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Software Development Best Practices

10x Engineering Principles

A Construx Seminar Preview

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Many Good Development Approaches

- Structured Development
- Computer Aided Software Engineering
- Rapid Application Development
- Object-Oriented Development
- COTS
- Agile Development
- Open Source
- Lean Development
- …

A Few Not So Good Approaches

They really didn't have names but would sound something like…

- "So, what should we do with this $5,000,000 in venture capital?"
- "Sure, this will scale from my Excel spreadsheet to the entire company"
- "It can't take that long, it's just a…"

Software Development Holy Grail

- Providing software that is…
  1. On time…
  2. On budget…
  3. With desired functionality…
  4. At the defined quality level…
  5. In a sustainable way…

But What About 10x?

- We also have data and experience that demonstrate at *least* a 10x productivity difference in software development
  - Between different developers working on same/similar systems
  - Between different designs for the same/similar problem
  - Between different organizations working on the same/similar products

The 10x Engineering Difference

Perform the five success factors at a fraction of the cost of other companies

An engineer does for a nickel what any damn fool can do for a dollar

Attributed to Henry Ford

Strategies & Principles

- Key to 10x Engineering is differentiating between strategies and principles
  - Strategies change with different times
  - Principles stay fairly constant
- 10x Engineering selects strategies that best apply the principles to the given situation

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Minus-x Engineering

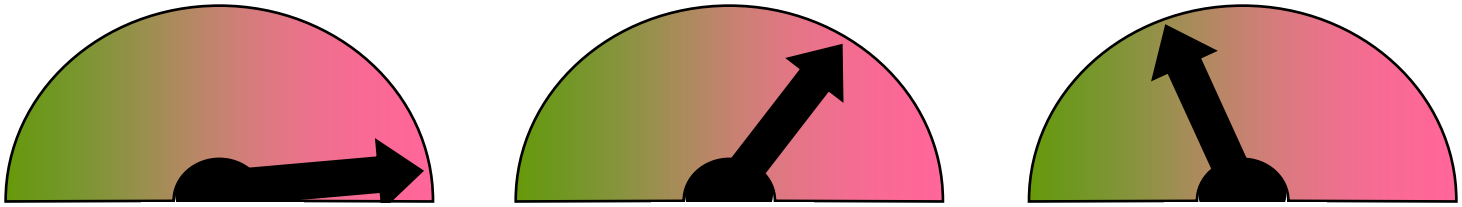
Doing software for $1.50

- Classic Mistakes
  - People oriented
  - Process oriented
  - Product oriented
  - Technology oriented
- Brute Force Quality
  - Testing in quality
  - Planning to refactor later
  - Little feedback
- Excessive Multi-Tasking

One Mistake is All It Takes

Chance of doing software for $1.50

Best Practice Use



Few **Some** **Most**

Specification Gets Rewritten

Yes **No**

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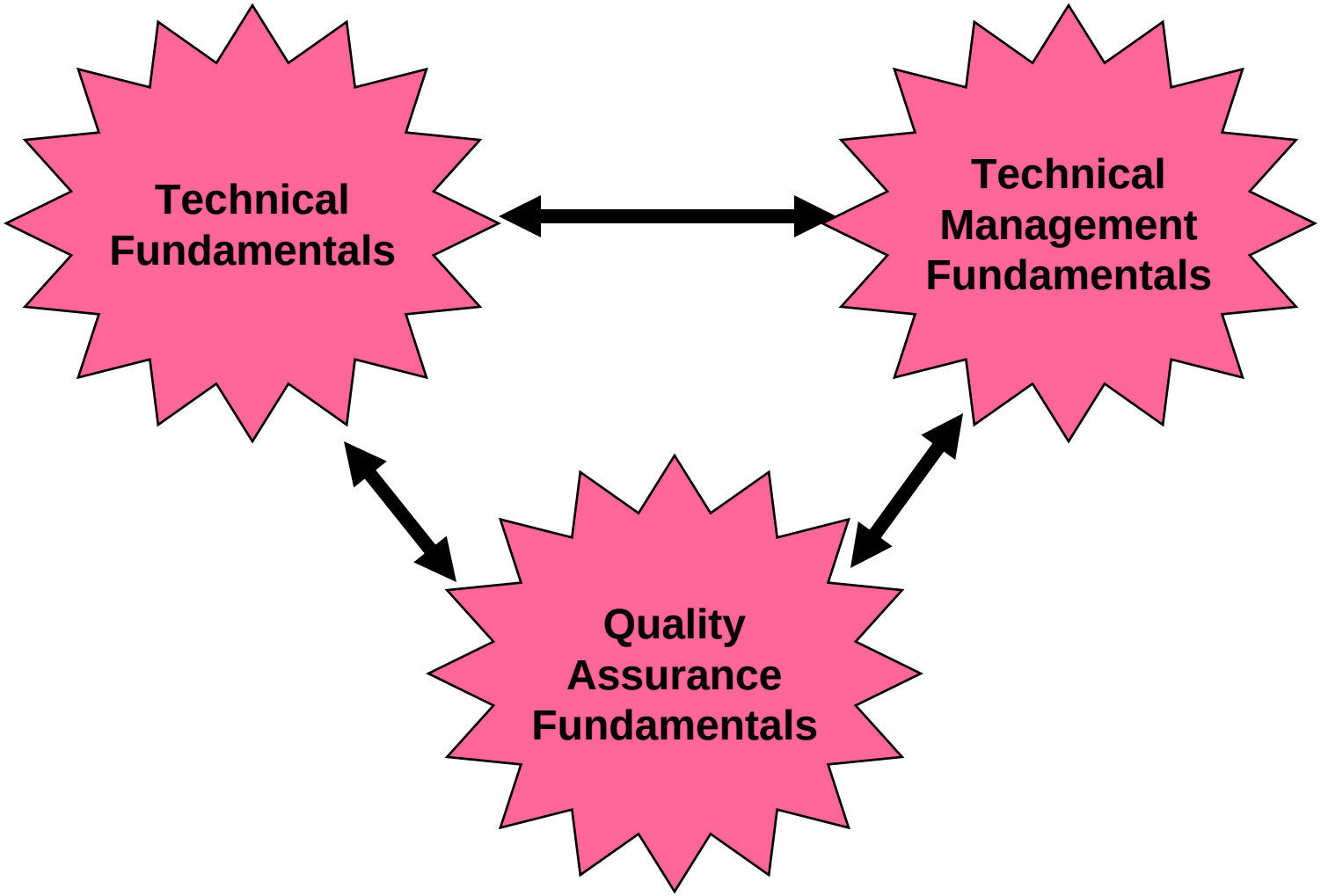
Basic Engineering

Mastery of Fundamentals & Excellent Execution

Being a Professional



Supporting Professional Development

- Software Engineering Titles
- Professional Development Plans
- Mentor Program
- Training Target
- Promotion Criteria
- Performance Reviews
- Salary Structure
- Accomplishment Plaques
- Book Discussion Groups
- Book Reimbursement
- Professional Memberships

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10x Engineering Principle

Evidence-based Decision Making

Typical Evidence Sources

Industry Rags

Water Cooler Conversations

Experience

Presentations

Random Internet Searches

Critical Evidence Sources

- Ground Truth
  - Project tracking
  - Frequent building and testing
  - Cause analysis
  - Gates and checkpoints
- Feedback
  - Plan-Do-Check-Act
  - Iteration and Incrementalism
  - Workshops

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10x Engineering Principle

Solution Fits the Problem

Corporate Methodology

A Proper Fit

- Organizing workflow to the project
  - Intellectual phase models
  - Lifecycle choices
- Efficient Information Capture
  - Documents
  - Web, whiteboards, cameras
- Toolboxes
  - Finding the best tool for the job

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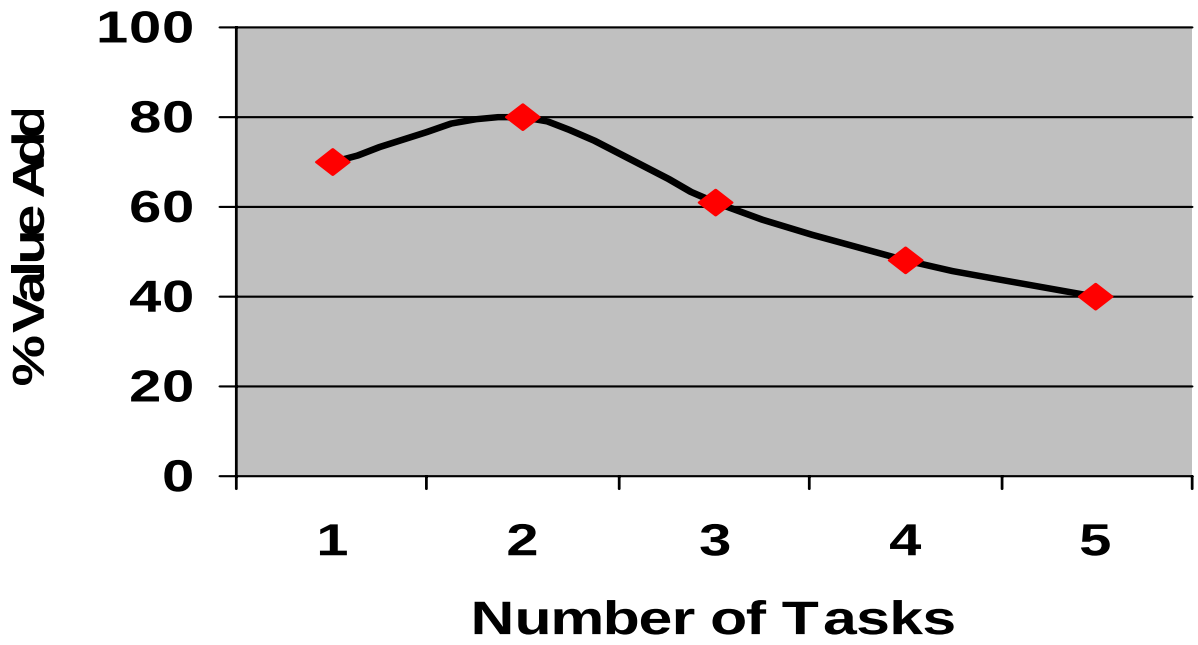
10x Engineering Principle

Prioritization

Hiding Competence

Decreasing Competency

- As the number of tasks go past two, productivity decreases



First Things First

- Satisficing
- Multi-level Planning
- Direction-in-the-Large
  - Early work selection
  - Vision & goals
  - Product backlog
- Direction-in-the-Details
  - Prototyping
  - Scenarios and use cases
  - Scrubbing

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10x Engineering Principle

Attacking Uncertainty

Known Unknowns

As we know,
There are known knowns.
There are things we know we know.
We also know
There are known unknowns.
That is to say
We know there are some things
We do not know.
But there are also unknown unknowns,
The ones we don't know
We don't know.

Certain Uncertainty

- Risk Management
- Accurate Estimates
- Rolling Wave Planning
- Defect Cost Containment
  - Early defect detection
  - Inspections
  - Test first development

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Increasing Capability

Building Capability

- Enhancing Individuals
  - Senior Staff
  - Professional Development
- Teams
  - Size and structure
  - Collaborative construction
- Environment
  - Thinking space
  - Information sharing
  - Empowerment

10x Principles

1. Mastery of Fundamentals and Excellent Execution
2. Evidence-based Decision Making
3. Solutions Fits the Problem
4. Prioritization
5. Attacking Uncertainty
6. Increasing Capability

Contact Information

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