

Project Management: Part 1

Why care about project management?

- 10% of projects were successful between 1998 and 2004

Project Management – 4 Ps

- **People** — the most important element of a successful project
- **Product** — the software to be built
- **Process** — the set of framework activities and software engineering tasks to get the job done
- **Project** — all work required to make the product a reality

Software Teams

What are the factors to consider while selecting a team?

- the difficulty of the problem to be solved
- the size of the resultant program(s) in lines of code or function points
- the time that the team will stay together (team lifetime)
- the degree to which the problem can be modularized
- the required quality and reliability of the system to be built
- the rigidity of the delivery date
- the degree of sociability (communication) required for the project

Organizational Paradigms

- Closed paradigm—structures a team along a traditional hierarchy of authority
- Open paradigm—attempts to structure a team in a manner that achieves some of the controls associated with the closed paradigm but also much of the innovation that occurs when using the random paradigm
- Synchronous paradigm—relies on the natural compartmentalization of a problem and organizes team members to work on pieces of the problem with little active communication among themselves
- Random paradigm—structures a team loosely and depends on individual initiative of the team members



Project Management Concerns



Project Management – 4 Ps

- People
- Product
- Process
- Project

Stakeholders are people too

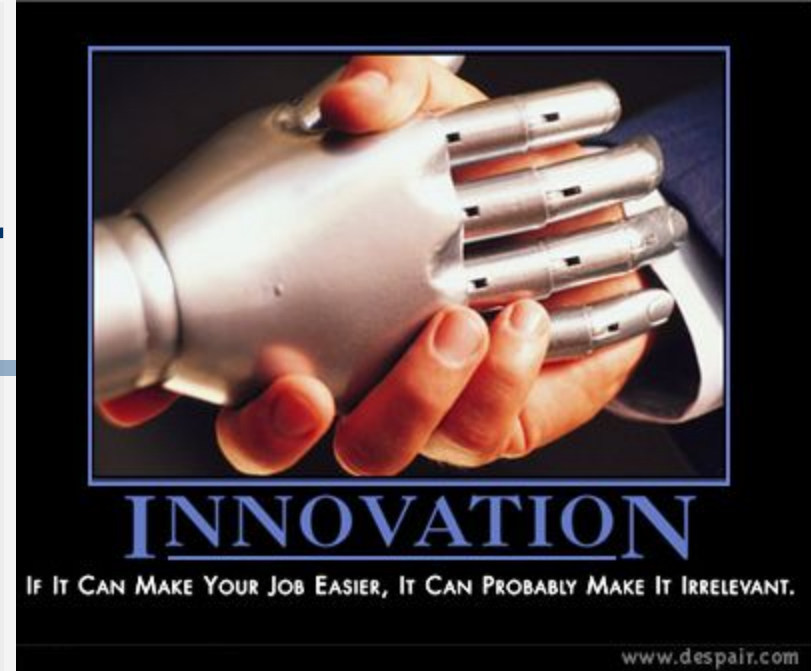
- *Senior managers* who define the business issues that often have a significant influence on the project.
- *Project (technical) managers* who must plan, motivate, organize, and control the practitioners who do software work.
- *Practitioners* who deliver the technical skills that are necessary to engineer a product or application; often make poor team leaders
- *Customers* who specify the requirements for the software to be engineered and other stakeholders who have a peripheral interest in the outcome.
- *End-users* who interact with the software once it is released for production use.

Your job is to organize and bring value from these people

Your job as a leader

- The MOI Model

- **Motivation.** The ability to encourage (by “push or pull”) technical people to produce to their best ability.
- **Organization.** The ability to mold existing processes (or invent new ones) that will enable the initial concept to be translated into a final product.
- **Ideas or innovation.** The ability to encourage people to create and feel creative even when they must work within bounds established for a particular software product or application.



Your job as a manager

Make sure these happen

- Formal risk management
- Empirical cost and schedule estimation
- Metrics-based project management
 - Tracking – amount of work done, costs, work remaining, etc...
- Defect tracking against quality targets
- People-aware project management



Project Manager

- Management is using tools and techniques
- Leadership is inspiring people to do the right thing
- Leadership with poor management practices can be successful, management with poor leadership will fail.

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Motivating People

- Use monetary rewards cautiously
- Use intrinsic rewards
 - Recognition
 - Achievement
 - The work itself
 - Responsibility
 - Advancement
 - Chance to learn new skills



Understanding the problem

At the beginning you should ask yourself these questions

- Why is the system being developed?
- What will be done?
- When will it be accomplished?
- Who is responsible?
- Where are they organizationally located?
- How will the job be done technically and managerially?
- How much of each resource (e.g., people, software, tools, database) will be needed?

Defining the problem

- Establish Scope: A narrative that establishes the boundary of the problem
- Decomposition: Establishes Functional Partitioning

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Define success and failure

- Don't lie to yourself!
- Be confident, trust yourself for success!
- Quantify your project outcomes to allow success or failure
- A vague or un-measurable outcome is much less helpful



Leadership Case Study: 3M

Philosophy:

- *As our business grows, it becomes increasingly necessary to delegate responsibility and to encourage men and women to exercise their initiative. This requires considerable tolerance. Those men and women to whom we delegate authority and responsibility, if they are good people, are going to want to do their jobs in their own way.*
- *"Mistakes will be made. But if a person is essentially right, the mistakes he or she makes are not as serious in the long run as the mistakes management will make if it undertakes to tell those in authority exactly how they must do their jobs."*
- *"Management that is destructively critical when mistakes are made kills initiative. And it's essential that we have many people with initiative if we are to continue to grow." .*
- *These are common themes now, but not in 1940s when 3M codified them*

3M Results

- Encouragement and a culture of innovation yields:
 - 1968 Dr. Spence Silver does an experiment that yields an adhesive that sticks, but not strongly
 - Presents around the company for 5 years with no “takers”
 - In 1973, 3M scientist Art Fry was trying to mark his place in his church choir hymn book with bits of paper that kept falling out.
 - Art works with Spence. Creates little notepapers.
 - Marketing says “not enough market, who wants to pay for scraps of paper?”, engineering says “too hard to make, will be costly”
 - Response: If it’s hard to make that’s great, no one but 3M will be able to do it!
 - Fry sends out “free samples” across the company, making sure to include executive’s assistants
 - Demand rises – finally the product is introduced. Within 1 year PostIt notes named “Outstanding New Product” and today generates \$100 million in US sales
 - This is possible because of a culture in the company to empower, encourage, and experiment!

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Software Projects

Factors that influence the end result:

- Size
- Delivery Deadline
- Budgets and Costs
- Application Domain
- Technology to be implemented
- System Constraints
- User Requirements
- Available Resources

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Why do Projects Fail?

- Changing customer requirements
- Unrealistic project deadline
- Underestimation of effort required
- Predictable or unpredictable risks
- Technical difficulties
- Miscommunication among project staff
- Failure in project management

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How to reduce Project Failure?

We can start by finding the answers to the following questions:

- Why is the system being developed?
- What will be done? By when?
- Who is responsible for a function?
- Where are they organizationally located?
- How will the job be done technically and managerially?
- How much of each resource (e.g., people, software, tools, database) will be needed?

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Critical Practices

- Formal risk analysis
- Empirical cost and schedule estimation
- Metric-based project management
- Earned value tracking
- Defect tracking against quality targets
- People-aware project management

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