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SOURCE (OR PART OF THE FOLLOWING SOURCE):

Type	Dissertation
Title	A method for valuing architecture-based business transformation and measuring the value of solutions architecture
Author	R.G. Slot
Faculty	Faculty of Economics and Business
Year	2010
Pages	xxii, 184

FULL BIBLIOGRAPHIC DETAILS:
http://dare.uva.nl/record/327269

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8.

Architecture and Business Performance

In the previous chapters, we discussed the value of architecture from a case study perspective. The necessary activities and conditions for the maximization of the value of enterprise architecture from an organizational perspective where only mentioned briefly. The purpose of this chapter is to define the relationship between the value of architecture as we have defined in our case studies, to the value of architecture for a corporation from an organizational perspective. We will discuss the necessary conditions that need to be filled in for architecture to be effective and valuable within the context of the organization.

8.1 Objectives of Enterprise Architecture

The purpose of the enterprise architecture discipline is to improve the organizational performance by aligning organizational structure, business processes, information success, IT assets and infrastructure to the core goals and strategic direction of the organization. Architecture is used at strategic level for planning purposes, at tactical level to improve the quality of transformation at an operational level to improve operational characteristics.

In the previous chapters, we discussed the value of enterprise architecture at the strategic and tactical levels. At strategic level, we defined a valuation method to quantify the value of enterprise architecture in business terms. This valuation method was illustrated using a case study. In the study, the value of the architecture-based business transformation was calculated. At tactical level, the value of solution architecture for IT projects was demonstrated. It was shown that several key project success variables benefit from development under architecture.

8.2 Enterprise Architecture from Organizational Perspective

Considering the role and purpose of enterprise architecture, we stated in Chapter 2: "Enterprise architecture is a managerial instrument intended to improve the effi-

ciency, effectiveness of business transformation initiatives." (Definition 2-2, page 10). Based upon the findings and conclusions of the previous chapters about the value of architecture, can we say that enterprise architecture indeed improves efficiency, effectiveness and agility of the organization? For business and IT architecture to be effective, several conditions need to be filled in. In this chapter, we will investigate what these conditions are. We will identify the main factors that allow architecture to be effective within an organizational context.

8.3 Maturity of the Enterprise Architecture

8.3.1 Foundation for Business Execution

One of the tasks of senior management is to manage the coherence and cohesion between all the various initiatives that are going on within the organization. The objective is that various initiatives strengthen and reinforce each other, so that the organization of the business and IT processes and systems develop to a higher level of maturity. The management of an organization needs to consider the cohesion between the various programs, to bring the organization as a whole – across the company – at a higher maturity level.

The purpose of the enterprise architecture discipline is, according to Ross, Weill and Roberson (2006), to create "a foundation for business execution". They define this foundation as "the digitized business processes and the IT infrastructure that automate the company's core capabilities." They state: "As with human development, a company's foundation for execution evolves – usually beginning with a few basic infrastructural services (e.g., employee hiring and recruiting, purchasing, desktop support, and telecommunications), then encompassing basic transaction processes (sales, accounts payable), and eventually including unique and distinguishing business capabilities. Building a foundation doesn't focus only on competitive distinctive capabilities – it also requires rationalizing and digitizing the mundane, everyday processes that the company has to get right to stay in business." (p. 4).

Ross et al. state that building this foundation for execution makes the company more flexible and better able to react on external influences. "Paradoxically, digitizing core business processes makes the individual processes less flexible while making a company more agile. To return to the human analogy, great athletes will have muscles, reflexes, and skills that are not easily changed. But these capabilities give athletes a tremendous ability to react, improvise, and innovate in their chosen sport. Similarly, digitizing business processes requires making clear decisions about what capabilities are needed to succeed. And once these new processes are in-

stalled, they free up management attention from fighting fires on lower-value activities, giving them more time to focus on how to increase profits and growth. Digitized processes also provide better information on customers and product sales, providing ideas for new products and services. The foundation for execution provides a platform for innovation."(p. 5)

In short, they argue that the discipline of enterprise architecture should lead to company-wide foundation for business execution. They argue that this foundation improves the quality of basic business processes and procedures and which has the effect that basic, day-to-day tasks require less management attention. When an organization has this foundation for execution in place, then it becomes more flexible and innovative, because the basics are in place and management can focus on improving value.

8.3.2 Enterprise Architecture Maturity Stages

A foundation for execution is not built overnight. It requires long-term planning to align short-term initiatives to this strategic goal. Ross et al. describe several stages in which a foundation for execution is realized. Their research shows that organizations that have built a foundation for execution have experienced comparable development stages. They describe the following four enterprise architecture maturity stages:

Stage	Name	Description	Characteristic	Main challenge
1	**Business Silos**	Delivering solutions for local business problems and opportunities	Automate specific business processes, justified on the basis of cost reductions	Manage complexity of disparate systems
2	**Standardized Technology**	Uniform technology standards are used throughout the company	Limited number of applications and platforms, justified on the basis of our traditions and risk control	Manage complexity of disparate business processes
3	**Optimized Core**	Enterprise-wide view on applications and data	Standardized core business processes and IT applications. Shared use of enterprise data.	Central control over distributed business processes.
4	**Business Modularity**	Strategic business agility through customized or reusable modules.	Seamless linkage between business processes. Individual processes are built on the optimized core, communicate through standardized interfaces with other processes and extend them with their own functionality.	Balance central core functionality with accessibility of individual modules.

Table 8-1. Stages of enterprise architecture maturity according to Ross et al.

With his knowledge, we are able to extend Definition 2-2 and reformulate it as follows:

Definition 8-1. Function of Enterprise Architecture (extended)
Enterprise architecture is a managerial instrument, intended to improve the efficiency, effectiveness of business transformation initiatives. The long-term goal of enterprise architecture is to improve the architecture maturity of the organization to achieve Strategic Business Agility.

Thus, from a business transformation perspective, the role of enterprise architecture is to ensure that a current business transformation initiative is successful. From an organizational perspective, enterprise architecture has an additional responsibility that the current initiative contributes to the long-term goal of building a foundation for execution.

8.4 Enterprise Architecture Effectiveness

Enterprise architects will need to discuss with the organisation's CIO the long-term goal of creating a foundation for execution and incorporate this goal in the business and IT strategy. The research in our thesis shows that solution architecture has a positive effect on transformation projects. This finding reinforces the message of Ross et al. by demonstrating that architecture contributes to the efficiency and effectiveness of an organisation. In their book, they describe the business benefits for organisations that achieve higher enterprise architecture maturity levels.

They state: "Companies with a foundation for execution [...] report 17% greater strategic effectiveness than other companies – a metric positively correlated with profitability. These companies also report higher operational efficiency (31%), customer intimacy (33%), product leadership (34%), and strategic agility (29%) than companies that had not developed the foundation for execution." (p. 26). Furthermore, they report that (p. 94 ff):

- The IT budget of Stage 2 and Stage 3 organisations are on average respectively 15% and 25% lower than Stage 1 organisations
- Improved IT responsiveness, because of faster development times
- Improved risk management, which consists of
  - Less business risk
  - Less security breaches
  - Higher disaster tolerance
- Improved managerial satisfaction, for senior management and business unit management

- Improved strategic business impacts, because of improved
  - Operational excellence
  - Customer intimacy
  - Product leadership
  - Strategic agility

The effects described by Ross et. al. and the positive effects they report are in line with the type of effects that we have measured.

8.5 A Vision on the Future of IT

A major difference between Information Technology and other technologies is the very intimate interaction between businesses and IT. IT changes in day-to-day operation of many organisations, it allows business models, which were unthinkable just 10 years ago and holds the promise to automate and digitise mundane business processes. There is no indication that this automation of the business world is going to stop somewhere in the near future. On the contrary, there are indications that computers step out of their traditional environments and are going to conquer other domains by means of robotics, cybernetics, etc. Unmanned subway carriages are becoming mainstream, many companies experiment with driverless cars and the Japanese are working on household robots. Many of these science-fiction fantasies from the 1950s finally promise to become real, just because of the developments in raw computing power and material sciences. Moore's law is still holding and the question is how to reap full benefits of these developments.

Building up an effective IT landscape and a 'foundation for execution', linking IT usage effectively to standardised business processes and creating an agile company is not a trivial process. Just like many mediaeval towns made a mess of their city planning and constructed all kinds of buildings seemingly random across their territory – nowadays many organisations extend their application landscape seemingly at random without an overall plan. Organisation can implement or build isolated application silos that create short-term advantages, but way of development creates long-term chaos and inflexibility, which hampers the development of the organisation.

Many organisations are working with 20 or 30-year-old legacy systems that create risks and liabilities, because the platform cannot be supported anymore. This gives the organisation an opportunity to start building a foundation for execution, while replacing the legacy systems. The knowledge of the benefits, role and function of enterprise architecture has increased considerably over the last years. We

have a much better understanding of the impact of building individual systems on the total application architecture of an organisation and the long-term effects on flexibility and agility, compared to twenty years ago. Organisations cannot afford anymore to linger in the 'Business Silos' stage of Ross et al. Enterprise architecture has become a 'mainstream' activity, supporting management to improve the quality and the efficiency of the organisation and, as this and other research demonstrates, it is a meaningful addition to the traditional management disciplines.