SE Stories: Why a Standard Systems Engineering Approach Is Not Enough

ADAPTING ENGINEERING PRACTICES FOR REAL-WORLD CHALLENGES

Introduction: The Relatable Scenario

Real-World Engineering Team's Effort Estimation

Effort Estimation Challenges

The engineering team conducts a bottom-up calculation. Based on experience and on current engineering practice.

Impact of Uncertainty

Uncertainties in estimates are represented as risks and opportunities.

Management's Push for Reduced Estimates

Cost Reduction

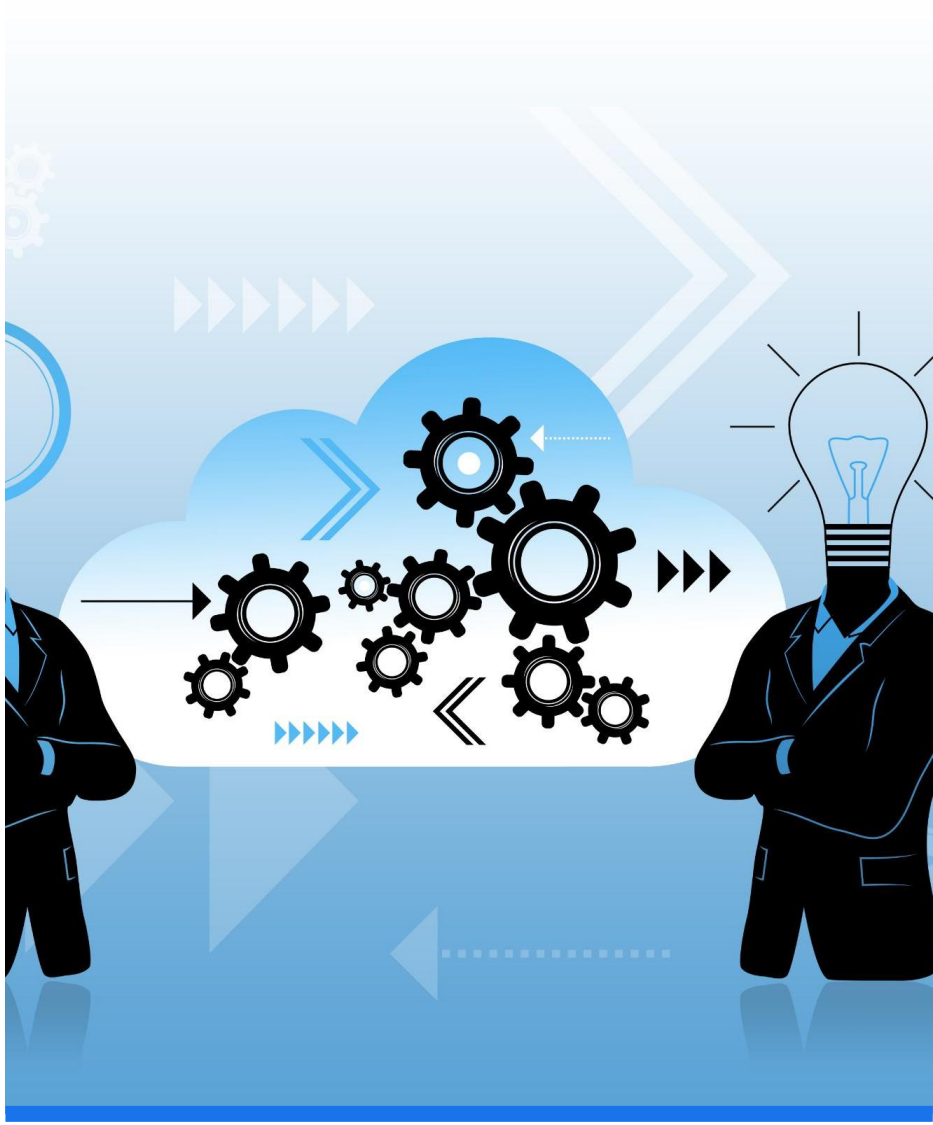
Management pursues innovative methods to lower project estimates, aiming for significant cost savings and enhanced efficiency.

Unrealistic Expectations

While reducing estimates may seem beneficial, it often results in unrealistic expectations for engineering teams.

Impact on Engineering Teams

The pressure to meet reduced estimates can lead to frustration and reduced engineering performance.



The Market Perspective

Opportunity to Expand the Customer Base

Reduced Estimates

Sales teams view reduced estimates as a chance to reach out to new customers and expand their market.

Faster Project Delivery

Increased pressure for faster delivery times can lead to challenges for engineering teams, impacting project quality.

Collaboration Between Teams

Effective collaboration between sales and engineering teams is crucial to balance customer demands with project feasibility.

Market Intelligence and Competitor Pricing

Competitive Landscape

Understanding the competitive landscape is crucial for making informed pricing decisions and strategic planning.

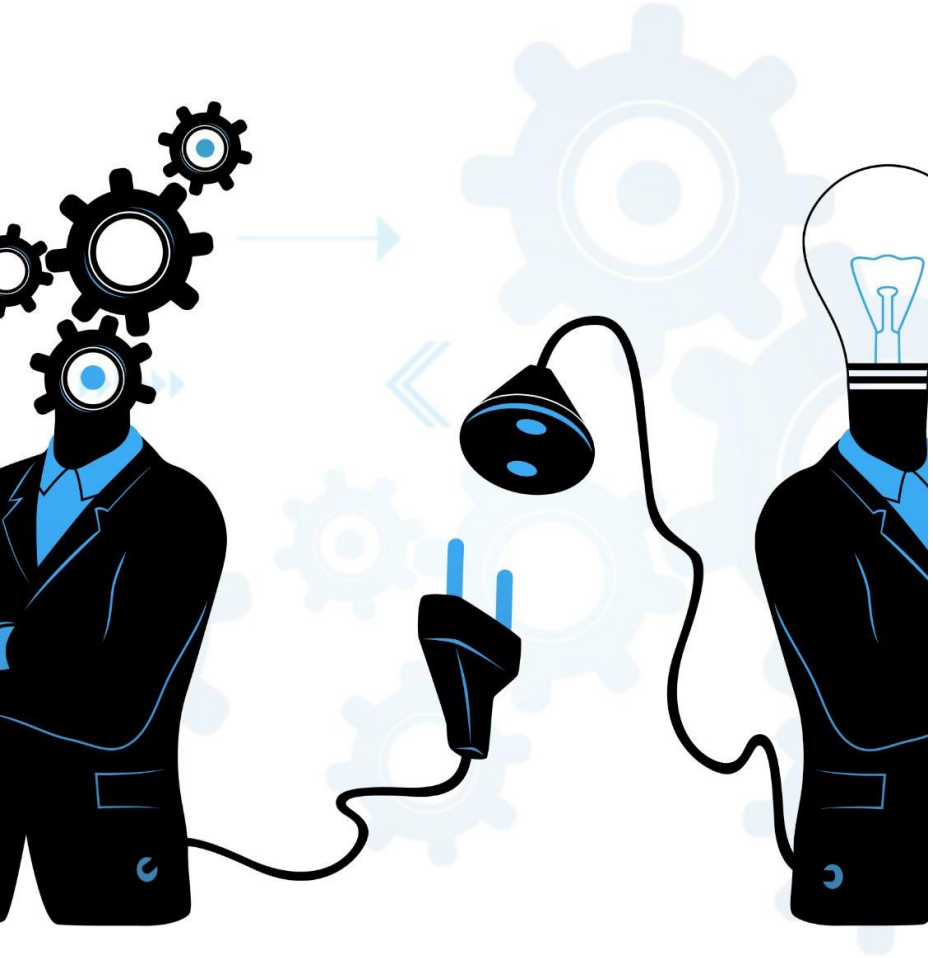
Pressure on Engineering Teams

Market intelligence can create pressure on engineering teams to deliver results quickly and efficiently.

Effort vs. Project Needs

There can be a disconnect between estimated efforts and actual project requirements influenced by market factors.

The Dilemma: Standard Engineering Practices



Competitors' Use of Standard Engineering Practices

Limitations of Standard Practices

Standard engineering practices might be sufficient for basic functions but can limit innovation and differentiation in competitive markets.

Adapting to Change

Competitors who adapt their engineering methods can leverage new technologies and approaches to gain a competitive edge.

Competitive Advantage

Firms that embrace flexibility in their engineering practices are likely to outperform those that are rigid in their methods.

Lack of Competitive Edge with Conventional Methods

Stagnation Risks

Reliance on conventional methods can result in stagnation, limiting growth and development in a rapidly evolving market.

Missed Opportunities

Industries that fail to innovate risk missing valuable opportunities, which can hinder business success and market position.

Decreased Market Share

Failure to adapt and innovate can lead to a decrease in market share as competitors embrace modern techniques.

The Solution: Adapting Systems Engineering Practices

Tailoring Recommendations for Systems Engineering

Assess Project Needs

Understanding the specific requirements of each project is crucial for effective systems engineering. Tailor your approach accordingly.

Customize Methodologies

Adapting engineering methodologies to fit project demands fosters innovation and improves efficiency throughout the project lifecycle.

Foster Collaboration

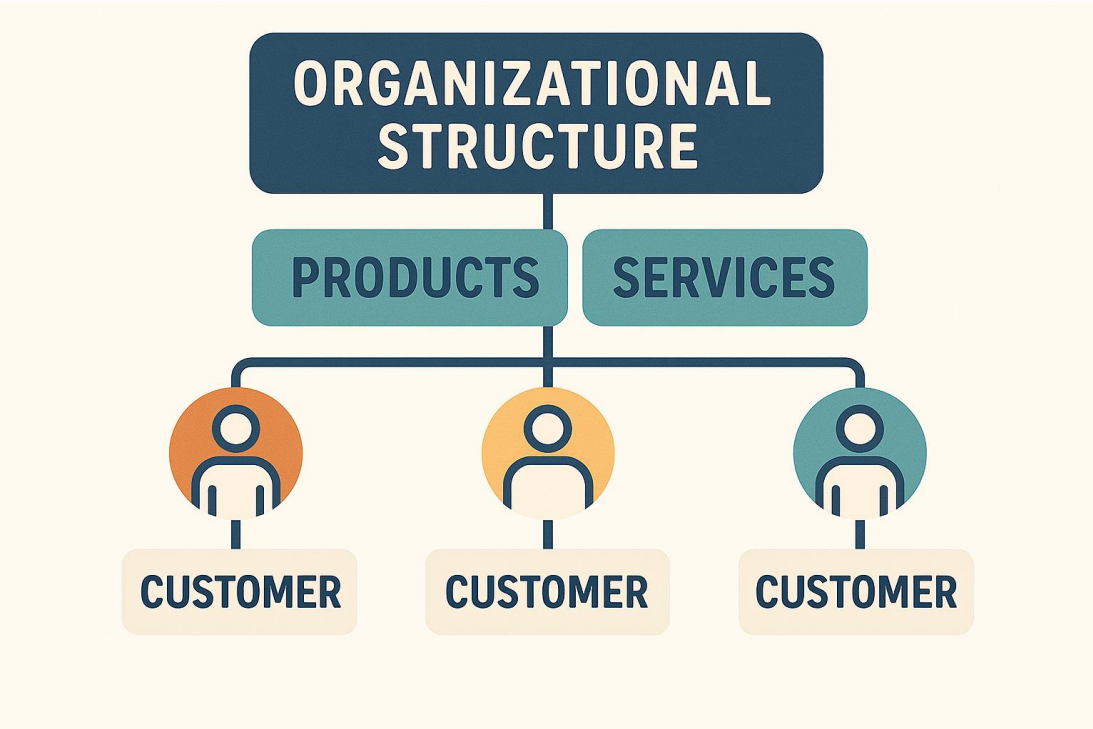
Encouraging collaboration among team members leads to more effective solutions tailored to project goals.

Customize Methodologies

- Re-use of design and organizational patterns
  - Re-use not only the design, re-use the confidence in that existing design
- Evaluate the maturity of your organization: where can you take additional risks?
  - Teams with low maturity are often too optimistic (underestimate risks)
  - Teams with high maturity are often too pessimistic (underestimate opportunities)
- Choose the appropriate life cycle model for your endeavor

Re-use of design and organizational patterns

- Key is the combination of the design and deployment/delivery.
- My perception is, that the current concentration on design pattern leads to a neglect of organizational patterns (How effective/efficient is the organization in delivering value with the deployed systems to that specific customer)

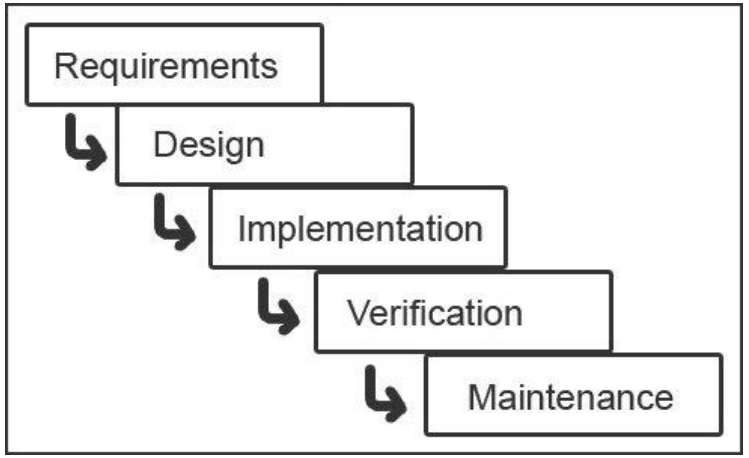


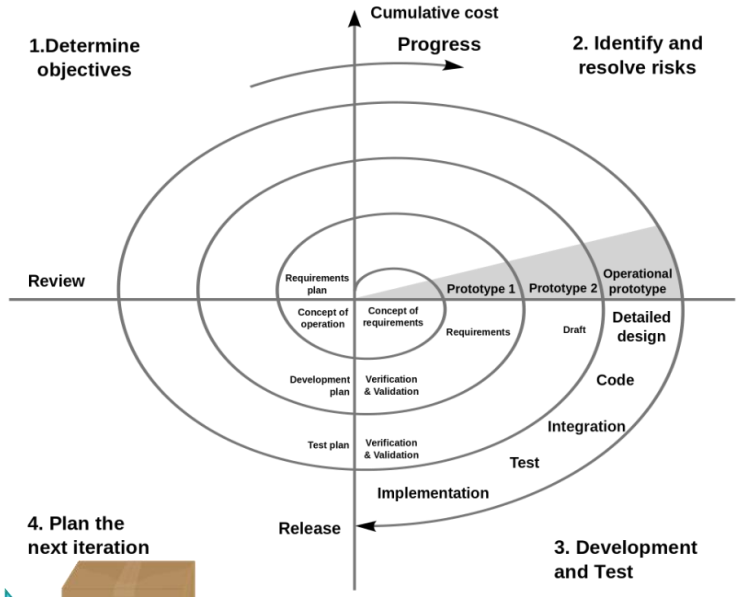
Evaluate the maturity of your organization: where can you take additional risks?

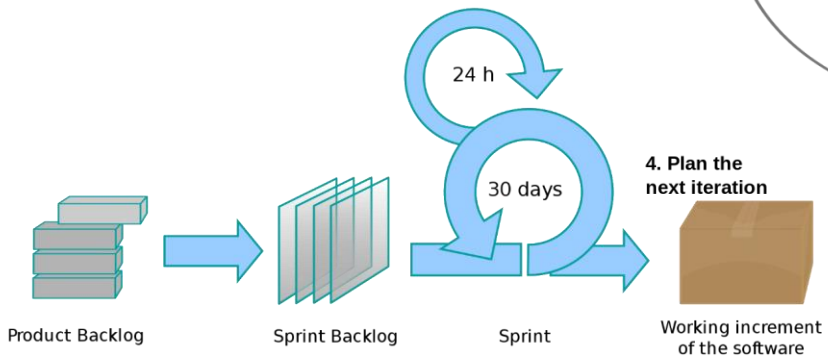
- Picking up where I left on the earlier slide:
- When our organization delivered successfully in recent years then they are ready to take a «stretch»
- Expect them to be more efficient than they were a year ago.

Choose the appropriate life cycle model for your endeavor

- Use the appropriate life cycle model (waterfall, spiral, incremental)







Choose the appropriate life cycle model for your endeavor

- Understand the logic (dependencies of activities) within your project
- Make a risk assessment of these activities and mitigate were necessary.
- Now you obtained a new project planning: update your life cycle model, where applicable