

Critical Thinking in Business Architecture

Introduction

Like any other analysis and design activity, architects are often in the role of soliciting requirements from a range of sources and stakeholders. As we have all experienced, this exercise is met with a wide range of opinions and perspectives from stakeholders who think they know what is required, and with a wide range of confusion and vagueness from those who don't know what they want. Given this situation, the architect needs to be able to dig into the issues, collect accurate and relevant information, and question assumptions. Then, the architect has to be able to examine the different opinions, evaluate them in the context of different perspectives, and balance and prioritize them.

The field of study called *Critical Thinking* is aimed at just these problems. This Column will provide an introduction to critical thinking and draw a parallel between these generic skills and the tasks of a business architect.

What is Critical Thinking?

The field of critical thinking has been around for over 100 years. One of the earliest definitions comes from John Deweyⁱ in 1909:

Active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends.

In this definition, we can see that the focus of Dewey is on examining the validity of someone's beliefs. What if any evidence is there to support it? Are the conclusions substantiated by the evidence, or simply based on beliefs with no evidentiary backing? Another good definition supporting this focus comes from Norris and Ennisⁱⁱ in 1989.

Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.

As you can see, being able to evaluate what opinions (or requirements) are based on facts, and apply 'reasonable thinking' to decide what to do is certainly applicable to the job of an architect. Perhaps the most detailed definition comes from The National Council for Excellence in Critical Thinkingⁱⁱⁱ

"The intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered

from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action".

Again, as an architect, I'd like to think that I can perform an 'intellectually disciplined process of conceptualizing, analysing, and synthesizing information'. So what are the skills required to perform critical thinking?

Critical Thinking Skills

According to Glaser^{iv}, critical thinking requires the ability to:

1. Recognize problems
2. Understand the importance of prioritization and order of precedence in problem solving
3. Gather relevant information
4. Recognize and question unstated assumptions and values
5. Comprehend and use language with accuracy and clarity
6. Interpret data to appraise evidence and evaluate arguments
7. Recognize the existence (or non-existence) of logical relationships between propositions
8. Draw warranted conclusions and generalizations
9. Put to test the conclusions
10. Adjust one's beliefs on the basis of wider experience

Some of these abilities or tasks are straightforward. Others deserve more discussion. Let's examine a few of those skills in the context of business architecture in more detail.

4) Questions Assumptions – Assumptions are inherent in almost everything we do. Some assumptions are cultural or historical, others come from a perspective or experience. More often than not, we don't even recognize when we are making assumption. But, innovative new products, services, and solutions depend on questioning assumptions and removing the unnecessary or unfounded constraints that they impose.

A simple example comes from an experience I had recently working with a travel company. The company was redefining a process having to do with international travel and the appropriate documents needed. The project team made two assumptions. First, that a traveller can only have one passport, and secondly, that it was not only important to verify this fact, but that their processes should take on that responsibility.

It was not hard to convince the team that their first assumption was wrong. Many people have two passports. Some people have dual citizenship, in which case they have one passport for each country where they are a citizen. Other people have both a diplomatic passport, used for official government travel, and a civilian passport used for personal travel. It is also possible for frequent travellers who require visas to have two passports so that they can be travelling at the same time as their (second) passport is being used for visa processing. Or, so they can travel to certain countries without concerns about where they have travelled in the past. For example, travellers to Saudi Arabia or Iran may have problems getting a visa or during passport control if they have evidence of travel to Israel in their passport.

These facts threw some of their team into a tizzy. Now, they would have to learn all the rules associated with multiple passports so that they could be verified. I asked

the obvious question “Why do your processes need to verify this?” There were several explanations offered, all of which proved to be wrong when actually examined. Still, it took a significant effort to convince the business analysts that it was not necessary to validate how many passports a traveller might have (as long as they have at least one) simply because they could not see past the historical (but incorrect) perspective of their existing product and their approach toward rule validation.

As an aside, this is also an example of distribution of responsibilities as a guide to implementation. I addressed the problem by asking “Who is responsible for validating if a traveller has more than one passport? Who understands (and can change) the rules?” Answer: It is the passport issuing authority, such as the Department of State in the USA. So, if you are not the State Department, you should not be trying to validate this rule, unless the State Department has explicitly delegated that responsibility to you, and provided the necessary interfaces to get current rules and required information.

Often, people who have been working with something for a long time can’t get past the current solution to imagine new and better approaches. This is frequently the source of questionable assumptions. And, an important opportunity for a critically thinking architect to provide value.

5) Accurate and clear language – As part of the investigation into requirements, or analysis of solutions, the meaning of terms needs to be questioned. Everyone has experienced the case where different people mean different things but are using the same term (such as customer, account, product). Or, where people mean the same thing, but are using different terms. To be able to evaluate information, we need to understand the meaning of terms, and the semantic context within which they are used.

As business architects, one of the activities that we often perform is the development of a capability map. This activity involves the discussion of what the business does with appropriate subject matter experts. It is easy to come up with a list of capabilities, but to assure that everyone means the same thing, we also come up with a 25-word description that clearly defines the capability. While developing the definition, we also identify specific teams that need to be defined. Those business terms are organized in a business information map. The information map can then be used as the ‘accurate and clear’ common vocabulary of business terms.

As another aside, the act of identifying key business concepts and clearly defining the terms and synonyms used to describe them requires different business subject matter experts to discuss and agree on precisely what those terms mean. Having a range of business SMEs involved is key to getting agreement and acceptance of those terms. Additionally, it takes the business architect or analyst out of the role (with the associated scars) of creating a business vocabulary, and puts them in the role of enabler.

6) Interpret data – All data and assumptions need to be evaluated for accuracy and context. Critical thinking should question:

- Goals, purpose, objectives – to make sure that discussions are relevant to meeting them
- The way in which questions are framed, problems posed, issues expressed – to expose underlying beliefs

- Information and sources of information – to ascertain accuracy, providence, and impartiality
- Assumptions being made – as above
- Concepts being used – to determine acceptability and applicability
- Perspectives or points of view – to understand semantics and biases
- Implications of assumptions, concepts, and perspectives – to identify dependencies and priorities
- Interpretations and conclusions – to validate against the evidence

8) Put Conclusions to the Test – Just as data needs to be evaluated, conclusions need to be tested, both against available evidence at the time of design, and later, in use against desired outcomes and objectives. As business architects, we can use the Business Motivation Model as a tool to help us articulate tactic associated with our conclusions and SMART objectives to measure them. See my February 2014 Column “Understanding Why and How Well”, <http://www.bptrends.com/understanding-why-and-how-well/>.

Critical Thinking Model

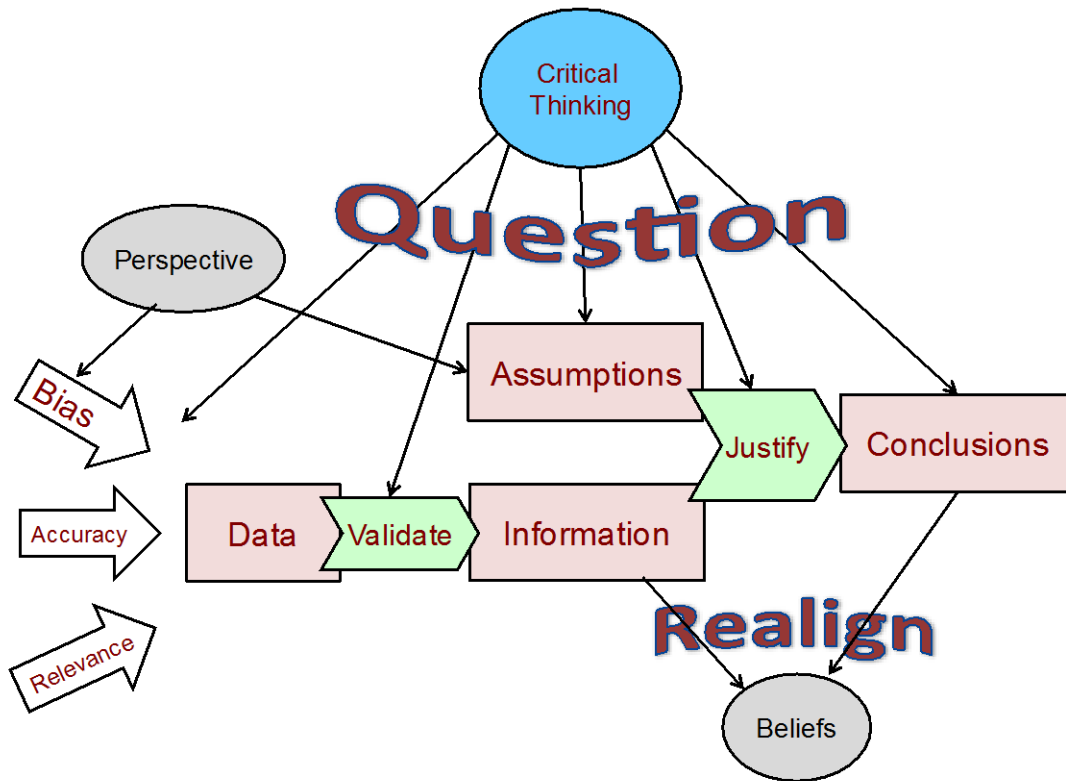


Figure 1 – Perspectives of Critical Thinking

Figure 1 summarizes the concepts that we have explored regarding critical thinking. Starting from left to right, there are a variety of source of *data* sources, each with some degree of *relevance* and *accuracy*, and each coming with a particular bias. We need to *validate* the data and put it into context so that we have specific *information* to create hypothesis and conclusions.

But, in addition to the specific information, we also have the stated and unstated assumptions. Both data and *assumptions* come with a *perspective* that colors the assumptions and the data *biases*. In addition, every person may be coming from a slightly different perspective. As critical thinkers, we must identify these different perspectives so that we can put the information and assumptions into context.

Now, given the information and assumptions, we can form hypothesis and *conclusions*. Again, as critical thinkers, we must *justify* the conclusions by validating them against the available information, taken in perspective.

Critical thinking *questions* every step in this overall process, from the data to the validation, to the assumptions, to the conclusions and the justification. But it doesn't end there. The final step is to evaluate the information and conclusions against our own perspectives and *belief systems*. As new evidence is discovered, or a wider experience or broader context is applied, or as previous assumptions and beliefs are challenged, we have to be able to *realign* our own preconceived notions. After all, this is what we are asking of our stakeholders when we perform critical thinking, so we better be able to do it for ourselves.

I consider this one of the key characteristics of a good architect. It takes a combination of open mindedness, fact based reasoning, and self confidence to evolve one's belief systems. Someone who is not open to different conclusions or new ideas in the face of the evidence is not who I want on my team.

The Critical Thinking Architect

When thinking about the skilled architects that I know, I came up with a list of actions that characterizes the critical thinking architect:

- Raises important questions and problems, formulating them clearly and precisely. Questions assumptions.
- Gathers and assesses relevant information, using abstraction to consolidate and interpret it.
- Comes to well-reasoned conclusions and solutions, testing them against relevant criteria, requirements, standards, and best practices.
- Thinks open-mindedly, recognizing and assessing their assumptions, implications, and consequences.
- Communicates effectively with others in arriving at solutions to complex problems, without being unduly influenced by preconceived notions or other's opinions.

These are certainly things I like to think I do as an Architect. How about you?

ⁱ Dewey, John. (1910). *How we think*. Lexington, MA: D.C. Heath & Co.

ⁱⁱ Norris, S. P. and Ennis, R. H. (1989). *Evaluating critical thinking*. Pacific Grove, CA: Midwest Publications

ⁱⁱⁱ <http://www.criticalthinking.org/pages/defining-critical-thinking/766>

^{iv} Edward M. Glaser (1941). *An Experiment in the Development of Critical Thinking*. New York, Bureau of Publications, Teachers College, Columbia University.



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