

Fictional Discussion Board Assignment

This is a fictitious discussion board assignment. There are 5 students posting and replying to the Systems Architecting Skills assignment:

- Student 1: Donald Duck
- Student 2: Hermione Granger
- Student 3: Luke Skywalker
- Student 4: Leslie Knope
- Student 5: Tyrion Lannister

Published

Edit

This is a graded discussion: 10 points possible

Systems Architecting Skills (Fictional Discussion Board)

Dr. Beth Wilson

In module 1, we discussed skills necessary for systems architects. Select a proficiency necessary for systems architecting and explain why it is different from systems engineering.

After you have posted, you need to reply to at least 2 other posts.

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Assignment Rubric Details

Discussion Board						
Criteria	Ratings					Pts
Original post by deadline	Explores several aspects of material, offers meaningful connections, and shows critical thinking 5.0 pts	Shows understanding of material and offers meaningful connections 4.0 pts	Summarizes material 3.0 pts	Post addresses some of question 2.0 pts	No post by deadline 0.0 pts	5.0 pts
Conversation enabler	Original post by Friday (11:59 Eastern time) OR another student replies before deadline 1.0 pts				No Marks 0.0 pts	1.0 pts
Replies	Replies to at least 2 other students with meaningful discussion 4.0 pts	Replies to at least 2 other students 3.0 pts	Replies to 1 other student 2.0 pts	No replies 0.0 pts		4.0 pts
Total Points: 10.0						



Hermione Granger



Wednesday

The system architect needs good communication skills to interact with the stakeholders with proficiency in soliciting mission objectives and balancing these against the business and technical constraints on the desired system. This proficiency is especially important in extracting and balancing inputs from multiple stakeholders that may express what appear to be conflicting objectives.

A system engineer is also involved in analyzing mission objectives, but the skill needed is to translate given mission objectives into requirements and decomposing established system structure into system elements. The systems architect needs to build the mission objectives from the discussions with the stakeholders and understanding of their needs and view of the desired system.

As described in the Buede and Miller textbook (page 49), "the stakeholders' requirements are written in the common language of the stakeholders (e.g., English and Chinese). The system requirements are a translation of the stakeholders' requirements into the appropriate engineering terminology (e.g., foot-pounds, bits, and decibels)." The system architect needs the communication skills to engage the stakeholders effectively and the domain experience to understand what the stakeholders are describing as a desired implementation of the completed system. The system architect describes the resulting mission objective as a capability in English so that the system engineer can then express this as a requirement in dB.



Reply



Luke Skywalker



Friday

I agree that these communication skills are important. Asking a set of stakeholders what they want and need can be a difficult process. It involves asking questions and trying to find out what they really mean even if they don't say it. The stakeholders may not know exactly what they want. Take, for example, the HGTV show "Love It or List It." Designer Hillary will ask the people what they must have her do in the house to stay there and Realtor David will ask the people what they must have him find for them to leave. The show then goes through a formula technique of having the people look at houses that have what they want but they are mad at David because it is too expensive or too far away. Meanwhile, Hillary finds problems in the renovation and has to make choices to stay under budget and they get mad at her for not delivering everything they wanted. The part I find interesting is that Hillary has to stay under budget and David always finds the perfect house that is way over budget. It seems to be okay, though, because after they have seen Hillary's work (under budget), David tells them "I have one more listing to show you, and it is yours" where he shows them that if they sell their house with all of Hillary's renovations, they can now afford to buy the house that was over budget.



Reply



Leslie Knope



Saturday

Interacting with the stakeholders is an important proficiency. It can be hard to ask a stakeholder (or set of stakeholders) what they need and want. Sometimes using mission scenarios and use cases can help with that.



Reply



Donald Duck



Saturday

Problem structuring is where we organize elements of the problem space with a primary focus on a "value model." The value model is an explicit model of the most important stakeholder's preferences, and it is intended to capture them without regard to consistency.



Reply



Donald Duck



Thursday

Architecting is both an art and a science – both synthesis and analysis, induction and deduction, and conceptualization and certification – using guidelines from its art and methods from its science. As a process, it is distinguished from systems engineering in its greater use of heuristic reasoning, lesser use of analytics, closer ties to the client, and particular concern with certification of readiness for use.

A great architect must be as skilled as an engineer and as creative as an artist or the work will be incomplete. Gaining the necessary skills and insights depends heavily on lesson learned by others, a task of education to research and teach.

◀ Reply



Luke Skywalker



Friday

Architecture is art. Some buildings we see are very boring and seem to be focused on purpose over visual appeal. We see many buildings in a city that are just functional -- steel, bricks, walls, and windows. Then we can find buildings that are very artistic. Some may even seem to be focused on art over function. The Stata Center at MIT is an example of this. It has won awards for its architecture, but has been criticized for the odd angles that walls come together and the mix of surfaces. If you google "MIT crazy building," this is what comes up.

◀ Reply



Luke Skywalker



Friday

The systems architect is building an architecture to help with decision making. As described in the lecture on the slide "Architecture for Decision-Making", the systems architect will ask "what needs are we trying to fill." They will evaluate the current system to determine what works well and what does not work well. This will help the system architect translate the stakeholder needs into an operational concept. At that point the systems architect must evaluate this operational concept to understand who are the intended users. Users can include operators and maintainers. The architect looks at how these users will interact with the system and try to understand how that might be different than how they interact with the current system. This helps the system architect translate the operational concept into functional capabilities. At that point the systems architect must focus on the capabilities to determine what specific capabilities the new or revised system will provide. They must decide what level of detail to provide in the resulting architecture. If there is too little detail, the elements may not come together as expected. If there is too much detail, the designs will be unnecessarily constrained. The element interfaces must be well defined so that when they come together the system will work as intended. This helps the system architect translate the functional capabilities into a system architecture. At that point the systems architect must decide what is the best course of action for the design that will follow. They need to decide what elements are necessary to satisfy the overall approach. They need to evaluate the elements that are described in the system architecture to make sure that these elements are complete, logical, and consistent.

◀ Reply



Hermione Granger



Friday

The Systems Architect (SA) can support the decision-making you have described by developing a set of possible solutions. The System Engineer (SE) can then proceed with the solution that was selected. The alternative architectures will show the implications of different emphasis. For example, one architecture may provide more reuse than another, but provide less desired functionality. Another architecture may show more functionality but at higher cost, but easier to maintain.

◀ Reply



Leslie Knope



Saturday

The systems architect needs to have technical knowledge with some depth and have general knowledge. The system architect needs to have business knowledge and insight into how this applies to the system being developed. The system architect needs to have some insight into the process and how this architecture relates to previous architectures. The system architect needs psycho-social skills to be able to solicit expectations, needs, concerns, and constraints from the stakeholders.



Reply



Hermione Granger



Saturday

Some of this is also true for System Engineers. A Systems Architect (SA) needs to have depth and general knowledge to have the context for the business acumen and domain insight. The System Engineer (SE) also needs depth and general knowledge to design the system. The difference is that the SA solicits ill-defined expectations and conflicting constraints from the stakeholders and translates them into well-defined requirements that the SE can proceed with.



Reply



Donald Duck



Saturday

It is the responsibility of the architect to know and concentrate on the critical few details and interfaces that really matter and not to become overloaded with the rest. Depending on the specific system under consideration, a great deal, or a very little depth, of understanding may be necessary.



Reply



Tyrion Lannister



Sunday

The systems architect needs to be proficient in creative design with ambiguity. The systems architect is focused on the art of the system while the systems engineer is focused on the science of the system. The systems architect must discover concepts that are not measurable and translate them into definitive requirements that the system engineer can use to design the system elements.



Reply