



So You Want to be a Software Architect?

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**Software Architect
is
Someone Who Can
Make
Sub-optimal Decisions
in
Total Darkness**

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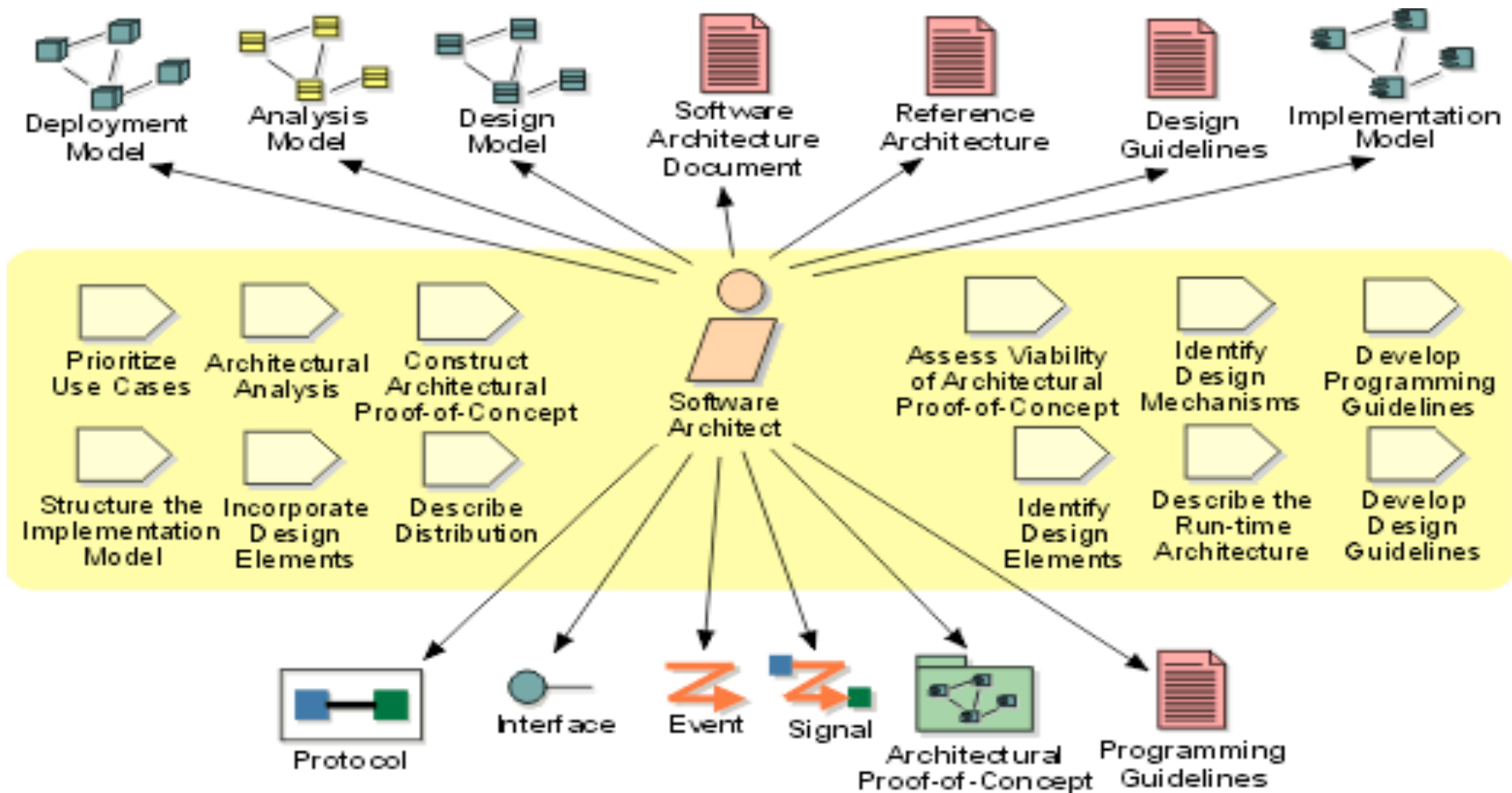
Where did Software Architecture come from



- Driven by business need
 - Cost cutting
 - Increase Revenue
 - Strategic Advantage
- Driven by new technology
 - Main Frame/Batch
 - PC/interactive Real time
 - LAN/WAN
 - Internet
- Driven by Software Engineering principle, methodology
 - Functional decomposition, sub routines

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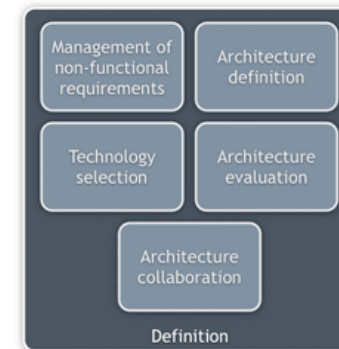
An architect will be many things to many people



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So what is a Software Architect?

- Some disagreement as to what exactly a Software Architect is
- Some basic terms associated with the title:
 - A technologist who makes high-level design choices and determines technical standards
 - Software architecture is all about having a view of an entire system and seeing the individual parts fit to understand how the software system works as a whole



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So what is a Software Architect?



- A software architect is really an expert position
 - Has responsibility for selecting the components and interaction patterns used across a whole project to achieve that project's goals
 - If the architect gets it wrong, the project will may fail completely with huge recriminations on all sides
 - Succeeding? with results that can't be rolled into production; because, they're so complex only the original developers can understand the design
 - Software architecture has to bear in mind project management too

An Architect is the sum of their experience



- Software architect generally requires a bachelor's degree in a computer discipline and additional training or credentials
- Continuously seek to improve
 - If there was one right way to do things, the role of an architect would not be needed
 - One obvious way to improve in the area of architecture is to read
 - All platforms, all technologies, not just your comfort zone
- Learn a new programming language every one to two years.
- Focus on an area
 - Have a high-level understanding of as many technologies as possible

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An Architect is the sum of their experience



- Play with different technologies, design patterns, architectures, etc
- Learn to speak the "language" of your target audience
 - You have to speak to a lot of different people as an architect
 - Each audience will have a different level of understanding of technology.
 - Learn to tailor your explanation in ways that each audience can understand
- Read magazines, go to user group meetings and technology conferences like SHARE
- Speak at SHARE and other conferences
 - Helps build knowledge
- Discipline is key
 - Always do your best work, even if it doesn't sound like the most fun
 - Schedule time every day to learn something new
 - Don't let other priorities take over this time

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Personal qualities required to be a software architect



- Software engineers need strong technical, analytical and problem-solving skills
- Developing software from conception to completion requires creativity, as well
- Excellent customer service and communications skills are also needed
- Software architects work with non-technical business managers and employees, and must translate technical jargon into terms users of the software understand
 - I call this the ability to speak English
- A critical role (but not the only one) is the ability to understand users' needs
 - A bit of user experience (UX) methodology helps

Establishing patterns, becoming an 'expert'



- It takes experience to become an architect
- Not be counted in the number of years, but in the amount of wisdom gained from it
 - There's no real short cut to that
 - It relates to how long your brain takes to lay down certain types of patterns
 - Understand the problems in terms of multiple levels of abstraction
 - That's not very easy, because each level of abstraction has its own restrictions and domain of applicability
 - Finding a good balance, especially one that you can explain to others, is difficult

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Earning your 'creds'



- You can make an excellent impression in one meeting, however it takes much more
 - Gaining the standing and credibility that makes others rely comfortably on you in important matters takes many years
 - A senior enterprise architect is in a position where C-level executives and board members must sometimes bet their careers on the correctness of their judgment
 - Errors can result in millions of dollar misspent
 - Excellent track record is best earned over a few years, in several different positions, with extensive experience in a wide-ranging array of topics and technologies
- Part of your credibility is the respect you enjoy with your peers and in the larger community
- If you're a respected and a top contributor in one or two fields, this might be beneficial to your credibility
- If you're a respected member of the developers community at your employer and colleagues tend to seek your advice, this might persuade others to listen to you more carefully
- Build the standing required to push through unpopular positions so that your word becomes of actual value to the C level types, because it was in the past
- It all boils down to: providing good value to many people over years

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Start with ‘why’

- As an architect, we want to make sure that an architectural solution will answer a real business scenario within the system
- For example, Do we need to provide fault-tolerance or 99.999% uptime
 - What is the business requirement
 - We need to define why we need high-availability
 - What will be the consequences of the downtime loss of a business transaction?
 - Loss of 100K dollars? loss of life? Government action?
 - It can save you money, keep you out of jail?
 - It will help you get to the right requirements
 - It will help you justify your decisions
- Critical thinking is not just a good idea, it is a requirement
 - WHY are we doing what we are proposing to do

Will you be able to answer these ‘simple’ questions

- Is this a “Good Idea”?
 - Feature creep — kill it or follow-on work
- DRY? Do I repeat this anywhere?
- How independent is this?
- Testable? How will I test this?
- Is there another way?
 - Having only one idea is dangerous
- Costs of changing
- What would the architecture look like if I didn't have this problem?
- What are the facts and assumptions?
- **Document rationale**

Employing frameworks and methodology



- There are many methods that can be employed to put structure around architecture
- Open Group Architectural Framework (TOGAF)—Although called a *framework*, is actually more accurately defined as a *process*
- Existing approaches are not really complete
 - Each has strengths in some areas and weaknesses in others
- Evaluate each and understand what it can do for you

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“You can’t always get what you want”

- An architect is the sum of their experience
- Tools such as frameworks help with organizing an architecture
- Take time to understand many different technologies
- User Experience is helpful in defining requirements
- Learn to ask why and evaluate what you hear
- Do not expect to be an overnight success
- Some universities such as DePaul offer SA curriculums, view it as a starting point See first bullet point

Questions?



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Sources

- “Software Architecture for Developers”, Simon Brown
- Barbacci, Mario, "
[Are Software Architects Like Building Architects?](http://interactive.sei.cmu.edu/news@sei/columns/the_architect/1998/September/architect-sep98.pdf)" *SEI Interactive*.
[http://interactive.sei.cmu.edu/news@sei/columns/
the_architect/1998/September/architect-sep98.pdf](http://interactive.sei.cmu.edu/news@sei/columns/the_architect/1998/September/architect-sep98.pdf)
- Rechtin, E. *Systems Architecting: Creating and Building Complex Systems*. Prentice-Hall, 1991
- Worldwide Institute of Software Architects ([WWISA](http://www.wwisa.org/wwisamain/index.htm))
<http://www.wwisa.org/wwisamain/index.htm>

Sources (continued)

- Bredemeyer, Dana. "James Madison and the Role of the Architect", <http://www.bredemeyer.com/madison.htm>, 1999.
- Bredemeyer, Dana and Ruth Malan. "[Role of the Software Architect](http://www.bredemeyer.com/role.pdf)", <http://www.bredemeyer.com/role.pdf>, 1999.