INTRODUCTION

This paper examines the strategic decision making process of managing IT infrastructures. In particular, this paper proposes a methodology that can be employed in making a company’s decision to implement a Service Oriented Architecture (SOA). SOA forces us, for the first time, to analyze and truly examine our IT operations through business—not technical—perspectives (Datz, 2004). Accordingly, the decision to embrace or not to embrace SOA and in what capacity, combines quantitative and qualitative factors from both business and technical perspectives. Therefore, it is not possible to provide a purely objective measure by which the decision to embrace SOA can be resolved. This paper proposes a methodology through which this decision can be analyzed and evaluated and describes the insight provided.

BACKGROUND

SOA is a step in an evolutionary chain of advancements in information systems architecture: Distributed Computing (Ganti & Brayman, 1995), Business Pressures for Integration: (Hopke & Woolf, 2003) and Cost Containment and Outsourcing (Bissonnette, 2005). At its most basic level, SOA is a collection of services that communicate with one another (Datz, 2004), (Wikipedia, 2005). Business applications are constructed by linking together the appropriate services. This service focus provides a better way to expose discrete business functions and is therefore an excellent way to develop applications that support business processes (Brown & Johnston, 2002).

A Web Service is an application or business logic that is accessible using standard Internet protocols such as HTTP and SOAP and standard data formats like XML (Hagel & Brown, 2001). Although the concepts behind SOA were developed well before the emergence of Web Services technology, Web Services play a vital role in modern SOA (Hashimi, 2003) and for the purposes of this paper we assume that a current SOA implementation includes Web Services.

SOA offers substantial technical benefits that make development, maintenance, and integration significantly less burdensome for an organization, while simultaneously improving over-all performance. SOA provides a variety of benefits related to support for heterogeneous environments and legacy systems by simplifying replacement and in some cases, extending the lives of these systems (Datz, 2004). The business-oriented benefits of SOA are not as well characterized, but these benefits can make SOA very attractive to organizations aspiring to control IT costs and maximize the value of their existing investments. The improved integration capabilities of SOA can lead to bottom-line savings by making IT costs more predictable, and easier to manage. Additionally, SOA makes it easier to share information with business partners across company firewalls, simplifying the implementation of business relationships (Datz, 2004).
Outsourcing Desires: Outsourcing desires are an indication of the company’s long term IT strategy and impacts how the company plans to focus its IT assets and initiatives.

Available IT Resources: By Available IT Resources include both IT personnel and tangible IT assets and technology. The Available IT Resources have a sizable bearing on the organization’s execution capability to implement an SOA solution.

Classification and Prioritization
The next steps are prioritization and classification of the decision factors; this is usually performed by constructing a decision tree. For the factors identified above, the decision tree is shown in Figure 1. We categorized factors based on whether they were primarily from the business side or the technical side of our organization. Once the AHP decision tree has been constructed, we evaluate whether each factor supports SOA and score each according to its relative importance.

While AHP has proven to be effective in prioritizing and simplifying the complexity of such decisions, this methodology has several weaknesses. These weaknesses are particularly apparent when AHP is used to analyze a technology such as SOA that has strong ties to a variety of business factors. First, it is prone to cause time-consuming disputes regarding which values are most important (Harfield, Driver, Beukman, 2001). Second, some factors are inherently qualitative and it may be difficult to assign them a quantitative value. Finally, it does not address the possibility of interdependence between the factors involved in the decision to adopt SOA decision. To address these weaknesses we turn to the realm of competitive strategy and marketing.

2 x 2 Matrix Analysis
To address the weaknesses of AHP analysis, we use the “2 x 2 matrix” format demonstrated by Porter in his analysis of competitive strategy (1998) and the Boston Consulting Group’s model of the Product Portfolio Matrix (2003). The 2 x 2 matrix allows us to subjectively analyze and understand two factors and the relationship between them. It can be especially effective when used to analyze factors on the same branch of the AHP factor tree.

CONCLUSIONS
We have demonstrated in the above analysis a methodology that can be used to facilitate a company’s SOA decision. First businesses need to identify the factors most important to their company’s situation. While these factors may differ from those identified in our example, the analysis methodology should be the same. The AHP methodology can be used in conjunction with the 2 x 2 matrices as an aid to making the SOA decision. Because the decision to adopt SOA is influenced by both business and technical considerations, it is necessary to use both business and technical methodologies in making the decision. We have proposed integrating AHP with 2 x 2 matrixes in order to address the weaknesses that the AHP methodology exhibits with regard to the SOA decision process (see figure 4 below).

The central benefit of SOA, as advocated by the IT community, is that it can help businesses use their existing IT resources to do more with less.
and ultimately improve the efficiency of the entire company, making it more competitive.

At a strategic level, however, SOA is a powerful tool for facilitating alignment between IT and business operations. The methodology, coupled with SOA, gives insight into the role of markets, value chains and IT assets as factors in the decision and the dominance / balancing aspects of the factors. Further research will provide more detailed insight.

We believe that the proposed methodology will help businesses make technology selection decisions that not only result in technologies more suited for their IT departments, but also the right business decisions in terms of market and industry dynamics. Given the need for alignment between IT and line-of-business operations, methodologies such as this will become increasingly necessary.

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