Enterprise Architecture and Systems
by Roger Evernden

TOGAF is based on the ISO 42010 standard which provides a conceptual model or metamodel showing the relationship between a system and an architecture. The relationship is a simple one: systems have architectures. But the relationship between these two terms can cause confusion. A common question is: is an architecture the same thing as a system? Another one is: exactly what is a system?

Firstly I need to be quite clear here. The word “systems”, in this context, has a very broad meaning. Systems does not mean the narrow sense of an IT system. The 42010 standard actually takes no position on what we mean by a system! This may sound like a cop-out, but it actually allows us to consider systems in a very broad way, which means that the concept applies in pretty much any EA situation. The 42010 standard actually says:

“In the Standard, the term system is used as a placeholder – e.g., it could refer to an enterprise, a system of systems, a product line, a service, a subsystem, or software. Systems can be man-made or natural. Nothing in the Standard depends upon a particular definition of system. Users of the Standard are free to employ whatever system theory they choose.”

Whenever we scope an EA initiative it is a good time to consider exactly what we mean by the “system” of concern. The concerns could be at a truly enterprise-level. Or they may be concerned about a part of the enterprise, such as a business division or a particular software application. Generally speaking, the system of concern needs is a complex mix of components that have a wide variety of interdependent relationships and require a high degree of interoperability. As a simple rule of thumb, whatever is in scope for your EA initiative can be considered as a system.

Leading enterprise architects have been talking about systems and systems thinking for years. There are a lot of good ideas in systems thinking that have a high relevance in EA, and a lot of EA techniques contribute to our understanding of systems.

In recent years this link between systems and enterprise architecture has become more topical. There has been a surge in articles and books on this topic. Here are two recent books that are relevant:

• Beyond Alignment: Applying Systems Thinking in Architecting Enterprises by John Gotze, Anders Jensen-Waud (Editors)
• A Journey Through the Systems Landscape by Harold “Bud” Lawson (author)

Each of these books, and the many other resources for systems thinking, provide useful ideas that can be applied in an EA practice. But... and it’s a big BUT... it is important to remember that systems thinking and architectural thinking are two separate disciplines. It is dangerous to apply systems thinking to describe an enterprise architecture without also adding architectural thought! Systems thinking is good at describing an operational, functional system at the systems level. Let’s clarify what this means. Harold Lawson, in the book mentioned earlier, says that “any collective set of elements (parts) that have some form of relationship can be viewed as a system.” He also quotes John Boardman and Brian Sauser, who wrote: “We believe that the essence of a system is togetherness, the drawing together of various parts and the relationships they form in order to produce a new whole...”

In other words, the great thing about systems thinking is that it looks at all of the elements of the system as a whole, in their togetherness.
This explanation makes it easier to see what architectural thinking offers, through approaches like TOGAF. To think as an architect, we need to separate concerns – at the high level, into the four architecture domains of TOGAF: business, data, application, and technology, but often into more detailed domains, such as product, process, event, or capability. To think as an architect, we need to deconstruct components and relationships, and understand the underlying constraints, dependencies, and relationships. To think as an architect, we need to reconfigure them in better ways.

To think as an architect, we need to create building blocks that can be reused in multiple contexts, thus magnifying the benefits and value that we define in an architecture pattern.

All these things that we do as architects give insight into a system, and allow us to proactively develop options for future target states that help us to govern architectural evolution, adaptability, and sustainability. Many of the systems that exist in the world are natural, and even emergent. They come into existence organically, or on their own accord.

There are some parts of a system that humans construct or build, but they are always part of a bigger system. Even if we were fully responsible for constructing every component in a complete enterprise architecture there would always be a wider environmental and social context that was outside our direct control.

Systems thinking allows us to consider this wider context. Enterprise architecture thinking gives us techniques and methods that can help to construct a good system.

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