Software Architecture

Assignment: Develop a proposal to hire a Software Architect

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3 Major Points Today

1. “Selling” to management

2. Using PowerPoint

3. Product is System Architect

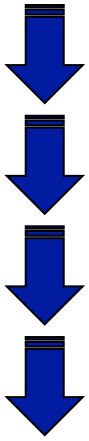
When preparing your presentation, know your audience.

- **Talk in the 4 Languages of Management**

1. **Description:** What is the technical content?
2. **Calendar:** When do you want it ?
3. **Money:** How much will it cost/save/make me ?
4. **Headcount:** How many people will it take ?

When preparing your presentation, know your audience.

- **Deal with 3 basic "buying" motivations**
  - **Fear** What could I lose? How could I fail?
  - **Greed** What can I gain?
  - **Reason** Does it make sense for me?



Use Presentation Design Principles

1. JFK started with, "Please be brief"
2. Leave room in the tree for the birds
3. Pictures stay after words fly away
4. Get comfortable with "3's"
5. Get nervous after "7"
6. Count stuff
7. K.I.S.S.

Understand Adult Learning Basics

1. Adults are busy and worried
2. Explain a reason to care
3. Entertainment gets attention
4. You have 40 minutes of attention
5. You get to make 3 excellent points each 40 minutes
6. Seek feedback
7. Presenting ≠ Learning

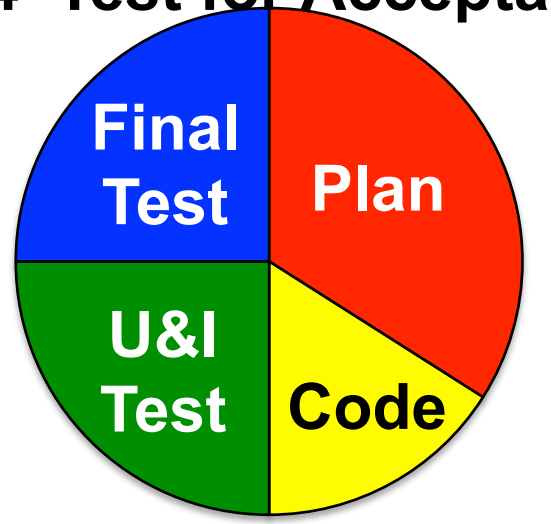
Deal with the Fear motivation first

Without an Architect, you won't have a design or a plan.

Would you start building a $90 million shopping center without a design from a professional Architect? Software professionals will.

Deal with the Fear motivation first

- **Without an Architect, you won't allocate time and resources properly.**
  - **1/3 Plan (~34%)**
  - **1/6 Code (~16%)**
  - **1/4 Test Units and Integration (~25%)**
  - **1/4 Test for Acceptance (~25%)**

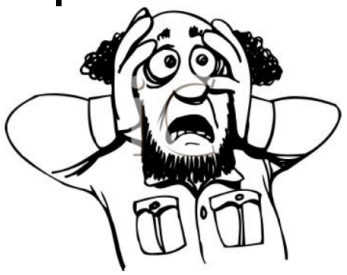


Scope / Schedule Creep

Deal with the Fear motivation first

Without an Architect, you won't balance competitive imperatives.

- **Coder-driven system:** Lacks discipline and metrics
  Creativity-driven, un-designed, feature-heavy, scope creeps



- **PM-driven system:** Disciplined by metrics
  Schedule driven, lack of appreciation of creativity needed

- **Architect-driven systems:** Disciplined by requirements.
  Design, coding and testing are balanced

Deal with the Greed motivation next

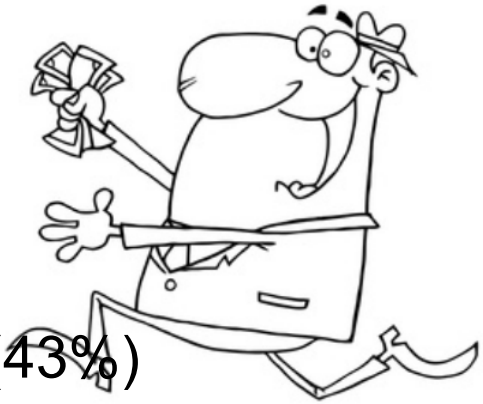
Without an Architect, you risk time, money, headcount, and user disappointment.

A real example of a fully deployed manufacturing control system.

Time: Reduced time to deploy from 24 to 18 months (25%)

Direct cost: Reduced direct cost from $192 M to $136 M (29%)

Headcount: Reduced direct engineering headcount from 61 to 35 (43%)



Deal with the Reason motivation next

Your project needs a "User's agent". The Architect will…

- **Describe the needs of the user** as a software system design – to be built or bought.
- **Protect the user's interests** from short-cuts, deviations from requirements, and schedule.
- **Help the project manager** develop rational cost estimates and maintain the budget.
- **Assess the adherence to specification** in support of the user requirements.

Deal with the Reason motivation next

Your project needs to focus and organize the wants of the User and system provider.

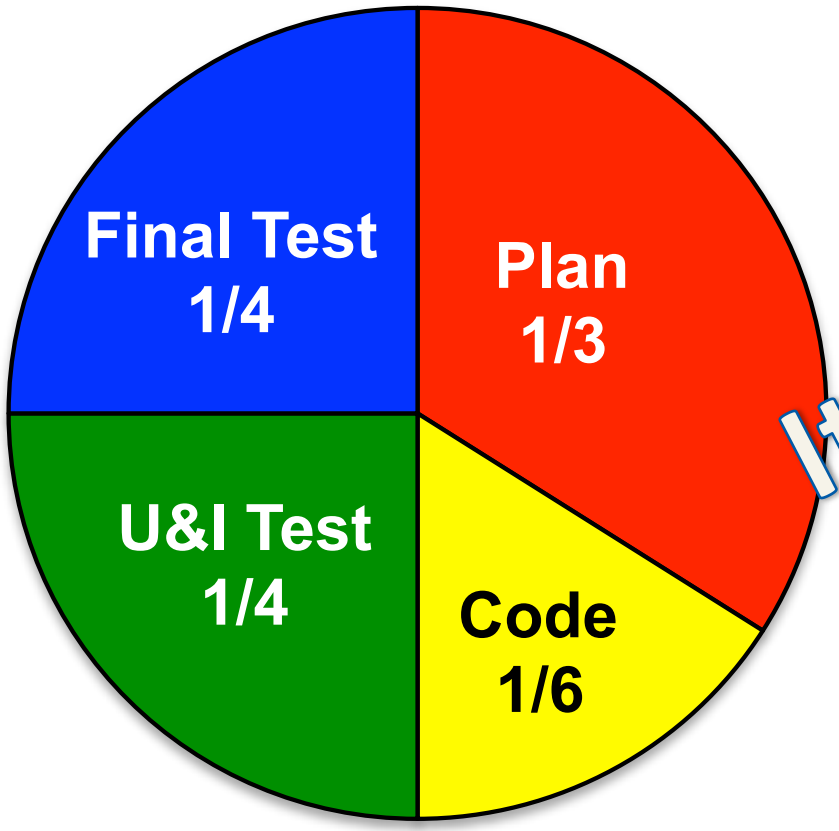
- **Focus the user on practical solutions** that are technically feasible, achievable, and available**.**
- **Help the project manager** develop rational cost estimates**.**
- **Focus the development team on priorities** to deliver the key system elements on time**.**

Deal with the Reason motivation next

You need to make one person responsible for controlling system concepts and providing conceptual integrity. (Ref. Fred Brooks, Mythical Man-Month)

- **Keep the technical development on track**
  maintain practical extra-functional requirements
- **Maintain discipline**
  adherence to the design
- **Maintain the effort distribution budget**
  assure a successful conclusion

Deal with the Reason motivation next



It just works!

Deal with the Reason motivation next

You need a person with the expertise and deliberation to define the system.

- "**The crucial task** is to get the product defined. Many, many failures concern exactly those aspects that were never quite specified." V.A. Vyssotsky, Bell Labs
- An architect must have **technical depth, a deliberate approach, professional integrity, and personal courage**.

What is an Architect ?

A technical director

Architect needs technical skills

1. How to **recognize excellent code**
2. How to **pull needs from users**/customers
3. How to **translate needs** into a system design
4. How to clearly **describe the system design** to technical and non-technical colleagues
5. How to **recognize the practical and essential**

What does an Architect know ?

1. How to **budget resources**
2. How to **prioritize needs** and delivery
3. How to **focus teams** of users, engineers, developers
4. How to **lead people**
5. How to **finish the job**

What does an Architect deliver ?

1. Clear, executable **user requirements**
2. A **clear system design** with prioritized deliverables
3. A comprehensive **functional specification**
4. Practical **technical solutions** to unforeseen pitfalls
5. Demonstrated **commitment** to complete the task
6. Courageous **leadership**
7. A **software product** that meets the users' needs

Recommended Reading

If you have not read Fred Brooks' book, The Mythical Man-month, please do. It can save you a lot of aggravation, lost sleep, and pain.