IT Sourcing Decision

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Introduction

The in or outsourcing decision should be based on a wide variety of assessments of current and future needs. The point, of course, is that there are many decisions that contribute to the final one of whether to make or buy. The decision process should begin with an honest assessment of current processes. It gains the organization nothing if it only automates processes that have evolved into unnecessary hindrances.

Article Review: "A multiple-criteria framework for evaluation of decision support systems"

Phillips-Wren, Hahn and Forgionne (2004) published "A multiple-criteria framework for evaluation of decision support systems" in the August, 2004 issue of *Omega*. Their purpose was to evaluate the usefulness of using decision support systems (DSSs) in making the determination of whether to make new systems in-house or to buy packaged products from outside vendors. Phillips-Wren, Hahn and Forgionne (2004) cite other authors (P. Humphreys, R. McIvor and G. Huang 2002. An expert system for evaluating the make or buy decision. *Computers & Industrial Engineering 42*(2-4):567-85) as stating that "firms do not have formal methods for evaluation of the make versus buy decision and often make the decision on the basis of a single criterion such as overhead costs" (p. 323).

The stories of any industry professional certainly can bear out this view. One such company, IMT Custom Machine Company (IMT-CMC), found itself with a system that was fragmented and outdated, to the point that individuals shopped for and added their own PCs rather than limit their computer access to IMT-CMC's old mainframe system (Brooks and DeHayes, 2000). The company held a wealth of problems, including trying to patch together incompatible systems inherited through acquisition of other companies.

Phillips-Wren, Hahn and Forgionne (2004) note that DSSs typically have "been evaluated on only a single criterion such as the outcome from decision making" (p. 323), a result of using them within the same context in which most make-or-buy decisions are made (i.e., the single criterion). The authors found that though DSSs as they currently are used have the potential to affect the outcome of the decision-making process, the use of a DSS "did not offer a statistically significant improvement in terms of outcome-related characteristics" (Phillips-Wren, Hahn and Forgionne, 2004; p. 323). Organizations still need to undertake thoughtful decision-making, whether they are approaching the make-or-buy decision with or without the assistance of a DSS.

At IMT-CMC, the company already had invested more than 7,000 hours into trying to make a "free" program work, without

success. The cost of the “free” program likely was higher than the cost of an efficient and integrated system produced specifically for IMT-CMC. The company already had wasted literally thousands of hours trying to make a free program and outdated equipment meet the current needs of the business, apparently without a thought of the needs of the future. It had choices ranging from bringing in an outside consulting company to design, build and implement an entirely new system to approaching the problem in the way it chose at the outset. Had the company’s management chosen the option for a totally new system, however, it still would have faced many of the same questions. It also may have ended up with a brand new system that met current needs, but only automated processes that should have been eliminated.

One of the first assessments that the organization needs to make is whether it has sufficient in-house talent to make its own system. This assessment should include competence, of course, but it goes much further than only that. Even if in-house personnel have the technical ability to design, build and implement a new system, do they have the time available to them? If so, then that determination raises yet another question: if technical personnel have the time to undertake such a project, does the organization approach staffing wisely?

Beginning the Assessment

A wise approach is to begin the decision-making process with a hierarchical decomposition of the current system, relative to identified needs for both the present and the future. Martin, Brown, DeHayes and Hoffer (2002) give a concise definition of hierarchical decomposition that made sense to this reader who has no technical background of any kind. The authors describe “the system” as “a set of interrelated components” (Martin, et al., 2002; p. 318), and that any one of the components making up the larger system can itself be viewed as a system. In turn, this subsystem can further be broken down into a more narrowly-defined set of components, which also may be able to be viewed as subsystems themselves. Martin, et al. (2002) explain that there are five primary goals of hierarchical decomposition:

- Break the larger system down into more manageable and understandable segments;
- Analyze or change only part of – rather than all – a system;
- Allow chronological design or construction of a specific subsystem;
- Allow targeted use of a specific subsystem; and
- Allow more independent operation of system components.

This necessarily involves both high- and low-level analysis of system operation and goals. Lee (n.d.) provides a nontechnical explanation of high- and low-level analysis. High level: [Go(Supermarket),Buy(Milk),Buy(Bananas),Go(Home)] … It is a long way from instruction fed to the agent's effectors (Lee, n.d.).

In contrast to this high level analysis is the low level approach, which Lee (n.d.) also illustrates in nontechnical terms: [Forward(1 cm),Turn(1 deg),Forward(1 cm),…] (Lee, n.d.).

In this example, the instructions and the effects gained from those instructions are much closer both in proximity and in time. Change in the system's effects, results, usefulness, relevance or any other characteristic can be done on this level; high level analysis provides an overview of how the system arrives at its visible results. Martin, et al. (2002) provide the reasons for viewing and analyzing systems in this way in their list of the five primary goals of hierarchical decomposition. It allows different people to work on different subsystems simultaneously, whether they are designing, building or altering existing systems. It also allows systems to be changed to provide information in the form it is most useful.

Two Beginning Points

Beyond the questions of ***what*** the system should do also are those of ***how*** it should accomplish those ends. As example, if

the company has many users, it can be more cost effective to use the thin client, three-tier approach rather than buying many PCs capable of supplying all processing needs, then adding an applications server to balance the deficiencies. It is also more efficient to update applications on a single server than on many client machines if users are dispersed over a wide area. Smaller organizations or departments may find it more cost effective to operate only a database server in a two-tier system while providing users with client machines with greater capabilities.

One of the leading points of consideration in the make-or-buy decision must be whether sufficient in-house expertise exists, as stated above. Following are two possible scenarios, one where there is a great deal of in-house expertise, the other where there is not.

Sufficient In-House Abilities

IT is famous for its failed projects, unintentionally expanded projects and slipped development and implementation schedules. Keil and Montealegre (2000) report that a survey recent to 2000 “revealed that 30% to 40% of all IT projects exhibit some degree of escalation” (p. 55). Most are not brought under control and end up being implemented well beyond schedule and over budget, if they are implemented at all (Keil

and Montealegre, 2000). One way to avoid this problem is to purchase a packaged product.

Advantages to purchasing a system include shorter cycle time to implementation; lower total cost; in-house resources are free for other uses. Application quality may be higher, and a packaged product can “infuse new expertise” (Martin, et al., 2002; p. 379) without increasing departmental or organizational headcount. Disadvantages include risk of lack of product knowledge; greater risk in the form of required business process changes; and long-term dependency on an external vendor.

Key decision rules should include comparison of overall costs of each option; whether there are tight time limits on implementation; and whether use of the packaged product would require business process changes. Total cost should be determined through cost-benefit analysis or capital budgeting. In the case of IMT-CMC, the company had invested more than 7,000 hours into trying to make a “free” external program work (Martin, et al., 2002), without success but at high cost. An analysis of total costs could have pointed the company to a packaged product that would have been operational in a relatively short time, at a cost much less than 7,000 hours of salaries and benefits.

Little or No In-House Expertise

The three leading concerns would be total cost, business process effects and making the best overall choice. There would be other considerations, but most of those other points ultimately would lead back to one of these three.

Total Cost

The first concern should be with total cost – not just the purchase price and cost to implement, but also the costs of not acting at present. Management should want to know what operating and maintenance costs would be over the expected life of the package, and it should want to have as accurate a dollar figure possible of how much a specific package could save (Horngren, et al., 2002). Will it allow the company to add new employees at a slower rate, or better yet, will it allow the company to avoid hiring a certain number of people as the business grows? Is the package a complex one (such as one used in computer-aided manufacturing) that will need a babysitter that the company will have to hire and keep? Will it be a solution or a problem?

Business Process Effects

Will the software make current processes more effective, or will it require that the company change important processes to accommodate its needs? One reason to use any software product is to make processes more efficient (Turban, et al., 2002), but

if a specific package requires that people serve it instead of it serving people, then it likely something that management should want to be certain to avoid. On the other hand, management also should not want to be putting any time into automating processes that should be changed.

This is an apt place to invoke high-level system analysis. What is the immediate need that the company seeks to meet through the proposed change? If it is merely automation of current processes, then what the company needs from the new system will be far different than if the company also is seeking to streamline processes for the purpose of enhancing internal efficiency. With the greatly heightened need for increased efficiency across all industries in all economic sectors, management can be considered to be remiss if it does not consider efficiency-related options as well.

Choosing the Best Option

How will management know if it decides on the most useful and trouble-free system that also fits the needs of the business? The company likely could benefit from having a consultant in on the process of identifying available choices and choosing the best fit for the business, but that can be costly in itself.

An appropriate approach for management would be first to ensure that it had identified all of the things the company

would need software to do for it in both the present and the future. When all involved are satisfied that they have identified every current and potential need they would like to see a new system fill, then it would be time to call in that consultant. The consultant's role would be to review the list - s/he's certain to add to it – and to make suggestions of available products.

Management should then give software salespeople the job of demonstrating how their software is best for the company's current and future needs, letting their employers take on labor costs for that stage. At the end of this process, the consultant should return to review what the salespeople have provided and to recommend a final choice.

The company's management may still have misgivings, but it could have far more confidence that the purchase is a wise one. The final decision would have been arrived at by people more technically knowledgeable than general managers, and there would be no unpleasant surprises in terms of total costs when the plan selected is one designed by the vendor selected to implement it.

Conclusion

When approached systematically and in consideration of all costs involved, the make-or-buy decision is one that has the ability to bring more benefit than only the fact of having a new system to use. The right decision can positively contribute to

the organization’s competitive advantage, but the wrong one can be insidiously detrimental.

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