Towards Enterprise Architecture Infused Organisations

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FOREWORD

This research article is the culmination of one year of intensive research led by Vlerick Business School in collaboration with our research partner LoQutus. We launched this partnership with a common goal: to better understand how “Enterprise Architecture (EA)” is used in organisations and how it contributes to business value creation. Not because we wanted to write another paper on business value creation and ICT – but because both Vlerick and LoQutus are truly convinced that Enterprise Architecture is a discipline well worth our attention. And by “our” we mean: enterprise architects, business and ICT architects, business managers, project managers, academics, CIOs, CFOs, CEOs, and all other possible CxOs out there.

From the academic as well as the practitioner viewpoints, we see that things are changing. For a good number of years now, organisations have been studying, implementing, evaluating, and sometimes experimenting but often struggling with EA. Some have reported success, others end up with a serious hangover. Yet all agree on one thing: EA is not a discipline for which you can offer an off-the-shelf solution or implementation plan. There is no one-size-fits-all. As we illustrate in this paper, the EA domain requires you to balance opposites: discipline and creativity, rigor and pragmatism, accuracy and nuance, long-term vision and short-term results. We argue that EA is not only an ICT discipline but also a business discipline that should not be confined to the ICT domain. That’s what makes it so challenging and so interesting!

The EA community is going through change, and this paper provides insights and guidance on how to adapt to this change. We step beyond the frameworks, modelling conventions, roadmaps and tools. To really understand the journey and the difficulties that organisations experience with EA, and how they respond, we listened to them describe their EA endeavours. We are very grateful to the thirteen organisations that agreed to collaborate and share their experiences in nineteen interviews.

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EXECUTIVE SUMMARY

In many organisations, Enterprise Architecture (EA) is regarded by insiders as an important discipline for dealing with business transformation and mapping out the road ahead. Unfortunately, few business leaders have taken up ownership of EA, as they still face a number of organisational challenges. The challenges we discovered by analysing our nineteen interviews can be grouped into three main domains:

- **Skills and techniques**, which are often ICT-driven and very formalised;
- **Organisational fit and integration**, which is sometimes lacking and puts EA on a path towards isolation;
- **Value & Return-On-Investment**, because payoff or added value is not easy to demonstrate.

In order to meet these challenges, we see organisations evolving towards a more creative, pragmatic, future- and client-oriented approach for EA, with enterprise architects attempting to morph from engineers to creative designers for the whole enterprise. In our case-study research, involving thirteen organisations, we’ve built a data set of practices, experiences, stories and lessons learned. Next to the challenges, we have also discovered a number of success stories:

- Organisations that have learned from their initial EA efforts and are evolving towards a different way of practicing EA;
- Organisations whose business executives do take up ownership of EA;
- Organisations that have evaluated their own EA method and are searching for “just enough EA” investment.

Some organisations are clearly still in the steep, early phases of learning, which we call the **EA-aware organisations**. Others have reached a level where EA is established as an integral part of managing the enterprise: the **EA-infused organisations**. We have distilled a number of lessons from our interviews and have formulated recommendations:

- Be more flexible, pragmatic and less strict in your EA approach;
- Screen and evaluate your own EA practices, so that you do not over- or under-invest in EA;
- Integrate EA in existing management practices;
- Let the business drive and take ownership of EA with strong ICT support.
CURRENT CHALLENGES WITH ENTERPRISE ARCHITECTURE

When we look at the academic EA literature, we can identify a clear trend. Earlier publications\(^1\) focused mostly on EA artefacts and models from an information systems/technical infrastructure point-of-view. The more recent literature\(^2\) has shifted its focus towards EA practices and how to embed them in existing processes and governance structures. The increasing amount of research on maturity models shows that organisations want to know which EA practices to invest in, and for how much\(^3\). Organisations go through different maturity stages, which are associated with different EA practices\(^4\). Yet we find little guidance on the degree of investment needed in EA practices. Similarly, many authors describe the use, strengths and weaknesses of selected EA practices – but, as things have evolved over the years, are we still talking about the same EA practices? Here are the main research questions we took to the organisations that we interviewed:

- Do you see an evolution in EA practices? If yes, how do organisations make this transition?
- How do organisations make their EA efforts sustainable? Do organisations over-invest or under-invest in EA? This question addresses "What is Just-Enough-EA?"

ABOUT THIS RESEARCH

This paper describes the results of a series of case studies that we conducted. The following organisations collaborated in this research project by describing their EA endeavours in multiple interview sessions: Acerta, AG Insurance, ArcelorMittal, Bizliner, BNP Paribas Fortis, Colruyt, De Lijn, Electrabel, Fluxys, Synergics, Telenet, Umicro and VDAB. This sample of organisations gave us a good variety of sectors: Transport, Financial Services, Media, ICT, Energy, Retail & Distribution, Heavy Industry and Services. We selected organisations that had a minimum level of affinity with EA and were willing to collaborate in this research project.

We conducted 19 interviews with different profiles: Enterprise Architect, Business Architect, Head of Architecture, Head of ICT Business Unit, CIO, Competence Centre Member and Consultant. We strove for a mix between business and ICT interviewees, yet most were on the ICT side of the organisation.

The interviews were semi-structured, open interviews; and the recorded conversations were used for further analysis. The main sections of the interviews were: drivers to do EA, current EA approach, difficulties encountered, competencies of a good Enterprise Architect, sustainability of EA, critical success factors for EA, and impact of new trends (social media, mobile, cloud, big data, …) on the importance of EA.

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\(^5\) See the discussion on the maturity of EA practices in Van Steenbergen’s doctoral dissertation (2011).

Figure 1 gives an overview of the challenges organisations are facing with regard to their EA initiatives. The list of challenges is distilled from our interviews. We asked each interviewee to name the most important challenges they see for EA in their respective organisations. Only those that were mentioned more than once were selected for the list. We identified more than fifteen challenges organisations are facing with regard to EA. These can be grouped into three clusters:

1. Skills & techniques
2. Organisational fit & integration
3. Value & Return-On-Investment

Figure 1 – Three clusters of challenges in EA
Skills & techniques: In many of the organisations we interviewed, EA is regarded as being too ICT-driven. Interestingly, both business and ICT interviewees acknowledge this. (As the majority of our interviewees have an ICT function, this is a remarkable result – they see this as a problem too!) Furthermore, business interviewees and C-level executives, including some CIOs, see EA as being too formal. One CIO stated it this way: "Our business still perceives EA as too technical, formal and prescriptive, relying on complicated techniques and elaborate frameworks."

This is mainly due to the fact that EA as a discipline has its origins in the ICT domain, and many "Enterprise Architects" are in fact ICT architects or even pure ICT profiles who, in their efforts to prove business value, have taken on the business domain. But the signal we get from the surveyed organisations is clear: you cannot just take the tools, techniques, frameworks and best-practices from ICT architecture to create an enterprise architecture. As one business architect put it: "Modelling the business side and modelling ICT systems/applications/infrastructure are two different metiers – each requires its own set of skills and tools."

What makes Enterprise Architecture different from ICT architecture is that the age-old business-ICT alignment challenge\(^5\) enters the equation. EA extends beyond the boundaries of one domain to span the entire enterprise, both business and technology. Therefore, the organisation’s business-ICT alignment becomes a valid concern, running into well-known alignment challenges: business and ICT not understanding each other, using disconnected planning techniques, speaking two different languages, and having different skill sets to tackle their respective problems.

Furthermore, business and ICT have been known to have different approaches to, and views on, the organisation. In the early 1980s, Daniels⁶ described this as a difference in cognitive maps (mental models, assumptions, expectations, values and beliefs) between managers in different functional areas. This certainly seems to be the case for business and ICT. Based on the research by Daniels et al., Tan & Galuppe⁷ describe how business-ICT alignment problems can be attributed to large differences in cognitive maps between business and ICT executives. In sum, in those organisations in which Enterprise Architecture is a mere extrapolation of ICT architecture to the entire enterprise, it is not surprising that many business managers feel “not equipped” with the right skill set for EA.

**Organisational fit & integration:** Enterprise Architecture is often still seen as a separate discipline, operating next to other management disciplines (strategy planning, portfolio management, business process management, ...). For the majority of the organisations we interviewed, EA is currently not part of the regular management practices but rather something extra that is additional to the well-established management practices. Furthermore, EA is often driven by externals (consultants) as the organisations need help or lack the proper skills for EA. Even when the necessary skills are in-house, some of our interviewees perceive EA as being dominated by a small group of what they themselves call “ivory-tower researchers” who have a very good understanding of EA theory, frameworks and modelling tools but lack the skills to infuse the business with their ideas and views. To conclude: it should not come as a surprise that many organisations indicate that there is low acceptance and understanding of EA, or even no fit with the organisational culture.

**Value & investment:** Many of the organisations we interviewed also seem to struggle with the fact that there is a serious time-lag between the investment in EA and the payoff. This was especially the case with business architects and competence centre heads with close ties to the business. The ICT profiles seemed to have a different view, focusing more on the long-term investment character of EA. Most interviewees agree that EA is an investment for the long run – and yet it is not always clear what the payoff will be, when exactly it can be claimed, or how it can be quantified. Especially in times of economic crisis, where organisations rely heavily on strong business cases with clear, short-term benefits, it is difficult to take a “leap of faith” and assign dedicated resources to EA. Furthermore, the effort does not stop with an initial design. Most organisations take an iterative approach to designing their EA and acknowledge that,

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given the constantly changing business environment, the EA will need to be updated and adapted.

In sum, the seemingly high additional effort and postponed payoff make it difficult for senior management to show real business interest in – and, more importantly, take business ownership of – EA. Nevertheless, we did come across a case where the CEO himself takes ownership of Enterprise Architecture and clearly communicates his commitment to the rest of the organisation. The next section is the result of analysing and learning from those companies that do succeed in facing the EA challenges.

**FACING THE CHALLENGES: THREE GUIDELINES**

In this section, we focus on three guidelines that will help organisations face the challenges that we discussed in the previous section. The guidelines are derived from the best practices we identified in our set of interview data. Based on commonalities in approach, we distilled the following three general guidelines:

1. Focus on nurturing EA-enabling competences
2. Evolve from an EA-aware to an EA-infused organisation
3. Don’t just design, contribute!

In the following three subsections, we discuss each of the suggested guidelines in detail.
Focus on nurturing EA-enabling competences

Defining Enterprise Architecture

Before we can really start to discuss which EA competences organisations need to focus on, we need to clearly define how we see Enterprise Architecture. There is an ample choice of EA definitions in the existing literature – some of the most commonly used are summarised in our sidebar.

One thing the sidebar makes clear is that most definitions of EA are diverse. Some include the deliverables (principles, models, documentation, ...); others focus on the components/layers (business, information systems, infrastructure, ...). The risk of including deliverables or components in the definition is that not everything is included, and so you are already steering people towards a certain approach to EA. In summary, the current definitions are prescriptive and focus on the outcome, the Enterprise Architecture itself, rather than on the process of architecting. We acknowledge the value of the existing definitions in defining the outcome, the deliverable.

Yet, based on the interviews, we argue that the process of architecting is at least as important as the result. Many interviewees stated that a lot of

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**EA definitions sidebar**

“Enterprise Architecture is a set of descriptive representations that are relevant for describing an enterprise such that it can be produced to management’s requirements and maintained over the period of its useful life.” - Zachman, J.A.

“Architecture is the fundamental organisation of a system embodied in its components, their relationship to each other, and to the environment, and the principle guiding its design and evolution.” - **IEEE Standard 1471-2000**

“Enterprise Architecture is a coherent whole of principles, methods, and models that are used in the design and realisation of an enterprise’s organisational structure, business processes, information systems, and infrastructure.” - **Lankhorst et al.**

“Enterprise Architecture is the analysis and documentation of an enterprise in its current and future states from an integrated strategy, business and technology perspective.” - **Bernard, S.**

“Enterprise Architecture is the organising logic for key business processes and IT capabilities reflecting the integration and standardization requirements of the firm’s operating model.” - **Ross et al.**

“Enterprise Architecture is the process of translating business vision and strategy into effective enterprise change by creating, communicating, and improving the key principles and models that describe the enterprise’s future state and enable its evolution.” - **Gartner Group**

“By being inclusive with all other management frameworks, EA is a discipline that helps the Enterprise define, develop and exploit the boundaryless information flow capabilities in order to achieve the Enterprise’s Strategic Intent.” - **The Open Group**
creativity is needed to design the future enterprise. One interviewee compared business architects to fashion designers and ICT architects to car engineers: both need to be creative and both have to design, but each from their own perspective. The enterprise architect ideally needs to combine both perspectives. In line with this view, we want to complement current definitions with a good understanding of what creative design entails. To do this, we further elaborate on the general theory of design and how this can be applied to EA.

![Diagram of the 3 elements of "Design"](image)

**Figure 2 – The 3 elements of “Design”**

In general design theory, design can be classified into three (complementary) elements (Taura & Nagai, 2009): *drawing, problem solving, and ideal pursuing* (Figure 2).

**Drawing** refers to transforming something abstract into a concrete image, picture or sketch. It focuses mainly on the past or current situation, and its objective is to make things explicit (Taura & Nagai, 2009). We asked the interviewees how they would describe their EA practices. From the responses, we conclude that organisations have a strong focus on developing this drawing competence. We received answers including: “we draw models, landscapes, holistic overview pictures of competences, business functions, applications, and technical infrastructure, and illustrate how they all interrelate.” What most interviewees agreed on – and

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this concurs with the existing literature – is that they easily fall into the trap of overly focusing on the formal and prescriptive aspects of delivering these drawings. And it is at least questionable whether this focus on formality delivers a substantial contribution to the organisation. Still, drawing is an important competence, as it enables organisations to make things explicit and, therefore, open for discussion. Drawing is an important enabler for open communication.

**Problem solving** refers to the process of analysing the current state and the desired goal in order to bridge that gap and find a solution (Taura & Nagai, 2009). In most of the organisations we interviewed, EA is expected to deliver in, and contribute to, projects. EA is often included at the start of a project to understand the current organisational design and to determine which parts of the organisation the project will impact. Surprisingly, more than half of our interviewees indicated that they deliver (or want to deliver) part of their EA on a project-by-project basis. This is highly correlated with the fact that they no longer believe in large-scale, corporate-wide, top-down EA programmes. Rather, they follow what they call a more pragmatic EA approach: they include EA as part of their projects, and deliver fragmented pieces of EA in these projects. This approach does not immediately give you the holistic overview of the organisation (which can be considered contradictory to the definition of Enterprise Architecture), yet it does make sure your EA endeavours are close to your daily organisational issues. One interviewee put it this way: 

“Launching a top-down corporate-wide programme to deliver the Enterprise Architecture is a huge effort with many pitfalls (it is seen as a separate programme, disconnected from the business, and people wonder if it will ever deliver...). On the other hand, with a grassroots, bottom-up approach, you risk missing the enterprise-wide “Big Picture”. In our pragmatic approach, we combine the two: we outline the bigger picture on a high-level (our frame), and fill in and deliver our specific architecture one project at a time.”

**Ideal pursuing** refers to surpassing present conditions and pursuing future ideals. It involves additional creativity to predict and envision the unexpected future and the path to it. Organisations move away from the current organisational problems and use their insight and
creativity to come up with a vision for the future organisation and the road towards it. This often occurs in large-scale change projects or major organisational restructuring. This is where EA comes close to the field of strategy. Typically, organisations make strategy maps, portfolio plans and roadmaps, which can be categorised as ideal pursuing.

We asked our interviewees what the most important benefits of EA are and what they should be according to them. The two answers are often quite different. Current benefits of EA included: to get a grip on our legacy, to understand the as-built, to stimulate re-use, to avoid duplication, to document, to scope projects, etc. What the benefits of EA should be included: economies of scale and scope, higher agility, enable the business to grow at the desired pace, eliminate business constraints, better business support for long-term investment decisions, help understand and control complexity for the business, etc. The answers to our second question (the ‘should be’) illustrate ideal pursuing itself as well as the fact that ideal pursuing is an essential and complementary component to the other two Design elements: drawing and/or problem solving have questionable value without a clear view on the future ideal.

Each of these three Design elements (drawing, problem solving and ideal pursuing) are valuable EA elements. Yet, not a single organisation in all of our cases is focusing on only one of these three categories – all of them combine at least two. Only a few are able to combine all three, and based on the cases we studied they seem to be the most successful in their EA endeavours. Drawing makes things explicit and enables communication. Problem solving is a way to add pragmatism and a problem-oriented approach to EA, which contributes to the organisation’s goals and objectives. Yet, in the end, perhaps EA’s biggest added value lies in how it can enable and support a vision of how the organisation can change, adapt and refocus in the future. So, when the three Design elements of Figure 2 are combined, Enterprise Architecture becomes a truly creative process, which is at least as important as the tools or the deliverables.
Architects as Creative Organisational Designers

So, EA is more than a set of tools and deliverables. In the previous section, we examined the process of architecting with a focus on design (drawing, problem solving and ideal pursuing). But more is needed to successfully infuse EA into organisations. All of our interviewees agree that the role of the “enterprise architect” is pivotal to the success of EA – yet, strong enterprise architects are a scarce good on the job market. Many of the organisations in our study report have difficulties finding the right people.

As we view the process of EA as creative design, we can regard enterprise architects as creative designers. A review of the design literature reveals the work of Goldschmidt\(^9\) (2010), who defines four critical attributes of good designers (Figure 3): flexibility, sensitivity, visual literacy and expertise.

The first, and often regarded as the most important, attribute of the designer is flexibility, or the ability to switch back and forth between associative (divergent) thinking and analytic (convergent) thinking. Both (and alternating shifts between them) are needed for creative

design. This means that the enterprise architect should be able to combine a broad, holistic view on the organisation with deep analytical competences.

The second important attribute of the creative designer is his or her **sensitivity**. This is a special kind of sensitivity, related to the ability to infer useful information from a variety of sources, which also requires considerable openness to people and to new experiences. The sensitive designer keeps his eyes wide open and is always ready to take in stimuli, whether in a planned manner or as a result of random encounters. This means that enterprise architects should always have their eyes and ears wide open. They have to build formal and informal networks within and outside the organisation and leverage them as sources of information input.

Further, a creative designer must possess **visual literacy**, which is “the ability to interpret, negotiate, and make meaning from information presented in the form of an image.” This is especially true for enterprise architects, as drawing and visual representations are an important aspect of EA.

Finally, experience and **expertise** is required. An expert in any domain boasts an extensive memory of cases and concepts in that domain, and is able to draw similarities between a current task and cases that he or she is knowledgeable about. Most interviewees strongly emphasised that experience is crucial for a good enterprise architect. Not only because it allows him or her to draw from previous experience, but also because it contributes to his or her natural authority, which is needed in this kind of role. Goldschmidt’s model provides a good overview of the critical attributes of good designers. We asked each of our interviewees to list the critical attributes of successful enterprise architects. When we compare Goldschmidt’s theoretical model to the results from our interviews, we find both agreements and differences. According to the interviews, the most important attributes (in order of importance: i.e. how many times they were mentioned) are the following:

1. Communicative
2. Pragmatic
3. Creative
4. Experienced
5. Analytical
The interview results indicate that, first and foremost (and this differs from Goldschmidt’s model), organisations are looking for enterprise architects who are good communicators. “They have to be able to convey their message, convince senior management, and explain to the rest of the organisation what their vision and goals are and how they will realise them. And they have to do this with a good dose of pragmatism and creativity.” We asked our interviewees whether the skills needed for a good enterprise architect have changed over time. The answer we received over and over again is that “he or she now needs to be much more of a communicator, a leader and an influencer.” Based on these results, we argue that strong leadership and interpersonal skills are important attributes that should complement the attributes of Goldschmidt’s theoretical model.

In summary, when we combine Goldschmidt’s model with the results from our interviews, we argue that a good enterprise architect is able to combine flexible thinking, an open and creative mind, and ample experience with strong interpersonal skills. It’s easy to see why these profiles are difficult to find: they unite a number of attributes that are scarce on their own, let alone in combination with each other.
From EA-aware to EA-infused organisations

In this section, we focus on the evolution in EA practices that we have derived from our multiple case study. Table 1 is the result of a series of interview questions regarding how EA practices have changed in organisations. We invited all interviewees to describe how and why they got started with EA, how it has evolved in their organisation, and what they see as the next steps. Our analysis of the interview data showed that a new vision or approach towards EA is starting to emerge. As they have different characteristics, we could clearly distinguish the new vision from the old one.

Table 1 gives an overview of the characteristics of what we call the EA-aware vision and the EA-infused vision. The EA-aware vision – EA 1.0 or the old vision on EA – has all of the characteristics that are now well-known in the EA domain. The EA-infused vision – EA 2.0 or the new vision on EA – is characterised by a new and different approach towards EA. We want to stress that, based on our interview data, we cannot classify organisations as belonging exclusively to either the old or the new vision on EA. Most organisations predominately score high on the characteristics of one vision, but they can also have some characteristics of the other vision.

<table>
<thead>
<tr>
<th>EA 1.0 (Old vision)</th>
<th>EA 2.0 (New vision)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics of the EA-Aware vision</strong></td>
<td><strong>Characteristics of the EA-Infused vision</strong></td>
</tr>
<tr>
<td>Formal/Conceptual EA</td>
<td>Pragmatic EA</td>
</tr>
<tr>
<td>EA is Framework-based</td>
<td>EA is Framework-inspired</td>
</tr>
<tr>
<td>Fixed-method for EA</td>
<td>Dynamic, flexible method for EA</td>
</tr>
<tr>
<td>EA is focused on completeness</td>
<td>EA is focused on usefulness</td>
</tr>
<tr>
<td>Modeling</td>
<td>Focussed, problem-driven modeling</td>
</tr>
<tr>
<td>EA to create output/documentation</td>
<td>EA for output + importance of process of architecting</td>
</tr>
<tr>
<td>EA is ICT-focused</td>
<td>EA is Business- &amp; Client-focused</td>
</tr>
<tr>
<td>EA is isolated/on its own</td>
<td>EA is integrated in existing management practices</td>
</tr>
<tr>
<td>ICT or CC has ownership of EA</td>
<td>Business has ownership of EA</td>
</tr>
<tr>
<td>EA is auditor</td>
<td>EA is enabler</td>
</tr>
<tr>
<td>Architect has mainly technical skills</td>
<td>Architect is creative organisational designer</td>
</tr>
</tbody>
</table>

Table 1 – EA-aware and EA-infused characteristics
**Pragmatic, flexible EA**

EA is often very formal and conceptual, with many modelling conventions and strict guidelines on which architectural views to produce, how to produce them and how/where to store them in a repository. We do not question the importance of a conceptual, framework-based approach, which can be very valuable. Yet, our case studies have revealed that organisations are moving away from strict guidelines for deliverables on how they should be produced or what they should look like towards more pragmatic approaches. The deliverables can be models (domain models, function models, ...), but they can also be a simple set of strategic principles that will govern future decisions to guide change initiatives. Pragmatic EA focuses on deliverables that are *useful and used* in the organisation, and avoids standard models that disappear into a repository, never to be used again. The goal is to create architectural products that contribute to solving the problems at hand – products that people are interested in, want to use, and even come and ask for.

One of the organisations we interviewed was working on a business project for which they produced a simple, high-level, 1-page overview of the most important organisational capabilities. They needed this to solve a discussion on outsourcing: which competences to keep and which to externalise. People from different departments, involved in other projects, were so interested in using this competence model in their own projects that they came and asked for it. When you walk through this organisation’s open office space, you see many A3-format posters of this capability model on the walls, used, drawn upon with markers. This is part of the EA, which is very much alive and used on the work floor. In sum, we do not suggest that all repositories, modelling guidelines or frameworks should be banned from Pragmatic EA, but they should survive the "useful and used" test. Pragmatic EA ensures that EA does not become *l'art pour l'art*.

**Business-Focused and Business-Owned EA**

As architecture originated from the engineering/ICT domain, it is still mainly owned by, and focused on, ICT in many of the organisations we studied. Enterprise Architects are often ICT profiles who are not always focused on day-to-day business problems. EA deliverables are still primarily ICT deliverables, and most interviewees stated that the ICT department usually takes ownership of EA in their organisation. Of course, there is nothing wrong with having a highly mature ICT department – but the risk of ICT-owned EA is that Enterprise Architecture will be reduced to ICT Architecture with a faint business flavour.
Most of the organisations we interviewed pointed out that EA spans both business and ICT domains and should contribute to business transformation. This means that there should be a clear link between business strategy and EA. As the business strategy shows the direction in which the organisation is heading, the EA should give a clear view on how this ideal can be pursued and how the obstacles will be handled. By connecting it to the business strategy, the EA becomes business-focused and business-owned, making it an enabler for business transformation. Most of the organisations we interviewed clearly acknowledge this transformative use of EA, yet many still struggle to achieve it in practice. The relationship between business strategy, EA, portfolio management, and other management practices is not always clear, nor is the sequence in which they should be executed. To conclude: organisations clearly indicate that EA should be business-driven and highly integrated with other business practices. However, the old 1.0 vision on EA is still omnipresent in organisations today. There is still a distance to go before organisations become truly EA-infused rather than EA-aware.

Don’t just design, contribute!

Why should we invest in EA? How will it create business value? What is the business case for EA? These questions have dominated the EA literature for the last few years, as establishing the effectiveness of EA appears to be difficult. EA offers a clear view of an organisation’s components and the links between them, visualises complexity, and helps guide transformation and manage risks. But the effectiveness of EA in supporting business goals is indirect, and making the link is not straightforward. Yet, especially in times of crisis, people look for certainties, ask for verifiable results, and demand positive business cases. As mentioned in the previous sections, our interviews indicate that some of EA’s challenges are that it’s difficult to make a business case for EA, the benefits are difficult to quantify, and results are long-term – whereas investments are immediate.

Making a financial case for EA is particularly difficult. Zachman states that “you cannot cost-justify architecture”. The danger is that, without financial justification, organisations are liable to over-invest in EA (i.e. spend more time and effort on EA than is required for the desired outcome). On the other hand, organisations must also be careful not to under-invest in EA (i.e. spend too little time and effort on EA to produce desired results). Achieving this difficult
balance leads to the question: what is “just enough architecture” for an organisation? How can organisations make sure they do not over- or under-invest in EA and make sure that EA contributes to their business goals?

To discover whether and how our interviewees are dealing with the question of what is “just enough architecture”, we asked them how they decide how much to invest in EA (avoiding over- or under-investment). From their answers, we discovered that second-order learning is the most commonly used approach to this problem. This means that organisations periodically evaluate their own EA practices and methods to learn how they can improve them to contribute more to their business goals. One organisation screens its EA practices annually, using two clear criteria to determine whether to continue the practices or to revise them:

- Do our EA practices enable new business or create new business advantages?
- Do our EA practices sustain current business or solve existing business problems?

If the answer to both questions is NO, the EA practices are revised.

Another organisation evaluates all of its EA deliverables annually and, based on input from the business managers, determines to what extent the EA practices were useful used and contributed to obtaining results. If the practices have not been productive, they are revised and the EA methodology is redesigned. The following questions are asked in each design cycle:

- Which “EA products” do our stakeholders in the organisation need?
- Which skills do we need to be able to deliver these EA products?
- Which processes will we install for that purpose?
- How can we optimise these processes (omit unnecessary steps, shorter iterations, lighter governance, e.g.)

The EA output is screened and then the practices are adapted when business contribution is insufficient.

Many organisations prefer short, fast iteration cycles in delivering EA output – preferring to deliver partial pieces of the architecture and tolerating imperfections in the deliverables as long as progress is being made and real business contribution can be demonstrated. One organisation in our study introduced the technique of pace layering to its EA practices, whereby each system is divided into different layers according to each layer’s speed of evolution. The organisation then categorised business transformation as either high dynamic – requiring fast response from the organisation, leading to new business requirements developed in short project cycles – or low dynamic, requiring normal project cycles. A different EA
approach is used for each of these two different business layers. For high dynamic business transformation, the EA iteration cycles are much shorter, certain steps of the EA methodology/framework can be omitted, and the EA governance is reduced. In essence, the organisation developed an ‘EA light’ version of its existing method to ensure fast and flexible response in highly dynamic business environments.

To sum up: organisations are looking for ways to make sure that EA clearly contributes to the business. In order to do so, they screen their EA practices for their usefulness and business contribution. Second-order learning is used to make sure that organisations invest in "just enough architecture" to contribute to business value.
RECOMMENDATIONS FOR THE ROAD AHEAD

1. Be a turtle, not a rabbit

Both the turtle and the rabbit have a clear end-result in mind: winning the race. But the way they reach this result is different. Organisations should not rush into an Enterprise Architecture adventure that is top-down driven and aims to deliver a holistic, corporate-wide architecture. Very few organisations possess the perseverance, resources and maturity to succeed in such a challenge – neither to build it, nor to maintain it. On the other hand, a bottom-up, stepped approach, delivering pieces of the Enterprise Architecture in a pragmatic way, will also help you guide your organisation’s business transformation. But most advisable are combinations: outlining the big picture from a top-down, corporate-wide perspective, and then fleshing it out in a pragmatic, step-by-step manner. Many organisations tie their EA endeavours to concrete projects and iterate each time a new project is launched, using the existing architecture as a starting point for the change ahead.

2. Get inspired, not indoctrinated

Enterprise Architecture as a discipline is deeply rooted in the use of a number of frameworks like Zachmann, TOGAF, etc. Although these frameworks contain a lot of useful information, description and prescription, there is no one best framework. Each of the frameworks has its own strengths – which approach tends to work best depends on the external environment and the organisational culture. Our research results indicate that organisations have leaned towards a pragmatic approach, combining best practices from several frameworks into an EA approach that best suits their goals. Whereas previously EA was very model/framework-driven – evangelised by a small group of enterprise architects – we now see more organisations using EA in a pragmatic manner to solve real business problems. Finally, organisations are starting to focus more on the importance of the process of architecting, rather than the outcome and documents that result from that process. Deliverables and documentation are important, but a good creative design process adds much more value than the documents themselves.
3. Prove your worth

If EA should be business-driven and business-owned, it should clearly contribute to business goals. Examples include: EA serving as enabler to make sure that the business can transform and keep growing at the pace it wants to; EA as enabler to make sure that the business is fast and flexible enough to handle changing customer demands; or, EA as a way to avoid duplicate initiatives conducted by different parts of the organisation. In the long run, EA should enable the organisation to make better business decisions. This means EA must not be a discipline on its own; instead, it must be thoroughly integrated into existing management practices. Furthermore, this also means that the enterprise architect is not merely a gatekeeper or auditor (as was often the case in the past), but also a creative designer, providing solutions rather than just highlighting problems.

4. Map the road ahead, but do it in pencil

EA is a business transformation instrument. This means that EA enables organisations to deal with the rapidly changing organisational environment by maintaining a good view and understanding of the organisation’s components and the links between them. However, there is no single way of architecting – the architecture design process differs from organisation to organisation. Whereas organisations used to employ a set method to draw up their enterprise architecture, we now see more variations and more flexibility in the approach. Flexibility in the EA method is especially needed in those organisations in which the business takes ownership of the EA. The enterprise architect should be tolerant of short-term deviations from the roadmap he or she has designed, as long as the general direction is maintained. The enterprise architect should also be able to compromise when necessary.

5. Talk the walk

Communicate, communicate, communicate! Enterprise architects must be careful not to work on isolated islands in the enterprise. They must sell the EA concept to the organisation, communicate EA’s added value to top management, influence decision-makers to take well-founded decisions, and explain the consequences of the strategic decisions to the workforce. The key communication aspects the enterprise architect must master include:
• Understanding and bridging both the business and the ICT domain.
• Building a strong network of influence – comprising both formal and informal relationships – within the business and ICT domains.
• Communicating successes and how EA contributes to the business.

The skills of the enterprise architect are a strong indicator for the organisation’s success with EA. In the end, the enterprise architect’s vision, leadership and expertise will determine whether an organisation remains simply EA-aware or evolves to become truly EA-infused.

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