Leveraging Psychology in Software Engineering

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Leveraging Psychology in Software Engineering

“Technology Changes Rapidly, Human Nature Does Not”
– *Personality & The Fate of Organizations*, Robert Hogan

SEPTEMBER 2012
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Agenda

Industry Data
Personality Tendencies
Software Challenges
Key Psychological Factors
Summary
The Painful Data

• High Project Failure Rates
  • About 1/3 Success Rate

• Stressed Projects May Lead To:
  • Compressed QA Cycles
  • Sloppy Coding Techniques
    • Higher Defect Rates
  • Partial Fulfillment of Requirements

• High Project Costs Naturally Follow
  • Wasting Billions of Dollars Every Year (nist.gov)

Digital Work in an Analog World
Are There Others Answers?

- Technical Work = Technical Solutions?
  - That’s How We’re Wired
- What About the Non-Technical Issues?
  - As a Group We Don’t Like Going Here
  - Should at Least be Explored
Personality Tendencies

- Generally Analytical
  - It’s Why We’re in the Business
- Introverted As a Group
- Creative
- Prideful
  - Identify Strongly With Our Solutions
- Highly Motivated
  - Must Know Your Signature Strengths
  - Hawthorne Effect

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Personality Tendencies

• Possible Pitfalls
  • Avoid Communication at Times
  • Dive Too Deeply Too Quickly
    • Use 3 & 1 Model
  • Limited Conflict Resolution Skills
    • Too Aggressive or Avoidant
    • Build Social Capital
    • Spend Time BEFORE the Crisis
    • Use Active Constructive Responding Style
    • Must Be Genuine – Use Signature Strengths
  • www.authentichappiness.org

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Personality Tendencies

• Possible Pitfalls
  • Our Solutions Become Personal
    • Wrong Part of Brain May Take Control
      • Identify Your Feelings
      • Try to Watch as a Distant Observer
      • Ask Questions about the Solution
  • May Continue Too Far Down Wrong Solution Path
    • Become Victim of Sunk Costs
    • View it as Eliminating One Solution Option
Software Industry Challenges

• Estimation
  • Overconfidence
    • Overconfidence Barrier
    • Most Overconfident of All – Fred Brooks
    • “Almost Certain”
  • Anchoring Influences
    • Tied to Overconfidence
    • Want to Succeed
    • Don’t Want to Appear Incompetent (Our Biggest Fear?)

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Software Industry Challenges

• Planning Concerns
  • Little or No Training
    • Optimal Utilization of Staff
    • Advance R&D Work
  • It’s Not What We Like to Do
    • We Want the Good Stuff
    • Leads to Procrastination Or Short Cuts

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Software Industry Challenges

• Planning Concerns (continued)
  • Planning Fallacy
    • Poor at Estimating Our Own Tasks
    • Discount Past Negative Experiences
    • Remember Only Where We’ve Succeeded!
    • Best, Likely, Worst Case Review

• Perfection Paralysis
  • Personality Side Effects
  • Special Cases Death March

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Key Psychological Factors

- Self-Discipline
  - Major Factor in Personal Success
  - Easy to Get Distracted
  - Looking for Silver Bullets
Key Psychological Factors

• Procrastination
  • Public Declaration of Plans is Best
  • Pre-Commitment Practices
    • Implementation Intentions
• Know-How vs. Discipline
  • Personal Software Process
    • 85% Fewer Defects
    • Estimation Improved Dramatically

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Key Psychological Factors

• Cognitive Dissonance
  • Developers Make Two Classes of Errors
    • Logic & Misinterpretation of Requirements
  • Focus On Requirements
    • An Effective Way to Approach Developers
• Code Reviews
  • Leverages the Power of Cognitive Dissonance
  • Must be Scheduled in Advance

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Key Psychological Factors

• Creativity
  • Hard to “Schedule”
  • Requires Well-Defined Steps
    • Preparation, Incubation, Illumination, Formulation
  • Brainstorming Modifications
    • Generate Ideas Before Meetings

Digital Work in an Analog World
Key Psychological Factors

• Problem Solving
  • Suppressing Solutions
    • Must Be “Qualified”
  • Either / Or Solutions
    • Analyticals Like These
  • Dialectical Thinking
Key Psychological Factors

• Team Dynamics
  • Team Selection
    • We Like Ourselves
  • Stages of Group Formation
    • Effective Groups Take Time
• Group Think & Conformity
• Evaluation Apprehension
• Process Loss
• Competition

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Summary

• Invest In Non-Technical Skills
  • Life-Long Career Benefit
  • Better Individual & Team Performance
• Know Your Signature Strengths
  • Find Your Best Fit for Success
• Build Social Capital
  • It’s a Constant Investment that Always Pays
• Understand Team Dynamics
  • Software Teams are Becoming More Complex

Digital Work in an Analog World
Questions?

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