



## Professional Software Development Projects & Teams

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## Professional Software Development

- Software Engineering is about developing complex software in a professional environment
  - Objective: **On-time** delivery of **high quality** software that **satisfies customers**
- Two major differences from simply “programming”
  - The need to take a “project” view, including working with customers, ensuring quality, planning, handling risks etc.
  - The need to work together in teams, with all the challenges of communication and coordination



## Managing software projects

- Activity Management
  - Identifying what needs to be done
  - Planning and scheduling activities
  - Assigning responsibilities for activities
  - Tracking them to completion
- People Management
  - Ensuring that suitable people are available
  - Building morale and motivating the staff
  - Helping staff to function as a team, resolving conflicts
  - Supporting the staff, handling administrative aspects



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## ... Managing Software Projects

- Acquiring the resources needed for the project
- Estimating and tracking costs
- Interfacing with the customer, reporting
- Managing changes in requirements
- Identifying and mitigating risks that can affect the project
- Coordinating with managers of other projects
- Monitoring and reviewing technical decisions
- Improving the process: finding more effective ways to get work done
- Putting in place practices that ensure high quality



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## Value of Team Development

- Divide and conquer
- Larger pool of skills and expertise to draw from
- Different backgrounds and perspectives
  - Contribute different ideas
  - See problems and solutions that another may miss
- Get feedback on ideas, designs
- Learn from each other
- Back up each other, in case of contingencies



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## Challenges of Team Development

- Need for coordination
  - Concurrent modifications to code and documents
- Difficulty of developing a shared vision
- Need to depend on others
  - One person missing commitments impacts all
- Need to deal with others' limitations
- Need to compromise
- Need to share ownership!



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## Keys to Team Development

- **Constructive conflict is normal *and necessary***
- Trust, respect, fairness
- Commitment to team goals
- **Shared understanding and communication**
- Willingness to compromise
- Identifying and leveraging everyone's strengths, working around limitations
- Creating space and opportunities to contribute for all
- **Managing concurrency and integration**



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## Roles and work allocation

- Role assignment shares the critical responsibilities among team members
- Roles can be used to leverage capabilities, create experts in each area
- Work allocation need not be totally tied to roles
- Considerations for work allocation
  - Individual skills, needs for skill development
  - Preferences and constraints
  - Equitable distribution of load
  - Fair distribution of “unpopular” work e.g. documentation



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