“There is no more Normal”

“Without exception, all of my biggest mistakes occurred because I moved too slowly.”

--John Chambers, Cisco CEO

“300 start-ups ... persisting with the initial business plan was the best single predictor of failure.”
“I recently asked a colleague [CIO] whether he would prefer to deliver a project somewhat late and over-budget but rich with business benefits or one that is on-time and under-budget but of scant value to the business. He thought it was a tough call, and then went for the on-time scenario. Delivering on-time and within budget is part of his IT department’s performance metrics. Chasing after the elusive business value, over which he thought he had little control anyway, is not.”

Cutter Sr. Consultant Helen Pukszta
Mixed Messages

- Conform to Plan
- Be Flexible
Measurement Concepts Quality Value The Agile Triangle
Standish Reports

- Standish Group “Chaos Reports”
  - 1994 — 82% challenged or failures
  - 2001 — 72% challenged or failures
  - 2009 — 68% challenged or failures

- Definition of project “success”
  - Successful: on time, on budget, all specified features;
  - Challenged: completed and operational, but over budget, late, and with fewer features and functions than initially specified;
  - Failed: canceled before completion or never implemented.

The Standish data are NOT a good indicator of poor software development performance. However, they ARE an indicator of systemic failure of our planning and measurement processes.
Which is Better?

If higher numbers are improvements, then which of these is better performance?

Budget 100 and achieve 100, or Budget 120 and achieve 110?

Which one would your performance measurement system reward?

Our problem is not that we aim too high and miss, but that we aim too low and hit.

--Aristotle
Step 1: Measurement system installed.

Step 2: Performance tends to improve while people figure out the system.

Step 3: People, under pressure, focus on measurement goals rather than outcomes. (Always a disconnect between the desired outcome and the measurement. Example: (1) productivity; lines of code.

Step 4:
The “Agile” Iron Triangle
The Agile Triangle

Value
(Releasable Product)

Quality
(Reliable, Adaptable Product)

Constraints
(cost, schedule, scope)
Quality
Is Quality Important?

“A cumulative defect removal rate of 95% on a project appears to be a nodal point where ... benefits accrue.”

Scientific Instruments Co.

- Overhaul the entire product development process
- Results from 6 before- and 6 after-Agile projects

<table>
<thead>
<tr>
<th></th>
<th>Previous Performance</th>
<th>Current Performance</th>
<th>Percent Improvement</th>
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<tbody>
<tr>
<td>Project Cost</td>
<td>$2.8 Million</td>
<td>$1.1 Million</td>
<td>-$1.7M (-61%)</td>
</tr>
<tr>
<td>Project Schedule</td>
<td>18 months</td>
<td>13.5 months</td>
<td>-4.5 mo (-24%)</td>
</tr>
<tr>
<td>Cumulative Defects</td>
<td>2,270</td>
<td>381</td>
<td>-1889 (-83%)</td>
</tr>
<tr>
<td>Staffing</td>
<td>18</td>
<td>11</td>
<td>-7 (-39%)</td>
</tr>
</tbody>
</table>

Source: Michael Mah, QSM Associates
Team about 100 people, highly distributed team

Database: 7,300 projects, 500+organizations, 18 countries: PI among the very highest recorded

<table>
<thead>
<tr>
<th></th>
<th>Industry Average</th>
<th>Current Performance</th>
<th>Improvement</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Cost</strong></td>
<td>$5.5 Million</td>
<td>$5.2 Million</td>
<td>-$0.3M (-5%)</td>
</tr>
<tr>
<td><strong>Project Schedule</strong></td>
<td>15 months</td>
<td>6.3 months</td>
<td>-8.7 mo (-58%)</td>
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<tr>
<td><strong>Cumulative Defects</strong></td>
<td>713</td>
<td>635</td>
<td>78 (-11%)</td>
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<tr>
<td><strong>Staffing</strong></td>
<td>40</td>
<td>92</td>
<td>+52 (+130%)</td>
</tr>
</tbody>
</table>

Source: Michael Mah, QSM Associates
Why is Technical Quality Important?

- The Impact of code quality on testing
- Error Location Dynamics
- Error Feedback Ratio
- Technical Debt
The Impact of Code Quality on Testing

Development: 10 days, 4 people, 4 KLOC, 1 d/KLOC

Development: 10 days, 4 people, 4 KLOC, 15 d/KLOC

Test time = 2 days

Test time = 30 days

How long to test? Assume ½ day to find & fix per defect.

Outcome: no time to finish testing, technical debt increases!
Difficult errors take longer to find:

1 hr/d to 50 hr/d
Error Feedback Ratio

The time to finish removing errors is critically dependent on the error feedback ratio. The three simulations differ only in their feedback ratios. A 20% difference in feedback ratio leads to an 88% difference in completion time, but the next 10% increase leads to a 112% increase.

**ERROR FEEDBACK:** Errors put into a system when attempting to correct other faults.

**ERROR FEEDBACK RATIO:** The number of problems created per fix.

$$EFR = \frac{ERRORS\ Created}{ERRORS\ Resolved}$$
Too Much Debt (Technical Debt)

- Once on far right of curve, all choices are bad ones
  1. Do nothing, gets worse
  2. Replace, high cost/risk
  3. Incremental investment

- Estimating nearly impossible
Agile Virtuous Cycle

- Technical agility creates a virtuous cycle of ever higher quality code and tests.
- Improves schedules.
- Reduces costs.

Cutter Study: Agile-developed products are easier to support (maintain)
Value
Reducing Cost and Scope

Paul Young, VP Business Capabilities & Integration, MDS Sciex.
Value Creating Opportunities

Increase: Productivity, Throughput, Flow, Highest Value Work, Profit, Growth, Share, Retention, Loyalty, Satisfaction, ROI, Efficiency, Cash Flow, Quality, Future Value, Visibility…

Decrease: Marginal Value Work, Cost, Time/Effort, Risk, Complaints, Turnover, Conflict, Waste (excess WIP/Inventory, waiting, rework, defects, technical debt, defects)

Improve: Engagement, Morale, Processes, Services, Collaboration, Information Flow, Quality, Loyalty, Talent (Skills), Image, Reputation, Value

Source: Pat Reed
Never Used 45%

Sometimes 16%

Rarely Used 19%

Often 13%

Always 7%

64% of code never or rarely used

2% of code used as written

$35 Billion, DOD Software Crosstalk Journal 2002

< 5% of code used

Commercial Software 400 projects over 15 years IEEE conference 2001

Standish Group Study, reported by CEO Jim Johnson, XP2002
Traditional Value Curve

Value Cost Ratio Curve (Traditional)

Value %
Cost %

Development Phases

Value Captured vs Cost Expended

1 2 3 4 5 6 7 8 9 10

0 10 20 30 40 50 60 70 80 90 100

50 60 70 80 90 100

Value %

Cost %

5 5 5 5 10 15 20 25 50 100

2 4 6 8 10
Agile Value Curve

Strategies
- Most valuable first
- Evolve features
- Determine right cut-off

Value Cost Ratio Curve (Agile)

Where is the right cut-off point?
Continuous Delivery

Flickr was last deployed 26 minutes ago, including 8 changes by 3 people.

In the last week there were 47 deploys of 364 changes by 19 people.
# Reducing Marginal Functionality

## Capability

<table>
<thead>
<tr>
<th>Feature 1</th>
<th>Feature 2</th>
<th>Feature 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story 1</td>
<td>Story 2</td>
<td>Story 3</td>
</tr>
<tr>
<td></td>
<td>Story 4</td>
<td>Story 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Story 6</td>
</tr>
</tbody>
</table>

### Marginal Value

- **Simplest**: Agent processes a special retail sale.
- **Basic**: Agent processes a special retail sale.
- **Expansive**: Agent processes a special retail sale.
Simple, Effective

Do the simplest thing possible that delights the customer

+ Throughput
+ Innovation

+ Value
+ Quality

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Strategic Value Model: Purpose-Alignment Model

Tactical Value Model: Calculating Story Value Points
<table>
<thead>
<tr>
<th>Market Differentiation</th>
<th>Mission Critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner</td>
<td>Differentiating</td>
</tr>
<tr>
<td>(3,5)</td>
<td>(8,13)</td>
</tr>
<tr>
<td>Who Cares</td>
<td>Parity</td>
</tr>
<tr>
<td>(1,2)</td>
<td>(3,5)</td>
</tr>
</tbody>
</table>

Source: Pixton, Nickolaisen, Little, McDonald
Stand Back and Deliver
Value Contributions

- Profit-based—ROI, NPV, etc.
- Aligning to Portfolio/Business Strategy
- Customer/Product Manager Priorities
- Align to Opportunity Phases
  - Start up
  - Scale
  - Mature
  - Decline

Value contribution types may be different for each phase! Easier to use points rather than money in early phases. Start up might be number of new web customers rather than revenue.
# Value Engineering

We need to understand both Value and Cost at the Capability/Feature level.

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portfolio</strong></td>
<td>Financial Business Case (NPV/IRR)</td>
<td>Portfolio T-Shirt Sizing</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td>Same as above</td>
<td>Inception - Revised Cost Estimate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iterative Development - Monthly Forecast</td>
</tr>
<tr>
<td><strong>Capability</strong></td>
<td><strong>Decision Making Sweet Spot</strong></td>
<td><strong>ROI = Value/Cost</strong></td>
</tr>
<tr>
<td></td>
<td><em>Where we want to start/continue to make better informed Value Engineering Decisions</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Top Down – Allocation of Value</strong></td>
<td><strong>Bottoms Up – Calculation of Cost</strong></td>
</tr>
<tr>
<td><strong>Feature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Story</strong></td>
<td><strong>MoSCoW or other prioritization method</strong></td>
<td><strong>Story Points (3,5,8)</strong></td>
</tr>
</tbody>
</table>

Source: Pat Reed
Value Point Assignment and Allocation

Value Points get allocated across all Capabilities and Features based upon their relationship to individual Business Value Drivers:

**Project A:**
NPV = $5 million

"Sales Increase"
5,000 Value Points

"Customer Experience"
250 Value Points

"Other"
150 Value Points

...allocation of Value Points across Capabilities and Features...

Source: Pat Reed
Stories with Value Points

As a sales associate, the ability to calculate the total amount of the sale.

As a sales executive, the ability to view all sales by product type, geographic region, and sales associate.

As a sales supervisor, the ability to verify the adequacy of the Customer’s Credit Rating.

Story Points are a calculation of cost. Value Points are an allocation of revenue.
“If you don’t have time to estimate value, we don’t have time to estimate cost!”
Business Value Maturity Model (Intel)

Level 1: No or Ad Hoc Practices

Level 2: Total Cost of Ownership

Level 3: Simple ROI & IT Business Case Discipline

Level 4: Options/Portfolio Mgt

Level 5: Optimized Value
The GAP: Business Value Dials

- Headcount Reduction (# of H/C reduced or avoided) x (Average burden rate for region & job type)
- Headcount Productivity (Number of employees affected) x (Time) x (Avg. burden rate) x (50%)
- Headcount Turnover (33% of annual burden rate/region/job type) x (# H/C turnover avoided)
- System End-of-Life (EOL) Cost of maintaining EOL’d system
- Hardware/Software Avoidance Total cost of the H/W or software avoided
- Unit and Other Cost Avoidance Total of actual costs avoided
- Fulfillment Center Optimization (Value of product) x (Volume increase)
- Waste Reduction Total value of waste reduced or avoided
- Risk Avoidance (Value of risk) x (Probability of occurrence)
- Time-To-Market (Value of increased market segment share) x (# weeks accelerated to market)
- Open New Markets (Increase volume) x (Average selling price)
- Optimize Existing Markets (Increase volume) x (Average selling price)
- Cross-Selling (Increase volume) x (Average selling price)
- Direct Revenue Total amount of revenue generated by projects

Adapted from Intel
Value and Priority
A traditional project manager focuses on following the plan with minimal changes, whereas an agile leader focuses on “adapting successfully to inevitable changes.”
Product vision

Project objectives

Business objectives

Capabilities/Features

Timebox schedule

---

**Product Roadmap**

<table>
<thead>
<tr>
<th>R 1.0</th>
<th>R 2.0</th>
<th>R 3.0</th>
<th>...</th>
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</thead>
<tbody>
<tr>
<td>I1</td>
<td>I2</td>
<td>I3</td>
<td></td>
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</tbody>
</table>

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**Project Data Sheet**

<table>
<thead>
<tr>
<th>Project Name: CRM Development</th>
<th>Project Leader: Brahim Quivera</th>
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</thead>
<tbody>
<tr>
<td>Project Start Date: 1/1/2010</td>
<td></td>
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<tr>
<td>Project End Date: 9/30/09</td>
<td></td>
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<tr>
<td>Project Manager: Roger Jones</td>
<td></td>
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<tr>
<td>Project Team: I1, I2, I3</td>
<td></td>
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<tr>
<td>Project Manager: Andrian Pineda</td>
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<tr>
<td>Project Start Date: 1/1/2010</td>
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<tr>
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</table>

**Project Objective Statement:**

The objective is to build a web-based CRM application that includes sales tracking, order management, Sales Management, and Marketing. The system needs to be operational by 9/30/09 and cost less than $2.5 million. Worldwide web access is required. <1/2 day training required.

**Business Objectives:**

- Better customer service
- Reduce paperwork
- More accurate order processing
- Integrate effectively with ERP system
- Maximize reusable components

**Quality Objectives:**

- Defects: 25% under industry average
- All Severity 1 & 2 defects fixed
- Comprehensive automated testing implemented
- Overall McCabe Cyclomatic Complexity < 10
- Quality Assessment = 4 (reliability & adaptability)

**Performance Guidelines:**

- Call Center volume of 3,500 calls per day
- The system needs to be operational by 9/30/09 and cost less than $2.5 million
- Worldwide web access
- <1/2 day training required
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<td>23</td>
<td>6 Hire FFCS Staff</td>
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<td>9 Develop Insurance Products for FFCS</td>
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<td>12 Obtain Legal Representation in Each State</td>
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<td>13 Determine Maximum Finance Rate Permissible</td>
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<td>14 Develop Field &amp; Operational Incentive Plans</td>
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<td>18 Develop FFCS Internal Procedures</td>
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<td>22 Develop Internal, Management and Field Sales</td>
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<tr>
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<td>25 FFCS Systems Running in ‘Mock’ Mode for Testing</td>
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<td>184</td>
<td>26 Vendor System Installation and Training</td>
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</tbody>
</table>
Report on Value

Project Development Schedule

Product Sale Management (PS)

Customer A/C Mgmt (CA)

Inventory Mgmt (IM)
Strategic Questions

- Why couldn’t we release this product today?
- What is our value-cost ratio?
- What is the product quality?
- Are we within acceptable constraints?
No problem can be solved from the same level of consciousness that created it.
Thank You!
QUESTIONS?