People Management and Team Organization

CS A401

People Management

- Software development involves teamwork
- Members must coordinate work, decisions, etc.
- As the size of the teams increase, communication between team members increases exponentially
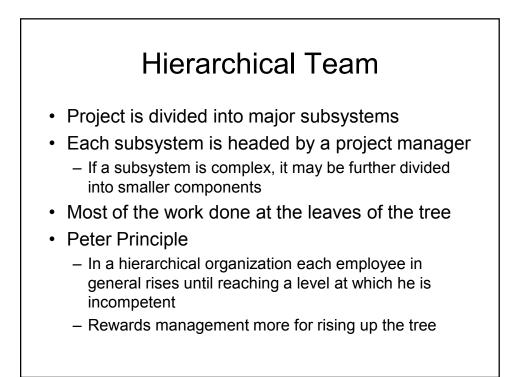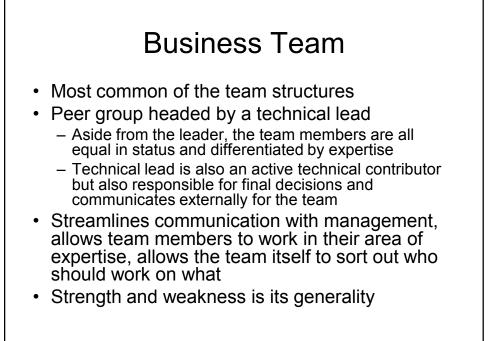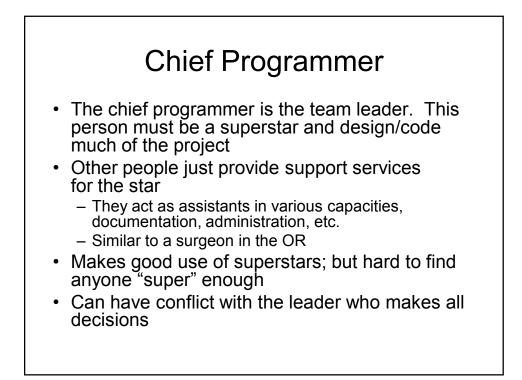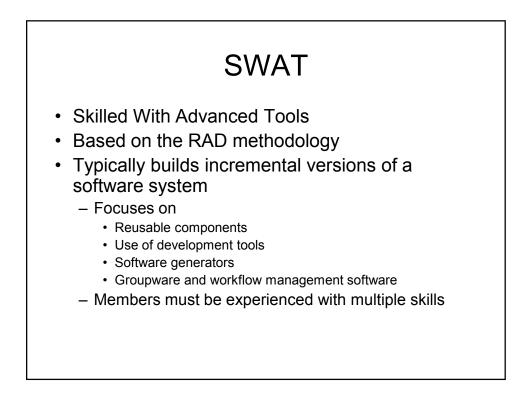 - Large teams usually split into smaller teams to confine coordination and communication

Types of Team Organizations

- Hierarchical
- Business
- Matrix
- Chief Programmer
- SWAT
- Open Structured
- Search and Rescue Team
- Professional Athletic Team

Hierarchical Team

- Project is divided into major subsystems
- Each subsystem is headed by a project manager
  - If a subsystem is complex, it may be further divided into smaller components
- Most of the work done at the leaves of the tree
- Peter Principle
  - In a hierarchical organization each employee in general rises until reaching a level at which he is incompetent
  - Rewards management more for rising up the tree

Business Team

- Most common of the team structures
- Peer group headed by a technical lead
  - Aside from the leader, the team members are all equal in status and differentiated by expertise
  - Technical lead is also an active technical contributor but also responsible for final decisions and communicates externally for the team
- Streamlines communication with management, allows team members to work in their area of expertise, allows the team itself to sort out who should work on what
- Strength and weakness is its generality

Matrix

- Basic units with specializations
- Individuals with their specialty assigned to projects requiring those talents
- Each feature team is responsible for developing one feature of the product
- Good for problem resolution teams

	Networking	Graphics	Databases	QA
Project A		X	X	X
Project B		X		X
Project C	X		X	X

Chief Programmer

- The chief programmer is the team leader. This person must be a superstar and design/code much of the project
- Other people just provide support services for the star
  - They act as assistants in various capacities, documentation, administration, etc.
  - Similar to a surgeon in the OR
- Makes good use of superstars; but hard to find anyone "super" enough
- Can have conflict with the leader who makes all decisions

SWAT

- Skilled With Advanced Tools
- Based on the RAD methodology
- Typically builds incremental versions of a software system
  - Focuses on
    - Reusable components
    - Use of development tools
    - Software generators
    - Groupware and workflow management software
  - Members must be experienced with multiple skills

Open or Weakly Structured

- Combine open management style with clear structure on team roles
- Technical leader
  - Responsible for resolving issues for which no consensus can be reached
- Moderator for meetings
- Rotate among members for various tasks
- Tries to combine a focus on individual specialists as well as centralized coordination of activities

Skunk Works

- Take a bunch of talented people, hide them from the rest of the world, and see what they can do
- Based on the "black program" model
  - Covert development of sensitive systems
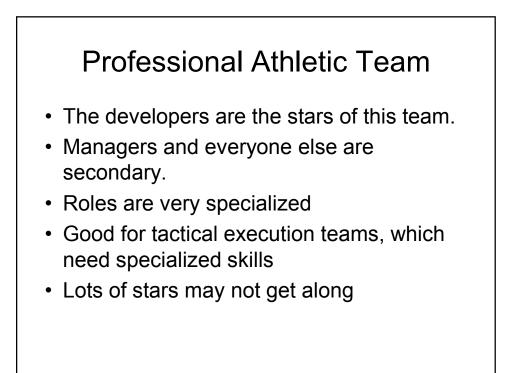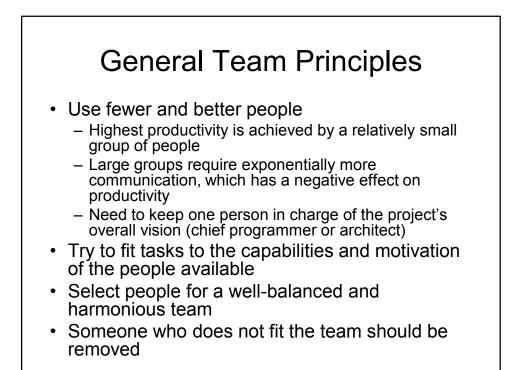- May get extremely high creativity in exchange for low visibility and high risk
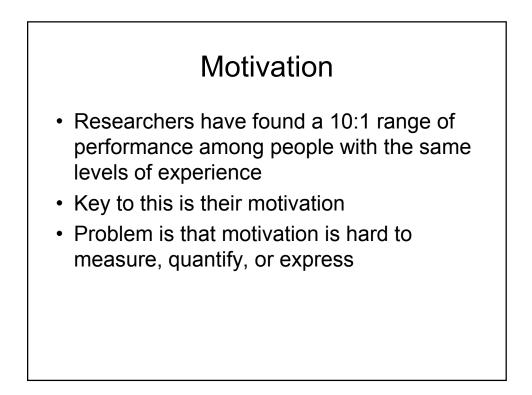
Search and Rescue

- Focuses on solving a particular problem
- Needs very specialized product knowledge
- Like a "tiger team" to attack a specific problem
- Consists of software and hardware specialists with detailed business environment knowledge
- Often used for emergency maintenance

Professional Athletic Team

- The developers are the stars of this team.
- Managers and everyone else are secondary.
- Roles are very specialized
- Good for tactical execution teams, which need specialized skills
- Lots of stars may not get along

General Team Principles

- Use fewer and better people
  - Highest productivity is achieved by a relatively small group of people
  - Large groups require exponentially more communication, which has a negative effect on productivity
  - Need to keep one person in charge of the project's overall vision (chief programmer or architect)
- Try to fit tasks to the capabilities and motivation of the people available
- Select people for a well-balanced and harmonious team
- Someone who does not fit the team should be removed

Motivation

- Researchers have found a 10:1 range of performance among people with the same levels of experience
- Key to this is their motivation
- Problem is that motivation is hard to measure, quantify, or express

Motivation

- Types of motivating factors will vary from person to person
  - **Career growth potential**
  - Management potential
  - **Personal life**: is it possible to have one?
  - Status
  - **Peer recognition**
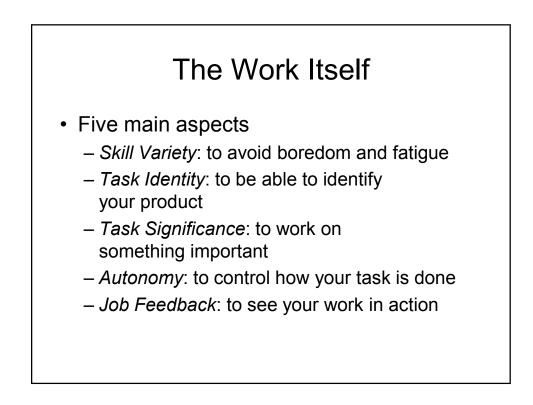 - **Personal achievement**...

Motivation

- More motivating factors:
  - Money! (or grades in our case)
  - Company ownership
  - Job security
  - Work environment
  - Home environment (travel, entertainment, …)
- No single thing motivates everyone

Top Five Motivational Factors

- Achievement (reaching goals)
- Possibility for Growth (personal improvement)
- The Work Itself
- Personal Life
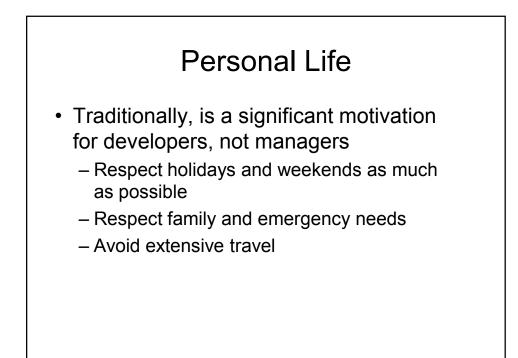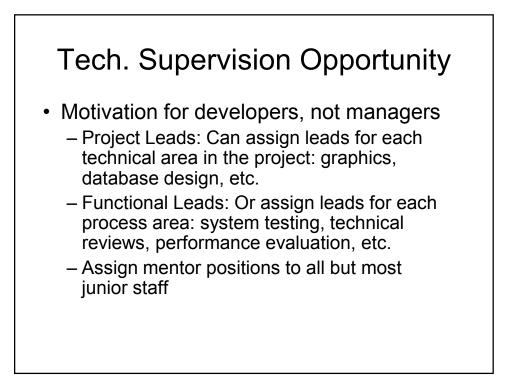- Technical Supervision Opportunity

Achievement

- Ownership: Get developers to own (set and agree to) the schedules they are working to achieve
- Goal Setting: Set specific goals for development (speed, quality, etc.)
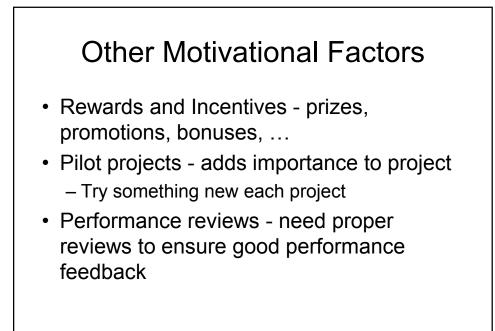 - Keep it to one or two specific goals

Possibility for Growth

- Support continuing education
- Conferences (attending, maybe presenting)
- Mentor new staff
- Avoid unrealistic schedule pressure
- Expect 2-3 weeks per year for training and education

The Work Itself

- Five main aspects
  - *Skill Variety*: to avoid boredom and fatigue
  - *Task Identity*: to be able to identify your product
  - *Task Significance*: to work on something important
  - *Autonomy*: to control how your task is done
  - *Job Feedback*: to see your work in action

Personal Life

- Traditionally, is a significant motivation for developers, not managers
  - Respect holidays and weekends as much as possible
  - Respect family and emergency needs
  - Avoid extensive travel

Tech. Supervision Opportunity

- Motivation for developers, not managers
  - Project Leads: Can assign leads for each technical area in the project: graphics, database design, etc.
  - Functional Leads: Or assign leads for each process area: system testing, technical reviews, performance evaluation, etc.
  - Assign mentor positions to all but most junior staff

Other Motivational Factors

- Rewards and Incentives - prizes, promotions, bonuses, …
- Pilot projects - adds importance to project
  - Try something new each project
- Performance reviews - need proper reviews to ensure good performance feedback

Motivation Killers

- Lack of hygiene - a clean office is required
  - Good lighting, office ergonomics, up to date equipment
- Management manipulation - don't pretend your staff are dumb
- Excessive schedule pressure - have we emphasized this enough yet?
- Lack of appreciation - kudos are not optional...

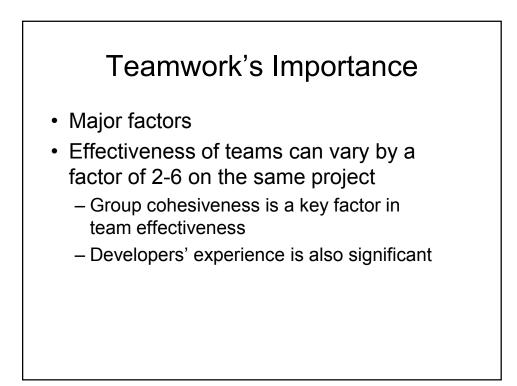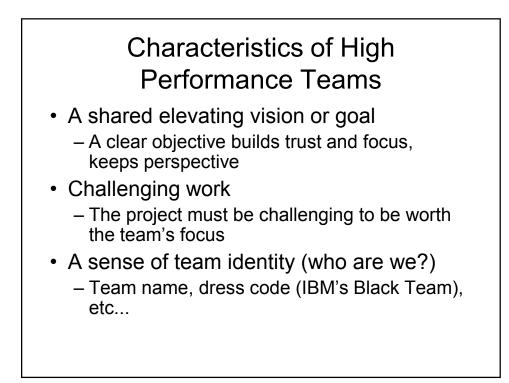# More Motivation Killers

- Meddling by technically inept managers
- Leaving developers out of decisions
- Productivity barriers in the environment
- Low product quality - destroys sense of achievement
- Blatant motivation campaigns - be subtle

Teamwork

- The Amish barn raising is cited as a prime example of teamwork
  - Barn raised in a single day without electricity or power tools
  - Jobs for entire community
    - Kids carry food, tools
    - Men cooperate
    - No gripes or distractions
    - Nobody leaves until the barn is complete
- Model of the perfect team?

Teamwork's Importance

- Major factors
- Effectiveness of teams can vary by a factor of 2-6 on the same project
  - Group cohesiveness is a key factor in team effectiveness
  - Developers' experience is also significant

Characteristics of High Performance Teams

- A shared elevating vision or goal
  - A clear objective builds trust and focus, keeps perspective
- Challenging work
  - The project must be challenging to be worth the team's focus
- A sense of team identity (who are we?)
  - Team name, dress code (IBM's Black Team), etc...

Characteristics of High Performance Teams

- A results-driven structure
  - Must have clear roles, monitoring, feedback, and decision making methods based on fact
- Competent team members (not expert)
  - Select people based on technical skills, desire to contribute, and teamwork skills
- Commitment to the team
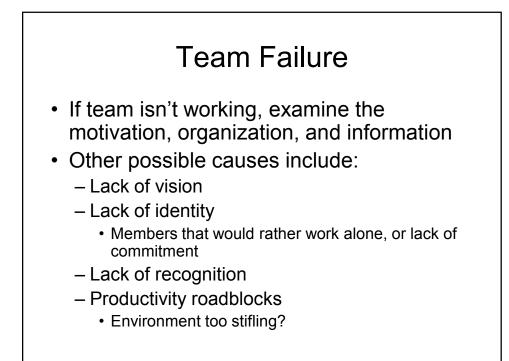 - Sometimes merely asking is enough to get it...

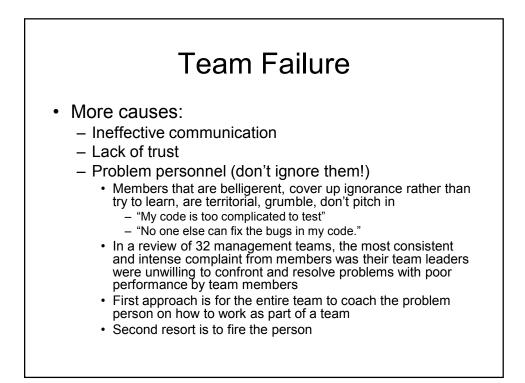# Characteristics of High Performance Teams

- Mutual trust
  - Honesty, openness, consistency, respect
- Interdependence among team members
  - Share decisions, balance strengths
- Effective communication
  - Need to be able to communicate bad news, while it still can be fixed or accommodated...

Characteristics of High Performance Teams

- A sense of autonomy (independence)
  - In spite of a chance of making mistakes
- A sense of empowerment (authority)
  - Can say 'no' to a request, or break a little rule
- Small team size
  - 3 to 5 per team, max of 10
- A high level of enjoyment (fun!)

How to Manage a Team

- Establish a vision for the team
- Create change needed to bring about the vision
- Manage the team as a team, not as individuals
  - Make the team responsible rather than individuals for their individual actions
- Delegate tasks clearly to the team
- Let team work out the details

Team Failure

- If team isn't working, examine the motivation, organization, and information
- Other possible causes include:
  - Lack of vision
  - Lack of identity
    - Members that would rather work alone, or lack of commitment
  - Lack of recognition
  - Productivity roadblocks
    - Environment too stifling?

Team Failure

- More causes:
  - Ineffective communication
  - Lack of trust
  - Problem personnel (don't ignore them!)
    - Members that are belligerent, cover up ignorance rather than try to learn, are territorial, grumble, don't pitch in
      - "My code is too complicated to test"
      - "No one else can fix the bugs in my code."
    - In a review of 32 management teams, the most consistent and intense complaint from members was their team leaders were unwilling to confront and resolve problems with poor performance by team members
    - First approach is for the entire team to coach the problem person on how to work as part of a team
    - Second resort is to fire the person

Practical Guidelines for Team Leaders

- As a team leader I will
  - Avoid compromising the team's objective with political issues
  - Exhibit personal commitment to the team's goal
  - Not dilute the team's efforts with too many priorities
  - Be fair and impartial toward all team members
  - Be willing to confront and resolve issues associated with inadequate performance by team members
  - Be open to new ideas and information from team members

Practical Guidelines for Team Members

- As a team member I will:
  - Demonstrate a realistic understanding of my role and accountabilities
  - Demonstrate objective and fact-based judgments
  - Collaborate effectively with other team members
  - Make the team goal a higher priority than any personal objective
  - Demonstrate a willingness to devote whatever effort is necessary to achieve team success
  - Be willing to share information, perceptions, and feedback appropriately

Practical Guidelines for Team Members

- As a team member I will:
  - Provide help to other team members when needed and appropriate
  - Demonstrate high standards of excellence
  - Stand behind and support team decisions
  - Demonstrate courage of conviction by directly confronting important issues
  - Demonstrate leadership in ways that contribute to the team's success
  - Respond constructively to feedback from others