

# Executive Summary

## UML Metamodeling for Enterprise Architecture

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There's a common thread in all of the current hot topics concerning enterprise architecture (from business-IT alignment to agile development to architectural conformance): they are all impossible without the timely availability of knowledge. The reason is simple; just ask yourself the following questions:

- How can you determine whether the business and IT systems are aligned if you do not have a clear understanding of each?
- How can you develop systems quickly if you do not know what you already have on which to build?
- How can the development effort conform to architectural principles if those principles are not readily available and easily applied?

No matter what architectural guidelines you apply or what development methodology you practice, without a systematic, well-thought-out approach to capturing the information needed about the business and IT systems, you are doomed to, at best, unsatisfactory results and, at worst, failure. Unfortunately, it seems the odds are stacked against you for numerous reasons.

Specifically, one problem is the abundance of available modeling tools. There are tools that are specialized for business modeling, tools specialized for the city planning approach to enterprise architecture, tools specialized for design and development, and some tools that do all three well. If using more than one tool, it is

advantageous for them to intercommunicate. If the different tools do not interoperate well, it becomes difficult to see the connections among the different models. This leads to a disconnect right where a connection is needed most. If one tool is used to model the business, a second tool is used to model the enterprise architecture, and a third is used for project development, then there may be no way, other than through visual inspection, to ensure that the business concepts are properly addressed by the architecture and that development teams are adhering to the architectural principles.

For this reason, it is beneficial to find a tool that can provide all of the different views that you require. Sometimes this may not be possible for nontechnical reasons, for example, when different departments responsible for the different views select different tools. If using one tool throughout your organization is not possible, it is important to make sure that the tools you do use conform to modeling standards, such as the OMG's XML Metadata Interchange (XMI). This will permit the exchange of data between the different modeling tools. You may still have to do some "fix-up" work and maintain information in more than one place, but it is still better than having to redo all of the work manually.

Another issue is that sometimes a tool may not do quite what you want it to. It may have a closed approach that constrains the way you can create your models and relate the information within them. Some design tools forget that they are drawing tools. They tend to force the placement of elements and relocate them, seemingly at random. Lack of a good user interface is a big reason that some designers go back to something like Visio. In doing so, they lose all of the benefits that a repository-based modeling tool provides, but their anger subsides when they do not have to redraw a diagram every time it is opened. Another hurdle, particularly for groups new to enterprise architecture and trying to sell it to management, is the high cost of some tools.



One question I'm often asked is whether or not UML can really be used to capture enterprise architecture. The reason, I think, that the question is even asked is because out-of-the-box UML provides such a diversity of diagrams, model element types, and approaches that it may seem overwhelming, providing confusion rather than clarity. If you were to give a UML modeling tool to five different designers and ask them to provide a solution to the same problem, I'm sure you would get five very different looking solutions. My original premise set forth above about the need for the timely availability of knowledge cannot be attained if there is no consistency in the captured information. Rather than ending up with a beautiful, well-conducted symphony, all you will have is the sound of an orchestra tuning up.

Fortunately, the OMG built into the UML standard the capability to extend the UML metamodel (the underlying structure of UML). These extensions use profiles and tagged values to enable a more focused approach for a given modeling domain. The accompanying *Executive Report* discusses an approach for UML modeling that addresses the different architectural views required to satisfy all of the stakeholders of an enterprise. It can be used to help ensure business and IT alignment, provide agility, and make the path to architectural conformance the easy path for development teams, as well as other goals that you might set for architectural modeling.

In the report, I will demonstrate an organized approach for modeling enterprise architecture that includes architectural views as well as the architectural principles, objectives, and guidelines necessary to ensure that development efforts proceed down the path prescribed by company visionaries and practitioners. A key aspect of these guidelines includes a UML metamodel for your specific approach to enterprise architecture that is flexible, powerful, and yet easy to use for designers.

Many development shops these days already have a UML modeling tool. The report explains how to leverage that tool to model your enterprise architecture using metamodeling to extend UML to make that effort more efficient and consistent.

Organizations considering enterprise architecture modeling tools, especially those already using a UML tool for designing their project solutions, may want to consider this approach as a prototype to help them fully understand their needs prior to selecting a high-cost modeling tool. You may even find that this approach fully satisfies your needs.



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