

7 Acquiring Information Systems

The main choices when acquiring information systems can be categorised as off-the-shelf (packaged), bespoke applications developed by an in-house IT department or a software house and end-user developed systems (Bocij et al., 2008).

7.1 Bespoke development

Bespoke development refers to when an information system is developed by an information systems professional to match the business requirements of the application. The information systems professionals will either work for the business which is termed 'in-house' bespoke development or for a third party such as a software house which is termed 'outsourced' software development. Bespoke development has the benefit of producing software tailored to the precise requirements of the business. Disadvantages include cost, bespoke development is the most expensive way of developing new information systems. In terms of time bespoke development, especially when using formal structured development methodologies, is notorious for time overruns, with delays of months or years not uncommon and quality. Finally in terms of quality bespoke software is not usually free from bugs; software bugs can range from the trivial to the catastrophic, the latter often attributable to poor analysis of requirements.

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7.2 Off-the-shelf software

Off-the-shelf purchase of packaged software is an acquisition method that involves direct purchase of a pre-written application used by more than one company. This type of software is pre-written and is available for a whole variety of hardware platforms from PCs to mainframes. Off-the-shelf software is written to offer a broad functionality that will suit a wide range of different businesses. This broad range of functions has the benefit of fitting the requirements of a large number of businesses. It also may offer too many features for any particular business, which may then feel that it is paying for things it will not use. At the same time, it may require businesses to process information in a particular way that is at odds with the way they normally do business. Alternatively, a certain off-the-shelf software package may not offer sufficient features. The major benefit, however, of off-the-shelf software packages is their low cost when compared with acquiring bespoke software with the same level of functionality. In addition, because packaged software has been developed for a commercial market, it is less likely to suffer from the bugs that afflict bespoke software. In a tailored off-the-shelf purchase, pre-written software is purchased from a supplier, but it is possible to configure it to be specific to the company. In a component off-the-shelf purchase, different modules may be purchased from different suppliers and built together.

7.3 End-user-developed software

End-user-developed software is software written by non-IS professionals, i.e. the business users.

Enterprise resource planning or institutional applications are those that affect general corporate activities, cut across more than one department or functional area, or systems that involve organisational data held in corporate databases. Examples include accounting systems, sales order processing systems and materials requirements planning. End-user applications are more limited in scope. Applications may be departmental or personal in nature and are usually output- or report-oriented rather than input-driven. These applications may either be written by IT professionals or by the end-users themselves. If the latter is the case, they are often referred to as end-user-developed applications. Such systems may be simple such as a spreadsheet or a small PC database or less commonly they may be more sophisticated such as a production planning system based on sales forecast data from several branches of the same organisation. Such applications are typically for individual or departmental use, although in the case of the second example the system may have company-wide relevance. The main benefit of end-user-developed software is that it is normally used by those who develop it, and so the requirements are not subject to mistranslation or the provision of over-sophisticated solutions. The negative side to this is that in some cases inappropriate software development tools might be used such as complicated spreadsheets instead of the construction of a database. A further significant concern with end-user development is that software may be riddled with bugs as a consequence of corner cutting such as poor or non-existent design, little or no testing, or no documentation.

There are also a number of hybrid approaches to acquisition. A group of organisations in the same business or activity area may have information systems requirements that individually may be very expensive to develop. A solution may be for a bespoke system to be developed by a third party, which allows the development costs to be spread among all the organisations involved. Similarly, an off-the-shelf package may provide 80 per cent of the required features, but others may need to be added through some bespoke development by either IS/IT professionals or by end-users. The approaches to systems acquisition described above are not mutually exclusive for a given project or within an organisation. Where the software is generic to all businesses, as is the case with systems software and office productivity packages, off-the-shelf software will be purchased. Where the business has more specific needs and wishes to achieve a competitive advantage, bespoke and tailored approaches to acquisition will be used. With e-business systems there is often a need to integrate in-house legacy systems and systems purchased from different vendors. This uses a building block approach of different components including data sources that are integrated together. This is referred to as enterprise application integration (EAI), and achieving this is a significant challenge facing project managers and systems designers.

7.4 Factors affecting software acquisition

There are a number of factors that will influence the choice of acquisition method. Three critical ones are time, cost and quality considerations. If an organisation has a pressing problem that requires a new information system quickly, it is probable that a package or tailored package will be sought. Similarly, an organisation that needs a 'quality systems solution' may well consider the packaged software route, especially if its requirements are straightforward. The different acquisition options have different strengths when considered in terms of the three critical criteria. Quality of the delivered product is considered from two respects: the number of bugs or errors found and the suitability of the software in meeting the requirements of the business user. Note that good quality in terms of the number of bugs that typically occur for packaged software may coincide with poor quality in terms of the business fit.

The benefit of packaged software occurs because the cost of developing and debugging the software is shared between more than one company. This results in lower costs and fewer bugs than bespoke development for a single company. The use of packaged software by more than one company is also its greatest weakness, since its features must suit the typical company. As a consequence, it may not meet the needs of an individual company. Other factors affecting software acquisition include the following:

- *Organisation size.* A small or medium-sized business will inevitably have relatively limited resources for the purchasing of information systems and information technology (IS/IT). This suggests that there will be a tendency for such organisations to favour the purchase of off-the-shelf packages or possibly end-user applications development.
- *In-house IS/IT expertise.* Where little in-house IS/IT expertise exists, either in the form of IS/IT professionals or experienced end-users, there will be a need to use third parties in the acquisition of new business information systems. These may include software vendors for off-the-shelf software packages, the use of consultants and/or software houses. Precisely what form of third party is used will depend on the other factors discussed here.

- *Complexity of the required information system.* Where a business information system requirement is particularly complex, or for an unusual application not available as a packaged solution, it is possible that one may view bespoke software (either developed in-house or by a third party) as the only viable solution. However, complexity does not necessarily equate to 'uniqueness'. For example, one could regard a materials requirements planning system or a complete accounting system as complex, but many packages exist for a variety of hardware platforms. Therefore, complexity is not necessarily an indicator that an off-the-shelf package should be ruled out.
- *Uniqueness of the business or business area to be supported.* The higher the degree of uniqueness that exists in the area to be supported, the less likely it is that a suitable off-the-shelf package can be found. This is clearly an indicator, therefore, for bespoke development of some kind. As before, we must not confuse uniqueness with complexity. It may well be feasible for a non-IS/IT specialist to develop a solution using tools available to end-user developers. Of course, if the required system is complex and also carries a high degree of uniqueness, then bespoke development by IS/IT professionals is probably the best acquisition method.
- *IS/IT expertise among end-users.* A certain degree of IS/IT literacy and expertise is necessary if end-users are to be able to develop information systems. In addition, such literacy is desirable when selecting suitable off-the-shelf packaged software, as it can help the business focus more clearly on its precise requirements from both a functional and a technological perspective. If an organisation has little end-user IS/IT expertise of its own, but has its own IS/IT department, it will be very much dependent on solutions provided by IS/IT professionals with or without third-party support.
- *Linkages with existing applications software.* Where new business software needs to integrate very tightly with existing information systems, there is a higher probability that at least some bespoke development work will need to be done to integrate the two systems. Also, a high degree of integration may imply that the new information system has to be developed in a bespoke fashion in order to achieve the desired level of integration. Having said that, many software vendors supply packages for different business areas which integrate very well with each other.

By looking at combinations of the above, it is possible to come up with a 'best-fit' acquisition method.