Applying Systems Thinking to the Issues of Software Product Development

Software Product Development issues

- Meet the schedule
- Implement desired functionality
- Remove sufficient number of defects

Software Product Development thinking

- Traditionally, choose any two of:
  - Maximize features
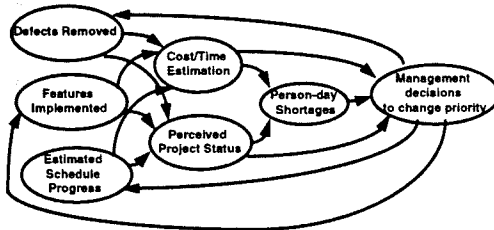 - Minimize defects
  - Minimize schedule

Two top priorities are one too many

- People optimize their efforts on one priority
  - Then prioritize the other two
- Need one focus
 - Need subsidiary priorities in same priority for everyone

Market Pressures

Customer Desire for Quality	Product Introduction	Initial Product Acceptance	General Product Acceptance	Near Obsolescence
Minimize Schedule	High	High	Medium	Low
Maximize Features	Low	High	Medium	Low
Minimize Defects	Medium	Medium	High	High

Effects of Priority on Project Tasks

Effects of Defect Removal

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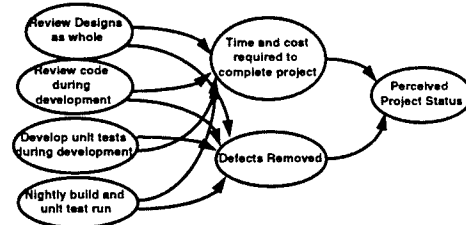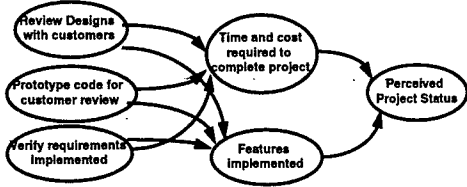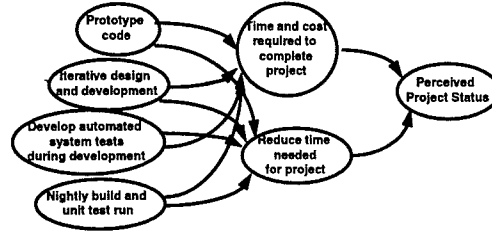
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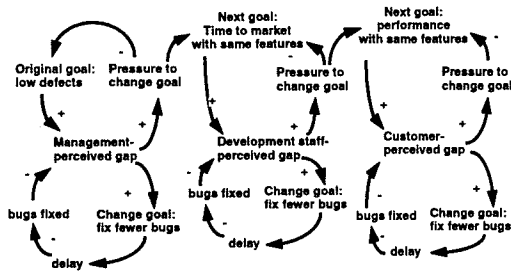
Effects of Maximizing Features

Effects of Minimizing the Schedule

Case Study

Actions, Immediate Effects are Interdependent

Type of Effect/ Actions	Schedule/Cost Estimations	Defects Removed	Features Implemented
Nightly build and test run	+	+	-
Develop automated test during development	+	+	-
Design Prototypes	-	+	+
Code Prototypes	-	+	+
Code Review	-	+	+
Unit test development and review	-	+	+
Design Review	-	+	+
Requirements Verification	+	-	+
Iterative Design and Development	-	-	+
Customer code review	-	+	+

Critical thinking is required

- **What is the product goal?**
  - Choose one goal
  - Prioritize goals
  - Use product development process and practices to assist in achieving goal
- **Plan the project**
  - Using appropriate product lifecycle and milestones
  - Consider flexibility if a long project
- **Be aware of changing conditions**
  - Monitor conditions
  - Proactively work the conditions (including corporate management)
- **Changing the goals will cause schedule slips**

References

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