Strengths and Weaknesses of Global Information Systems:

Ownership Versus Consortium

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This paper is a review of some of the strengths and weaknesses of global information systems (GIS) created and owned by an organization compared with GIS developed by various organizations where GIS responsibilities are divided among multiple partners. The strengths and weaknesses of GIS ownership affect how organizations do business and the effective implementation of information technology internationally (Luftman, 2004). The flow of information across a global enterprise is at the core of organizational concerns in GIS and influence decision-making processes for global enterprises.

The migration and integration of information plays an important part of GIS architecture. When examining flow of information, according to Laudon and Laudon (2006):

> Electronic commerce, electronic business, and intensifying global competition are forcing firms to focus on speed to market, improving customer service, and more efficient execution. The flow of information and work needs to be orchestrated so that the organization can perform like a well-oiled machine (p. 54).

The successful flow of information provides a basis for leadership to create a strategy that can exploit the strengths of GIS. Leadership can mitigate the weaknesses of GIS to maintain core competencies and provide opportunity to facilitate business process and models to adapt to a global environment (Luftman, 2004).

Standards, Architecture, Systems, and Support

When considering GIS, organizations need to examine several factors so that leadership can fulfill organizational needs, core competencies, and strategies while creating a successful environment for business. Factors that influence core competencies and strategies include

standards, architecture, support, and systems. These factors have are an integral part of the strengths and weaknesses of GIS because each factor controls the flow of information. Using an information system that allows successful information flow across a global enterprise is one of the biggest challenges today (Laudon, & Laudon, 2006).

Standards. Standards are extremely important to information technology (IT) functions and organizational procedures need standardization to transfer information in a timely fashion to allow information to be used quickly and efficiently. The development of integrated tools requires data exchange standardization. An organization responsible for creating and owning a GIS can set its own standards and enforce all subsidiaries to follow those standards. However, if leadership does not actively participate in setting its own standards, an organization risks an isolated IT departments that does not effectively calculate risk because of a lack of global enterprise perspective when determining standards (Beck, 2010). A consortium can set a more useful and reliable standard by involving more stakeholders worldwide, creating a better consensus for a standard among a larger group of participants.

The standard an organization sets for GIS may not match other organizations' standards and inhibit the exchange of information. Management developing a strategy should recognize the importance of standards and the risk of poor standardization in risk assessment. The risk of insufficient exchange of information may also happen with global systems developed by a consortium if not using an accepted standard. The London Stock Exchange (LSE) is an example of the strengths and weaknesses of a single organization versus consortium GIS.

In 2005 after a terrorist attack, the LSE decided that a consortium should handle non-algorithmic trades. The LSE implemented a system, however no standard data exchange format existed. No standard data exchange meant that counterparty risk calculations could not match

real-time transactions causing financial IT infrastructure to halt in 2008 to prevent the loss of hundreds of millions of dollars world-wide when Lehman Brothers failed (Beck, 2010).

No risk calculation took place as transactions happened during the Lehman Brothers failure because without standards there is no way to identify and stop financial transactions that have internal trading risks. The risks must be calculated manually. According to Beck (2010) no standards currently exist for data exchange in the LSE market. The weakness in a consortium GIS is the lack of a cohesive deciding force to create standards to allow flow of information to determine risk.

Architecture and systems. System architecture relies on standardization to support effective GIS. Although control of the architecture and systems provides strength for an organization internally through ownership, organizational ownership of architectural components to GIS has a number of weaknesses for external business exchange. For example, organizations converting to e-business by moving organizational operations to the Internet discover increased complexity and issues. The problems include a number of difficulties such as legacy applications in currently in use, agreements with outside partners on standards, data, and integration creating insufficiently planned architecture and systems that inhibit the transfer of information to all stakeholders (Lan, 2005).

Multiple partners developing system architecture and deploying it through an environment such as cloud computing allow an organization to integrate services and systems among partners without organizations developing responsibility for integration, upgrades, or support. However, an organization must trust the security of the cloud for information protection, which can leave organizational information vulnerable. As in the case of the LSE, when no one organization was responsible for real-time credit risk calculations, experts assumed transactions

were fine until the poor transactions were executed and loses accumulated forcing organizations to disconnect from the system (Beck, 2010).

Support. Supporting GIS is challenging for an organization (Siew, Soh, & Weil, 2010). In the case of both organizational ownership and consortium ownership, both recognize weaknesses in the systems and recognize that support and developmental improvement are essential to maintaining success. Many organizations recognize that support includes improvements for data management, risk evaluation, algorithms, and testing systems (Beck, 2010).

A major strength for GIS an organization owns is internal IT business support and external compliance. Information systems controls require continuous monitoring controls, especially to detect irregular transactions in e-commerce systems (Murthy, 2004). Continuous monitoring in a specific way for example, in regulatory compliance by an organization isn't always possible with a GIS system not owned by an organization because the organization needs specific tools, which may not exist.

However, in organizations with low internal controls on GIS by leadership can have poor results with internal IT support with disconnects between local and enterprise IT (Shenkar & Luo, 2004). Cost of development of enhancement can also limit support. Technology developed by multiple partners can have more support from external resources such as open source programming languages where response to bug fixes can be faster if open source services require standards for information circulation among participants (Turban, Leidner, McLean, & Wetherbe, 2007).

Decision-making processes. To avoid failures in GIS project, management needs to be as informed as possible in the decision-making process whether owning the development and

implementation of GIS or using GIS or GIS components owned by a consortium. Top management's failure to understand project intricacies and lack of support for risk assessment in the implementation phase linked with scope creep attribute to project failures (Biehl, 2007).

The decision-making process is a strategy developed by leadership to include business agility, new sources of innovation, efficiency, and business requirements. According to Kettinger, Marchand, and Davis (2010) organizational standardization and flexibility create a successful business environment by integrating core business processes into GIS and create information centralization. As part of the decision-making process, risk management is an important aspect of GIS and is a primary consideration when examining different strengths and weaknesses of GIS ownership.

Conclusions

GIS not owned by an organization but developed by multiple partners have strengths including the creation of useful and reliable standards through consensus of stakeholders worldwide. Other strengths include developing and deploying system architecture through an environment such as cloud computing to integrate services among partners and technology developed by multiple partners can have more support from external resources allowing faster delivery of updates. The weaknesses of a GIS not owned by an organization but developed by multiple partners include difficulty in agreeing on standards, unknown security risks, and potential lack of tools for continuous monitoring of compliance to regulations.

The strengths of GIS owned by one organization include organizations can set its own standards and enforce those standards, architecture and internally owned systems provides strength for an organization through ownership, and the ability to supply continuous monitoring controls. Weaknesses of single organization GIS include isolated IT departments not effectively

calculating risk, external business exchange weakness, and poor internal support because of disconnect between local and enterprise IT. The examination of these strengths and weaknesses is a part of the decision-making process to avoid failures in GIS using risk management processes and procedures.

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