Software Engineering

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Software Design (Architecture, Verification and Validation)

Chapter 8

What you do before a project starts significantly influences the success or failure of your effort.

There are 4 things to project success:

- **Focus on Feasible**
- **Get the Numbers Right**
- **Accurate cost Estimate**
- **Don’t Loose Control**

Focus On Feasibility

FACT:

You can't determine feasibility until you know the details of a project.

Based on the details you can determine:

- Technical feasibility
- Financial feasibility
- Schedule feasibility
- Organizational feasibility

The Easiest Way to Get the Details is to Write a System Description

System Description - Table of Contents

1. **System overview**
2. **Current system definition**
3. **New system definition**
4. **Impacts of the new system (organizationally, financially, etc.)**
5. **Advantages and disadvantages of new system**
6. **Notes**

The recommendation is to write a System Description as a first step in project planning.

System Description Table of Contents

1. System overview
2. Current system definition
3. New system definition
4. Impacts of the new system
5. Advantages and disadvantages of new system
6. Notes

	YES	NO
Technical	X	
Financial		
Schedule		
Organizational		

Technical Feasibility

Is the network OK?

Do we have enough processing power?

Are we pushing the state of the art?

Will performance be an issue?

Are there technical limitations?

Has this been done before?

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	YES	NO
Technical	X	
Financial	X	
Schedule		
Organizational		

Financial Feasibility

Is the total budget adequate?

Is the budget per period adequate?

Are there hidden costs?

What are the intangible benefits?

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	YES	NO
Technical	X	
Financial	X	
Schedule	X	
Organizational		

Schedule Feasibility

What is the drop dead date?

Can the project be completed by then?

When do major milestones need to be completed?

Can they be completed on time?

What happens if the project is late?

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	YES	NO
Technical	X	
Financial	X	
Schedule	X	
Organizational	X	

Organizational Feasibility

Does the IT team have the experience for a project of this size?

Do we have a world-class Project Manager?

Do we have experience with this technology?

How will the new system impact the organization?

What impacts are there to vendors/partners, etc.?

How much training is required?

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Feasibility Analysis

→ Technical →

Financial

Schedule

Organizational

Once feasibility analysis is complete, it is easy to put together a plan for any item not feasible or marginally feasible

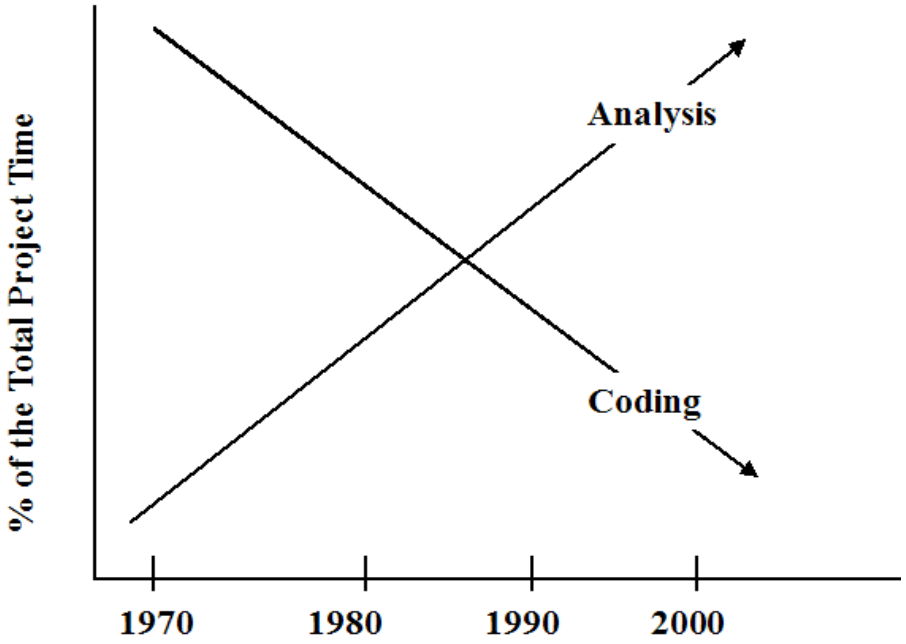
Feasibility is the cornerstone of early project planning.

Before we discuss estimating, a few thoughts:

You have to spend time up front getting requirements

Only after you have requirements can you create an accurate estimate

The better the requirements, the better the estimate



Analysis is becoming a larger percent of total development time!

Suppose You Collected These Requirements and Grouped Them As Follows

Requirement	Design Element
Shall be able to view general ledger entries in multiple currencies	**Accounting**
Shall allow viewing of general ledger entries by invoice	
Shall be able to select consumer accounts	**Order Entry**
Shall be able to select business accounts	
Shall be able to create source codes	**Marketing**
Shall be able to modify source codes	
Shall be able to perform product catalog entry	**Fulfillment**
Shall be able to perform product catalog changes	

It Would Then Be Straightforward to Create an Accurate Estimate As Follow:

The project estimate is based on determining how long it will take to implement each requirements based on a given life cycle.

For example:

	Estimate In Hours				
	Complete Analysis	Complete Top Level Design	Complete Detailed Design	Complete Coding	Complete Testing
1 - Shall be able to view general ledger entries by date	50	20	20	40	40

Total effort to implement this requirement: 170 Hrs.

Creating Accurate Estimates

What needs to be built

Your life cycle

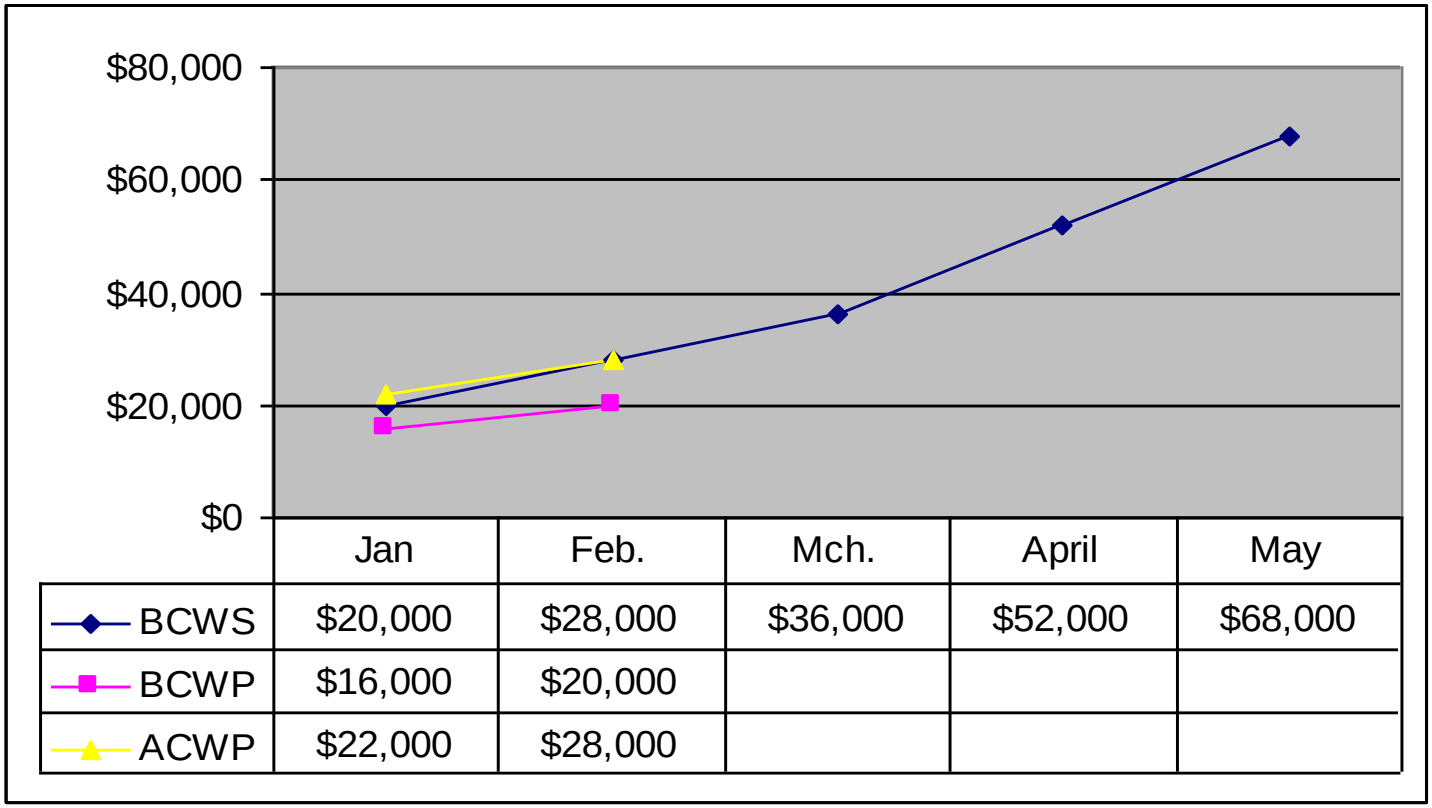
	Estimated Hours			
	Analysis	Design	Coding	Testing
Shall be able to view general ledger entries in multiple currencies	1	2	3	4
Shall allow viewing of general ledger entries by invoice	5	6	7	8
Shall be able to select consumer accounts	9	10	11	12
Shall be able to select business accounts	13	14	15	16
Shall be able to create source codes	1	2	3	4
Shall be able to modify source codes	5	6	7	8
Shall be able to perform product catalog entry	9	10	11	12
Shall be able to perform product catalog changes	13	14	15	16
Total Accounting	36	Hours		
Total Order Entry	100	Hours		
Total Marketing	36	Hours		
Total Fulfillment	100	Hours		

How much effort is required

Now We Can Turn Our Attention to the Last Things: Don't Loose Control

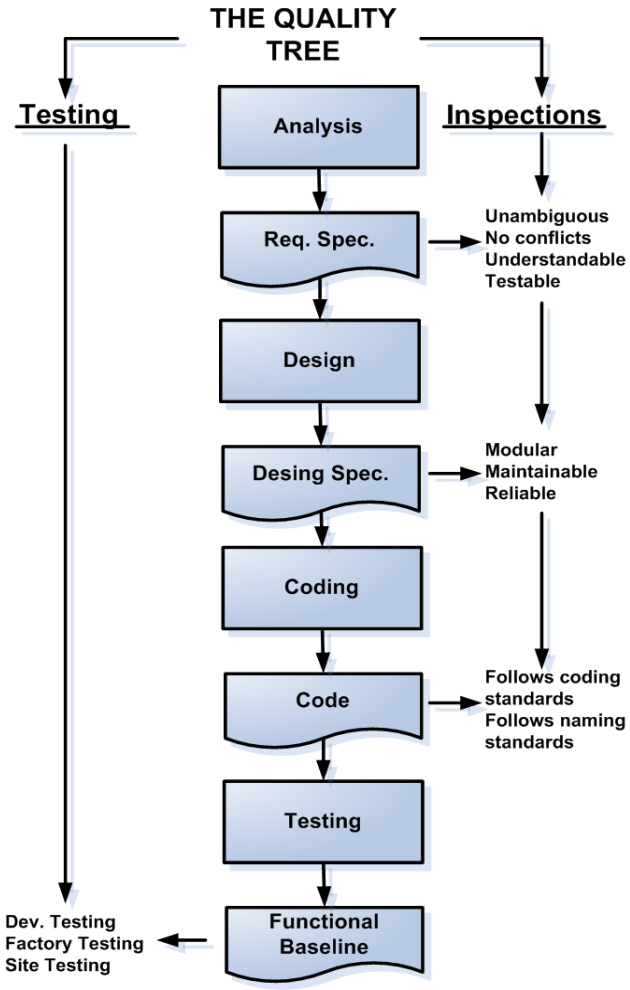
- **Control Cost & Schedule**
- **Control Changes**
- **Control Quality**

Controlling Cost and Schedule



	Jan	Feb.	Mch.	April	May
BCWS	$20,000	$28,000	$36,000	$52,000	$68,000
BCWP	$16,000	$20,000			
ACWP	$22,000	$28,000			

Controlling Quality



Building quality into your project from day one will significantly contribute to overall project success.

Example of the Software Design by using UML