Agile

Project Management

for Large & Complex Programs

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Agile Capabilities: http://davidfrico.com/rico-capability-agile.pdf
Agile Cheat Sheet: http://davidfrico.com/key-agile-theories-ideas-and-principles.pdf
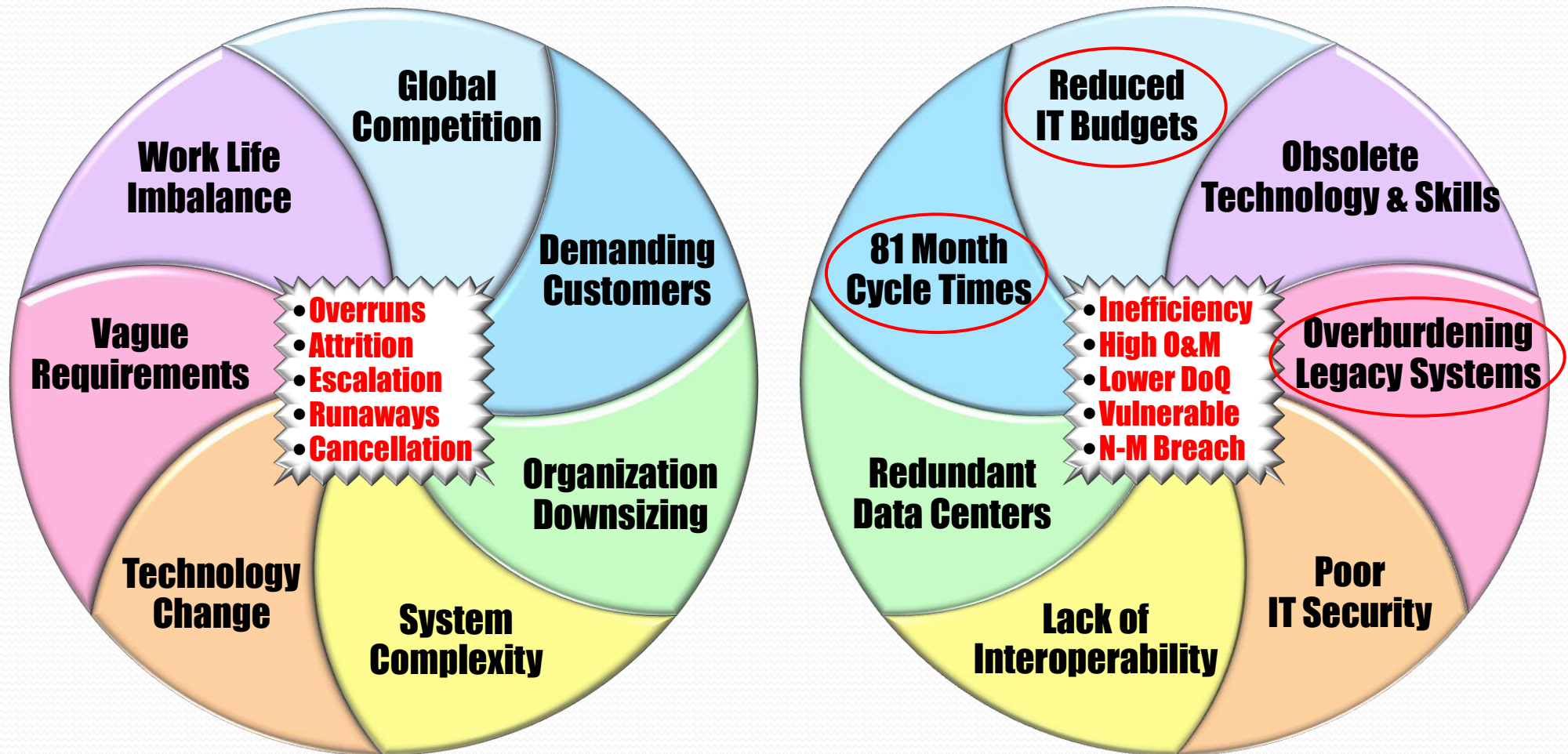
Dave's GENERAL BACKGROUND

□ Gov't contractor with 32+ years of IT experience

□ B.S. Comp. Sci., M.S. Soft. Eng., & D.M. Info. Sys.

☞ □ Large gov't projects in U.S., Far/Mid-East, & Europe
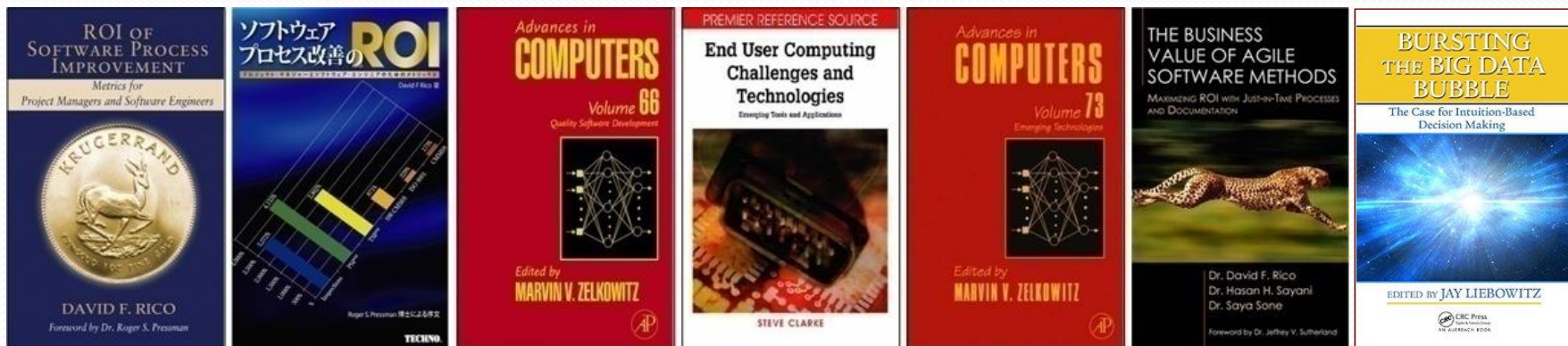
→ *Career systems & software engineering methodologist*
→ *Lean-Agile, Six Sigma, CMMI, ISO 9001, DoD 5000*
→ *NASA, USAF, Navy, Army, DISA, & DARPA projects*
→ *Published seven books & numerous journal articles*
→ *Intn'l keynote speaker, 130 talks to 12,000+ people*
→ *Specializes in metrics, models, & cost engineering*
→ *Cloud Computing, SOA, Web Services, FOSS, etc.*
→ *Adjunct at five Washington, DC-area universities*

Today's WHIRLWIND ENVIRONMENT

Left wheel segments:
- Global Competition
- Work Life Imbalance
- Demanding Customers
- Vague Requirements
- Organization Downsizing
- Technology Change
- System Complexity

Left center burst:
- Overruns
- Attrition
- Escalation
- Runaways
- Cancellation

Right wheel segments:
- Reduced IT Budgets
- Obsolete Technology & Skills
- 81 Month Cycle Times
- Overburdening Legacy Systems
- Redundant Data Centers
- Poor IT Security
- Lack of Interoperability

Right center burst:
- Inefficiency
- High O&M
- Lower DoQ
- Vulnerable
- N-M Breach

Pine, B. J. (1993). *Mass customization*: *The new frontier in business competition*. Boston, MA: Harvard Business School Press.
Pontius, R. W. (2012). Acquisition of IT: Improving efficiency and effectiveness in IT acquisition in the DoD. *Second Annual AFEI/NDIA Conference on Agile in DoD, Springfield, VA, USA*.
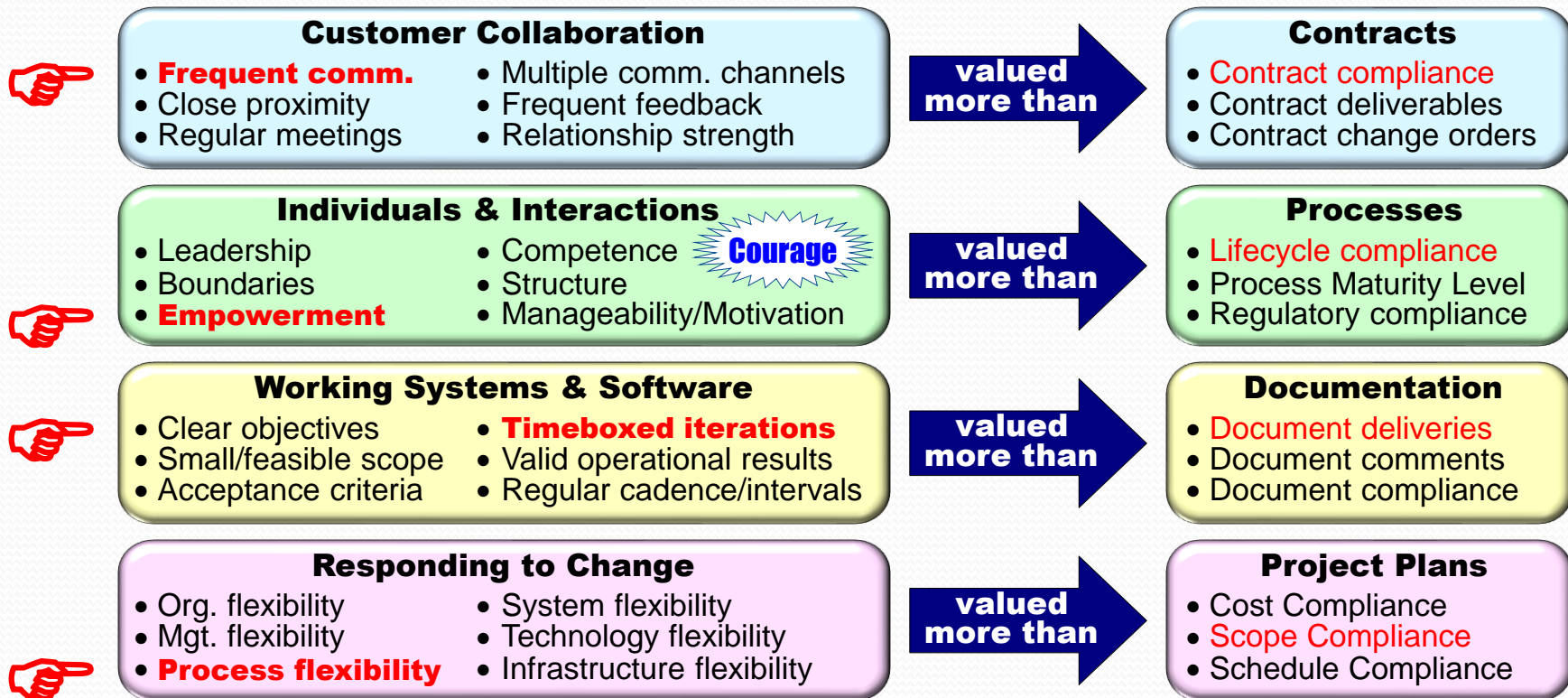
What is Agility?

- **A-gil-i-ty** (ə-'ji-lə-tē) Property consisting of quickness, lightness, and ease of movement; To be very nimble

  - *The ability to create and* **respond to change** *in order to profit in a turbulent global business environment*

  - *The ability to* **quickly reprioritize** *use of resources when requirements, technology, and knowledge shift*

  - *A very* **fast response** *to sudden market changes and emerging threats by intensive* **customer interaction**

  - *Use of* **evolutionary**, **incremental**, *and* **iterative** *delivery to converge on an optimal customer solution*

  - *Maximizing* **BUSINESS VALUE** *with right sized, just-enough, and just-in-time processes and documentation*
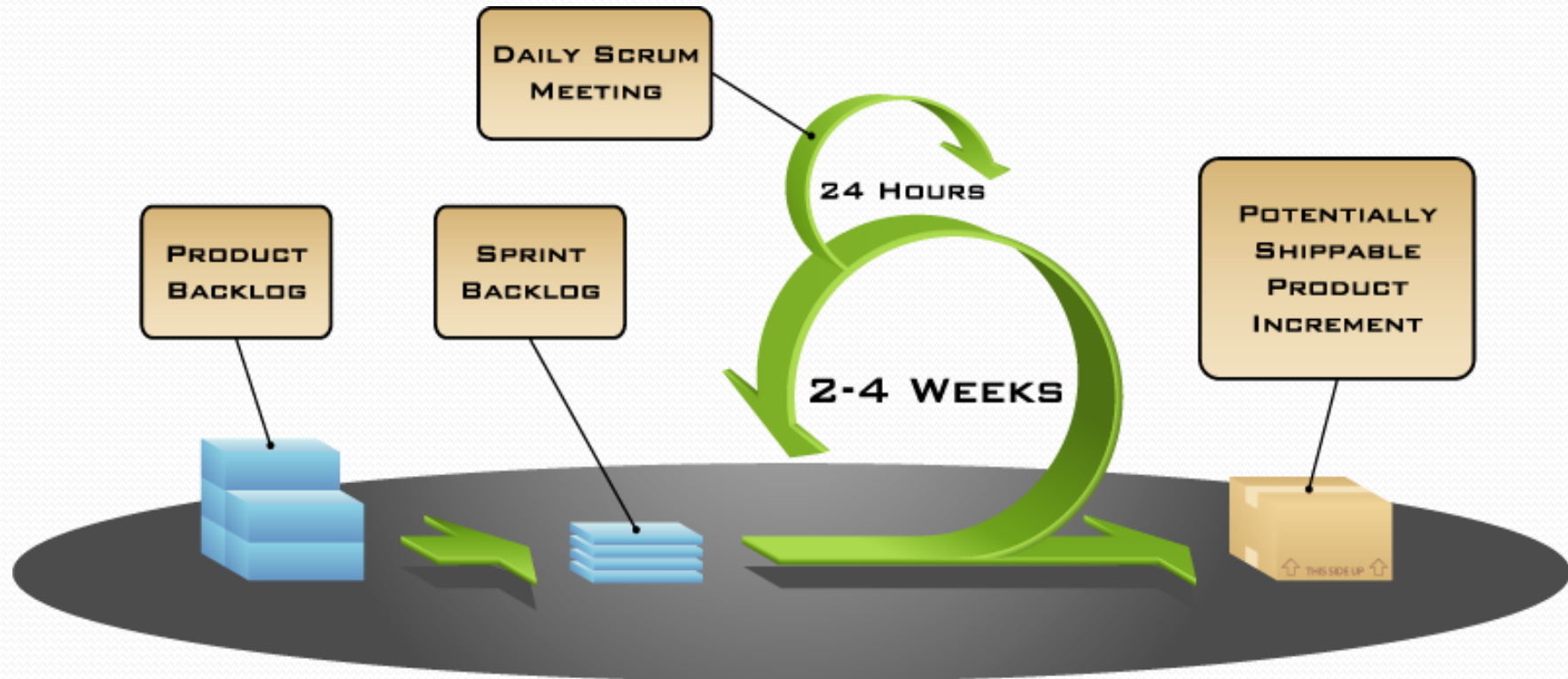
Highsmith, J. A. (2002). *Agile software development ecosystems*. Boston, MA: Addison-Wesley.

What are Agile Methods?

- **People-centric** way to create innovative solutions
- **Product-centric** alternative to documents/process
- **Market-centric** model to maximize business value

Customer Collaboration
- **Frequent comm.**
- Close proximity
- Regular meetings
- Multiple comm. channels
- Frequent feedback
- Relationship strength

valued more than

Contracts
- Contract compliance
- Contract deliverables
- Contract change orders

Individuals & Interactions
- Leadership
- Boundaries
- **Empowerment**
- Competence
- Structure
- Manageability/Motivation

Courage

valued more than

Processes
- Lifecycle compliance
- Process Maturity Level
- Regulatory compliance

Working Systems & Software
- Clear objectives
- Small/feasible scope
- Acceptance criteria
- **Timeboxed iterations**
- Valid operational results
- Regular cadence/intervals

valued more than

Documentation
- Document deliveries
- Document comments
- Document compliance

Responding to Change
- Org. flexibility
- Mgt. flexibility
- **Process flexibility**
- System flexibility
- Technology flexibility
- Infrastructure flexibility

valued more than

Project Plans
- Cost Compliance
- Scope Compliance
- Schedule Compliance

Agile Manifesto. (2001). *Manifesto for agile software development*. Retrieved September 3, 2008, from http://www.agilemanifesto.org
Rico, D. F., Sayani, H. H., & Sone, S. (2009). *The business value of agile software methods*. Ft. Lauderdale, FL: J. Ross Publishing.
Rico, D. F. (2012). *Agile conceptual model*. Retrieved February 6, 2012, from http://davidfrico.com/agile-concept-model-1.pdf

Basic SCRUM Framework

- Created by Jeff Sutherland at Easel in 1993
- Product backlog comprised of prioritized features
- Iterative sprint-to-sprint, adaptive & emergent model

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Schwaber, K., & Beedle, M. (2001). *Agile software development with scrum*. Upper Saddle River, NJ: Prentice-Hall.

What is AGILE PROJECT MGT.?

- **A-P-M** (ā-pē-ĕm): Light, lean, flexible, & collaborative; Disc. model for emergence under risk & uncertainty:
    - *Sound, yet* flexible process *to manage projects under* uncertainty, *urgency, and a need for* unique expertise
    - Values, principles, *and* practices *to help project teams in coming to grips with a challenging environment*
    - *Managing the flow of* human *thoughts, emotions, and* interactions *in a way that produces* business value
    - Rapidly *and* reliably *creating value by engaging customers, continuously learning, and* adapting
    - Lightweight, *yet disciplined project management model for building high-quality* technology-intensive *systems*

Augustine, S. (2005). *Managing agile projects*. Upper Saddle River, NJ: Pearson Education.
Chin, G. (2004). *Agile project management*: *How to succeed in the face of changing project requirements*. Broadway, NY: Amacom.
DeCarlo, D. (2004). *Extreme project management*: *Using leadership, principles, and tools to deliver value in the face of volatility*. San Francisco, CA: Jossey-Bass.
Highsmith, J. A. (2010). *Agile project management*: *Creating innovative products*. Boston, MA: Pearson Education.

Models of AGILE PROJECT MGT.

- ☐ Dozens of Agile project management models emerged
- ☐ Many stem from principles of Extreme Programming
- ☞ ☐ Vision, releases, & iterative development common

RADICAL - 2002 -	EXTREME - 2004 -	ADAPTIVE - 2010 -	AGILE - 2010-	SIMPLIFIED APM - 2011 -
• Prioritization	• Visionate	• Scoping	• Envision	• Vision
• Feasibility	• Speculate	• Planning	• Speculate	• Roadmap
• Planning	• Innovate	• Feasibility	• Explore	• Release Plan
• Tracking	• Re-Evaluate	• Cyclical Dev.	• Iterate	• Sprint Plan
• Reporting	• Disseminate	• Checkpoint	• Launch	• Daily Scrum
• Review	• Terminate	• Review	• Close	• Retrospective

Thomsett, R. (2002). *Radical project management*. Upper Saddle River, NJ: Prentice-Hall.
DeCarlo, D. (2004). *Extreme project management*: *Using leadership, principles, and tools to deliver value in the face of volatility*. San Francisco, CA: Jossey-Bass.
Wysocki, R.F. (2010). *Adaptive project framework*: *Managing complexity in the face of uncertainty*. Boston, MA: Pearson Education.
Highsmith, J. A. (2010). *Agile project management*: *Creating innovative products*. Boston, MA: Pearson Education.
Layton, M. C., & Maurer, R. (2011). *Agile project management for dummies*. Hoboken, NJ: Wiley Publishing.

Simplified APM Model

- Created by Mark Layton at PlatinumEdge in 2012
- Mix of new product development, XP, and Scrum
- Simple codification of common XP-Scrum hybrid

Layton, M. C., & Maurer, R. (2011). *Agile project management for dummies*. Hoboken, NJ: Wiley Publishing.
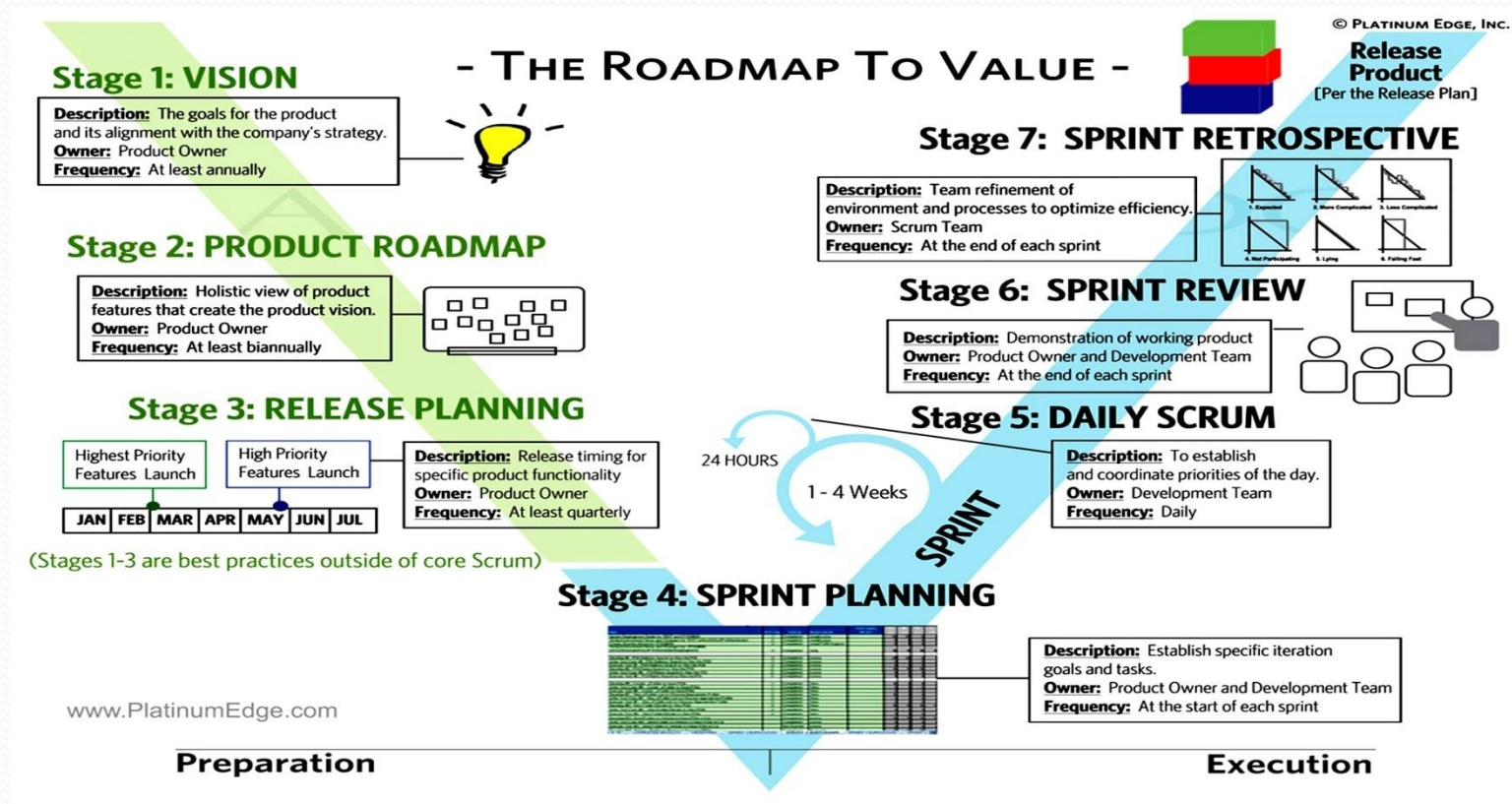
Simplified APM—VISION

- Description. Product goals aligned with strategy
- Owner. Product Owner
- Frequency. At least annually [1-2 hours]

Process Steps

1. Develop product objective.

2. Create draft vision statement.

3. Validate and revise vision statement.

4. Finalize vision statement.

Vision

- For. *<target customer>*
- Who. *<needs it>*
- The. *<product name>*
- Is a. *<product category>*
- That. *<product benefit, reason to buy>*
- Unlike. *<competitors>*
- Our product. *<differentiator, value added>*

Example

- For. *Bank customers*
- Who. *Want mobile banking*
- The. *Mobile banking application*
- Is a. *Mobile device enable banking app*
- That. *Provides secure, 24x7 mobile banking*
- Unlike. *Brick-and-mortar access points*
- Our product. *Enable 24-hour a day services*

Product owner identifies product vision. *Vision is project's destination. It defines what product is, how it supports organization strategy, who will use it, and why people will use it*.

Simplified APM—ROADMAP

- ☐ Description. Holistic view of product features
- ☐ Owner. Product Owner
- ☐ Frequency. At least biannually [2-4 hours]

Process Steps

1. **Identify product features.**

2. **Arrange product features.**

3. **Estimate and order product features.**

4. **Determine high-level time frames.**

Features

Account	Status	Transaction
• Open acct.	• Login	• Deposit
• Modify acct.	• Balances	• Withdrawal
• Close acct.	• Statements	• Transfer

Roadmap

1Q	2Q	3Q	4Q	5Q

Account

Status

Transaction

Product owner creates product roadmap. *Roadmap is high-level view of product requirements with loose timeframe for development. Identify, estimate, valuate, prioritize, and schedule themes.*

Simplified APM—RELEASE PLAN

- ☐ Description. Release timing for product functions
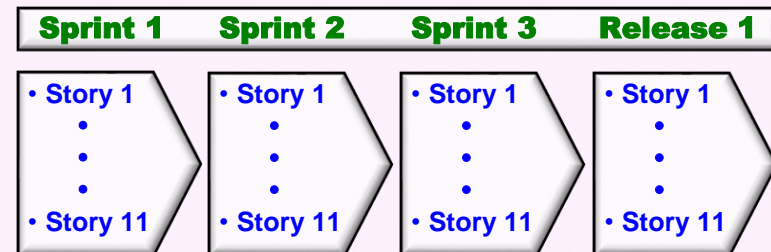- ☐ Owner. Product Owner
- ☐ Frequency. At least quarterly [4-8 hours]

Process Steps

1. **Decompose product features.**

2. **Create release plan.**

   - **Establish release goal.**

   - **Prioritize or order user stories.**

   - **Set release date.**

   - **Refine user stories.**

   - **Verify release plan.**

Decomposition

Account

Open	Modify	Close
• Create • Login • Setup	• Password • Address • Type	• Notify • Refund • Rationale

Release Plan

Sprint 1	Sprint 2	Sprint 3	Release 1
• Story 1 ⋮ • Story 11	• Story 1 ⋮ • Story 11	• Story 1 ⋮ • Story 11	• Story 1 ⋮ • Story 11
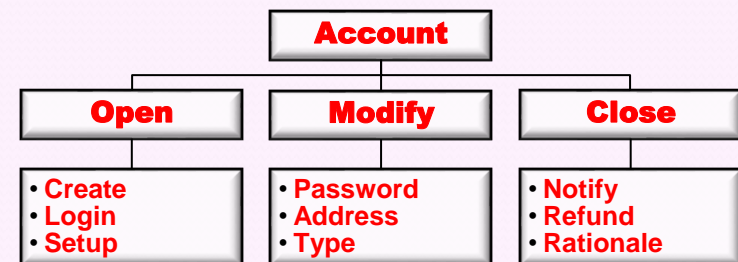
Product owner creates release plan. *Release plan identifies high-level timetable for releasing functions. Mid-term goals that team mobilizes around. There are many releases in priority order.*

12

Simplified APM—SPRINT PLAN

- ☐ Description. Specific iteration goals and tasks
- ☐ Owner. Product Owner and Development Team
- ☐ Frequency. At the start of each sprint [2-4 hours]

Process Steps

1. **Establish goals and choose user stories.**

2. **Decompose stories into tasks and create sprint backlog.**

Goals & User Stories

As a mobile banking customer, I want to create an account so I can write personal checks

- Create account.
- Login to account.
- Setup checking account.

Sprint Backlog

Task	Pri	Status	Who	App.	M	T	W	T	F
• Create account:									
− Setup	1	Done	Sue	Joe	4	4	0	0	0
− Install	2	Done	Sue	Joe	4	4	0	0	0
− Schema	3	Done	John	Joe	0	0	8	0	0
− Queries	4	In-work	Bob	-	0	0	0	8	0
− Forms	5	N/S	Patty	-	0	0	0	0	0
− Test	6	N/S	Sam	-	0	0	0	0	0

Product owner, Scrum Master, and Developers create sprint plan. *Sprint planning done at start of sprint. Product backlog must be ready. Developers select sprint goal and what can be done.*

Simplified APM—STANDUP

- Description. Establish & coordinate daily priorities
- Owner. Development Team
- Frequency. Daily [15-minutes]

Process Steps

1. Hold daily standup meeting.

2. Update sprint burndown chart.

3. Perform design, development, test, and evaluation.

Daily Standup

All Developers on Team Answer Three Questions in Round-Robin Style
- What has been done since the last meeting?
- What will be done before the next meeting?
- What obstacles are in my way?

Sprint Burndown

7/23/2004 - 8/14/2004

Developers hold daily standup meetings. *Purpose is to coordinate daily priorities. Identify what was done, what will be done, and impediments. Task boards and Sprint burndown are updated.*

Simplified APM—DEMO

- **Description**. Demonstration of working product
- **Owner**. Product Owner and Development Team
- **Frequency**. At the end of each sprint [2-4 hours]

Process Steps

1. **Prepare sprint review meeting.**

2. **Hold sprint review meeting.**

3. **Collect feedback from stakeholders.**

Product Demonstration

Developers Perform a Live Demo Target Hardware and Answer Stakeholder Questions
- What was the goal of the sprint?
- What user stories were attempted?
- What user stories were implemented?

Stakeholder Feedback

Poll Stakeholders One-by-One in Round-Robin Style to Solicit their Feedback
- Is the product acceptable as implemented?
- Is the product acceptable with modifications?
- Is the product unacceptable as implemented?

Developers hold a sprint review. *Sprint review performed at end of sprint. Developers demo validated code to stakeholders. Stakeholders vote on demo outcome. Product backlog reprioritized.*

Simplified APM—RETROSPECTIVE

- Description. Refine environment and processes
- Owner. Development Team
- Frequency. At the end of each sprint [1-2 hours]

Process Steps

1. **Plan sprint retrospective meeting.**

2. **Hold sprint retrospective meeting.**

3. **Inspect and adapt.**

Sprint Retrospective

Developers Perform a Live Demo Target Hardware and Answer Stakeholder Questions

- What went well in the last sprint?
- What could be improved in the next sprint?
- What people, process, and tools should change?

Process Improvements

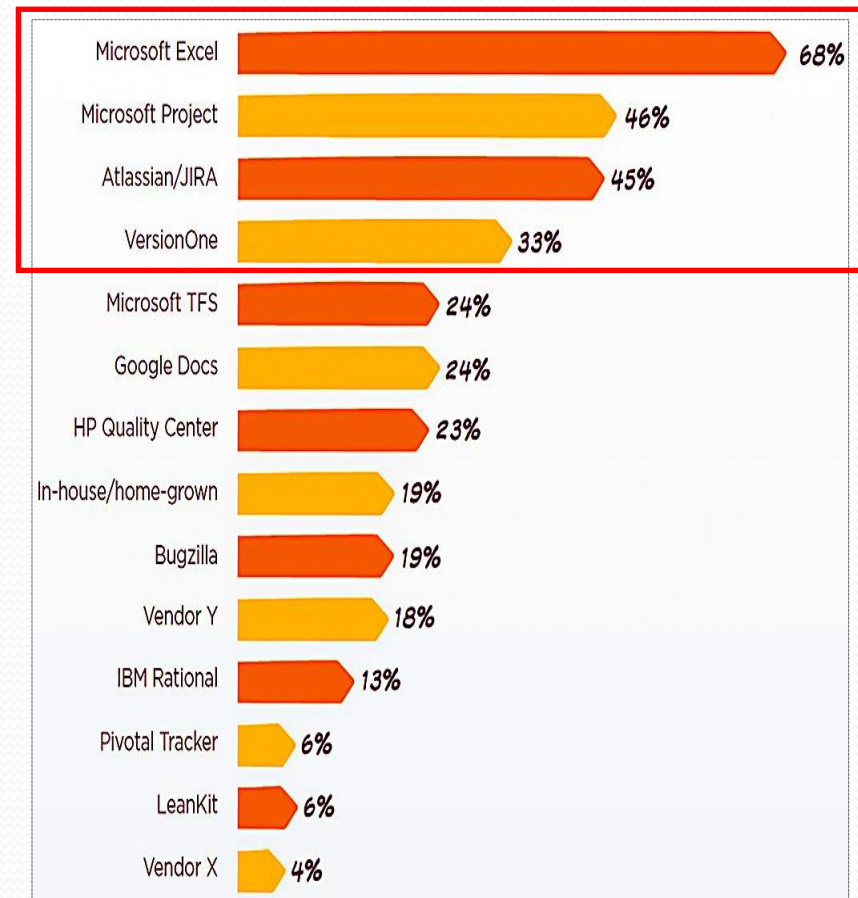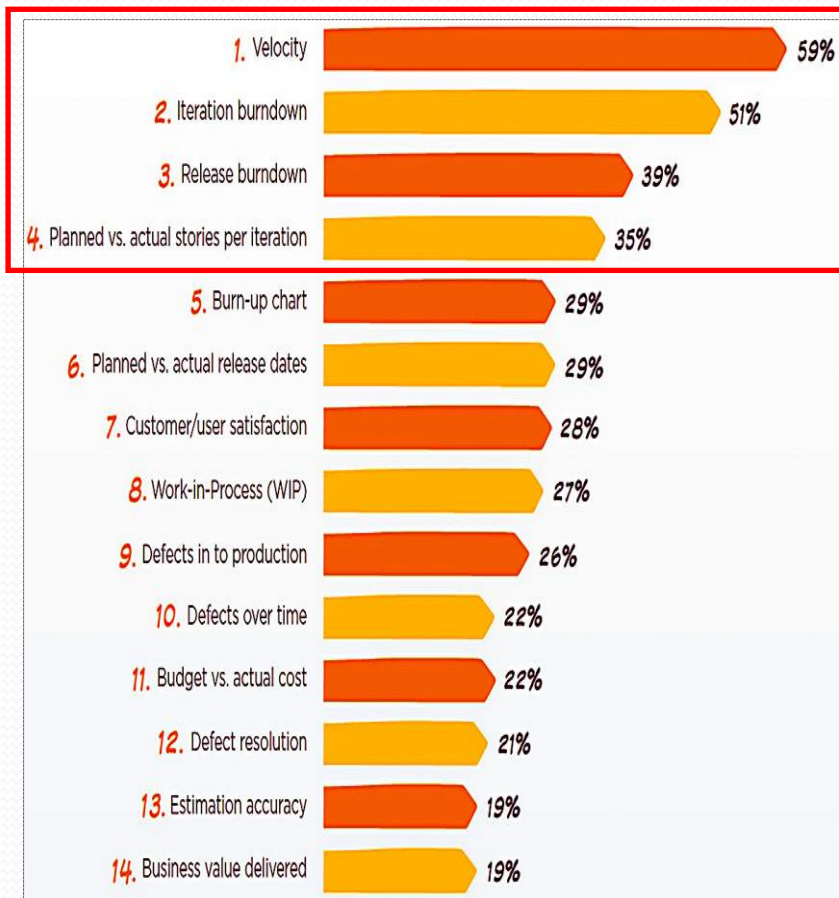**Scrum Master Records Action Items and Prepares Process Improvement Plan**

- Scrum master records suggested improvements.
- Developers prioritize suggested improvements.
- Add high-priority non-functional items to backlog.

Developers hold sprint retrospective. *Retrospective held at end of sprint. Developers identify the good and bad. Scrum master records results. Processes, tools, and backlog may be adjusted.*

Simplified APM—METRICS & TOOLS

- ☐ Metrics and tools for agile project mgt. emerging
- ☐ Velocity, burndown, defects, and agile EVM popular
- ☞ ☐ <u>Excel, JIRA, MS Proj., & VersionOne most often used</u>

Metric	%
1. Velocity	59%
2. Iteration burndown	51%
3. Release burndown	39%
4. Planned vs. actual stories per iteration	35%
5. Burn-up chart	29%
6. Planned vs. actual release dates	29%
7. Customer/user satisfaction	28%
8. Work-in-Process (WIP)	27%
9. Defects in to production	26%
10. Defects over time	22%
11. Budget vs. actual cost	22%
12. Defect resolution	21%
13. Estimation accuracy	19%
14. Business value delivered	19%

Tool	%
Microsoft Excel	68%
Microsoft Project	46%
Atlassian/JIRA	45%
VersionOne	33%
Microsoft TFS	24%
Google Docs	24%
HP Quality Center	23%
In-house/home-grown	19%
Bugzilla	19%
Vendor Y	18%
IBM Rational	13%
Pivotal Tracker	6%
LeanKit	6%
Vendor X	4%

Holler, R. (2015). *Ninth annual state of agile survey*: *State of agile development*. Atlanta, GA: VersionOne.

Simplified APM—BENEFITS
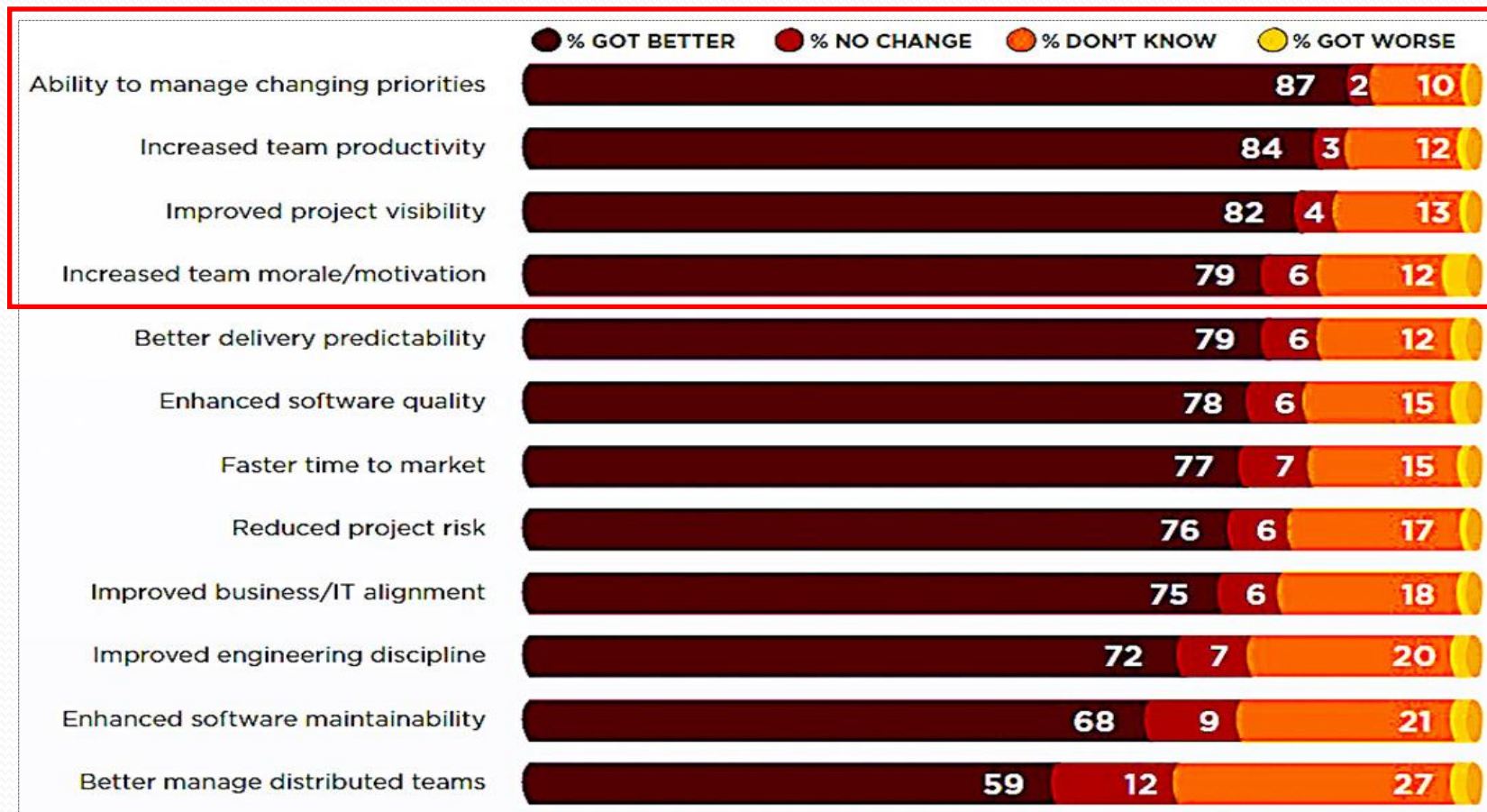
- Analysis of 23 agile vs. 7,500 traditional projects
- Agile projects are 54% better than traditional ones
- Agile has lower costs (61%) and fewer defects (93%)
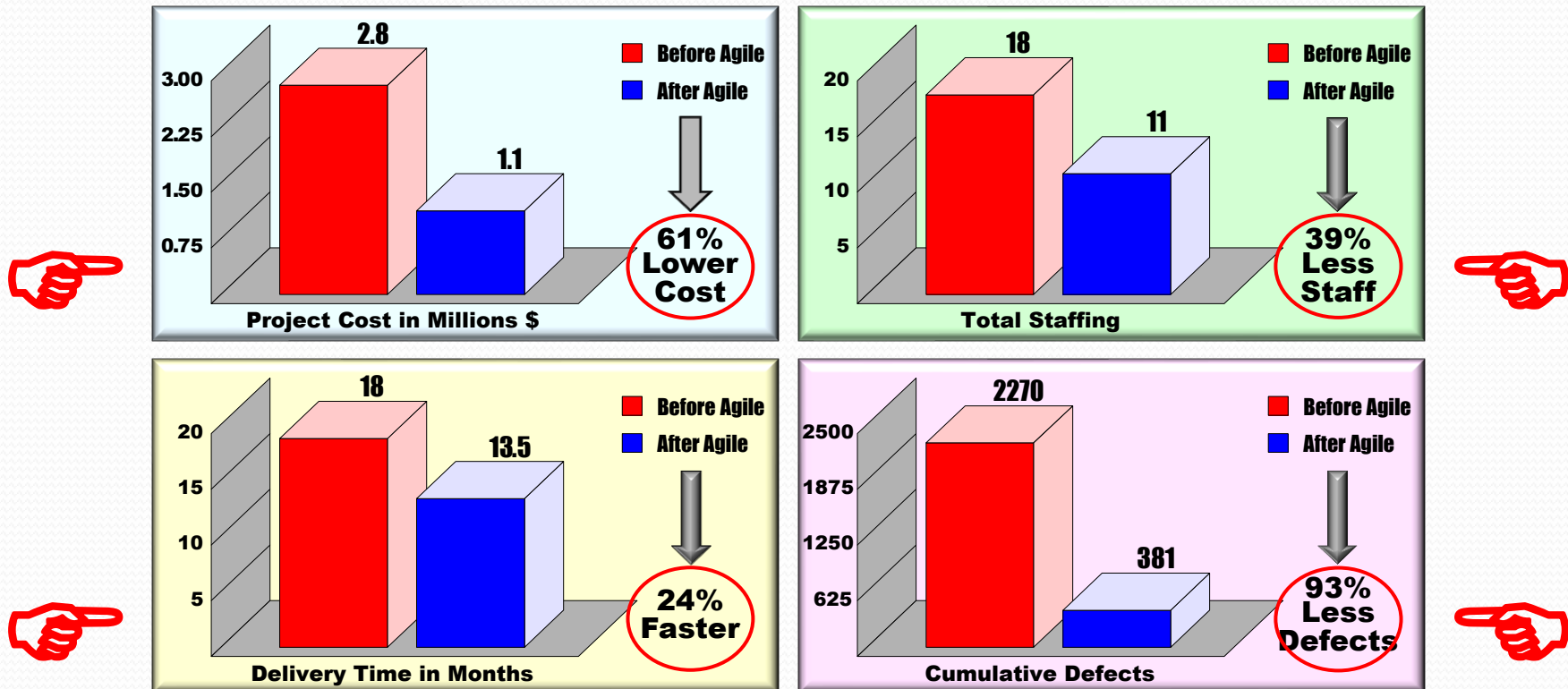
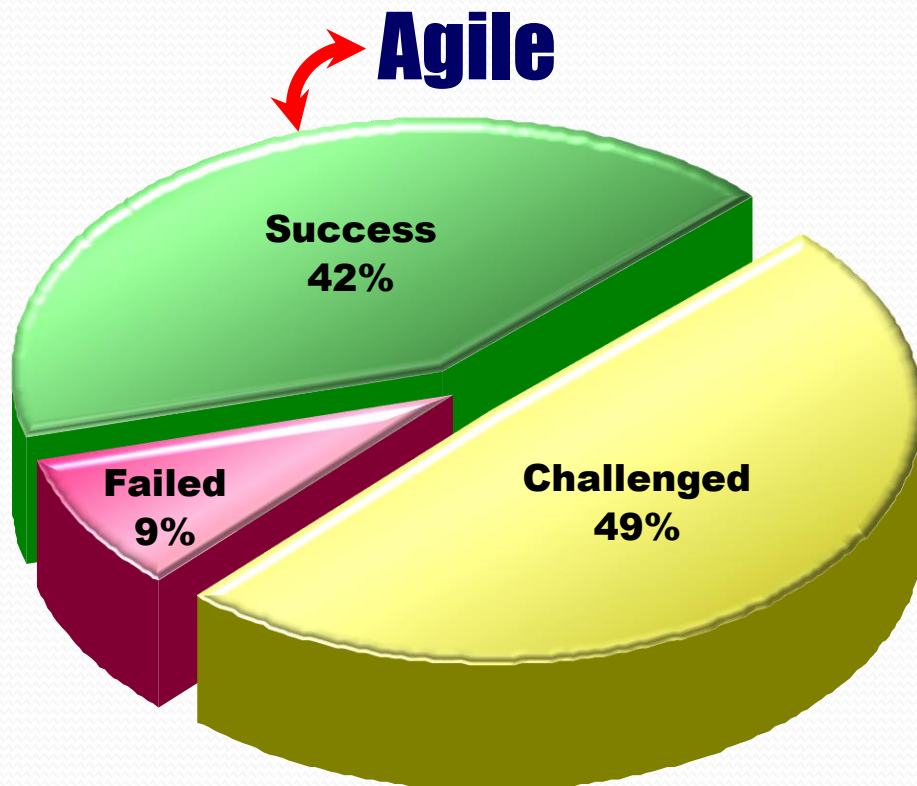Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

Simplified APM—MORE BENEFITS

- ☐ Benefits of agile methods known for decades
- ☐ Improves productivity, speed, efficiency, & quality
- ☞ ☐ <u>Biggest are team morale, customer satisfaction & ROI</u>

	⬤ % GOT BETTER	⬤ % NO CHANGE	⬤ % DON'T KNOW	⬤ % GOT WORSE
Ability to manage changing priorities	87	2	10	
Increased team productivity	84	3	12	
Improved project visibility	82	4	13	
Increased team morale/motivation	79	6	12	
Better delivery predictability	79	6	12	
Enhanced software quality	78	6	15	
Faster time to market	77	7	15	
Reduced project risk	76	6	17	
Improved business/IT alignment	75	6	18	
Improved engineering discipline	72	7	20	
Enhanced software maintainability	68	9	21	
Better manage distributed teams	59	12	27	

Holler, R. (2015). *Ninth annual state of agile survey*: *State of agile development*. Atlanta, GA: VersionOne.

Simplified APM—SUCCESS

- Traditional projects succeed at 50% industry avg.
- Traditional projects are challenged 20% more often
- Agile projects succeed 3x more and fail 3x less often

Agile

Success 42%

Failed 9%

Challenged 49%

Traditional

Success 14%

Failed 29%

Challenged 57%

Standish Group. (2012). *Chaos manifesto*. Boston, MA: Author.

Simplified APM—CASE STUDIES

- 94% of worldwide IT projects use agile methods
- Includes regulated industries, i.e., DoD, FDA, etc.
- Agile now used for safety critical systems, FBI, etc.

Industry	Org	Project	Purpose	Size	Metrics
Electronic Commerce	Google	Adwords	Advertising	• 20 teams • 140 people • 5 countries	• 1,838 User Stories • 6,250 Function Points • 500,000 Lines of Code
Shrink Wrapped	Primavera	Primavera	Project Management	• 15 teams • 90 people • Collocated	• 26,809 User Stories • 91,146 Function Points • 7,291,666 Lines of Code
Health Care	FDA	m2000	Blood Analysis	• 4 teams • 20 people • Collocated	• 1,659 User Stories • 5,640 Function Points • 451,235 Lines of Code
Law Enforcement	FBI	Sentinel	Case File Workflow	• 10 teams • 50 people • Collocated	• 3,947 User Stories • 13,419 Function Points • 1,073,529 Lines of Code
U.S. DoD	Stratcom	SKIweb	Knowledge Management	• 3 teams • 12 people • Collocated	• 390 User Stories • 1,324 Function Points • 105,958 Lines of Code

Rico, D. F. (2010). Lean and agile project management: For large programs and projects. *Proceedings of the First International Conference on Lean Enterprise Software and Systems, Helsinki, Finland*, 37-43.

Simplified APM—SWEET SPOT

- Exploratory or research/development projects
- When fast customer responsiveness is paramount
- In organizations that are highly innovative/creative

Traditional Project Management	Agile Project Management
• Predictable situations	• High levels of uncertainty and unpredictability
• Low technology projects	• High technology projects
• Stable, slow moving industries	• Fast paced, highly competitive industries
• Low levels of technological change	• Rapid pace of technological change
• Repeatable operations	• Research oriented, discovery projects
• Low rates of changing project performance	• Large fluctuations in project performance
• Long term, fixed price production contracts	• Shorter term, performance based RDT&E contracts
• Achieving concise economic efficiency goals	• Achieving high impact product/service effectiveness
• Highly administrative contracts	• Highly creative new product development contracts
• Mass production and high volume manufacturing	• Customer intensive, one off product/service solutions
• Highly predictable and stable market conditions	• Highly volatile and unstable market conditions
• Low margin industries such as commodities	• High margin, intellectually intensive industries
• Delivering value at the point of plan	• Delivering value at the point of sale

Pine, B. J. (1993). *Mass customization*: *The new frontier in business competition*. Boston, MA: Harvard Business School Press.
Rico, D. F. (2012). *Agile vs. traditional projects*. Retrieved February 6, 2013, from http://davidfrico.com/tpm-vs-apm-ii.pdf

Simplified APM—SUMMARY

- ☐ Agile methods DON'T mean deliver it now & fix it later
- ☐ Lightweight, yet disciplined approach to development
- ☐ Reduced cost, risk, & waste while improving quality

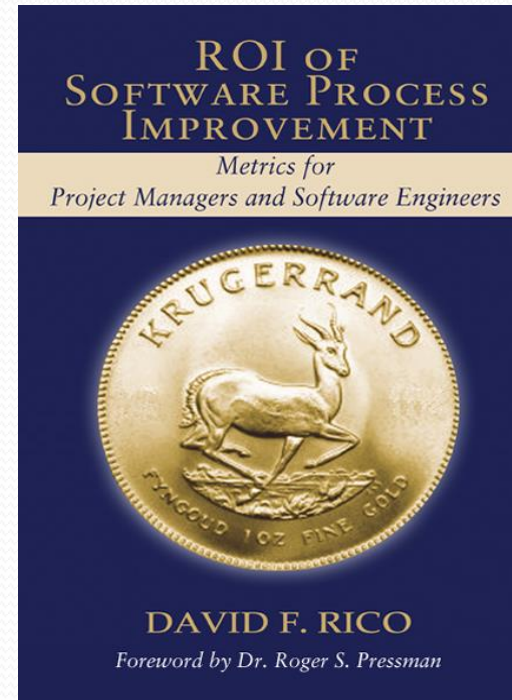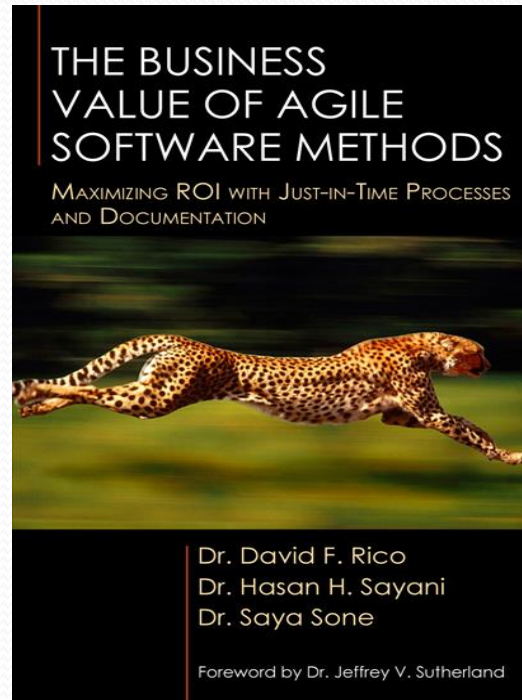| What	How	Result
Flexibility	Use lightweight, yet disciplined processes and artifacts	Low work-in-process
Customer	Involve customers early and often throughout development	Early feedback
Prioritize	Identify highest-priority, value-adding business needs	Focus resources
Descope	Descope complex programs by an order of magnitude	Simplify problem
Decompose	Divide the remaining scope into smaller batches	Manageable pieces
Iterate	Implement pieces one at a time over long periods of time	Diffuse risk
Leanness	Architect and design the system one iteration at a time	JIT waste-free design
Swarm	Implement each component in small cross-functional teams	Knowledge transfer
Collaborate	Use frequent informal communications as often as possible	Efficient data transfer
Test Early	Incrementally test each component as it is developed	Early verification
Test Often	Perform system-level regression testing every few minutes	Early validation
Adapt	Frequently identify optimal process and product solutions	Improve performance

"The world of traditional project management belongs to yesterday"
"Don't waste your time using traditional project management on 21ˢᵗ century projects"
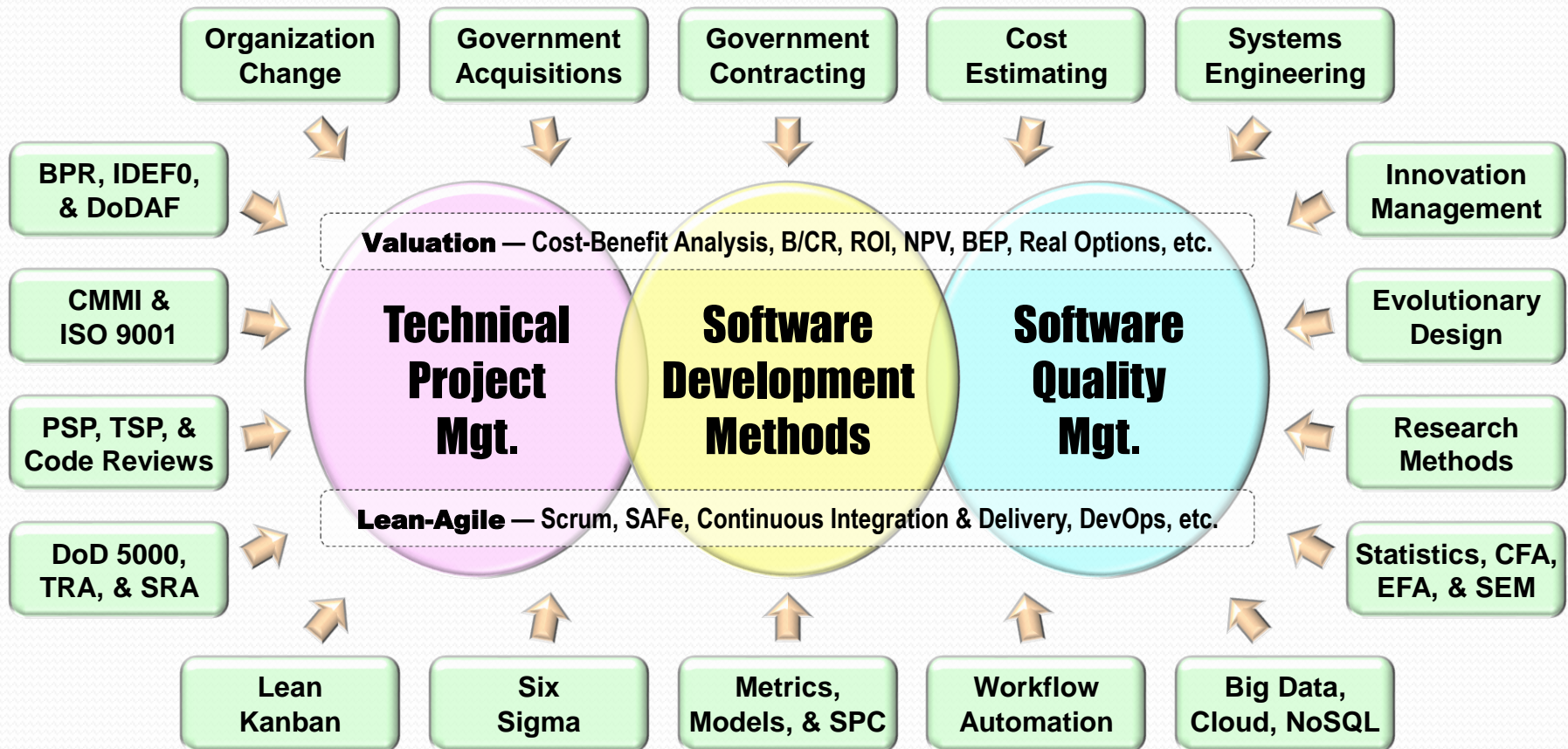
Books on AGILE & TRAD. ROI

- Guides to software methods for business leaders
- Communicates the business value of IT approaches
- Rosetta stones to unlocking ROI of software methods

- http://davidfrico.com/agile-book.htm (*Description*)
- http://davidfrico.com/roi-book.htm (*Description*)

Dave's PROFESSIONAL CAPABILITIES

Organization Change	Government Acquisitions	Government Contracting	Cost Estimating	Systems Engineering

BPR, IDEF0, & DoDAF		Innovation Management

Valuation — Cost-Benefit Analysis, B/CR, ROI, NPV, BEP, Real Options, etc.

Technical Project Mgt.

Software Development Methods

Software Quality Mgt.

CMMI & ISO 9001		Evolutionary Design

PSP, TSP, & Code Reviews		Research Methods

Lean-Agile — Scrum, SAFe, Continuous Integration & Delivery, DevOps, etc.

DoD 5000, TRA, & SRA		Statistics, CFA, EFA, & SEM

Lean Kanban	Six Sigma	Metrics, Models, & SPC	Workflow Automation	Big Data, Cloud, NoSQL

STRENGTHS – Data Mining ● Gathering & Reporting Performance Data ● Strategic Planning ● Executive & Management Briefs ● Brownbags & Webinars ● White Papers ● Tiger-Teams ● Short-Fuse Tasking ● Audits & Reviews ● Etc.

- **Data mining**. Metrics, benchmarks, & performance.
- **Simplification**. Refactoring, refinement, & streamlining.
- **Assessments**. Audits, reviews, appraisals, & risk analysis.
- **Coaching**. Diagnosing, debugging, & restarting stalled projects.
- **Business cases**. Cost, benefit, & return-on-investment (ROI) analysis.
- **Communications**. Executive summaries, white papers, & lightning talks.
- **Strategy & tactics**. Program, project, task, & activity scoping, charters, & plans.

32 YEARS IN IT INDUSTRY

PMP, CSEP, FCP, FCT, ACP, CSM, & SAFE

25