

SWAT Solutions, Inc.

Leveraging Psychology in Software Engineering



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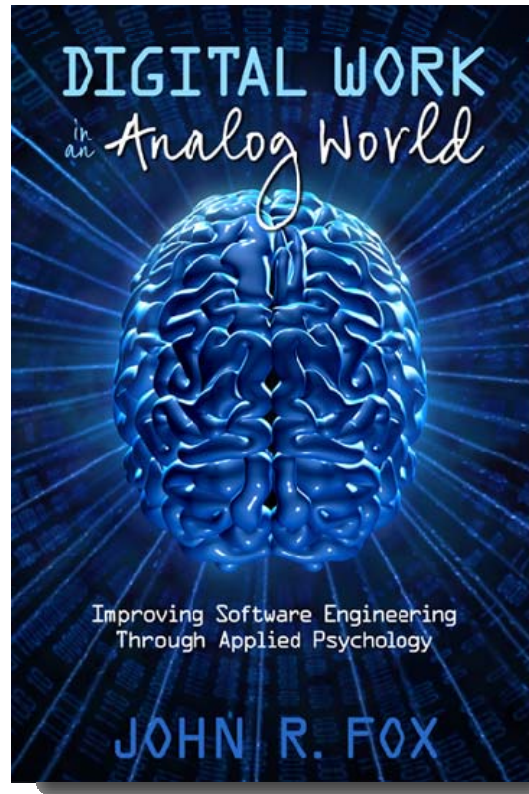
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Leveraging Psychology in Software Engineering

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

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Leveraging Psychology in Software Engineering

Agenda

Software 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
 - Partial Fulfillment of Requirements
- Higher Project Costs Naturally Follow
 - Wasting **Billions** of Dollars Annually (nist.gov)

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Are There Others Answers?

- Technical Work = Technical Solutions?
 - That's How We're Wired
 - No Matter the Question – More & Better Technology
- What About the Non-Technical Issues?
 - We've Tried New Technologies & Methodologies
 - We Don't Like Going Here
 - “Analog Development” Should be Explored

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Personality Tendencies

- Generally Analytical
- Introverted As a Group
- Creative
- Proudful
 - Identify Strongly With Our Solutions
- Highly Motivated
 - Must Know Your Signature Strengths (Seligman)
 - Hawthorne Effect

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Personality Tendencies

- Possible Pitfalls
 - Avoid Communication at Times
 - High Speed CPU
 - I/O of Commodore 64!
 - Dive Too Deeply Too Quickly
 - Use 3 & 1 Communication Model
 - 3 Possible Solutions
 - 1 Recommended Solution
 - Justify Solution

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Personality Tendencies

- Possible Pitfalls
 - Limited Conflict Resolution Skills
 - Too Aggressive OR Completely Avoidant
 - Build Social Capital with Key Stakeholders
 - Spend Time BEFORE Crisis
 - Need More Positive Interactions – 3:1 or 5:1
 - 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
 - Ask Questions about the Solution
 - Request a Later Meeting to Discuss

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Personality Tendencies

- Satisficing vs. Maximizing
 - Maximizers Want the Very Best
 - Satisficers – Just Good Enough
 - Know Your Team's Tendencies!
 - Determine Where to Satisfice or Maximize

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Software Industry Challenges

- Software Project Estimation
 - Overconfidence
 - Overconfidence Barrier
 - Most Overconfident of All – Fred Brooks Jr.
 - “Almost Certain” Problem
 - 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

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Key Psychological Factors

- Self-Discipline
 - Major Factor in Personal Success
 - Works Like a Muscle
 - Easy to Get Distracted

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Key Psychological Factors

- Cognitive Dissonance
 - Developers Make Two Classes of Errors
 - Logic Errors & Misinterpretation of Requirements
 - Logic Errors Create More Dissonance
 - Best Way To Approach Developers?
 - Focus On Requirements
 - Code Reviews or Inspections
 - Powered by Cognitive Dissonance
 - Must be Scheduled in Advance

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```

// HANDLE KEY DOWN AND KEY UP EVENTS
PUBLIC BOOLEAN KEYDOWN(EVENT E, INT KEY) {
  INT FLAGS = E.MODIFIERS;
  IF (E.ID == EVENT.KEY_PRESS)      // A REGULAR KEY
    SHOWSTATUS("KEY DOWN: "
      + MODIFIER_KEY_NAMES(FLAGS)
      + KEY_NAME(E));
  ELSE IF (E.ID == EVENT.KEY_ACTION) // A FUNCTION KEY
    SHOWSTATUS("FUNCTION KEY DOWN: "
      + MODIFIER_KEY_NAMES(FLAGS)
      + FUNCTION_KEY_NAME(KEY));
  RETURN TRUE;
}
PUBLIC BOOLEAN KEYUP(EVENT E, INT KEY) {
  INT FLAGS = E.MODIFIERS;
  IF (E.ID == EVENT.KEY_RELEASE)    // A REGULAR KEY
    SHOWSTATUS("KEY UP: "
      + MODIFIER_KEY_NAMES(FLAGS)
      + KEY_NAME(E));
  ELSE IF (E.ID == EVENT.KEY_ACTION_RELEASE) // A FUNCTION KEY
    SHOWSTATUS("FUNCTION KEY UP: "
      + MODIFIER_KEY_NAMES(FLAGS)
      + FUNCTION_KEY_NAME(KEY));
  RETURN TRUE;
}

```

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Key Psychological Factors

- Procrastination
 - Publicly Declare Your Plans
 - Pre-Commitment Practices
 - Implementation Intentions
 - Pre-Decisions

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Key Psychological Factors

- Creativity
 - Hard to “Schedule”
 - Requires Well-Defined Steps
 - Preparation
 - Incubation  Key Step
 - Illumination
 - Formulation

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Key Psychological Factors

- Team Dynamics
 - Team Selection
 - We Like Ourselves
 - Stages of Group Formation
 - Effective Groups Take Time
 - Conformity & Group Think
 - Evaluation Apprehension

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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

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Questions?

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