organisation to purchase not only the application base but also the expertise embodied within the package (Davis, 1988). In theory, the buy approach allows an organisation to exploit the economies of scale that can be leveraged externally to minimise development costs (Gremillion and Pyburn, 1983) and investment risks (Kurokawa, 1997) by essentially

allowing a third party (the package vendor) to shoulder the application development and associated risks.

Buy advocates suggest that packages can be used to manage risks in a development portfolio (Davis, 1988; McManus, 2003) by changing several development risks such as completion risk, cost/budget risk, controls risk and performance risk. Davis argues that packages mitigate project completion risk by providing a pre-built foundation providing at least basic functionality. Davis suggests that the additional cost/budget risks associated with tailoring a package are 'probably easier to manage' than the risks of building a new application, while practitioners contend that the hidden integration, tailoring and management costs of real-world buy projects limit their cost benefit over build options (Rosen, 2001; Ulfeder, 2003).

While addressing (and as some would argue, reducing) traditional development risks, the buy approach introduces vendor risks associated with documentation, implementation, support and maintenance, as well as long-term issues such as vendor viability (Davis, 1988). Project management is also affected – the introduction of an external third party increases management risks on buy projects as strategic alignment becomes a greater concern (Martin and McClure, 1983; Ulfeder, 2003). Ongoing vendor relationship issues, such as opportunism or support and maintenance commitment, and ultimately, misalignment of objectives between the vendor and the client can increase the aggregate project risk (Nelson *et al*., 1996, Rosen, 2001). The ongoing support or improvement of the information system is another key issue, especially if a package is highly customised. Factors such as a lack of expertise or a lack of intellectual property control may mean that an organisation becomes dependent on a vendor; relying on the commitment and turnaround of the vendor for ongoing support or maintenance (Davis, 1988; Rosen, 2001; Anthes, 2004). The long-term viability of the vendor is also an issue.

Support structures

Build options necessitate greater IT capability and resourcing including available human resources, appropriate skill mix, hardware and software capabilities (Buchowicz, 1991). A buy option may necessitate adoption of certain technologies or processes. Conversely, the intricacies of an organisation's existing technology back-end may actually necessitate complete build, or heavy package customisation (Anthes, 2004). Custom build is often the only choice when considering legacy system replacements (Whiting, 2003). Similarly, packaged applications interfacing with existing databases or data warehousing solutions often entail significant data cleansing, migration and integration costs (Anthes, 2004).

Support from the vendor is a factor in determining the viability of buy options (Martin and McClure, 1983). Vendor support may include training and integration assistance (Davis, 1988), and/or on-going maintenance and feature support. Organisations often mistakenly assume that by buying software packages, support and maintenance tasks are left to the vendor, while evidence indicates that ongoing system and maintenance costs outweigh the initial procurement cost (Anthes, 2004).

Despite a possible larger up-front investment, in-house development provides a stable, well-understood code base from which management and maintenance can be performed (Lyons, 1995). Upgrading a highly customised package can entail high implementation hurdles (Lyons, 1995; McManus, 2003), particularly if support is not provided by the vendor for customisations and transitions. The cost of documentation and skill maintenance – in terms of time, funding and skilled resourcing – may again erode any cost benefit a package solution can provide over an in-house implementation (Rosen, 2001; McManus, 2003; Anthes, 2004).

Organisational factors

The organisation's information systems development culture, and its established technology acquisition history is likely to affect the future outcome of buy *vs* build decisions (Kurokawa, 1997). He also suggests that organisations with no history of external technology acquisitions are more likely to depend upon in-house development even if the build case is not rational.

The 'empire building' phenomenon may also bias organisations towards build (Nelson *et al*., 1996). Here, key personnel or teams attempting to consolidate power-bases within an organisation are more likely to entrench their position by championing a build approach, rather than adopting an open, easily replaceable package-based buy approach (Nelson *et al*., 1996; Knowles, 1997).

The extent of management support towards in-house development will also affect the build or buy decision. In-house development requires a higher level of managerial commitment and effort when compared with external acquisition (Kurokawa, 1997). It can also impact the morale of an organisation's information systems function (Singleton, 1981).

The knowledge-based view of a firm has been used in addressing the build or buy issue, basing decisions on which systems to build and which systems to buy on the organisation's knowledge base (Poppo and Zenger, 1998; Nonaka *et al*., 2000).

Intellectual property

When a system is built in-house, the intellectual property generally remains with the organisation. However when customisations are made to a package or when development is performed 'externally', the innovations, customisations and processes may be owned by the vendor or outsourcing partner. The build approach can be used to proactively guard an organisation's intellectual property (Rands, 1992; Rands, 1993). Retaining the intellectual property to an information system can also yield further returns. Many innovative products have been created to fill an internal need, before being released as a packaged solution (Brooks, 1997).

Adopting a packaged solution also entails ongoing licensing costs and considerations. While custom-built software may be sold with intellectual property agreements defined, packages are usually licensed (Martin and McClure, 1983), often requiring annual maintenance payments.

Research methodology

The purpose of this research is to determine the key factors that are considered when making buy *vs* build decisions in large Australian organisations. The research design comprised three phases. The first phase involved an analysis of the literature to identify potential factors. The second phase involved discussions with two experienced information systems practitioners to confirm and refine the factors we found from the literature. The two experienced information systems practitioners were a Chief Information Officer and an Enterprise Architect who had been involved in a number of buy *vs* build decisions. The results of these first two phases were reported in the previous section and resulted in 10 main factor groupings.

The third phase was a multiple case study involving 10 organisations across a variety of industry segments. A multiple case design was selected to allow cross case comparison and to strengthen the research findings (Benbasat *et al*., 1987; Yin, 2003). Organisational strategy theorists (e.g. Mintzberg *et al*., 1976) argue that in-depth interviews are the dominant method for examining decision-making processes. Key decision-making personnel were interviewed in each of the organisations. Drawing on the experience of interviewees with buy *vs* build decisions, the semi-structured interviews focused on the organisational approaches to buy *vs* build, identifying the specific factors that drive these approaches and past decisions. Semi-structured interviews allow interviewees to identify and explore in-depth the factors affecting issues (Cavana *et al*., 2001) such as the buy *vs* build decision. The interviews also attempted to identify the importance of certain factors, the impact factors have on both other factors and the decision process as a whole; and most importantly, uncover factors that have not been previously identified in the literature.

Instrument development

The instrument was piloted with academic staff from the School of Information Systems at The University of New South Wales. In addition, pre-interview discussions with potential participating organisations revealed that both the criticality of buy *vs* build to information systems management and the maturity of buy *vs* build as an issue to the industry as a whole have led to organisations taking more of an overarching strategy towards buy *vs* build and less of a project-by-project examination. Although the relative importance of the various factors would differ on a project-by-project basis (for example, in one project it may be more cost effective to build rather than to buy), practitioners suggested that the overall approach to the problem and the factors considered would be primarily driven by the broader organisational approach. The research instrument was consequently modified to focus more on any broader organisational trend or strategy towards buy *vs* build, and the factors that have influenced this approach – while referring to specific projects as examples illustrating the decision process and broader organisational strategy.

Data collection

Letters were initially sent to 30 organisations with a turnover greater than $750 million seeking their participation in the study, including a research overview and an outline of the key research objectives. From this initial canvassing, 12 organisations indicated an interest. Scoping meetings were then held to identify whether an organisation was suitable for study, and the degree to which the organisation was willing or able to participate. Two organisations were removed from the research. One indicated that buy *vs* build decisions (and a large proportion of other strategic IT decision making) was mandated from an overseas head office, and that very little autonomy or visibility into IT decision making was present in the domestic office. The second organisation was not able to participate within the timeframe during which data collection occurred. Depending on the degree to which the organisation sought to participate, one to four interviews were carried out at each organisation. Interviews were targeted to last for an hour, although the majority of interviews were completed in about 45 min. In total (not including pilot interviews), some 21 interviews were completed. The organisations were asked to nominate key decision makers in the buy *vs* build decision. The organisations nominated respondents from the senior levels of information systems decision-making, ranging from IT architects to group IT leaders or chief information officers (Table 1).

Analysis techniques

Data collection yielded some 20 h of interview material. All interviews were tape recorded with the interviewee's permission. They were subsequently transcribed by the authors and these transcriptions were analysed using thematic analysis, with a two-staged open and axial coding approach. Ezzy (2002) suggests that thematic analysis is more suited than other methods such as content analysis to the exploratory nature of this research, and to the stated research aim of identifying factors important to practitioners in making a buy *vs* build decision without introducing researcher bias.

During the first open coding stage, exploration of the data inductively provided initial codes. Iterative coding then facilitated the progressive consolidation of these codes, allowing integration of codes around the axes of central categories (Ezzy, 2002). The second axial coding stage involved the analysis of codes developed in open coding for recurring themes or overlapping central categories. Meta-coding was chosen as the technique since it is recommended for identifying more abstract themes and produces a limited number of large meta-themes (Ryan and Bernard, 2003). In doing so, care was taken to ensure that candidate factors identified in the literature review did not unduly influence the meta-coding. In negotiating between the candidate factors determined from the literature review and the initial codes obtained through open coding, initial codes were not 'forced' into presupposed categories based around each factor. Instead, through iterative comparison of emergent categories with pre-existing categories as suggested in (Ezzy, 2002), a more thorough and complex understanding was developed. Categories retained codes that were more reflective of the information they represented (such as 'timing' or 'long term temporality'), with no propensity, proclivity or

Table 1 Participating organisations and respondent positions

Organisation		*Respondents*
Uni-Alpha	Tertiary education	Chief IT Architect Enterprise Architect
Manu-Alpha	Manufacturing – Fast moving consumer goods	Business and IT Manager
Manu-Bravo	Manufacturing – pharmaceuticals	Business & IT Senior Consultant Manager, Information Systems Manager, IT External Systems Manager, IT Internal Systems
Ins-Alpha	Insurance	National Manager for Application Development Enterprise Architect
Ins-Bravo	Insurance	Head of Insurance Systems Group 1 Head of Insurance Systems Group 2
FS-Alpha	Financial services	Chief Operating Officer, IT
FS-Bravo	Financial services	Executive Director, IT Associate Director, IT
FS-Charlie	Financial services	IT Manager
Telco-Alpha	Telecommunications	Chief Information Officer Tactical Architect
BPO-Alpha	Business process outsourcing	Group IT/R&D Manager General Manager, R&D R&D Manager National IT – IT Manager, NSW

inclination towards the designations of candidate factors (such as 'time').

Results and discussion

Although each organisation exhibited variations in the factors underpinning its buy *vs* build decision processes, common threads can be identified that influence buy *vs* build. This section will proceed to identify these factors. They are presented in three groups. Core factors are those that have underpinned various build *vs* buy strategies and are regarded as capable of swaying a decision. Peripheral factors represent those that are either seen as benefits of either buy or build, or secondary considerations that, although taken into account are alone insufficient in affecting a decision. Additional factors are issues that were not uniformly supported but are important to individual organisations.

Core factors

Strategy

Overwhelmingly, the information systems strategy of each organisation determined the way buy *vs* build was approached. Of the organisations studied, Manu-Alpha is perhaps the closest to a pure 'buy' organisation. Strategically, Manu-Alpha prefers to acquire packages whenever possible, except in areas where no suitable package exists. This package preference extends to the few areas where in-house development is a necessity. Even these in-house solutions are targeted for commercial off-the-shelf software (COTS) replacement when this becomes feasible. Driven by a view that IT had become a commoditised resource that no longer presents a point of differentiation, Telco-Alpha made a similar decision to Manu-Alpha in deciding to move away from development:

> …we don't do the build or the development any more, but we control the business analysts, the architects and the change people and the customer interface. That's where we see our critical things are.

Manu-Bravo, Ins-Alpha and Ins-Bravo also had a preference to buy first. This buy first policy is in line with literature suggesting that organisations build in areas of core competency while buying in non-core areas (Venkatesan, 1992; Knowles, 1997; McIvor *et al*., 1997).

Core vs non-core systems: Whether the system is core or non-core also affects the buy *vs* build decision. For

instance, the weak alignment between the system's purpose and the organisation's core business increased FS-Charlie's willingness to move to an external solution for its human resources system. However, Ins-Bravo indicated that its core reinsurance engines, although package based, were so heavily modified that they resembled the original package only in name. The scale and depth of the package meant that, as with an ERP system, Ins-Bravo would never consider building the core insurance engine in-house. However, the fact that the package forms part of the organisation's core business overrides the view to implement 'vanilla'[2] without customisation. Ins-Bravo indicated that this was a necessity in achieving the differentiation necessary to its core business.

The core/non-core nature of an information system may indeed give an indication as to the most appropriate development path. The core nature of Ins-Bravo's reinsurance engine has, through customisation, essentially transformed the package into an in-house system – moving towards the build end of the spectrum. Conversely, the non-core nature of FS-Charlie's human resources system resulted in the adoption of an outsourced solution, a move towards the buy end of the continuum. In broader terms, the more a system forms part of an organisation's core, the greater the tendency towards build – while the more a system is recognised as non-core, the greater the tendency towards a buy orientation.

Effect of information systems strategy: The relationship between an organisation's approach towards buy *vs* build and its information systems strategy is perhaps best reflected in its IT resourcing and capability. While the literature notes that a build approach is more feasible when an organisation possesses the requisite resources (Buchowicz, 1991), the data suggests that capability and resourcing are often a conscious strategic decision. This is most evident in organisations Ins-Bravo and BPO-Alpha. Here the organisations have strategically chosen to maintain a build capability. This strategic choice may also be viewed as an extension to the suggested importance of management commitment and support towards build (Kurokawa, 1997). Interestingly, Ins-Bravo's technology function sees technology and development as its core business. One respondent indicated that 'there's a lot of investment that's been made over many years' towards maintaining and cultivating Ins-Bravo's in-house function, and that its capability had reached a high level of maturity. The organisation sees a mature in-house capability as a key differentiator. The mature in-house capability and therefore the viability of a build approach is driven by this chosen information systems strategy.

Likewise, BPO-Alpha's decision to maintain a mature core build capability has been a conscious strategic choice. BPO-Alpha sees a key differentiator in its flexibility to produce a customised technology-driven solution to a client's process problem. Executing this strategy has required a strong in-house build capability implemented with a two-tiered resourcing model. BPO-Alpha produces 'generic' components using a centralised core development team. Client-facing technology groups plug together these components within a modular framework to produce each service offering.

Commoditisation vs competitive advantage

The notion of buying commodity while building competitive advantage is suggested in the literature (Venkatesan, 1992; Knowles, 1997; McIvor *et al*., 1997). Perhaps the greatest support for buying commodity while building advantage was found in the back-end/front-end or internal-facing/external-facing system dichotomy. Back-end (especially ERP-type) systems, where processes are highly common and uniqueness is rare, are heavily commoditised and hence tend towards a buy. Alternately, operational or front-end systems that are either highly unique, adapted to the way an organisation operates or those that provide competitive advantage are less obviously a buy case and, in some instances, lean more towards build. This was prevalent in a number of organisations, most noticeably FS-Bravo, Ins-Bravo and BPO-Alpha. Despite possessing an in-house MRP system, BPO-Alpha indicated that build was not a consideration when evaluating 'ERP type systems' even though the operational portion of its business is driven by a 'build' strategy. Ins-Bravo suggested that the inability to gain competitive advantage through a pure commodity item had lead to the front-end/back-end split and the tendency for buy to exist more in the back-office areas.

Carr (2003, 2004) argues that IT has become a commodity and investments in IT are unlikely to deliver competitive advantage. Manu-Bravo considered this paradox thus:

> I think the issue is more around what represents a better competitive advantage – and if you can buy a package that all your competitors are also using, and you're using it, I mean are you really gaining a lot in terms of competitive advantage there? However if you believe that you can actually develop a better package or a more unique one that has in-house capabilities that you don't want other people to share, then that might influence a decision that way.

This idea of maintaining competitive advantage through both technology and process also affected Manu-Bravo's in-house built systems. Unlike heavily buy-oriented organisations such as Manu-Alpha and Telco-Alpha, Manu-Bravo did not look to replace its bespoke solutions with packages as they became available.

Organisations such as Uni-Alpha and Ins-Alpha that characterised themselves as 'fast followers' indicated that keeping abreast of competition was also a decision factor.

Maturity

Overwhelmingly, the trend towards buy over build can be attributed to a combination of package maturity, market maturity, maturity of the internal information systems function and the increased availability of packages. Of the organisations that indicated a buy leaning, all indicated that a key factor driving their approach was the availability of mature, reliable, packages that were realistic and able to be implemented. While the specific criteria for package

acceptance varied (with a majority indicating an approximate 80% feature fit), these organisations indicated that they preferred to acquire a suitable package where available, and build where no such package existed.

Indeed, it could be argued that the level of maturity represents the breakpoint at which a package becomes more attractive than an in-house development. When a system is specifically unique to a business context, the most mature solution is likely to be developed in-house where the core information system or business expertise around the specific uniqueness lies. As time progresses, available packages become more mature. A combination of specialisation and economies of scale available to vendors generally allows packages to mature much faster than in-house developments. It is at the point where a package becomes 'suitably mature' to an organisation that a buy becomes more attractive than a build.

In examining this tendency, we consider the maturity of the internal information systems function, package maturity, package market maturity and its effect on availability.

Internal information systems maturity: The literature has often recognised the importance of comparing internal skills to external skills in addressing buy *vs* build (Higgins, 1955; Dale, 1984; Ford and Farmer, 1986; Buchowicz, 1991; McIvor *et al*., 1997; Anthes, 2004). The maturity of the organisation's information systems function and hence its' internal capability was a key factor for organisations such as Ins-Bravo and Uni-Alpha. For instance, one respondent from Uni-Alpha quoted research suggestive of industry trends:

> …I think the business environment has changed where there's no longer the support for good development disciplines. I think they're much less patient and they're much less prepared to put in the infrastructure needed for a good development team.

This drop in organisational information system maturity could be attributed to the prevalence of packages supporting commodity capabilities, and the shift from build towards buy. As the tendency to acquire and implement a package increases, the skill profile and resource focus of the organisation moves from information systems development to information systems configuration and integration, which may account for the reduction in maturity. The literature has suggested that neglecting build competencies for a buy approach of commoditised parts can lead to competence erosions (McIvor *et al*., 1997). This drop in organisational information systems maturity may well indicate this tendency in action. In many areas, the maturity gained through a long affiliation with build is a result of an initial lack of available packages as is the case with Manu-Bravo and BPO-Alpha. Their internal information systems maturity supports the literature suggestion (McIvor *et al*., 1997) whereby build can be used to enhance and strengthen an organisation's core build capability.

Package and package market maturity: Respondents indicated that package market maturity and package availability were key factors underpinning organisational buy *vs* build approaches (e.g. In-Alpha, Telco-Alpha and Ins-Bravo). It was widely accepted that once a package reaches a satisfactory level of maturity and thus matches the capabilities of an in-house development, the advantages of a specialised solution from a vendor specifically focused upon developing that product begin to outweigh the benefits of internal knowledge and familiarity. From this point on, the advantages and economies of scale available to the vendor in furthering the product generally increase the divide in capability when comparing packages to in-house solutions, in turn increasing the attractiveness of package acquisition. For instance a respondent from Manu-Bravo stated that:

> Until now we'd actually built [our system], but because of the requirements from the business, and the fact that there are so many tools which have matured over time now, the position has been to look for COTS products.

Ins-Alpha also indicated that maturity in both technology and market were key drivers in its decision to move away from in-house maintained monolithic applications architecture to a package-based, buy-oriented Service Oriented Architecture (SOA) model. The literature similarly recognises the preferability of a buy option as external options mature (Rands, 1993). This tendency is best reflected in the COTS replacement strategies adopted by some organisations. Manu-Alpha, for example, chooses only to build when no package is available and in-house, bespoke solutions are seen to be 'always on our technology roadmaps to be replaced'.

Conversely, Company BPO-Alpha suggested that the long-standing investment in a mature in-house technology made it difficult to replace. Comparative consideration of internal maturity *vs* external maturity, as in BPO-Alpha's case is supported by Welch and Nayak (1992).

Requirements fit

All organisations indicated the importance of alignment with business needs with organisations such as Ins-Bravo indicating the need to consider the longer term perspective when determining the solution as business needs may change over time. There was also general acceptance that obtaining a 100% feature fit from any solution was improbable (cf. Rosen, 2001). The threshold, therefore, becomes where each organisation is willing to accept a trade-off between cost and functionality. Many indicated the 80% fit mark, including Telco-Alpha:

> I want my package to be at 80–85% pure vanilla…

The business requirement for flexibility in its service offering has driven Company BPO-Alpha's build-from-component approach.

> In an industry like ours, we don't know what we're going to be asked to do next. And therefore we cannot be certain that a product that we buy, or a product that we build will handle tomorrow's requirements. We need the

flexibility to be able to quickly implement tomorrow's requirement… So speed to reliable product is very good.

Cost and value

The IT groups within each of the organisations (including the development branch of BPO-Alpha) exist as cost centres and not revenue centres, with the exception of BPO-Alpha's customer-facing branch units. Financial performance, therefore, comes not through revenue generated by these IT groups, but through the reduction of costs.

Prior literature (Dale, 1984; Ellis, 1992; Ellis, 1993; Balakrishnan, 1994; Poppo and Zenger, 1998; McNally and Griffin, 2004; Balakrishnan and Cheng, 2005) recognises the importance of cost as a factor in buy *vs* build. Indeed, cost still remains an important factor in the buy *vs* build decision for the organisations.

A number of specific cost-related issues were raised in relation to package acquisition. (A number of these cost issues also relate to the build option.)

- Multiple respondents indicated that a suitable package should both provide suitable requirements fit and be economical (e.g. Uni-Alfa).
- Implementation cost should not be ignored when considering the cost of acquiring packages. The cost of implementation is often underestimated. (e.g. Telco-Alpha).
- The on-going cost of support and maintenance should not be ignored (e.g. FS-Bravo).
- Customisation, and the cost of customisation, affects both the initial and ongoing timeframes (e.g. Ins-Bravo).
- The effect of upgrade costs ongoing and the risk of creating an 'upgrade legacy' through over-customisation was heavily supported throughout the organisations.

Interestingly, a respondent from Uni-Alpha took a wide perspective on the likely benefits suggesting that organisations should recognise the business value not only in the package lifespan, but also the value and knowledge derived from the acquisition process.

Peripheral factors

The factors discussed here are those stated to be either secondary considerations or benefits of either a buy or build approach, or factors that respondents felt were important considerations that alone were incapable of influencing a buy *vs* build decision.

Risk

Three aspects of risk were the most prevalent through the study: implementation, development and vendor risk.

While some respondents indicated that risk was fundamental to making a buy *vs* build decision, others discounted its importance. Organisations such as FS-Alpha, FS-Bravo, Ins-Bravo and Manu-Bravo indicated that risk affected both buy and build. As with cost, the specific risks vary depending on the approach – build places risk internally, while to a degree buy could be seen to shift risk externally (although this view of risk transference is debatable, as explored further in this section).

Ins-Alpha indicated that unwillingness to accept risk was a key factor in its buy-first approach. FS-Bravo supported this view that buy may be less inherently risky than build. Although largely agreeing with the view presented by FS-Bravo, Ins-Bravo introduced the dimension of customisation as a disruption to this balance.

The view that the buy model presents a method of leveraging a vendor to shoulder development risks (Gremillion and Pyburn, 1983; Kurokawa, 1997) was also largely supported by respondents. The use of buy as a means of transferring development risk was, however, not supported by FS-Alpha and Manu-Bravo.

Ins-Bravo felt that the buy approach did not necessarily represent a risk reduction. Respondents suggested that the process changes associated with retrofitting an external solution to an internal environment was perhaps a greater risk in itself. Ins-Bravo essentially disagrees with the core premise present in buy-favourable literature representing risk in buy *vs* build as uncertainty and visibility. Primarily, the risk in in-house build involves uncertainty: uncertainty in the capability, cost and timeframe of the final delivery. Conversely, the strength of a buy (Davis, 1988) is in the reduction of these risks through providing a known, transparent base product with less uncertainty. While this is certainly true in an up-front comparison, Ins-Bravo contends that the realities of implementation introduce more risks in fitting the package to the environment. The risk in implementation rises as changes are introduced, and hence risk is not transferred to an external party but instead shifted from the development to the implementation phase.

Another latent implementation issue noted both by the literature (Martin and McClure, 1983; Davis, 1988; Ulfeder, 2003) and the organisations was associated vendor risks introduced by a buy approach. One respondent from Manu-Bravo indicated that where ultimate accountability lay should be considered. Telco-Alpha also highlighted the long-term ramifications of vendor lock-in. However, vendor lock-in risk has generally been accepted by the organisations, as the benefits of adopting the package were seen to outweigh this risk. As solutions mature, and as the vendor market consolidates, lock-in has become more a risk to be accepted and mitigated rather than avoided (e.g. Manu-Bravo).

Buchowicz (1991) suggested that risk-averse decision makers repeatedly avoided in-house build despite past successes. Extending this notion, this research suggests that the risk position of the organisation affects its development appetite – the more a company is willing to accept risk, the more likely it is to approach in-house development. Conversely, this research suggests that the more risk averse an organisation, the greater the likelihood that the organisation moves to a buy or vendor-based outsourcing model, and the greater the perception that a package implementation is more favourable than an in-house build. For instance BPO-Alpha, the most build-aligned organisation, characterised itself as technology risk-accepting in dealing with a high-risk market with highly uncertain client requirements, while Uni-Alpha – which, with a strong build history, maintains an equal consideration of buy and build options – also characterised itself as more risk accepting.

Manu-Bravo indicated a more open local risk position despite the risk aversion of the global organisation. The global risk appetite reflects Manu-Bravo's global push towards buy. Locally, however, despite the global trend to

buy, Manu-Bravo's more open risk position has allowed the maintenance of a small, mature build capability (albeit a diminishing function) around certain external aspects of its business.

Risk affects all development initiatives. Indeed, there is risk in both buy and build approaches, although the specific risks differ. While in-house build requires an organisation to accept development risk, the increasing tendency towards buy introduces vendor risks and brings vendor management to the fore.

Time and timing

Three temporal aspects of information systems development were evident through the study: initial time to implement, ongoing time to change, and timing of system acquisition.

While buy-oriented organisations, including Manu-Bravo and Telco-Alpha, tended to perceive package implementation to be quicker than in-house build supporting the literature (Davis, 1988; Buchowicz, 1991; Fowler, 2004), more build-capable organisations tended to disagree. For instance, BPO-Alpha indicated that because of its highly developed skill set, close familiarity with business requirements and the maturity of its modular framework, in-house build was generally faster than package acquisition.

Uni-Alpha indicated that the protracted package/vendor evaluation and selection process, from requirements solicitation through to tender, commercial negotiation and proof of concept often took up to nine months. Indeed, while it may be true that the package removes the need for an organisation to invest time in development, the time required to undertake a diligent assessment and procurement phase should also be taken into account. In light of increasingly prevalent rapid application development methodologies, and particularly in more build-capable organisations, it should be considered whether a lengthy procurement phase indeed negates the perceived timing benefits of package acquisition.

BPO-Alpha characterises the effect of timing on buy *vs* build as a trade-off between time to implement and flexibility and agility. In seeking a flexible service offering, BPO-Alpha has chosen to build in-house and rely on in-house skills to provide a faster turnaround than could otherwise be achieved through a package. Ins-Bravo extended this notion, suggesting that 'stable' systems would tend more to buy, while systems that required flexibility in adapting to requirements or conditions lent to build.

The flexibility in a build solution hence comes from the ability to dictate and execute changes whenever necessary, as opposed to relying upon a vendor's quarterly or half-yearly release cycle. A counterargument was presented by more buy-oriented organisations, particularly those such as Manu-Alpha and Manu-Bravo where the majority of systems were back-end. Here, the size of the organisation meant that vendor relationships could be leveraged to achieve more favourable release schedules.

A different view of timing comes from the fact that greater package capability becomes available for an equal or lesser cost over time with the resultant trade-off between feature fit and implementation timeframe. While a package solution may be implemented now at an 80% feature fit, the next release may perhaps provide a 90% fit. Because of the wide availability of a mature package, the issue then therefore becomes not whether to buy or build, but when to buy into a certain technology.

Another view of timing was presented by Uni-Alpha, where one respondent characterised it as the balance between gaining a potential advantage and accepting implementation risk:

> Buying something that you've not had before, earlier, can give you a competitive advantage and buying it later can let others deal with the teething problems. So you have to decide whether you want to take the risk and go early and deal with all the problems post-buy.

Political factors

While dissimilar to the organisational political factors suggested in literature (Buchowicz, 1991; Kurokawa, 1997), a number of respondents indicated that, despite the best efforts of managed, reasoned decision making, at times the decision to buy or build was mandated or heavily influenced by more senior management.

Other factors mentioned were:

- the preference of the project manager for a particular option based on prior experience;
- the influence a vendor exerts on senior management;
- the way in which projects are initiated in the organisation where the scope infers a buy solution and
- the increasing tendency for the business to specify the type of technology solution rather than just the requirements.

Ultimate accountability for delivery, however, was found to remain with the IT function. One respondent indicated that delaying a decision to implement a specified technology solution may result in a loss of support from the business owner or project sponsor. Balancing this political pressure is the greater long-term technology cost of a possibly less architecturally amenable solution, whereby satisfying a current demand may lead to greater future cost.

Ongoing support

Although maintenance is an important consideration, ongoing support was seen to be more an issue addressed after the buy *vs* build decision was made, rather than have an influence on the choice. This broadly contrasts with suggestions that support availability may limit the feasibility of buy or build approaches (Martin and McClure, 1983). A respondent from Uni-Alpha indicated:

> Business need usually comes first, cost second, and then how do you support this, can we support it. And that's more a yes/no decision rather than an influence on which one [of buy or build] you'll pick.

Organisations that have adopted a more build-oriented approach have consciously decided to bring support in-house. While being a buy organisation, Ins-Alpha has traditionally been build-oriented and has retained a build-

centric maintenance methodology. Respondents from Ins-Alpha indicated that its method of acquisition for major packages was often to acquire the source and accept the ongoing maintenance internally. BPO-Alpha also chooses to maintain support in-house for both built and bought components.

Conversely, organisations such as Manu-Bravo and Ins-Bravo rely on vendor support for packages and look in-house for built solutions. While Ins-Bravo had heavily customised its core insurance package beyond the point of vendor supportability, more 'vanilla' packages remained supported by the vendor. Ins-Bravo indicated that it was able to optimise benefit in the support space for in-house solutions because of the maturity of its internal information systems function.

In line with the literature (Lyons, 1995), while requiring a larger resource overhead and a base requisite skill-set, Ins-Bravo saw the benefits of in-house support to include faster turnaround and flexibility.

Additional factors

Although not broadly supported through the research, the following factors were important within individual business environments.

Standards

Organisations with a build capability, and organisations employing (or moving to) a componentised, modular or SOA indicated that standards were a consideration in buy *vs* build. The high degree of integration necessary in these environments, both in internal build and in modular architectures, meant that standards and standards compliance was a necessity. For instance, Telco-Alpha, Ins-Alpha and BPO-Alpha looked to standards in building their architecture. BPO-Alpha also used standards as a way of instilling robustness and extensibility into its applications.

Interestingly, the Uni-Alpha looked to standards not as a key enabler in integrating components or systems, but instead as a potential exit strategy from a specific package.

Intellectual property

While many organisations acknowledged the view that organisations may choose to build systems to protect core intellectual property (Rands, 1992, 1993), few indicated that this was a core factor. Some noted the valuation of intellectual property: its often short-term nature and the fact that it is only worth accumulating if it results in a competitive advantage. Any decision to build was therefore usually linked more to strategic considerations than to intellectual property.

Interestingly, some organisations, most notably Manu-Alpha and Telco-Alpha, leveraged intellectual property to aid in package acquisition through long-term vendor partnering. By injecting process knowledge into the package, Manu-Alpha was able to essentially obtain a package release that satisfied its requirements and had been tested on a world stage.

Open source

Two organisations indicated an affiliation with open source. BPO-Alpha saw expediency benefits in the availability and no-obligation nature of open source components, although it was recognised that a clear space existed for commercial products. BPO-Alpha did, however, note that open source typically required more ground-work, although the broader community was seen to assist this need.

Manu-Bravo, on the other hand, sought 'best practice' components with no predilection towards or away from open source.

Interestingly, neither organisation adopted open source for cost reasons as is commonly suggested. Both were quick to note that they did not engage in evangelism, and that the open source solution simply represented the best available solution in that particular space. Both also acknowledged the need for a mature in-house capability using open source tools.

Regulation

Aspects of the regulatory environment were impacts for many organisations (particularly those in regulated industries such as Manu-Alpha and Telco-Alpha, and financial services organisations such as FS-Alpha and Ins-Bravo). They indicated that Australia's niche regulatory environment led to a lack of available packages in certain application spaces.

End-customer impact

Companies directly servicing end customers indicated that the impact of a solution on the customer was a consideration that must be taken into account, particularly in that a more attractive solution will usually derive more business. As FS-Alpha noted:

> …for the end customer, it doesn't really matter. If you go and do online banking at [Bank A], or [Bank B], or whatever, do you really care what platform it's running on? Probably not. Almost certainly not. For millions of millions of customers, you don't care what the technology *per se* is – you don't worry about that. So whether the organisation buys or builds is immaterial – what you're interested in is the different perspective on what the service is, how the service is provided to you… the end customer really doesn't care about the technology. As long as it works and it's easy to use, it's accurate, it's there all the time if you provide 24×7, it's fast (there's nothing worse than waiting for screens for 3 or 4 minutes), that sort of thing.

The wholesale environment in which Telco-Alpha operates entails an interesting deployment model whereby Telco-Alpha's systems are deployed to intermediaries who then on-deploy the system to eventual end-customers. This n-level deployment has meant that Telco-Alpha must also consider the 'customer perspective' in addressing buy *vs* build. Ins-Alpha faces a similar situation when dealing with intermediary insurance brokers.

Security

A number of organisations, particularly those dealing with large amounts of confidential information, indicated that the security of a solution or how well a solution fitted

into an existing security framework was an important consideration. For instance, Ins-Bravo felt that security was a key issue due to its information dependence:

> Security is a big thing for systems as to whether you buy or build it, especially in our industry. We're not a manufacturer of products; we're a manufacturer of services. And information is key. So security around that is pretty important, and you have to integrate with your security platform…

Knowledge

Across the organisations studied, there was a degree of support for the literature suggestion that organisations may choose to build in order to develop organisational knowledge (Novak and Eppinger, 2001). Ins-Bravo embarked on a large development project where one factor in the decision to build was to augment a gap in in-house capability and develop expertise. The degree of business knowledge entrenched within the internal information systems function was also a key factor in its decision to maintain its internal capability. The high level of knowledge of the business led to greater levels of responsiveness and better decision making in support. BPO-Alpha similarly felt that the internal knowledge was a key cornerstone of its operational strategy.

The knowledge developed in adopting a build was seen to provide both internal and external benefits. Indeed, one respondent indicated that the knowledge base from which BPO-Alpha operated provided a distinct competitive advantage.

Conclusion

The core aim of this research was to identify the main factors in determining a buy *vs* build decision. This objective has been reached, furthering the understanding of key factors and identifying the issues surrounding buy *vs* build.

Through interviews with strategic IT decision makers across 10 organisations in a range of industry segments, it was found that, as a whole, the industry is widely trending towards package acquisition. Organisations spanned the buy/build capability spectrum; five organisations indicated a 'buy first' strategy, three indicated a mix of both with a tendency towards buy, while one indicated no clear leaning. One organisation was build-based. The 'buy first' organisations do not consciously compare buy and build options. Instead, it is whether the buy option in and of itself is feasible that determines whether or not the build option will be considered in these organisations. Essentially, build is relegated to a second tier in the decision tree.

The factors that the organisations considered when making a buy *vs* build decision, both in forming organisational strategies and in deciding specific project development paths, can be divided into core and peripheral factors. A number of additional factors were interesting in their effect within a specific business context: standards and standards compliance, intellectual property, open source, regulation, end-customer impact, security and knowledge.

The core factors identified were:

Strategy – IT strategy drove the buy/build approach. Organisations that considered build an option (most notably Ins-Bravo and BPO-Alpha) strategically chose to maintain a build capability. Alternately, buy-oriented organisations (most notably Manu-Alpha, Telco-Alpha and Manu-Bravo) either maintained few development capabilities, or were phasing out of development entirely. Additionally, the core/non-core nature of the system is a consideration.

Commoditisation vs competitive advantage – Whether a system represents a commodity or a competitive advantage can determine the adopted approach. Broadly, commodity capabilities should be bought while, for systems providing a competitive advantage, build may be a consideration. The front-end/back-end system dichotomy (as evident in organisations such as FS-Bravo and Ins-Bravo) exemplifies this balance, where commodity back-end processes are served by acquired packages, while more niche, advantage-yielding front-end systems may more likely be built in-house.

Maturity

Package maturity – Once a package reaches the maturity breakpoint and is mature enough to be able to satisfy an organisation's requirements, the advantages afforded to the vendor – including economies of scale, wide customer base and a dedicated build focus where the development of the package is a core business begin to outweigh the initial benefits of in-house knowledge and familiarity. Past this breakpoint, specialisation and scale advantages leveraged by the vendor in furthering the product increases the capability gap between buy and build options, in turn increasing the attractiveness and likelihood of package acquisition.

Internal Capability – Non-IS literature has often suggested adopting a build approach in light of appropriate core competencies (Venkatesan, 1992; McIvor *et al*., 1997). Extending this notion to IS development, a build decision is more likely if development exists as a core competency. The organisations studied similarly support the literature. Organisations that consider build (BPO-Alpha, Ins-Bravo, FS-Bravo, FS-Charlie) have decided to maintain an in-house capability, while organisations favouring buy (Manu-Alpha, Manu-Bravo, Telco-Alpha, Ins-Alpha) have generally shifted or begun shifting their IT profiles away from development and towards analysis and project management.

Requirements fit – The primacy of the business need and satisfaction of business requirements are key to determining buy *vs* build. Because IT exists as a supporting function enabling the core business within the organisations studied, wherever possible, satisfaction of business requirements is of paramount importance.

Cost and value – Although no longer of prime significance (contrasting the weight afforded to cost in literature), cost and value to the business nevertheless remain a core consideration. The IT function typically exists as a cost centre and not a revenue centre within the organisations studied, and as such its financial performance

is measured in terms of the cost incurred *vs* the value provided. The cost of package acquisition was indicated as a core criterion in determining the suitability of a buy approach by organisations including Ins-Alpha, Telco-Alpha, FS-Bravo, Ins-Bravo, Manu-Bravo and FS-Charlie.

Peripheral factors in the decision to buy or build were:

Risk – While respondents suggested risk was not core to the decision process, its importance was acknowledged. Specifically, risks in implementation and vendor management were important. The risk appetite of an organisation also affected its stance on build – more risk-accepting organisations such as BPO-Alpha were more build-oriented, while risk-averse organisations such as Ins-Alpha were more buy-oriented.
Time and timing – Three temporal factors affect buy *vs* build– the initial time to implement, the ongoing flexibility and adaptability and the time at which an organisation chose to invest in a technology.
Political factors – In isolated instances, a political decision overrode any transparent buy *vs* build decision-making process. In these situations, respondents felt that opinions and opaque decision making clouded the process, although empire building and not-invented-here cultures suggested in literature were largely not present. The balance between decision making and accountability also has a large impact and influence on the direction of buy *vs* build decisions, whereby a less technically amenable but more business-accepted solution may be selected despite longer term value failings.
Ongoing support – Like risk, support was an important consideration that was seen to be more a by-product or a secondary consideration taken after the buy/build approach was chosen. The specific logistics of supporting a system were also often driven by the organisation's technology strategy and defined buy *vs* build approach.
Type of system – Although effectively a result of commoditisation and maturity, the system type can also affect the approach taken towards buy *vs* build. Certain application spaces such as ERP/CRM represent 'classic package buys', while a lack of maturity in other spaces render build more amenable. Business intelligence and the use of rules engines presents a capability space where packaged generic capabilities are used in formulating component-based 'built' applications while the integration space presents the entire spectrum of buy *vs* build.

The effect of specific factors on buy *vs* build is difficult to quantify, as specific factors may have different impacts on specific projects and in different scenarios. When asked how a specific factor would impact the direction of buy *vs* build, many respondents indicated this view:

> …Once again, it really is specific to the actual project or the situation (Ins-Bravo).

This research provides senior information systems managers with a number of factors (both core and peripheral) that will help guide their buy *vs* build decision. The weighting applied to each factor will be organisation and possibly project specific. We do not suggest that this list excludes the consideration of other issues for specific organisations and/or projects. For instance, we found that some organisations are more likely to consider in-house build when knowledge around the business and the technology exists internally.

Research limitations

In evaluating this research, a number of limitations must be addressed. One such issue is generalisability. The research investigated the buy *vs* build decision process in 10 companies in a range of industry segments with an annual turn-over in excess of $750 million. The findings may have been different if the research had considered smaller organisations with less capability to spend on information systems. In addition, the buy *vs* build decisions cannot be described as 'green fields' decisions since the organisations studied often had legacy systems prior to the buy *vs* build decision. This issue was not ignored in the interviews but the relative importance of some factors may have been affected compared with a 'green fields' organisation.

The research only interviewed respondents from the senior levels of information systems decision making, ranging from IT architects to group IT leaders or chief information officers. We believe that these professionals provided the necessary information on the business drivers as well as the more purely information systems factors. While interviews with senior business managers would have provided another lens on the issue, we feel confident that the interviewees provided a good understanding of the relevant business drivers and the reaction of information systems to these drivers.

Future research would include these senior business managers to determine if there is indeed a different perspective on the buy *vs* build process to that of the information systems professionals. We also intend to examine in detail the decision process on individual buy *vs* build projects and extend the research to smaller organisations.

Notes

1 A similar comment is made by Keil and Tiwana (2006) who reviewed the literature for packaged software selection criteria.
2 See also (Parr and Shanks, 2000).

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