

10 | Valuing Enterprise Architecture

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In programs and projects it is quite common to create a business case in which expected costs and benefits of projects are balanced. Nowadays, within organizations Enterprise Architecture has become a major stakeholder (or even originator) of many projects. In this context the question arises: What is the contribution of Enterprise Architecture to organizational success? We have labeled this (non financial) contribution as the value of Enterprise Architecture and this chapter deals with assessing this value.



The value of Enterprise Architecture is measured with respect to two mutually independent axes. The first one is based on the balanced scorecard which is used in many organizations to express their business goals. The second axis is the time, which is subdivided in four phases corresponding with the architectural process. This results in a 4 by 4 *value matrix* which is used as a framework

for a questionnaire. Furthermore, a scale has been developed in which the “measurability of value” can be expressed. Both the questionnaire and the scale have been applied in an assessment in a pilot organization.

In order to give a more precise picture of the value of Enterprise Architecture in an organization, indicators will be developed supplementary to the questionnaire.

10.1 On the value of enterprise architecture

It has been 25 years since John Zachman introduced the concept of architecture as a new approach in reducing the complexity of the information function within an organization. Since those days the alignment of business processes with the applications and infrastructure of an organization has become known as Enterprise Architecture. In the last decade the question has arisen what exactly is the added value of Enterprise Architecture. Such questions often come from business departments that see architecture as an issue hindering their (innovative) activities. A first step in bringing architectural value to the surface was realized by Raymond Slot⁶. In his PhD-thesis he demonstrated a positive correlation between Solution Architec-

⁶ Raymond Slot. A method for valuing Enterprise Architecture based Business Transformation and Measuring the value of Solutions Architecture. Universiteit van Amsterdam, 2010.

ture and project results. However, the effect of Enterprise Architecture on the performance of an organization is still an open question.

By its very nature Enterprise Architecture is not active on the operational, but rather on the tactical and strategic level of an organization. It has a lot of characteristics in common with the policies of the organization and as such is generally deemed valuable. The Enterprise Architecture Value Index aims at measuring this value. We focus on value rather than on benefits alone as is common in the literature. Our rationale is that the Enterprise Architecture should direct its efforts on maximizing this value and thereby its contribution towards the goals of the organization.

Note that with value not only benefits are involved, but costs as well. At any point in time, value may become negative. Negative values most certainly will occur in the first phases as investments precede benefits.

The value framework

The development of the Enterprise Architecture value assessment started with two observations.

The first observation is that adding value is equivalent to contributing to the business goals of the enterprise. Value in this respect is not only financial value, but may be found in improved customer satisfaction or a better management decision as well. In our value framework, we use the perspectives of Kaplan & Norton's balanced scorecard to express this value as business goals. These perspectives are:

- **the financial perspective:** costs and benefits, risk reduction.
- **the customer perspective:** concerning the external parties to the enterprise.
- **the internal perspective:** concerning the internal parties of the enterprise.
- **the perspective of learning and growth:** which contributes to innovation and change.

The second observation is that value increments with time and that along the time-axis, phases can be discerned which are defined by the architectural process. To comply with this dependence we distinguish four time-related phases in our value framework:

- **Development:** the first phase where enterprise architecture is developed (and maintained).
- **Realization:** the phase where projects are started and carried out to implement the architecture.
- **Usage:** in the third phase the results of the projects have been implemented in the organization and yield benefits. This phase continues seamless in the next phase:
- **Re-usage:** where 'second-level' benefits may occur based on the re-use of earlier implemented parts of the architecture. For example: from the introduction of an 'enterprise bus' in an organization, later projects may benefit.

The resulting value framework is constructed from these two mutually independent dimensions (phases and perspectives) and depicted in Figure 44.

PERSPECTIVE PHASE	FINANCIAL	CUSTOMER	INTERNAL	LEARNING AND GROWTH
DEVELOPMENT VALUE CREATED IN DEVELOPING THE ARCHITECTURE				
REALIZATION VALUE CREATED IN PROJECTS TO IMPLEMENT (PARTS OF) THE ARCHITECTURE				
USE VALUE CREATED IN ARCHITECTURE-BASED SOLUTIONS AFTER IMPLEMENTATION				
RE-USE VALUE CREATED BY BUILDING ON EARLIER IMPLEMENTED ARCHITECTURE				

Figure 44 The value framework

The way in which we constructed this framework makes it clear that the framework covers all of the 'value-universe': every value-construct, i.e. every construct that contributes to the goals of the enterprise, can be placed in one of the columns of the framework. Moreover, when value is added to a value-construct, it can be attributed to one of the rows of the framework. However, the difficult question remains if this added value is (at least partly) the result of the Enterprise Architecture. In the last paragraph we will address this question.

The questionnaire

The primary strength of the framework is that it subdivides the value-universe. Each cell of the framework is focused on a specific aspect and timeframe which makes it easier to identify where benefits and costs may originate and who are the stakeholders. For every cell in the framework a series of organization-independent questions has been constructed. These questions are leading in the interview scheme for assessing the information on value from stakeholders.

The questions are derived from a cascade of universal questions as depicted in Figure 45.

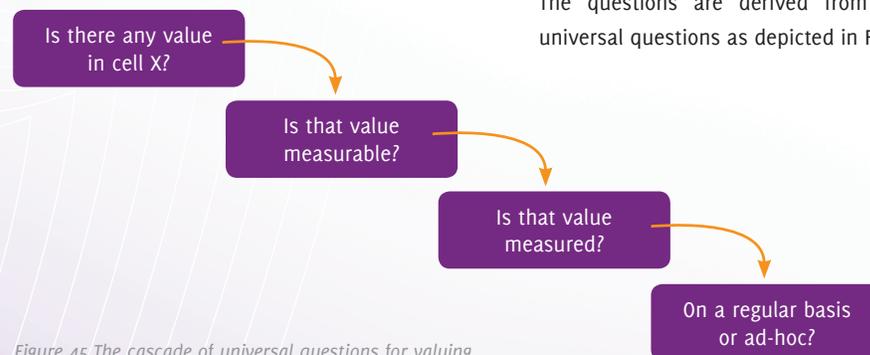


Figure 45 The cascade of universal questions for valuing

For example: in the Customer perspective we focus on the interaction between the organization and the outside world. This may be done regarding individual external entities (customers) or a group of external entities: a market. In the Use-phase, value therefore may be found in increased customer satisfaction and/or a greater market share, both of which are measurable. To maximize this value, market research or usability testing can be carried out in the Realization phase. The result of these actions in the Realization phase is a reduction in uncertainty, likely leading to better decisions and hence to a better implementation and to value. However, measuring this value might prove quite difficult - if not impossible. With our questionnaire we establish the actual situation in an organization: is it measured and if so, how and to what extent.

10.2 Using the framework in valuing Enterprise Architecture

Before starting an investigation towards the value of Enterprise Architecture, it is recommended to precede it with an assessment of the Enterprise Architecture's effectiveness in reaching its goals. The Enterprise Architecture Realization Index (EARI) as described in chapter 8 of this handbook may be used for this purpose as it gives an excellent view on the processes and procedures of the Enterprise Architecture function as well. The framework and its derived questionnaire may then be used in valuing the Enterprise Architecture function in an organization. To that end an assessment is organized, consisting of four different steps: preparation, interview sessions, reviewing documents and feedback. This is illustrated in Figure 46.



Figure 46 Structure of a value assessment

An assessment starts with a preparation phase with the responsible stakeholder, quite often the head of the architectural department. In the preparation phase the scope of the assessment is determined. Typically the domain where the measurements will take place is established and within this domain, enterprise architectural goals and projects to be investigated are agreed upon. Of course, all projects to investigate should aim at implementing parts of the target architecture. In the preparation phase the various stakeholders to be interviewed are identified and relevant documentation is collected as well.

After the preparation phase, interview sessions with stakeholders using the questionnaire are held. These interviews start with an explanation of the framework and will usually focus on one or two rows in the framework. For example, enterprise architects may be interviewed about the phases Development and Re-use, while solution architects and project managers are questioned about the phase Realization. For this phase, along with the Use-phase, business managers are important

discussion partners as well because they have a good view on the impact of the projects on the business.

In all interviews, the focus should be on measurements and documentation. In this way, supplementary documentation is collected for reviewing. In parallel with the interviews, the documentation gathered is reviewed. By doing this in parallel, facts learned may be used in upcoming interviews. In this way a complete picture can be build showing where value is created in the architectural process, if this value is measured and if so, if the measurements are made routinely or ad-hoc.

With the knowledge gathered in the interviews and by reviewing the documents, feedback is given to the organization. Of course, wherever value can be measured (be it positive or negative), it is reported back to the organization in detail. As this feedback is very organization-specific, we have developed a more independent “measurability scale”. This scale informs the organization about its value-awareness and makes a comparison with other organizations possible. The scale consists of five levels:

- 1 **Ad-hoc**: measuring relevant aspects of value is sometimes done, but not systematically.
- 2 **Measurable**: systematic measurements of value aspects are available, but not every relevant aspect is covered.
- 3 **Measured**: systematic measurements are made to such an extent that a value can be derived.
- 4 **Manageable**: measured value is sometimes used as an instrument for managers, but not systematic.
- 5 **Managed**: value is systematically used as an instrument in managing the organization.

This scale is developed in accordance with the familiar stages used by most maturity models (see chapter 3 of this handbook) and should be applied to every cell of the value framework. Please note that with the current questionnaire no statements concerning levels 4 and 5 (manageable and managed) can be made.

The next section illustrates the use of the value framework. Should you want to apply the value assessment in your own organization, the authors can provide you with the necessary explanation. Optionally, support may be provided in using the instrument and interpreting the outcomes.

Application

The value framework and its corresponding questionnaire have been applied at a Dutch governmental organization in the fall of 2011. The assessment has been carried out as described in the previous paragraph and the observed measurability is plotted in Figure 47. Note that some aspects could not be measured due to insufficient information.

From Figure 47 it shows that the assessed organization has a reasonable good understanding of the value created by finished projects. It also shows clearly that in the last couple of years the focus has been on internal efficiency (perspectives Financial and Internal) and that innovation (perspective Learning and growth) has been underexposed.

Note: the Enterprise Architecture function is still quite young in this organization and as such has not delivered a lot of value in the field of Re-use.

PERSPECTIVE PHASE	FINANCIAL	CUSTOMER	INTERNAL	LEARNING AND GROWTH
DEVELOPMENT	2	1	2	1
REALIZATION	3	1	2	1
USE	2	3	3	1
RE-USE	1	0	2	0
LEGEND	0: insufficient data	1: ad-hoc	2: measurable	3: measured

Figure 47 Measurability at a Dutch governmental organization

10.3 Outlook

From an assessment as described above, a first, very qualitative view on the value created by the Enterprise Architecture function can easily be derived. To extend this view, our questionnaire will be completed with questions on value as an instrument in managing the organization. This will be done by implementing two more universal questions in the value-cascade: “Is value used as a tool for management?” and “Is value systematically used as a management tool?”

Next a set of indicators for every cell in the framework will be developed. These should make it possible for every cell to grade its contribution

to value. These grades in turn can be seen as a 16-dimensional index by which the “value-awareness” of an organization may be expressed: the Enterprise Architecture Value Index (EAVI). With the EAVI, an assessment can be compared to an earlier assessment and or to an assessment in another organization.

The EAVI may be expressed in a cobweb diagram like shown in Figure 48.

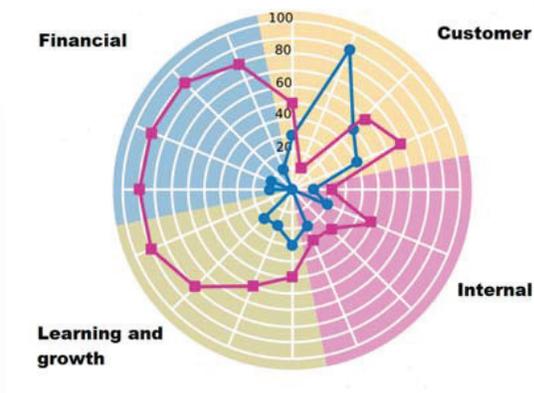


Figure 48 The EAVI expressed in a cobweb diagram

With this EAVI an individual organization should be able to express value more quantitative in statements like:

- The cost of Enterprise Architecture is xx yearly; on the financial side the benefits are...
- Enterprise Architecture has contributed to organizational goal X for xxx %

The last statement brings us back to the start of this chapter where we stated: the difficult question remains however if this added value may be contributed (at least partly) to the enterprise architecture. Most projects not only have an architectural goal, but different goals (like updating to a new environment, adding new functionality for the users or better coupling to different systems) as well. In the pilot we have tackled this question by a careful choice of projects to be assessed so we could be sure that every project was compliant with at least one of the goals of the architecture. To express this “traceability of the Enterprise Architecture” will be our next line of further development.