

Lecture 22: Configuration Management

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Outline

- n Configuration management
 - n Motivation
 - n Challenges
 - n Examples
 - n Reality

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Resources

- n *The Pragmatic Programmer*, by Andrew Hunt and David Thomas
 - n Ch. 3 (section 17), p. 271
- n *Code Complete*, by Steve McConnell

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Configuration Management – What and Why?

Student
Submission

- n **What:** A technique for simultaneously handling multiple versions (configurations) of a set of documents (code) by multiple people
- n **Why:** (List two main reasons that you see.)
 -
 -

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Reasons for Doing Configuration Management (1/3)

- n Allows multiple people to collaborate in producing a common piece of work without imposing elaborate or overly strict management rules
 - n E.g.: "You can only touch the code between 8am and 10am, then it's my turn."
- n Ability to revert to a previous version of the code
 - n Undoing undesirable changes
 - n Allowing testers to work independently on a different (not latest) release

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Reasons for Doing Configuration Management (2/3)

- n Tracking changes and project progress metrics
 - n Who makes the largest number of changes?
 - n How large/extensive are individual changes?
 - n Who changed this line of code?
 - n Which modules get changed most often?
 - n How much did module X change since the last release?
 - n In lines of code (LOC), new methods, etc.

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Reasons for Doing Configuration Management (3/3)

- n Splitting source tree into multiple versions / branches and later merging (some of) them
 - n **Motivation:** different customers need / pay for different updates; teams working independently on same codebase
 - n **Challenge:** avoid duplication of effort across different branches of the tree; more conflicts to resolve if there has been no recent syncing
- n Central place / repository that keeps an authoritative version of the work
 - n Can be properly protected and managed with fewer human resources
 - n Everyone knows where to look for things
 - n Enables running (repeatable) automatic builds & regression tests

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Recap: High-Level Motivation for Configuration Management

- n Maximizing effectiveness of the team
 - n Efficient collaboration on a common body of work
 - n People can work on snapshots of the system, created at different points in time
- n Robustness (against mistakes)
- n Accountability (of contributors)
- n Managing complexity (and avoiding nightmares)

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The Hardest Challenges with Using CMS

- n A human has to keep track of all the different configurations and decide which updates to apply to which branches, and when
 - n Gets increasingly error-prone with large projects and many branches (many releases, many customers)
- n Challenges you've experienced (e.g., using CVS, Subversion, etc.)?

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Examples of Configuration Management Systems (CMS)

- n CVS / RCS
- n Perforce
- n Subversion
- n Visual Source Safe
- n Roundtable
- n ...

Note: Not all CMS are created equal:

- (a) handling of branching
- (b) conflict resolutions (before merging)

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In Reality...

- n Most companies use some CMS
 - n Including all companies where I have worked
- n There are, surprisingly, also companies that don't use a CMS
 - n This should be a **red flag** for you if you're considering working for one of those
 - n It is a huge risk for dubious (or none) cost savings
 - n Management can easily buy into using a CMS to reduce their risks

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Relevance of CMS

- n Applicable to all types of valuable documents and artifacts, not just source code
 - n "You don't need to floss all your teeth – just the ones you want to keep."

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Lecture 23: Conflict Management (Part I) (with quotes of wisdom)

"Every problem is also an opportunity."

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Outline

- n Conflict defined
- n Benefits and downsides of conflict
- n Sources of conflict: at work, at school
- n Ideas for preventing and resolving conflict
 - n Internal
 - n Inter-personal (covered next time)

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Resources

- n "*Rapid Development*", by Steve McConnell
 - n Ch. 29: "*Principled Negotiation*"
- n "*Speech Acts*" (handout)

Other:

- n "*The 7 Habits of Highly Effective People*", by Steven Covey
- n "*When Conflict Helps Learning*", by David Socha and Valentin Razmov
- n "*Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*", by Steven Levitt and Stephen Dubner

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What Is Conflict?

- n Definition (according to Merriam-Webster):
 - n **1** : fight, battle, war
 - n **2 a** : competitive or opposing action of incompatibles : antagonistic state or action (as of divergent ideas, interests, or persons) **b** : mental struggle resulting from incompatible or opposing needs, drives, wishes, or external or internal demands
 - n **3** : the opposition of persons or forces that gives rise to the dramatic action in a drama or fiction
- n Conflict can be:
 - n internal (intra-personal; confined within you)
 - n inter-personal (involving multiple people)

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Potential Consequences of Conflict

Student
Submission

- n What may be some consequences of conflict?

Positive:

Negative:

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Potential Consequences of Conflict

- n Positive consequences
 - n Illuminates problems (that have been unknown and/or unaddressed)
 - n Provides an incentive for change
- n Negative consequences
 - n Wastes resources (time, money, patience, etc.)
 - n Can be stressful
 - n De-motivates

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Conflict Is *Not* Always Bad

- n "A good scare is worth more to a man than good advice." -- Edgar Watson Howe, novelist and editor
- n If carefully controlled, conflict can be a powerful motivator for positive change.
 - n But don't let it grow to become disruptive.
- n Without some conflict, people don't change.
 - n Humans are used to doing things in specific ways...
 - n ... and resist changing until those approaches prove clearly inadequate for what they want to achieve.
 - n Presence of conflict can provide the needed incentive.

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Origins of Conflict

- n **Misaligned incentives**
- n **Ungrounded expectations**
 - n "Expectations are a premeditated resentment."
-- Louis Fox
- n **Scarce resources**
 - n Time
 - n Money
 - n Decision power
 - n Information
 - n etc.

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Typical Psychological Reactions to Conflict

- n **"Fight"**
 - n People who tend to be critical, vocal, demanding, seeking control...
- n **"Flight"**
 - n People who tend to be indecisive, caring, wanting to be right...
- n The type of reaction a person has depends on personalities and context, among other factors.

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Experiences of Conflict You Have Had at Work

Student Submission

- n **What sources of conflict have you experienced with your managers / supervisors / advisors?**
 - a) Micro-management; not giving people ownership in the tasks they do
 - b) Exercising authority for decisions without first getting a buy-in from everyone
 - c) Penny pinching
 - d) Skewed reward structure and preferential treatment
 - Including being taken for granted
 - e) Setting false expectations; not following through on expectations
 - f) Not devoting proper mindshare to projects of importance to you
 - E.g.: professional development opportunities
 - g) Perception of differing interests ("Win-Lose", Us vs. Them, etc.)
 - h) Others (specify): _____
- n **Did you let management know that you disagreed?**

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Sources of Conflict between Students Who Work in Teams

- n The most frequent sources of conflict we have observed in student teams:
 - n "free riding", unequal work distribution
 - n making commitments but not following through on them
 - n ignoring the contributions of peers
 - n power struggles
 - n ego showing: (over)emphasizing one's perceived technical superiority

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Ideas for Preventing (Too Much) *Internal* Conflict

- n **Don't take it personally (because it rarely is so)**
 - n "Whenever anyone has offended me, I try to raise my soul so high that the offense cannot reach it."
-- Rene Descartes, philosopher and mathematician
- n **Ask questions to clarify, don't assume you're under attack**
 - n "I've had many troubles most of which have never happened."
- n **Learn to use the multiple possible responses to a request**
 - n Agreement ("Yes")
 - n Disagreement ("No")
 - n Counter-offer ("How about we do X instead?")
 - n Commit to commit ("I'll get back to you by tomorrow.")
- n **Learn to say 'No' – it takes practice.**
 - n If 'No' is not a possible answer, then what does 'Yes' really mean?
 - n "I don't know the key to success, but the key to failure is trying to please everybody." -- Bill Cosby
 - n "It is kindness immediately to refuse what you intend to deny."
-- Publilius Syrus
 - n "Half the truth is often a great lie." -- Benjamin Franklin

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