Make More Money

Improve Our
Standard of Living

Mary Poppendieck
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Law of Productivity

• Productivity is the prime determinant of our standard of living

• On a level playing field, more productive companies enjoy higher profits

And

• The key to improving our standard of living is to increase software development productivity
Productivity

- The value of what you get out compared to what you put in
From: “What high tech can learn from slow growth industries” Janaki Akella, James M. Manyika, and Roger P. Roberts The McKinsey Quarterly, 2003 Number 4
Software Productivity

1990’s

Intense Customer Demand
Rapidly increasing technical capability

Y2K
ERP / CRM
Better Software
Faster Hardware
Internet
Expense
Expense
Expense
Expense
Expense
Expense

2000’s

Y2K Over
ERP / CRM
Problems
Internet
Grows Up
Outsourcing
Expense
Expense
Expense
Expense
Expense

December 03
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US Manufacturing Productivity

Lessons From The Winners

• How do the pros increase productivity?
  – Focus on core business processes
    • Levers that drive productivity
  – Decide where to match and where to lead
    • Match ‘best practice’ in most processes
    • Pick a few areas for leadership
  – Create end-to-end improvements
    • Close interaction across the value chain
    • No Silver Bullet

From: “What high tech can learn from slow growth industries” Janaki Akella, James M. Manyika, and Roger P. Roberts The McKinsey Quarterly, 2003 Number 4
Processes that Drive Software Development Productivity

- Idea-to-product processes
  - Translate customer needs into software
    - Do you really understand customers?
  - Manage the development portfolio
    - Do you limit work to actual capacity?
  - Deploy complete solutions
    - Are you fully invested in your customer’s success?
  - Manage the lifecycle
    - Do you design for maintainability?

From: “What high tech can learn from slow growth industries” Janaki Akella, James M. Manyika, and Roger P. Roberts The McKinsey Quarterly, 2003 Number 4
Productivity Metrics

• Lines of Code per Developer?
  – Are lines of code proportional to revenue?

  Alternatives

• If you sell software
  – Revenue per employee

• If you have a support organization
  – Increased revenue in the supported business per dollar spent by the IT organization
Increasing Productivity

Do Less Work

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Create More Value

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December 03

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Increasing Productivity

1. Reduce Direct Cost
   – Provide only what the customer will pay for

2. Reduce Indirect Cost
   – Streamline processes and eliminate waste
Reduce Development Effort

Features and Functions Used in a Typical System

Standish Group Study Reported at XP2002 by Jim Johnson, Chairman

- Often or Always Used: 20%
- Sometimes: 16%
- Rarely: 19%
- Never: 45%
- Rarely or Never Used: 64%
Overproduction of Features

• Ask Customers what they want
  (When they really don’t know)
• Reward them for thinking of everything
  (Call the initial list ‘Scope’)
• Penalize them for adding things later
  (Control ‘Scope’ aggressively)

• The result is Overproduction of Features
  (80% of the value comes from 20% of the features)
The Biggest Opportunity to Increase Productivity

• Develop 20% of the features
• Get 80% of the value

How?

• Define Minimum Marketable Feature (MMF) sets
• Calculate the ROI for each MMF
• Maximize ROI
  – Deploy MMF’s with highest ROI first
  – Stop when you run out of justification

Software by Number
by Mark Denne and Jane Cleland-Huang
Minimum Marketable Features (MMF)

Deploy Early & Often – Move Profit Forward

- Investment
- Payback
- Profit
- Breakeven
- Self-Funding

Time

Cost

Software by Number by Mark Denne and Jane Cleland-Huang

December 03

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1. Reduce Direct Cost  
   – Provide only what the customer will pay for  

2. Reduce Indirect Cost  
   – Streamline processes and eliminate waste
Streamline Core Processes

• It’s all about rapid delivery of value
  – “Efficiencies” and “cost reductions” that delay or reduce customer value will decrease productivity!

• The Measure of Maturity:
  – The speed with which an organization can reliably and repeatedly execute its key processes.

• Software Development Maturity:
  – The speed with which customer needs are reliably and repeatedly translated into deployed code.
Streamline the Flow of Value

Three Levers

1. Value Stream Mapping
   • Find the bottlenecks

2. Kaizen Events
   • Eliminate the bottlenecks

3. Integrated Product Teams
   • Streamline Information
Traditional Value Stream

- **Total Time:** ~55 weeks
  - **Work Time** ~17.6 weeks
    - 1/3rd of the time
  - **Wait Time** ~37 Weeks
    - 2/3rds of the time
- **Bottlenecks:**
  - Approvals
  - Sign Offs
  - Design Review
  - Testing
  - Deployment
**Lean Value Stream Map**

- **Total Time:** ~17 weeks
  - **Work Time:** ~14.2 weeks
    - 84% of the time
  - **Wait Time:** ~2.8 Weeks
    - 16% of the time

- **Levers:**
  - Concurrent Development
  - Effective Gating Process

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**Value Added Time**

**Wait Time**

- **Submit Request:** 1d
- **Project Approval:** 1h
- **Preliminary Architecture:** 2 wk
- **Select 1st Segment, Assess the Problems, Design, Code & Test Solutions, Review with Customer, Deploy (optional):** 4 wk
- **Select 2nd Segment, Assess the Problems, Design, Code & Test Solutions, Review with Customer, Deploy (optional):** 4 wk
- **Select 3rd Segment, Assess the Problems, Design, Code & Test Solutions, Review with Customer, Deploy:** 4 wk

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*December 03*
Software Kaizen Event

- Bring people together
- Give them a challenge
- Brainstorm solutions
- Present recommendations
- Decide at a Town Meeting
- Implement immediately

December 03

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Integrated Product Teams

Integrated Problem Solving

Least Integrated

Sequential (phased)

Documents e-mail

Batch Transmission (one-shot)

Unilateral

Late Release Of Complete Information

Timing of Upstream-Downstream Activities

Richness of Information Media

Frequency of Information Transmission

Direction of Communication

Timing of Upstream-Downstream Information Flow

Stage Overlap (simultaneous)

Face-to-Face (high bandwidth)

Fragmented (piece-by-piece)

Bilateral (feedback)

Early Release of Preliminary Information

Most Integrated
Increasing Productivity

Do Less Work

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Create More Value

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Do Less Work
Create More Value
Increase the Value Proposition

Three Levers

1. Shorten the customer feedback loop
   • Iterative development is fundamental

2. Improve your customers’ productivity
   • When your customer wins, you win

3. Optimize the entire economic chain
   • Local optimization destroys global optimization
Shorten the Feedback Loop

• Iterative Development
  – Early, small, frequent releases
  – Timebox for cost and schedule control

• Deploy MMF’s
  – Maximize ROI

• Integrated Product Teams
  – Offshore development increases the challenge

• Stop when you run out of justification
  – 20% of the features deliver 80% of the value
Improve Customer Productivity

• Michael Dell visits a customer
  – Watches them reconfigure Dell computers
  – Offers to pre-configure computers for them
  – Creates a whole new business line
    • Increased revenue and customer loyalty

• How can you help your customer?
  – Map your customer’s value stream
  – Extend the value you offer your customer
    • This is the best way to increase revenue in a commodity business
Optimize the Economic Chain

• “In every single case, the Keiretsu (*K-ret-soo*), that is, the integration into one management system of enterprises that are linked economically, has given a cost advantage of at least 25% and more often 30%.”*

• *Keiretsu* : a group of affiliated companies in a tight-knit alliance that work toward each other's mutual success.
  – GM: 1920’s – 1960’s
    • Ownership
  – Sears: 1930’s – 1970’s
    • Partial ownership, contracts
  – Marks & Spencer: 1930’s – ?
    • Contracts
  – Toyota: 1950’s – present
    • Contracts, economic incentives

* Management Challenge for the 21st Century, Peter Drucker
Optimize The Economic Chain

• Organizations usually focus on their own interests, at the expense of the overall venture.
  – Arms length contracts make collaboration difficult
  – Outsourcing makes supply chain integration difficult

• To increase productivity, focus on performance and results across the entire economic chain
  – Create a software *Keiretsu*
  – Focus on overall, not individual, benefit
  – Expect a 25 - 30% increase in overall productivity
Improve our standard of living: Increase productivity!

Do Less Work

Create More Value

80-20 Everything!