

Taking Enterprise Architecture to the Next Level

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Abstract

For years companies have been using Enterprise Architecture (EA) to align Information Technology with the business. The promise of EA is that it will manage a company's technology, transforming it into a driver for revenue growth and production efficiencies. Although successful in defining the business and IT linkages, these efforts frequently fail to fully deliver on this promise. Companies with forward thinking leadership are looking to take EA to the next level. This next level of EA is a tool-enabled architecture methodology. This white paper defines and discusses tool-enabled architecture that takes EA to the next level.

An Introduction

The Argument for Taking Enterprise Architecture to the Next Level

For years, companies have been using Enterprise Architecture (EA) to build the necessary links between business and the Information Technologies (IT) intended to support the business. The promise of EA is that it will manage a company's technology, transforming it into a driver for revenue growth and production efficiencies. The architecture acts as a blueprint that specifies the direction for IT to take in order to enable the organization to meet its goals and objectives in an efficient and cost-effective manner. Although successful in defining the business and IT linkages, these efforts frequently fall short of achieving the full potential that EA offers. There are many reasons for this shortfall. The EA usually consists of manually maintained repositories of related but separate items and documents. It is often not universally available to and understandable by all the stakeholders both within the IT department and the business. Because it is comprised of static documentation, it is hard to update and difficult to use for decision making. Companies with forward thinking leadership are looking for enterprise architectures that are dynamic, adaptable, and which facilitate information sharing and enhance decision-making. These companies are fine-tuning their EA effort through the use of tools so that the architecture delivers all that it promises. These companies are looking to take EA to the next level.

As we have stated, most companies with an active enterprise architecture process typically have artifacts¹ of that architecture that are comprised of an assortment of intellectually related but physically separate items. These are usually in various formats of electronic files such as word processing, spreadsheet, presentation, diagrams, Adobe Acrobat (PDF) files, databases, etc. Some teams may store these artifacts on company intranets with HTML navigation and indexing pages to provide users with a framework to locate and retrieve the artifacts. The common thread here is that these artifact repository systems are basically manually maintained collections with simplistic indexing and devoid of metadata to help manage, organize and retrieve the information.

Enterprise architecture teams work hard and long to build their architectures and collect these artifacts. Yet, these collections hold static information about dynamically, changing enterprises. In the typical robust evolving environment of today's fast paced, IT intensive companies, much of this information is merely a snapshot in time becoming out of date rather quickly. Manually maintaining artifacts to keep them current is a challenge, at best. It is very expensive, taking significant labor resources to stay abreast with the changes. Such an enterprise architecture is typically devoid of any physical links between the intellectually related information that it contains. The documentation for the EA may not be easily accessed or readily understood by the various stakeholders. Relation to the business strategy and goals is not explicit. This makes using the EA for decision making marginal at best.

¹ The term *artifact* used in the context of enterprise architecture was introduced by John Zachman. Artifacts, in the context of an enterprise architecture, are items of documentation or information relevant to the architecture.

Clearly, evolving EA to the next level is needed so that companies can realize the full value of their EA efforts. The next level needs to be accomplished in a way that it offers solutions to the problems hindering current EA efforts. Bold companies are looking for solutions which include graphical, navigable models built on database technology, with interlinks to business and IT documentation as the path to reaching the full potential of EA.

Chance favors the prepared mind. - Louis Pasteur

▪ **What is the Next Level of EA?**

The next level of EA is really about an innovative new way of implementation that realizes the full value of the EA efforts. This next level of EA is *a tool-enabled architecture methodology*. This means that the EA documentation is enabled through a software tool that takes it from the level of individual artifacts and documents to an active document repository and reporting system which is web publishable. It maintains and illustrates all the interconnections between the business goals and strategy as well as all the interconnections between the components of the EA. This disciplined approach to EA is more than just using a tool. It uses a tool in a “combined solution,” meaning the design of the enterprise architecture is primary but is combined with the use of a tool. By this method, the solution will overcome the shortcomings of current EA methods.

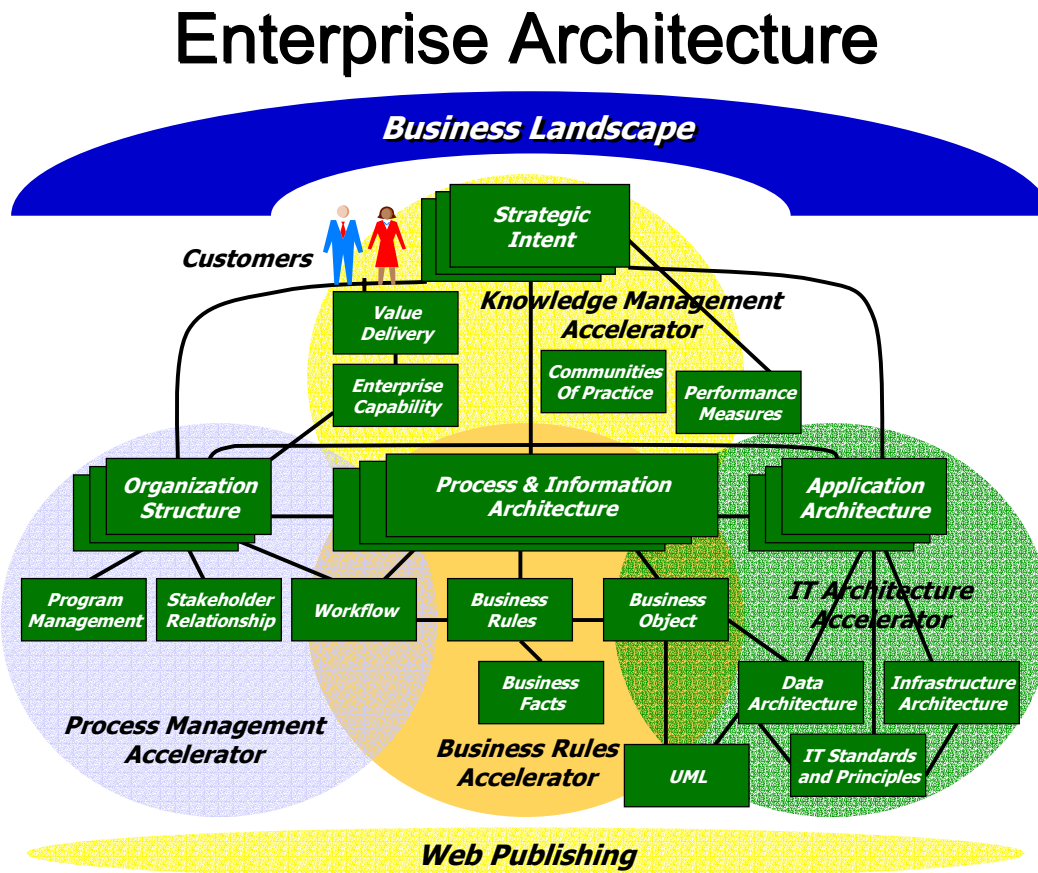


Figure 1 - The tool enabled enterprise architecture enables business with technology.

The key point to convey is that EA is a process designed to bridge the gap between forward-looking business vision/strategy and the detailed descriptions of the portfolio of investments an organization will make to support that strategy. This definition overcomes the “shelfware effect” (i.e., the narrow obsession with the artifacts or documents created by EA teams), and it encourages organizations to institutionalize the process of “architecting,” so all artifacts can be refreshed as required. – META Group Inc. 2003²

What and Why Enable With a Tool?

▪ What is an EA Tool Anyway?

The business world today is technology-dependent and the technology systems are so large and complex that understanding, communicating and managing them is difficult. Communicating between technical experts and business experts then is overwhelming. When things get complicated, visual models are a very powerful medium for understanding complexity and seeing how things interact. An Enterprise Architecture tool must provide visual models which illustrate all the pieces and interrelationships between the components of the architecture to provide a holistic view of the enterprise. The tool must facilitate updating and reporting so that decisions can be made on more complete and current information. Through a tool, the EA and related documentation and reports can be output in HTML and distributed via the company intranet at any time. The EA tool will maintain the EA documentation in a repository where all the stakeholders can access and browse the EA at any time.

What to Look for in an EA Tool

Some companies have been content to simply move their EA artifacts into a website on their intranet and then wrap them in a set of HTML pages. Although a website containing the artifacts of an EA could be considered a rudimentary EA tool, this really only addresses one of the features of a useful EA tool. An EA tool must address the entire EA process and support all aspects of enterprise architecture. This is true even for those companies that are just beginning to develop and use enterprise architecture. Selecting a tool that will not support the growth and maturity of company’s EA will make this maturation process that much more difficult, costly and time consuming. Conversely, having an effective EA tool when initially developing a company’s enterprise architecture will not only facilitate the initial development but will significantly assist the company in expanding and maturing their EA process, thus, greatly reducing the time and effort necessary to achieve significant EA impact and support.

When evaluating an EA tool, the following features are considered desirable:

- *Modeling technology underlies the basic tool* – The tool is far more than merely a repository for artifacts. It must provide a framework within which the enterprise architecture information itself is maintained - modeled. The artifacts become supportive and additive to the EA information in the tool.

² Buchanan, Richard, *Answering Tough Questions About Enterprise Architecture*, Delta 2050, March 19, 2003, The META Group Inc.

- *Artifact repository is built on database technology* – The repository technology is a true database that can store and manipulate metadata about the artifacts and links between the document-based artifacts and the other information in the model. The links are as important as the more traditional components.
- *Unrestricted ability to interlink the EA information, artifacts and concepts in the EA* – The tool must be built around technology that exploits the interrelationships between the EA information. The relationships are themselves objects (information) in the EA as well as links relating the artifacts and other information.
- *Simple ability to update, add, replace and change EA information* – The tool must be easy to use by the members of the EA team and supporting personnel in the extended teams to add, delete, update and change information in the EA model as required to keep the EA current.
- *Ability to produce a web accessible result to the enterprise* – Communicating the EA is one of the critical factors in achieving a successful EA. The tool should facilitate this communication by making the creating and management of web based EA information easy to perform. Enterprises should make the most current approved version of their EA available for all enterprise participants to see and use.
- *Provide graphic and textual data* – Many EA concepts and information are better communicated through the use of graphics in place of or in addition to textual information. The tool should support the creation of diagrams as well as the use of graphics as artifacts.
- *Support a powerful intuitive graphical navigation paradigm* – The tool should allow the development of a navigation scheme where navigation and EA information are tightly integrated to the point of uncertainty between where information ends and navigation elements (for their own sake) begin.
- *Serve as the focal point of top level IT management within the enterprise* – Moving EA from an annual exercise producing a large notebook on the shelf to becoming the focal point of IT management within the enterprise takes EA to the next level.

Selection of a comprehensive EA tool is critical as a company's EA should contain all the elements to enable it to become the focal point of high level IT management. An inappropriate tool will be more of a hindrance and distraction than no tool at all. The EA contains the what, why, who, how and where of the company's IT. Information spanning the entire path from why we are doing a project to what is the project's status and impact should also be in the EA. Where the enterprise is and where it wants to go with IT (and business) should be in the EA. The EA tool exposes this information in a way that allows EA to accept and excel in the role of IT management focal point - much to the betterment of the enterprise.

Key Drivers for Tool Enabling Enterprise Architecture

Why would you want to enable enterprise architecture with a tool? As tempting as it might be to answer, "because we can," the true answer lies in better achieving and maintaining the promise of EA in today's ever changing business and IT environment. An EA tool leverages the EA process and information to better achieve these goals. It should make the EA team more

productive and communicate the EA throughout the enterprise. The use of a tool provides a much faster track for companies to develop and establish their EA.

Key drivers to take EA to the next level by enabling it with a tool include:

- *Create a near real time coupling of the EA with and in support of the business* – Coupling the EA to the business is a major goal of EA and it can really only be effective if this coupling is continuous and subject to updates. The alignment between the EA and the business strategy and goals must remain current and dynamic.
- *Communicate the EA to all members and levels of the enterprise*³ – If the company’s personnel and management can not locate critical information incorporated in the EA when they need it, they will not use it in support of business decisions. They will not find it important to comply with EA direction, standards and guidance. Communication of the EA is a critical success factor. This is a key aspect to making collaboration a foundation of the EA process.⁴
- *Allow the EA to support business decision making on a continuous basis* – Business decisions in today’s leading companies are made all the time and not just once a year with an annual plan exercise. If the EA is truly going to support business decisions, it must be able to do so on a continuous basis throughout the year and on demand.
- *Enhanced ability to incorporate all EA related information in the enterprise* – Although it has been said that “a little EA is better than no EA at all,” it can also be said that the more EA the better. The more complete and exhaustive an EA is, the better it will support the business and IT. Having all the EA related information incorporated in one repository facilitates maintaining the consistency of integration between all the systems and the alignment of IT with business.
- *Reduced cost of maintaining the EA* – Tools, by definition, reduce labor and improve effectiveness. An EA tool will do this to the support required for the EA resulting in a lower EA total cost of ownership (TCO).
- *Improve adherence and compliance to the EA* – By making the EA easily and readily available to all in the enterprise, there is little excuse or reason for IT staff to not comply with the EA. This improves the benefit to the enterprise and establishes the value of the EA.

Addressing the Key Drivers to Take the EA to the Next Level

▪ Why Keep the EA Current and Dynamic?

Your business is constantly changing and growing. Customers come and go. Products are added, changed and removed. You acquire a competitor. You sell off a division. Your chief competitor invents that greatest widget of all time. The next big thing becomes the last big thing.

³ Success in enterprise architecture (EA) is directly correlated to the quality of communication within complex organizations. . – Buchanan, Richard, *Answering Tough Questions About Enterprise Architecture*, Delta 2050, March 19, 2003, The META Group Inc.

⁴ Organizations that make collaboration a foundation of their EA approach will enhance their ability to make rapid decisions, improve consistency, and lower aggregate risk. – Paras George, *We Built It, They Didn't Come*, Delta 2142, April 24, 2003, META Group Inc.

As trite as it may sound, *the only constant is change*⁵. So, for an enterprise architecture to continue to provide value and assist in decision making in the enterprise, it too must continue to change and evolve with the corporate strategy. This evolution must be constant and seamless. A periodic update or fine-tuning every six months will mean that your EA is as much as six months out of date twice a year.

“How do you cost-justify architecture? How do you fund the development of assets that can be reused or assembled to order to satisfy changing demand in the future?” The answer to this question is implied in the definition of EA as an ongoing strategic planning process. META Group Inc. 2003⁶

IT alignment with the business is the primary driver for maintaining a current, dynamic enterprise architecture. This alignment requirement is a major contributor to the value of enterprise architecture and is often the main reason why a company adopts EA. Since enterprise architecture is the means of establishing and maintaining this critical alignment, it follows that success is directly coupled with the ability of the enterprise architecture to stay current.

Every enterprise ought to be striving for optimal IT-business alignment and elasticity – the ability to gracefully contract, expand, and flexibly respond to changing business and technological conditions. IT executives should develop and implement policies and technologies that enable such alignment and elasticity, while also positioning the enterprise to take maximum business advantage of relevant new technologies. – Michael Dortch, Robert Frances Group 2003

▪ **Improve Communication and Understanding through Visual Models**

An important attribute of the next level of EA is improved communication to the entire organization. A goal of the higher level of EA is to build a common baseline of understanding throughout the enterprise. The aim is twofold: to empower business leaders to take charge and communicate the business needs to the technology side of the organization and to provide a view of the entire enterprise to all stakeholders. By thus empowering business managers through the EA, support for the EA is strengthened.

META Trend: Through 2005, enterprise architecture (EA) success will be determined by the extent to which corporate and line-of-business managers comprehend, support, and enforce the architecture. EA efforts that do not gain management support will fail, regardless of the design and engineering quality. – META Group Inc. 2003⁷

On its Enterprise Architecture website, Microsoft calls EA a “comprehensive set of cohesive models.”⁸ The key here is that architectures are models. Often though, the models representing the architecture suffer from a combination of the following weaknesses which limit their effectiveness.

- They many be presented in formats and styles which vary from one part of the organization to another.
- They usually lack strong interconnections to other processes and models.
- They may not be maintained in a central repository and updated regularly.

⁵ This quote first attributed to pre-Socratic philosopher Heraclitus of Ephesos (born 535 BC).

⁶ Buchanan, Richard, *Answering Tough Questions About Enterprise Architecture*, Delta 2050, March 19, 2003, The META Group Inc.

⁷ ,Burke, Brian, *Building the Enterprise Architecture Team: Part 2 — Talents and Skills*, EPAS 178, February 28, 2003, The META Group Inc.

⁸ <http://msdn.microsoft.com/architecture/>

An EA tool can eliminate these problems by pulling together all the models into a coherent whole, graphically portraying interactions between all parts of the EA and the organization with all the documentation properly formatted and integrated.

In a rapidly changing, highly interconnected, technology-dependent business environment, complexity and uncertainty become natural byproducts of an organization culture. META Group research indicates a rising demand among Global 2000 organizations for models and diagrams to increase both the quality and speed of decision making - in effect, to combat the volatility of these surroundings. The degree to which senior management can "see" the dependence of certain conditions (either to achieve business value or avoid sub optimal results) is predicated on the effectiveness of the enterprise architecture team to create the right portfolio of models, and to select an appropriate toolkit for the creation, dissemination, and management of the models. – META Group Inc. 2000⁹

Human beings gain greater understanding when information is presented as a visual image, therefore models are best understood visually. Visual models are particularly useful for portraying complexity in an understandable manner. Large technology systems within an organization are extremely complex. It follows that presenting the Enterprise Architecture as a graphical model will increase the effectiveness of the EA.

Organizations that make communication and clarity of thought a centerpiece of their architecture leadership activities will accelerate strategic integration and speed portfolio decision making. – META Group Inc. 2003¹⁰

Presenting the EA in an easy to access and understand format elevates the EA from a collection of IT artifacts to a useable vehicle for moving a company's strategic vision forward through its IT. The wider audience reached by the distribution of information made possible with an EA tool will translate into better use of the EA as a direction setting mechanism for the enterprise.

▪ **Executive Access and Enhanced Decision Making**

Companies frequently undertake corporate initiatives and spending with inadequate understanding of the supporting Enterprise Architecture. The results are seen in unaligned, unfocused initiatives that do not contribute to the company bottom line and may even adversely impact other existing systems and projects. Disciplined analysis and decision making requires access to the most complete and recent information possible. Communication of the EA through a tool allows the EA to enable business decision making with real time information. It improves access to the information contained in the EA to all the stakeholders throughout the organization. Improved accessibility of information provides the potential for better decision making.

In order to make decisions that optimize conflicting requirements of the various business units or departments, executives must be able to visualize the organization in its entirety. When an EA illustrates all the interconnections in an organization both external and internal to the IT group, a holistic view of the enterprise emerges. This full view of an organization enhances understanding of the implications of a decision throughout an organization. This will have a positive impact on technology initiatives as project managers can see all affected departments.

⁹ Macpherson, Carole, *The Business Value of Modeling: A Framework for Categorizing Modeling Tools*, Practice 40, December 1, 2000, The META Group Inc

¹⁰ Buchanan, Richard, *Answering Tough Questions About Enterprise Architecture*, Delta 2050, March 19, 2003, The META Group Inc.

The common view of the entire organization results in decisions best for the whole enterprise rather than those optimized for individual departments or business units.

META Trend: Through 2005, the primary justification for enterprise architecture will be the business value derived from integration of separate business and IT planning processes into a unified enterprise architecture planning and execution function. . – META Group Inc. 2000¹¹

An ongoing challenge for business and IT groups is defining the best¹² IT projects to undertake. Will the latest technology provide a path to reaching the strategic goals and objectives, or is the budget better spent by allocating more to developing new avenues to customers through existing technology? Companies are increasingly trying to apply sound financial measurements to technology projects just as they do to other areas of their business. IT groups have in the past focused on evaluating potential projects on technical merits. Evaluating the financial merits of a project requires access to financial data, and the more this access is straightforward and easy, the better the quality of the resulting analysis. A good EA modeling tool will also allow a company to integrate the financial data required for measurements such as ROI and TCO analysis. With the EA defining the future state for technology, the financial links improve analysis and selection of IT projects.

An EA tool links all the organizational information pertinent to the architecture and makes reporting on all of it easy. This increases the value of the organization by transforming its knowledge into usable decision criteria.

- **Incorporate and Integrate All EA Related Information**

The more complete and exhaustive an EA is, the better it will support the business and IT. By integrating all the EA related information into one metadata driven repository, the alignment of IT with business is made visible. This facilitates keeping the alignment current. The consistency of integration between all systems is also improved by inclusion of the greatest possible amount of information within one location. Presenting the information with the iterative links between the various elements will foster unity in the organization as the interdependencies are exposed.

- **Reduced Cost of Maintaining the EA**

A tool-enabled EA offers improved access for the stakeholders to their individual pieces of the EA. This means they can update existing and include new documentation and information at any point in time, providing real time access to the latest versions of EA documents. The tool simplifies the process and includes all interconnections, so maintenance time and labor are greatly reduced. With a tool-enabled EA, managing and tracking information is more accurate and efficient. This in turn reduces the TCO of the EA.

- **Improve Adherence and Compliance to the EA**

Ignorance is the most common reason why employees fail to comply with company rules. Certainly, inaccessibility to information also provides an excuse to those few that want to “do their own thing” anyway. Because a tool-enabled EA is easily and readily available to all in the

¹¹ Westbrook, Tim, *Justifying and Linking Enterprise Architecture with Business Strategy*, Delta: 0088, June 7, 2000.: The META Group Inc.

¹² Best here is defined as providing the best return on investment to the company taking into account all aspects of the project and its impact to the enterprise.

enterprise, compliance to the included standards and goals improves. This translates into increased value provided to the enterprise.

The Strength of a Tool-enabled EA or EA Benefits in Action

Companies enabling their EA efforts through the use of a tool achieve significant EA impact and benefit. Their EA efforts more fully realize the goal of better support of the business, enabling the organization to meet its goals in an efficient and cost-effective manner. The improved understanding provided by a tool's visual models translates into increased use of the EA in everyday operations and decision making. This allows the EA to become the focal point of high level IT management. Improved accessibility allows employees to utilize the greater amount of information integrated into the EA resulting in decisions based on more complete and current information. Working from a common understanding of the organization and finding the design and guidelines of the EA at their fingertips, employees look to the EA for guidance on the impacts of projects and changes on the organization as a whole. Improvements in project planning and analysis are also realized as department heads and project managers find access to financial data simplified by the EA tool. Project management is facilitated by the improved reporting capabilities provided by the EA tool. Cost savings are realized as technology standards compliance is improved and maintenance time and labor are reduced. The benefits of a tool-enabled EA in action are many and varied, resulting in an EA that delivers a full course of the potential benefits of enterprise architecture.

Summary

The next level of EA is a tool-enabled architecture methodology. Tool-enabling EA adds power and value to the EA, solving the problems affecting current EA efforts. A tool-enabled EA creates a near real time coupling of the EA with and in support of the business to fully deliver the value promised. Tool-enabled enterprise architectures prove to be as dynamic and adaptable as the businesses they serve. Companies that tool-enable their EA efforts find that the improved communication of the EA leads to increased and improved use. Information sharing is facilitated, thereby enhancing decision-making and empowering business leaders. Companies with tool-enabled EAs are realizing the power of EA to manage technology, transforming IT into a driver for revenue growth and production efficiencies. These companies are using their EA as a useable vehicle for moving their strategic vision forward through IT.

The Zachman Framework for Enterprise Architecture provides the "why" of EA. Tool enabled methodologies characterized by that used by GoAgile provide the 'how'. – John Zachman 2003

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