

THE INFLUENCE OF ENTERPRISE ARCHITECTURE ON THE INTERNAL AUDIT

Cardoş Vasile Daniel

Babeş-Bolyai University Cluj-Napoca, Romania, Faculty of Economics and Business Administration, 58-60 Teodor Mihali Str., Cluj-Napoca , vasile.cardos@econ.ubbcluj.ro, 0745-216-416

Volkan Ildiko Réka

Babeş-Bolyai University Cluj-Napoca, Romania, Faculty of Economics and Business Administration, 58-60 Teodor Mihali Str., Cluj-Napoca, ildiko.volkan@econ.ubbcluj.ro, 0745-797-690

Abstract: Information technology (IT) has a pervasive influence and it is a critical factor in many organizations. As such, it's often one of the most valuable assets an organization owns and uses as a cost-effective tool to attain their goals. But IT can also be a failure factor if the strategy used in designing, deploying and maintaining the IT architecture doesn't meet or converge with the overall strategy of the organization and it's continuous need for information. Enterprise architecture incorporates the main enablers an entity needs to achieve this convergence. From the internal audit's function perspective this can raise a wide range of challenges due to business strategy amendments that has an influence on the information system and the supporting technical architecture. The aim of this article is to set off the way an enterprise's architecture influences the work of the internal auditor in performing an IT audit.

Keywords: internal audit, IT audit, enterprise architecture

Introduction

In a dynamic business environment with harsh competition an organization cannot secure it's survival without a constant adaptation to the requirements such a market poses. External factors has to be "internalized" by the managers who have to rethink the organization's strategy which is supported by the business processes and operations and guided by information and decisions. An effective enterprise architecture is needed that must facilitate the flow of information regarding the initial state and position of the organization and also the desired or achieved status in comparison with the objectives predefined. Also, such an enterprise architecture must be adaptable, dynamic in order to cope with the future changes in cost-efficient and reliable manner.

Having this in mind we have to consider any organization as being a system which is „...a set of different elements so connected or related as to perform a unique function not performable by the elements alone” (Rechtin Eb., 1991, pg.7). Indeed an organization consists of several different elements such as departments, compartments, functional structure, that connected and related to each other by a formal or informal communication networks that permits the flow of data, information and decisions among them, but none of these elements or communication networks cannot assume and accomplish the function the organization does as a whole.

The influence of management reaction to change on the enterprise architecture

„Defining an enterprise architecture is complex, because it encompasses the systems within the context of the whole enterprise. To simplify this, an enterprise architecture is typically structured by considering a business or system as a series of components (or services) with inter-relationships, without having to consider the detailed design within the individual components.” (Macaulay A., 2004, pg. 2)

Zachman J.A. (1987, pg. 276-277) attempted for the first time to define what system architecture is. But he came to the conclusion that at the time being there was „little consistency in concepts or in specifications of <architecture>”. Also he notes that there was little chance that various definition would emerge. Still there are several definition of the term architecture generally accepted in the existing literature. One of them is stated in the ANSI/IEEE Standard 1471-2000 as: 'the fundamental organization of a system, embodied in its components, their relationships to each other and the environment , and the principles governing its design and evolution'. (Macaulay A., 2004, pg. 1)

Enterprise architecture allows organizations to build foundations they need to survive and adapt to present and future business challenges. Sound enterprise architecture supports the ability to stay agile, provides for increased return on investment, and creates a framework for making future technology decisions. It identifies the main components of an organization and how components in the organization's nervous system function together to achieve defined business objectives. These components include personnel, business processes, technology, financial information and other resources. If decisions about components and their interrelationships are uncoordinated, minimally effort and resources will be duplicated, performance and management problems will arise.

Enterprise architecture has also a role in the ability of the organization to align and coordinate its business strategy reflected by the business architecture and the corresponding an supporting information systems reflected by the technical architecture. Existing literature supports to a great extend this particularization. Wagter R. et. all (2005, pg. 39) considers that the various architectural domains can be grouped in: business architecture, information architecture and technical architecture. We considered above information architecture and technical architecture as a whole. Somehow in the same direction we can note the areas identified by Morgan T. (2002): business architecture, technical architecture and component architecture. Here to we can conclude that technical architecture and component architecture can be converged if we approach the architecture perspective of the enterprise from a more general perspective. Macaulay A.(2004, pg. 2) considers only these two components: business architecture and technical architecture.

Wagter R. *et. all* (2005, pg. 39) considers that „business architecture sketches the contours of the way in which an organization can be structured to effectively pursue its business objectives. Business architecture consists of three domains: the products and services offered, the processes responsible for producing these products and services and the organizational structure required to carry out these processes.” Morgan T. (2002, pg. 40) states that “business architecture is a way of describing businesses and what they do or intend to do in the future”

„Technical architecture sketches the design contours for the provision of information within an organization. It consists of two domains: the data that is important for the correct functioning of the organization and the applications that ensure that this information is correctly distributed within the organization.” (Wagter R. et. all, 2005, pg. 39). Morgan T., (2002, pg. 40) considers that “technical defines the technology that can be used to create specific information systems”

In a constantly changing environment strategic decisions regarding the organization have to be made more and more frequently. These decision made in the present time are based on information provided mainly by the organization's information system. In order to be reliable the business architecture must be aligned and coordinated with technical architecture. Present time decision have an influence on the organization's structure and behavior in the future which changes the entire enterprise architecture. In order to cope with these rapid changes enterprise architectures must be agile but still coherent.

A report issued by GAO (2003, pg. 1) recognizes that „the importance of developing, implementing, and maintaining an enterprise architecture is a basic tenet of both organizational transformation and IT management. Managed properly, an enterprise architecture can clarify and help optimize the interdependencies and relationships among an organization's business operations and the underlying IT infrastructure and applications that support these operations.” (GAO 2003)

The role of the internal audit function in a changing organization

A modern and competitive organization, as a system, is inconceivable without using the advantages and benefits information technology has to offer in processing data, communicating information and decisions, interconnecting heterogeneous processes and departments in a reliable, flexible and time-efficient way. But we cannot omit the fact that information technology beside the benefits it brings it can be subject to risks the organization faces if it doesn't uses IT in proper way.

In order to assure that the use of information technology doesn't exposes the organization to undesired risk, there is a need for a fully capacitated internal audit function that can perform information technology audits as part of it's mission. The Institute of Internal Auditor's Definition of Internal Auditing states: " Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic,

disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes." (IIA, 2008).

The scope of internal auditing covers all of an organization's activities, without regard for internal boundaries or geographical restrictions. Their work is based on the risk assessment and encompasses the adequacy and effectiveness of governance, risk management and internal control processes in identifying and responding to the risks facing the organization. A professional internal audit activity will be able to support risk management in two ways. Firstly, it will provide objective assurance to the board and to management that the risk management framework as a whole is operating effectively and that specific risks are being managed to the expected level. Secondly, it will invest its time and effort in consulting activities, which contribute to the establishment of sound risk management processes across the organization.

Therefore, we can say that the role of the internal audit is to report internal control issues to the audit committee and senior management. The real value comes when issues are addressed and problems are solved. In other words, reporting the issues is a means to an end. In this context, the end is to improve the state of internal controls at the company. Reporting them provides a mechanism by which the issues are brought to light and therefore receive the resources and attention needed to fix them. Therefore, the real mission of the internal audit department is to help improve the state of internal controls at the organization. Admittedly, this is accomplished by performing audits and reporting the results, but one must remember that these acts provide no value in and of themselves. They only provide value when the internal control issues are resolved.

An effective internal audit department considers the audit to be a partnership with the rest of the organization and not a policing function. An effective audit department is involved year round with key functions and does not just swoop in and out when performing audits. The audit should be just an occasional event in an ongoing relationship.

In a constantly changing environment the internal audit function faces a series of challenges it must cope with in order to prevent the materialization of risks emerging from changes an organization faces. „Without adequate control and visibility, an organization can spend money and effort on unneeded or low-priority changes while neglecting more important initiatives. Poorly designed or ill-considered changes can cause disruptions that must be addressed after the fact, or the changes must be “backed out.” IT changes to one component can disrupt the operation of other components.” (IIA GTAG 2, 2005, pg. 4)

The IIA's GTAG no.2 (2005, pg.5) Change and Patch Management Controls: Critical for Organizational Success stresses that internal audit can assist management and the board of directors in their change management by: understanding the objectives of the organization regarding, confidentiality, integrity and availability of IT processing, identifying risks that could arise from changes and determine whether such risks are consistent with the organization's risk tolerance, looking for and foster a culture of disciplined change management, including promoting the benefits of good change management.

Auditors are aware of the tight relationship between change and risk. IT assets seem to be in a state of constant change. According to Davis C. (2007, pg. 20) the technical areas in which an IT auditor might have constant preoccupations are:

- „*Entity-level controls*. The controls that are pervasive across the organization and provide the basic foundation for the control environment at the company. Examples of standard entity-level controls are company policies and mechanisms for complying with regulations such as Sarbanes-Oxley.
- *Physical facility*. The physical building and data center housing the computer equipment on which the system in question resides.
- *Networking and communications infrastructure*. They allow other systems and users to communicate with the system in question when they do not have physical access to it. This layer includes basic networking devices such as firewalls, switches, and routers.
- *Operating system*. They provides the basic operating environment on which the higher-level application runs. Examples are Unix, Linux, and Windows.
- *Middleware*. This is software that provides additional integration between two separate "programs" that were not originally designed to communicate with each other (e.g., between a database system and a web server or between an application and a database that it was not originally designed to access).

- *Database*. This is the tool that organizes and provides access to the data being run by the end application.
- *Application*. This is the end application, which actually is seen and accessed by the end user. This could be an *enterprise resource planning* (ERP) application providing basic business functions, an e-mail application, or a system that allows conference rooms to be scheduled.”

This is not intended to be an exhaustive list of potential subject areas and technologies that could be reviewed by an IT auditor. It is instead intended to illustrate some of the more common layers that might be reviewed during an audit. The stack of potential auditing subject areas could be made significantly more complex and granular if desired, spiking out topics such as storage and web servers. ”

Conclusions

During this article we stressed that the environment in which an organization operates has a pervasive influence on it. As a resultant of this influence the organization needs to assimilate the most effective and efficient technologies. But this leads to a reshape in the business architecture.

The increasing complexity of a business information systems that is the foundation of an enterprise architecture poses a wider range of threats and risks an organization is exposed to due to extensive usage of information technology capabilities. This leads to a need for a flexible and adaptable internal audit function and it’s component the IT audit team.

IT auditors ensure that the core infrastructure supporting the company's systems has the proper security and controls. These audit teams generally consist of IT professionals who understand how to use application systems. In addition, the IT auditors might help to review some of the general application controls, such as change controls and overall system access administration.

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