

BUILDING AN AGILE ENTERPRISE

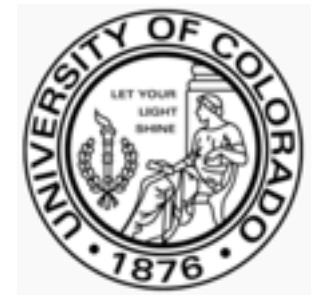
Faster Than You Think: Software in 30 Days

With help from Citrix Online, Google, Yahoo, Microsoft, IBM, Oracle, MySpace, Adobe, GE, Siemens, Disney Animation, BellSouth, Nortel, Alcatel-Lucent, GSI Commerce, Ulticom, Palm, St. Jude Medical, DigiChart, RosettaStone, Healthwise, Sony Ericsson, Accenture, Trifork, Systematic Software Engineering, Exigen Services, SirsiDynix, Softhouse, Philips, Barclays Global Investors, Constant Contact, Wellogic, Inova Solutions, Medco, Saxo Bank, Xebia, Insight.com, SolutionsIQ, Crisp, Johns Hopkins Applied Physics Laboratory, Unitarian Universalist Association, Motley Fool, Planon, FinnTech, OpenView Venture Partners, Jyske Bank, BEC, Camp Scrum, DotWay AB, Ultimate Software, Scrum Training Institute, AtTask, Intronis, Version One, OpenView Labs, Central Desktop, Open-E, Zmags, eEye, Reality Digital, DST, Booz Allen Hamilton, Scrum Alliance, Fortis, DIPS, Program UtVikling, Sulake, TietoEnator, Gilb.com, WebGuide Partner, Emergn, NSB (Norwegian Railway), Danske Bank, Pegasystems, Wake Forest University, The Economist, iContact, Avaya, Kanban Marketing, accelare, Tam Tam, Telefonica/O2, iSense/Prowareness, AgileDigm, Highbridge Capital Management, Wells Fargo Bank, Deutsche Bank, Hansenet/Alice, GlobalConnect, U.S. Department of Defense, Agile Lean Training, Good Agile, Océ, aragostTRIFORK, Harvard Business School, Schuberg Philis, ABN/AMRO Bank-Dialogues House, Acme Packet, Prognosis, Markem-Image International



Biographical Sketch - Jeff Sutherland

- 1960-1975 - West Point, Fighter Pilot, U.S. Air Force
 - 100 missions over North Vietnam - RF4C Phantom
- 1975-1983 - Medical School Professor
 - Complex adaptive systems research
 - Mathematical simulations of cancer cell formation
- 1983-2011 - VP/CTO/CEO 11 technology companies
 - 1983-1993 prototyping Scrum
 - 1993-2011 VP/CTO/CEO 7 Scrum companies
 - 2006-2011 Senior Advisor, OpenView Ventures
 - 16 portfolio companies doing Scrum



Traditional Projects are High Risk

	1994	1996	1998	2000	2002	2004	2006	2009
Successful	16%	27%	26%	28%	34%	29%	35%	32%
Challenged	53%	33%	46%	49%	51%	53%	46%	44%
Failed	31%	40%	28%	23%	15%	18%	19%	24%



Late
Upset
Pressure
Unhappy

Projects are late
Management is upset
Developers are under pressure
Customers are unhappy

Sources:

<http://www.softwaremag.com/L.cfm?Doc=newsletter/2004-01-15/Standish>

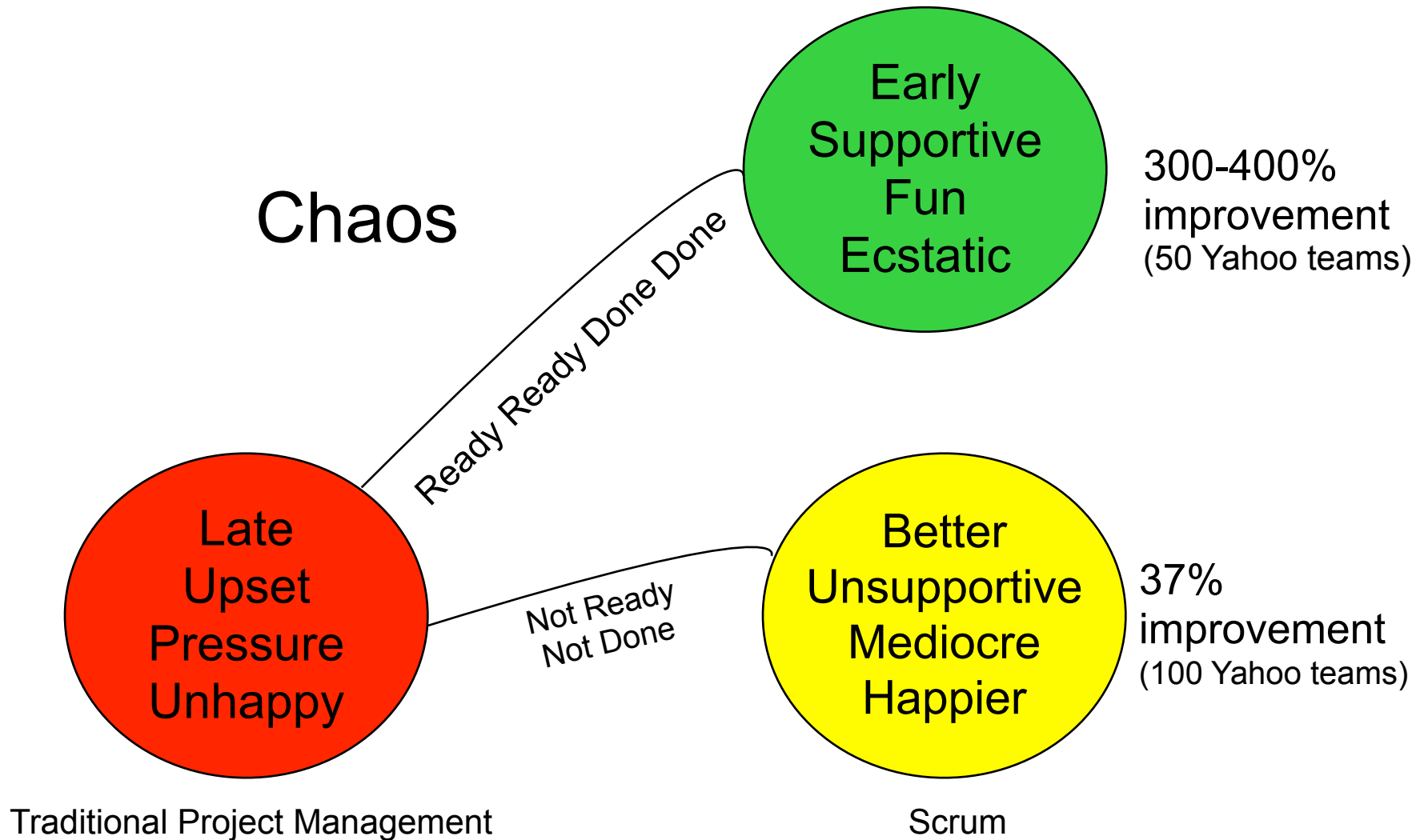
<http://www.infoq.com/articles/Interview-Johnson-Standish-CHAOS>

<http://www.projectsart.co.uk/the-curious-case-of-the-chaos-report-2009.html>

Bigger organizations have bigger problems

- The biggest bank in the Netherlands had a project with 91 people.
- Scrum coach asked to meet with engineers (only 10 of them). Other 81 people were project leaders.
- Now have 10 developers and 1 Product Owner.
- Cost reduction of 88% before even starting Scrum implementation.

After introducing Scrum ...



Changing the way of work

- Team needs to be hyperproductive.
- What does a great ScrumMaster do?



The Scrum Way



Sutherland, Kenji, Nonaka - Tokyo, Jan 2011

The Japanese view Scrum as:
A way of doing
A way of being
A way of life

Project Management Styles

Requirements

Analysis

Design

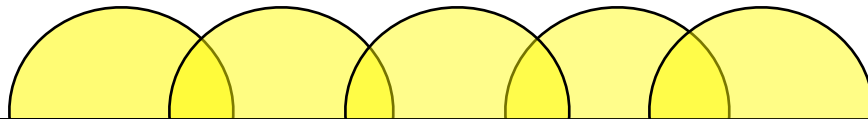
Implementation

Testing



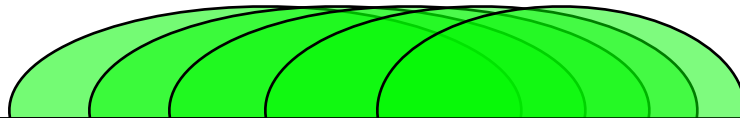
Type A – Isolated cycles of work

NASA Waterfall



Type B – Overlapping work

Fuji-Xerox Scrum



Type C – All at once

Honda Scrum

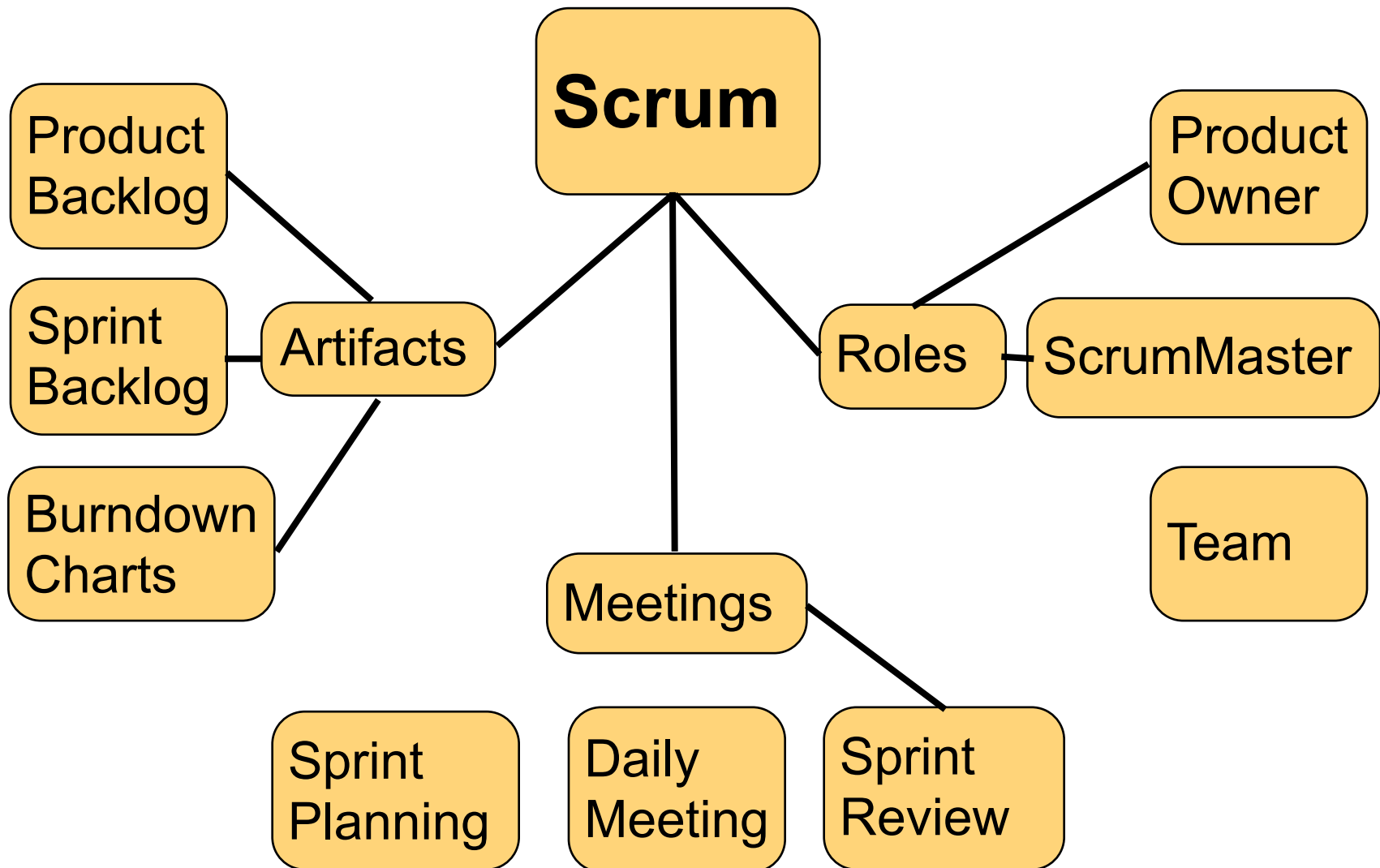
*The overlapping of phases does away with traditional notions about division of labor.
Takeuchi and Nonaka (1986)*

What is Scrum?



All Blacks New Zealand

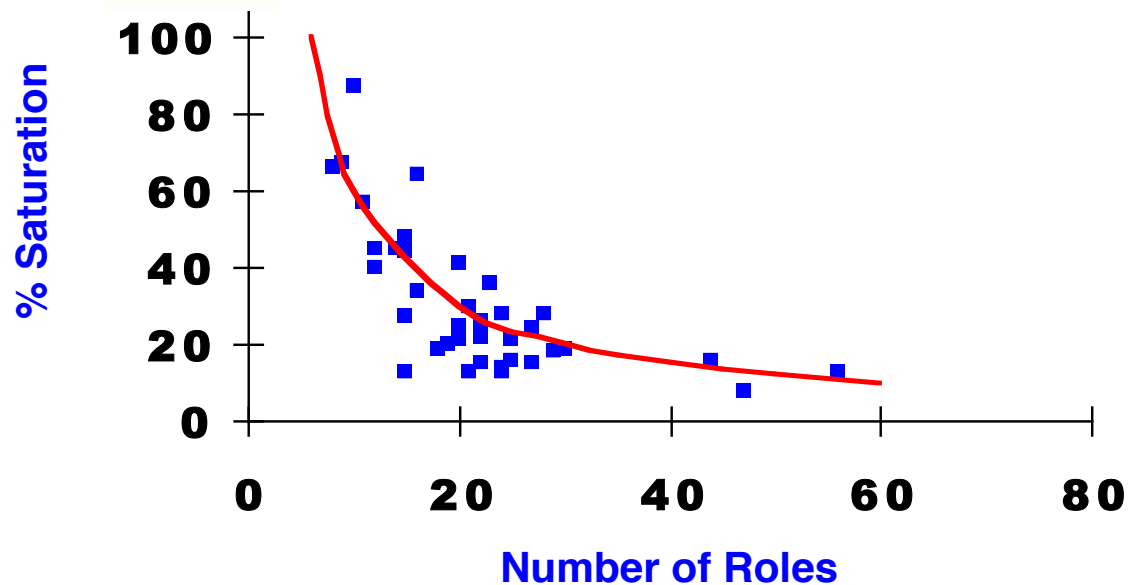
Scrum is a Simple Framework



Why we have a daily meeting

ATT Bell Labs Pasteur Project

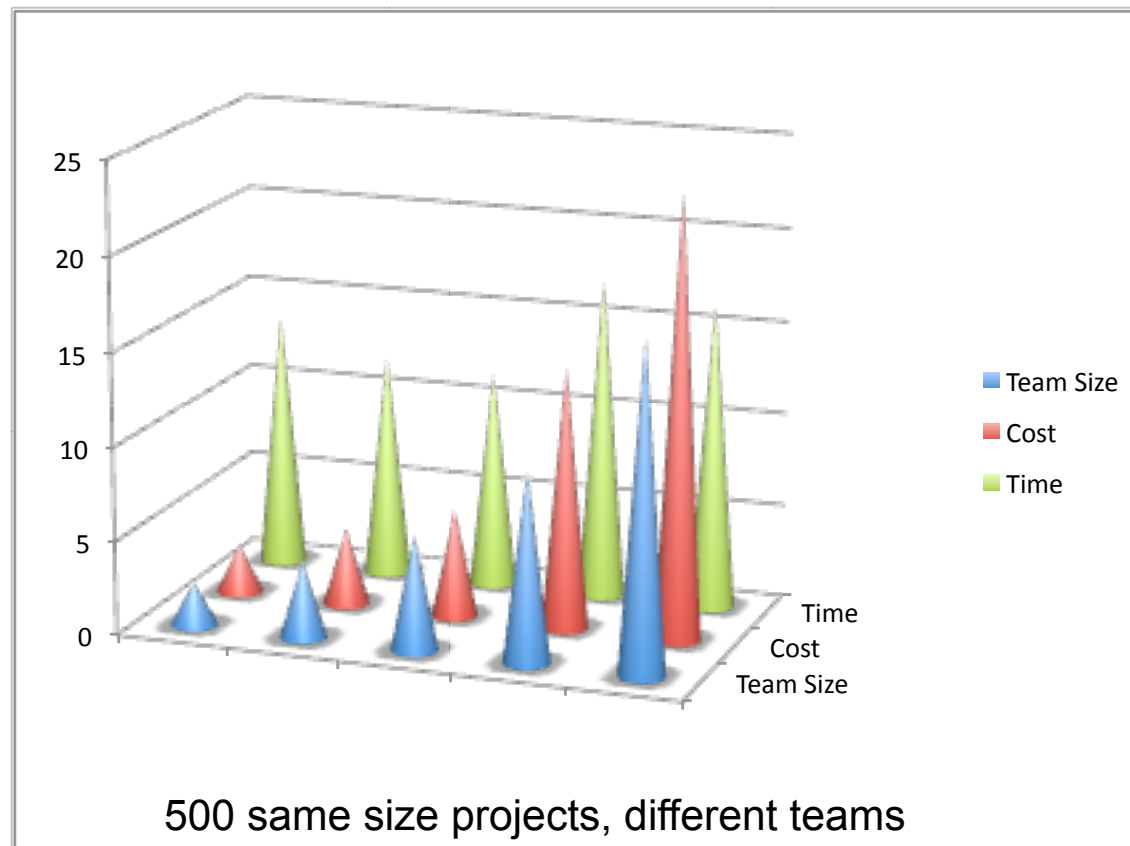
- Communication Saturation is key performance driver
- Daily meeting with few roles maximizes communication saturation



Communication Saturation and Roles. Organizational Patterns of Agile Software Development by Coplien and Harrison (2004)

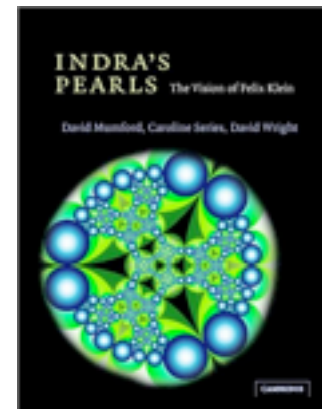
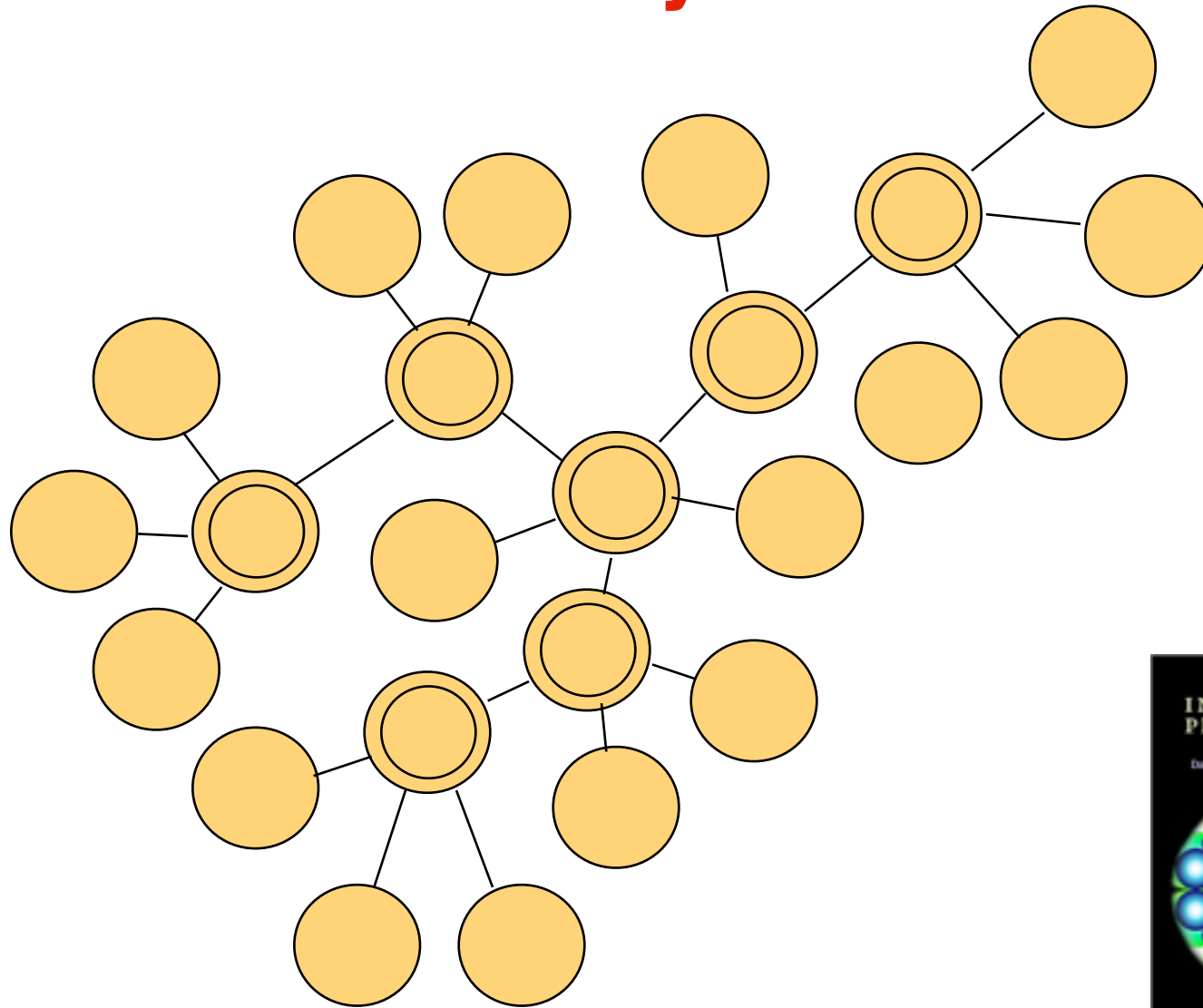
Brooks Law

- Adding people to a late project makes it later



Source: http://www.qsm.com/process_01.html (491 projects)

Linear scalability



Company Structure

Disciplined	Bureaucracy <ul style="list-style-type: none">• Rigid rule enforcement• Extensive written rules and procedures• Hierarchy controls	Leadership <ul style="list-style-type: none">• Empowered employees• Rules and procedures as enabling tools• Hierarchy supports organizational learning
	Autocracy <ul style="list-style-type: none">• Top down control• Minimum rules and procedures• Hierarchy controls	Organic <ul style="list-style-type: none">• Empowered employees• Minimum rules and procedures• Little hierarchy
Whimsical	Coercive	Empowering

Adapted from Liker, JK (2004) The Toyota Way. McGraw Hill.

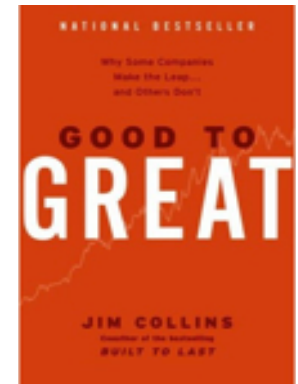
Breaking down command and control

- Emergent strategy self-organizes through local actions
 - Distributed cognition and actions
- Scrum team must be allowed to self-organize
 - Autonomous
 - Transcendent
 - Cross-fertilization
- Team chooses own work



Managers need to be Leaders

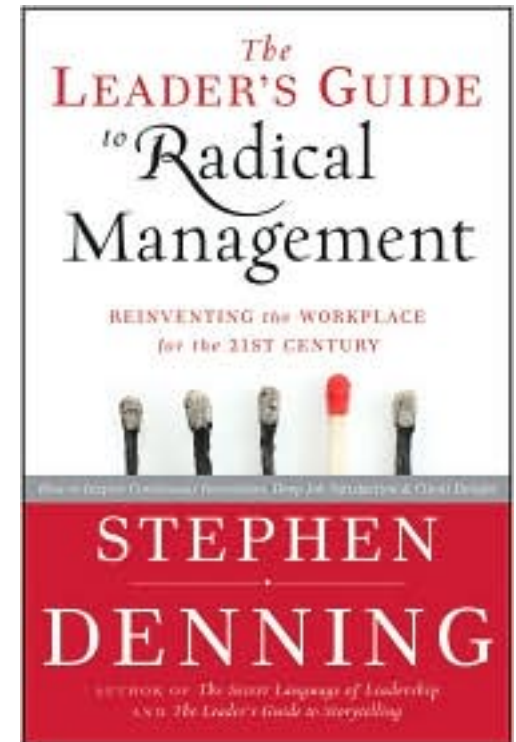
- Leaders can “find” and utilize spontaneously formed *ba*
- Leaders can build *ba* by providing space for interactions
 - Physical space such as meeting rooms
 - Cyberspace such as computer network
 - Mental space such as common goals
- Fostering trust and commitment forms the foundation of knowledge creation (self-organization)
- *Scrum is based on TRUTH, TRANSPARENCY, COMMITMENT, and TRUST*



The Practices of Scrum

Radical Management by Stephen Denning

- Organize work in short cycles.
- The management doesn't interrupt the team during a work cycle.
- The team reports to the client not the manager.
- The team estimates how much time work will take.
- The team decides how much work they can do in an iteration.
- The team decides how to do the work in the iteration.
- The team measures its own performance.
- Define work goals before each cycle starts.
- Define work goals through user stories.
- Systematically remove impediments.



Source: Steven Denning: Scrum is a Major Management Discovery. Forbes Blog. April 29, 2011.



Going from Good to Great with Scrum

Are you **READY READY** to be **DONE DONE**?

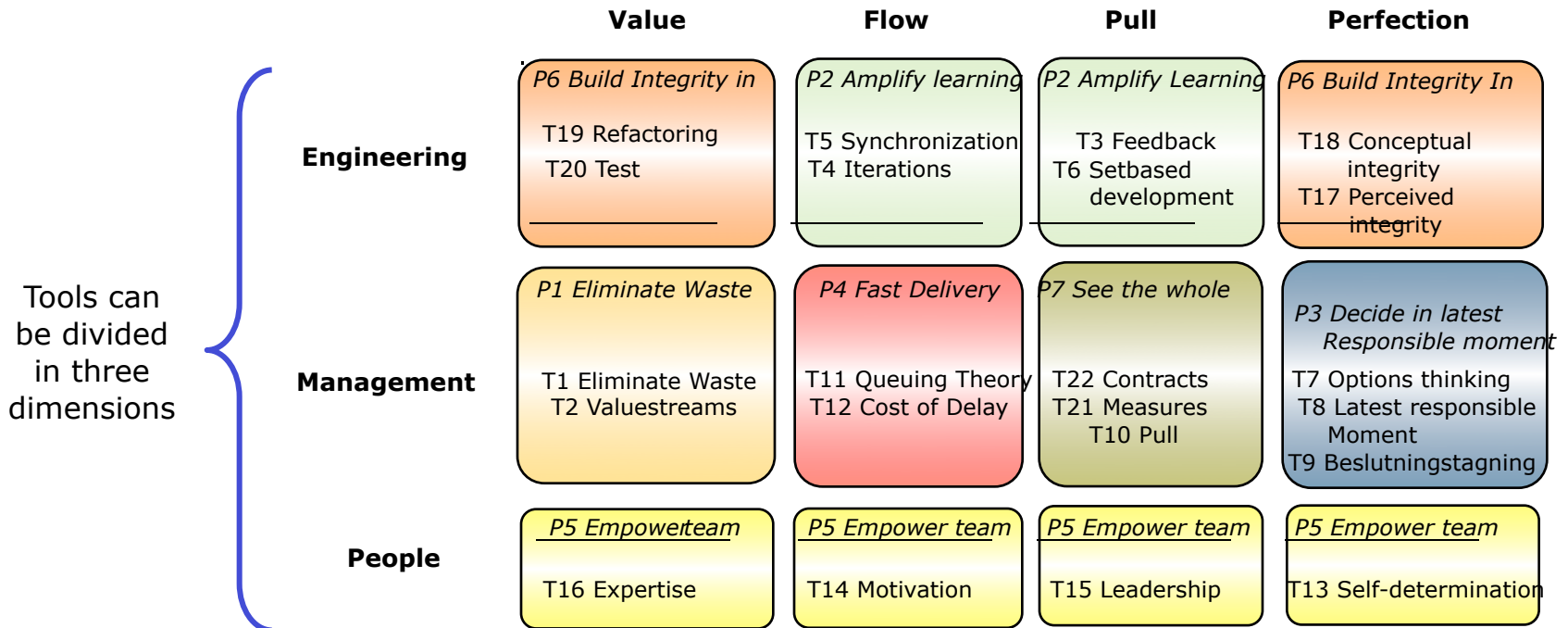
Carsten Ruseng Jakobsen and Jeff Sutherland

SYSTEMATIC

© Jeff Sutherland 1993-2011

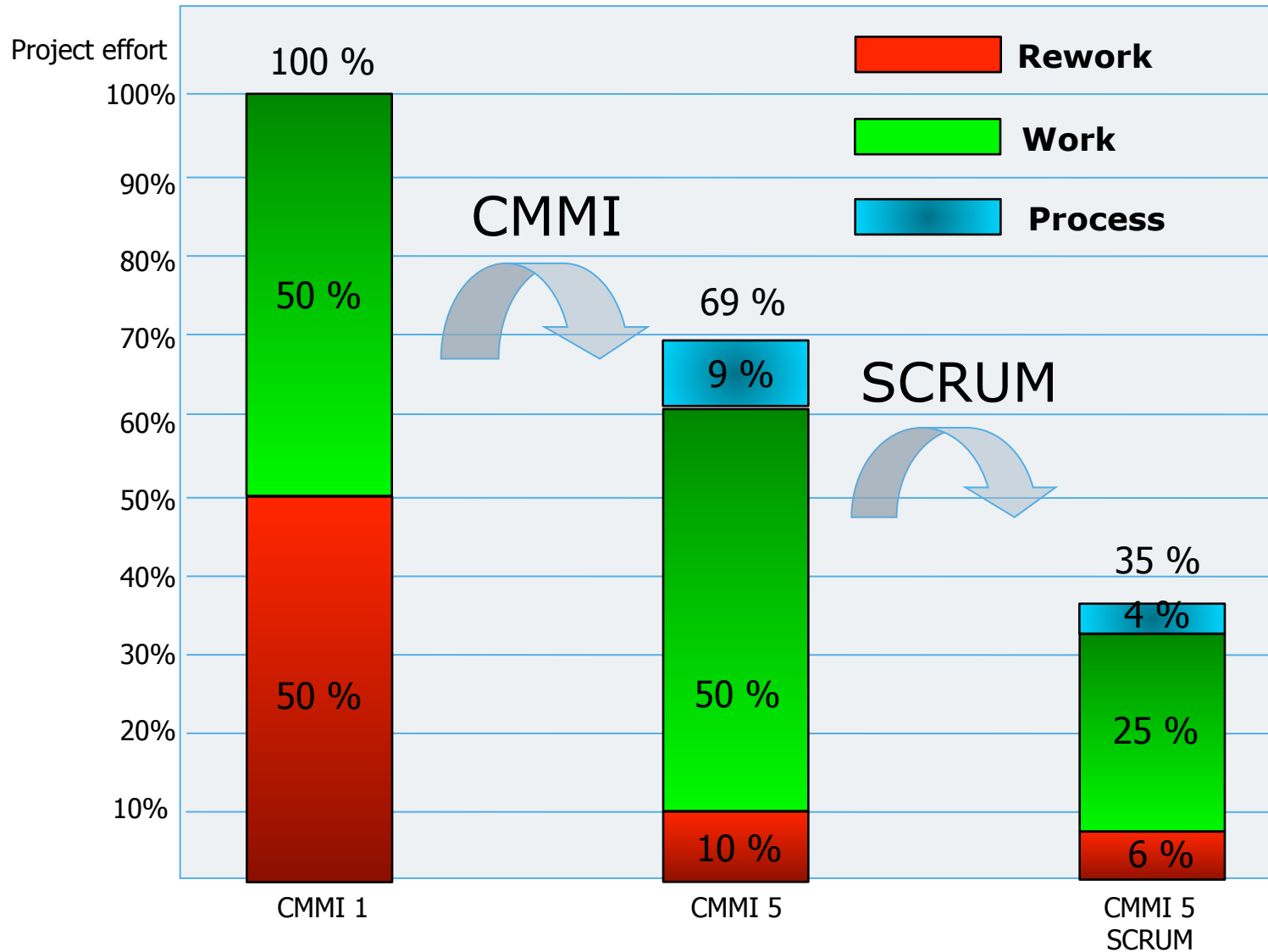
scruminc. 道德

Scrum and Lean - Systematic



Lean thinking tools

Beginner's Scrum - Systematic Results



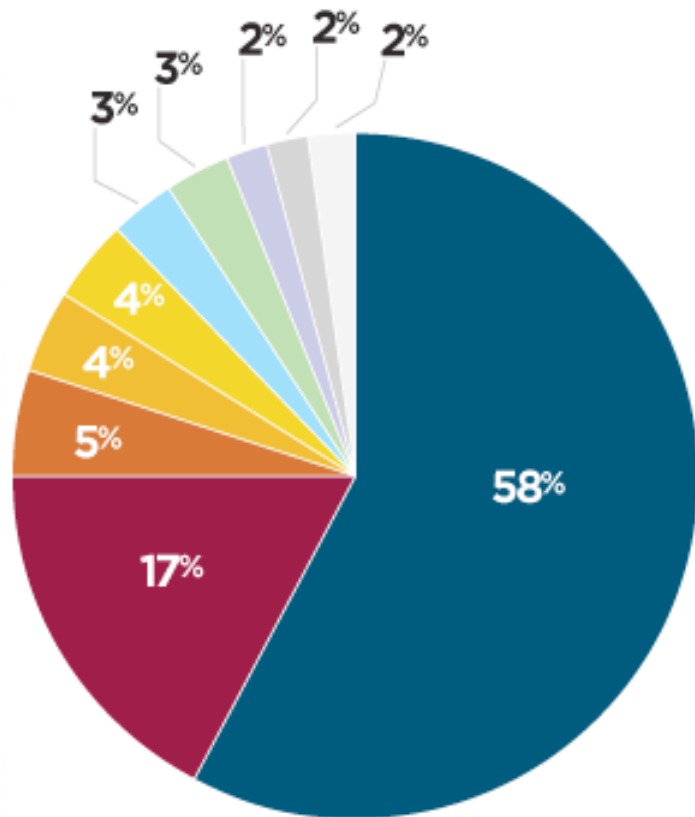
Systematic CMMI 5 Analysis (conservative)

- 80% reduction in planning cost
- 40% reduction in defects
- 50% reduction in rework
- 100% increase in overall productivity
- Estimation error < 10%
- Project completion on time > 95%
- Waterfall projects (required by some defense and healthcare contracts) are now contracted for twice the cost of Scrum projects (and produce lower quality).

J. Sutherland, C. Jacobson, and K. Johnson, "[Scrum and CMMI Level 5: A Magic Potion for Code Warriors!](#)," in *Agile 2007*, Washington, D.C., 2007.

C. Jakobsen and J. Sutherland, "[Scrum and CMMI – Going from Good to Great: are you ready-ready to be done-done?](#)," in *Agile 2009*, Chicago, 2009.

5th Annual State of Agile Development Survey



Scrum or Scrum variants were the most common agile methodologies employed.

- SCRUM
- SCRUM/XP HYBRID
- CUSTOM HYBRID
- OTHER
- EXTREME PROGRAMMING (XP)
- DON'T KNOW
- SCRUMBAN
- LEAN
- FEATURE DRIVEN DEVELOPMENT (FDD)
- AGILE UP

- This fifth annual survey was conducted between August 11 and October 31, 2010 by Version One.
- Includes information from 4,770 participants from 91 countries.
- Data was analyzed and prepared into a summary report by Analysis.Net Research, an independent survey consultancy.

Distributed/Outsourced Scrum

Google Adwords



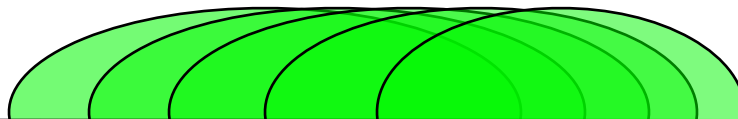
Isolated Scrums

Typical Distributed Scrum



Distributed Scrum of Scrums

U.S. - Russian Teams (SirsiDynix)



Totally Integrated Scrums

40th Annual Hawaii International Conference on System Sciences (HICSS'07)

Distributed Scrum: Agile Project Management with Outsourced Development Teams (PDF)

Big Island, Hawaii

January 03-January 06

ISBN: 0-7695-2755-8

Jeff Sutherland, Patientkeeper, USA

Anton Viktorov, StarSoft Dev. Labs, Russia

Jack Blount, SirsiDynix, USA

Nikolai Puntikov, StarSoft Dev. Labs, Russia

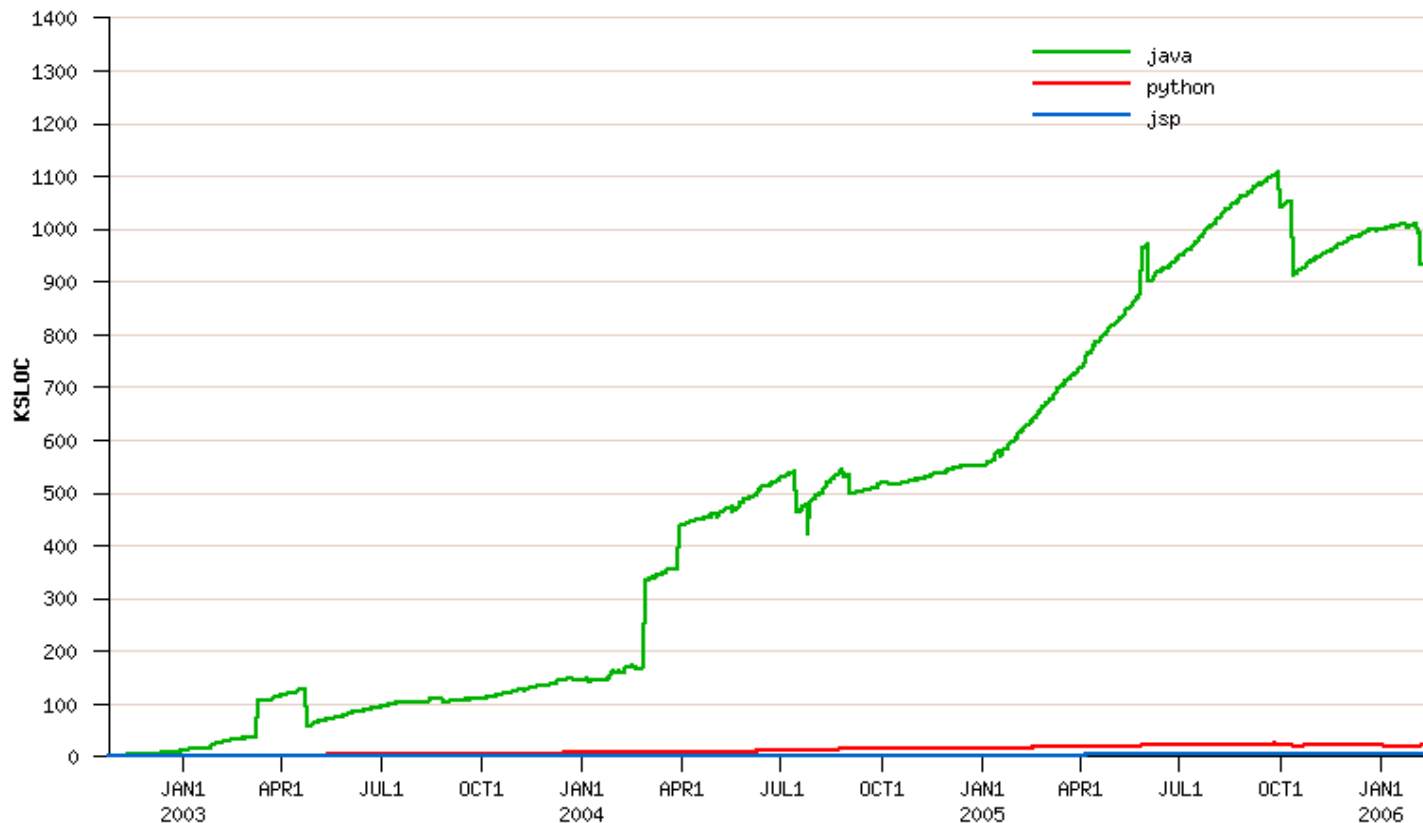
DOI Bookmark: <http://doi.ieeecomputersociety.org/10.1109/HICSS.2007.180>

ABSTRACT

Agile project management with Scrum derives from best business practices in companies like Fuji-Xerox, Honda, Canon, and Toyota. Toyota routinely achieves four times the productivity and 12 times the quality of competitors. Can Scrum do the same for globally distributed teams? Two Agile companies, SirsiDynix and StarSoft Development Laboratories achieved comparable performance developing a Java application with over 1,000,000 lines of code. During 2005, a distributed team of 56 Scrum developers working from Provo, Utah; Waterloo, Canada; and St. Petersburg, Russia, delivered 671,688 lines of production Java code. At 15.3 function points per developer/month, this is the most productive Java project ever documented. SirsiDynix best practices are similar to those observed on distributed Scrum teams at IDX Systems, radically different than those promoted by PMBOK, and counterintuitive to practices advocated by the Scrum Alliance. This paper analyzes and recommends best practices for globally distributed Agile teams.

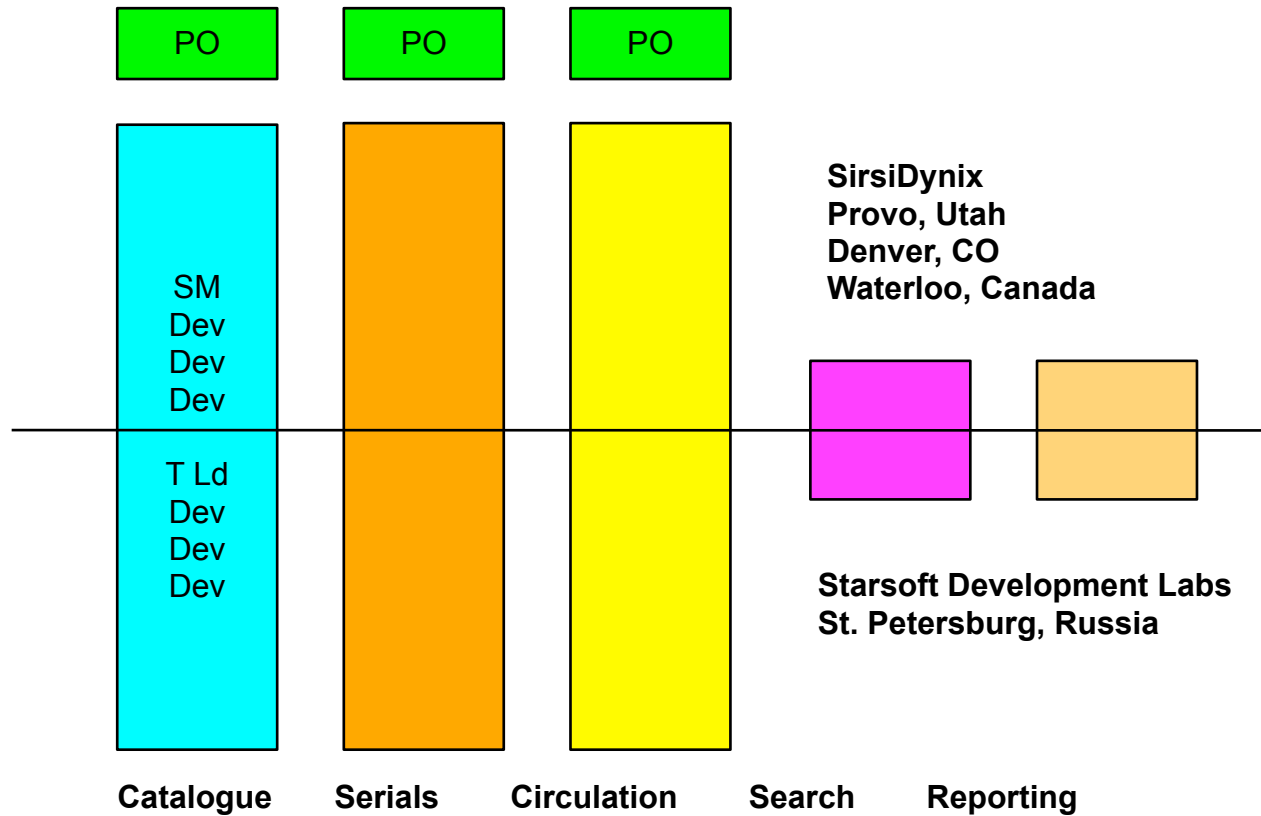
SirsiDynix - 12,500 library systems in 42 countries

- Over a million lines of Java code



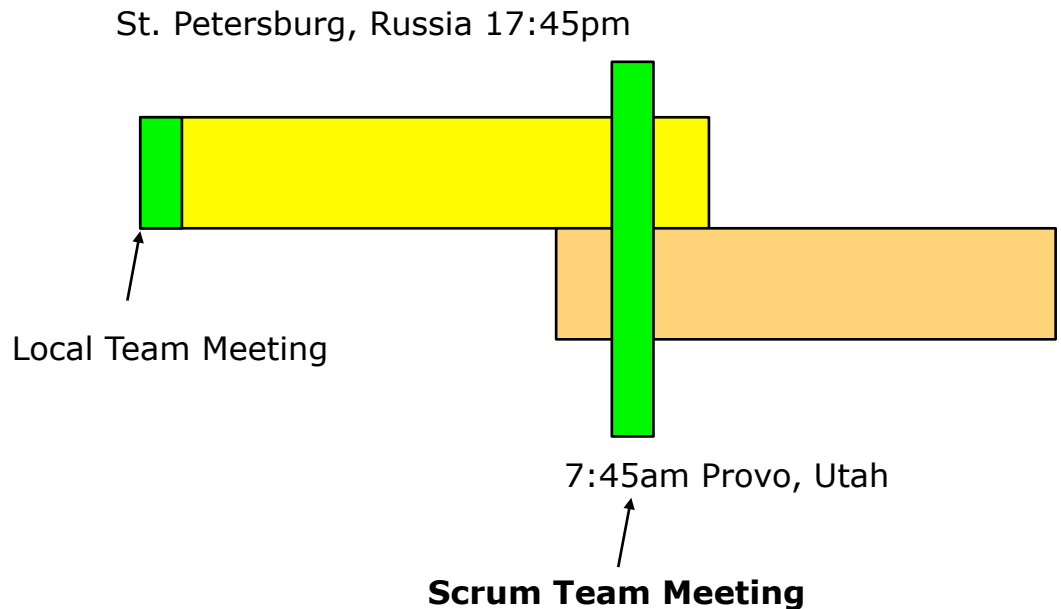
SirsiDynix Scrum Teams

- 56 developers distributed across sites



SirsiDynix Scrum Teams

- Scrum daily meetings



Velocity in Function Points/Dev month

	Scrum[1]	Waterfall[1]	SirsiDynix[2]
Person Months	54	540	827
Lines of Java	51,000	58,000	671,688
Function Points	959	900	12673
Function Points per Dev/Month	17.8	2.0	15.3

1. M. Cohn, User Stories Applied for Agile Development. Addison-Wesley, 2004
2. J. Sutherland, A. Viktorov, J. Blount, and N. Puntikov, "Distributed Scrum: Agile Project Management with Outsourced Development Teams," in HICSS'40, Hawaii International Conference on Software Systems, Big Island, Hawaii,

Research Issue

- SirsiDynix was a retrospective study of a single data point
- Even if quality was perfect, it does not prove anyone else can do it.
- Even worse, if you observe a finding after the fact, you cannot infer causality
- Is SirsiDynix a lucky accident? Or maybe an unlucky accident?

SirsiDynix Opportunity

- A prospective study should be done
 - full XP technical practices
 - multiple projects with standard model
 - meet or exceed SirsiDynix velocity
 - ensure quality levels in the top 1% of the software industry.

The Cutting Edge of Research
ICN Clinical Trial
& Research Center

Research into IC/PBS is at a fast pace as the medical community seeks to develop new therapies and understand the physiology and genetics of IC and its related conditions. Your participation can help to advance our knowledge of this puzzling syndrome.



Setting up a prospective study

- Define the distributed team model before projects start
- Assure consistent talent, tools, process, and organization across geographies
- Establish high quality data gathering techniques on velocity, quality, cost and environmental factors.
- Run a consistent team model on a series of projects and look for comparable results
- Demonstrate that local velocity = distributed velocity
- Demonstrate that local quality = distributed quality
- Demonstrate linear scaling at constant velocity per developer

Agile 2008

Fully Distributed Scrum: The Secret Sauce for Hyperproductive Offshored Development Teams (PDF)

August 04-August 08

ISBN: 978-0-7695-3321-6

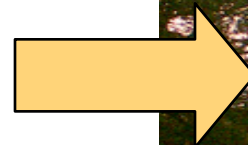
Jeff Sutherland
Guido Schoonheim
Eelco Rustenburg
Maurits Rijk

DOI Bookmark: <http://doi.ieeecomputersociety.org/10.1109/Agile.2008.92>

ABSTRACT

Scrum was designed to achieve a hyperproductive state where productivity increases 5-10 times over industry averages and many collocated teams have achieved this effect. The question for this paper is whether distributed, offshore teams can consistently achieve the hyperproductive state. In particular, can a team establish a localized velocity and then maintain or increase that velocity when distributing teams across continents. Since 2006, Xebia started projects with half Dutch and half Indian team members. After establishing localized hyperproductivity, they move the Indian members of the team to India and show increasing velocity with fully distributed teams. After running XP engineering practices inside many distributed Scrum projects, Xebia has systematically productized a model very similar to the SirsiDynix model [1] for high performance, distributed, offshore teams with outstanding quality.

Xebia Case study: Building a new railway information system (ProRail)



Xebia / ProRail Example

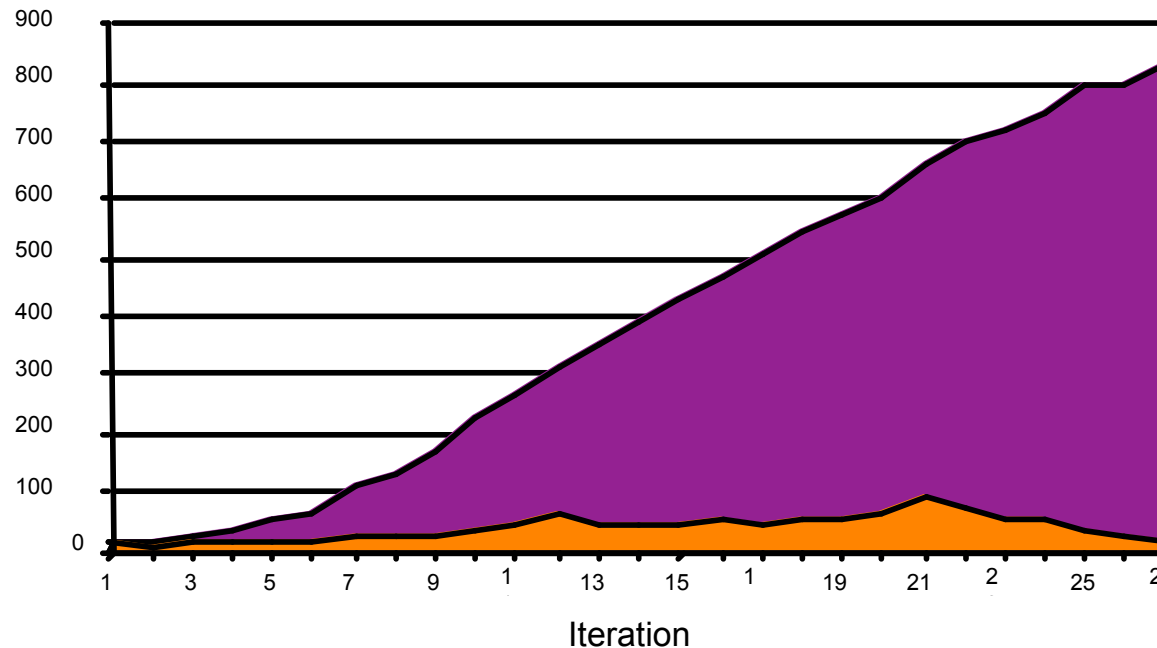
- ProRail rescued a failed waterfall project to build a new scheduling system and automated railway station signs at all Netherlands railway stations
- An 8 person half-Dutch and half-Indian Scrum team started the project and established local velocity.
- After establishing local velocity at 5 times other waterfall vendors on the project, the Indian half of the team went back to India.

Xebia/ProRail Definition of Done

- The customer completes acceptance testing on all features during each Sprint.
- Done at the end of the Sprint means customer has accepted the code as ready for production.
- Defect rates are less than 1 per 1000 lines of code and steadily getting lower.

Xebia/ProRail Defect Tracking

Cumulative vs. open defects



- Defect rate gets lower and lower as code base increases in size
- 95% of defects found inside iteration are eliminated before the end of the iteration

Xebia Team Characteristics

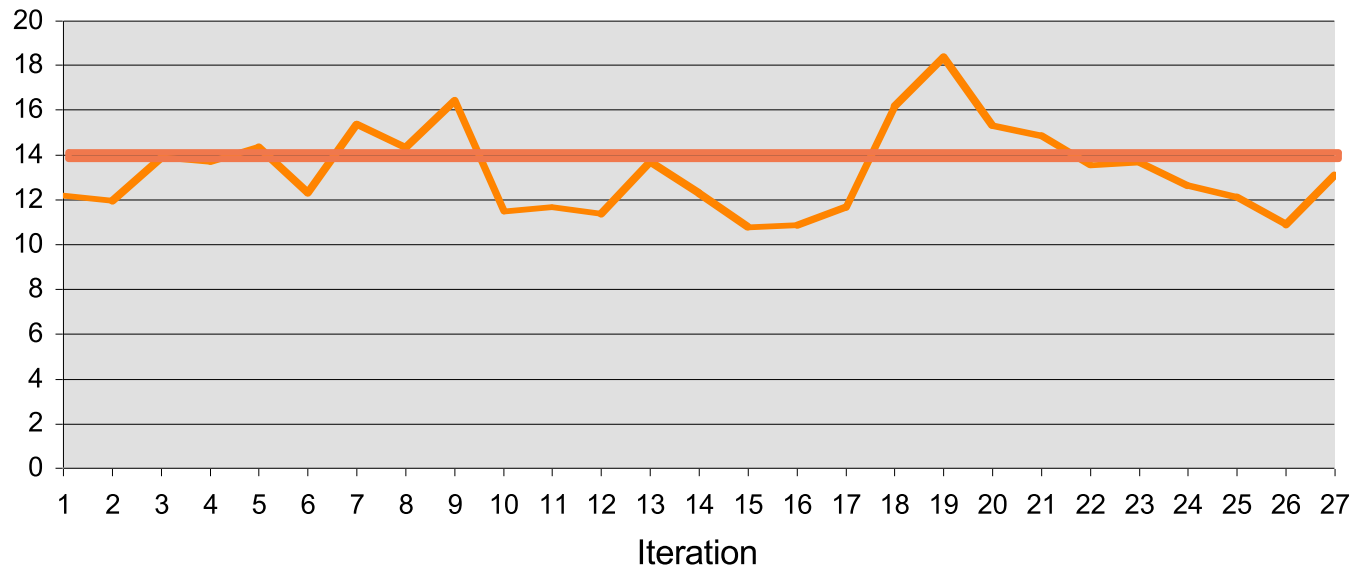
- TDD, pair programming, continuous integration. Same tools and techniques onshore and offshore.
- Daily Skype video Scrum meeting of team across geographies.
- SmartBoards, wikis, and other tools used to enhance communication.
- Indians say it feels exactly the same in India as it does in Amsterdam. They do the same thing in the same way.

Resolving Cultural Differences

- One team had velocity decrease after distributing the team.
- Root cause analysis indicated the Indians were waiting for the senior Indian developer to tell them what to do.
- The same day this was determined, the Dutch ScrumMaster became a team member and the lead Indian developer became the ScrumMaster.
- Distributed velocity immediately went up to previously established local velocity.

Xebia Monitors Cost per Story Point

Hours/Storypoint

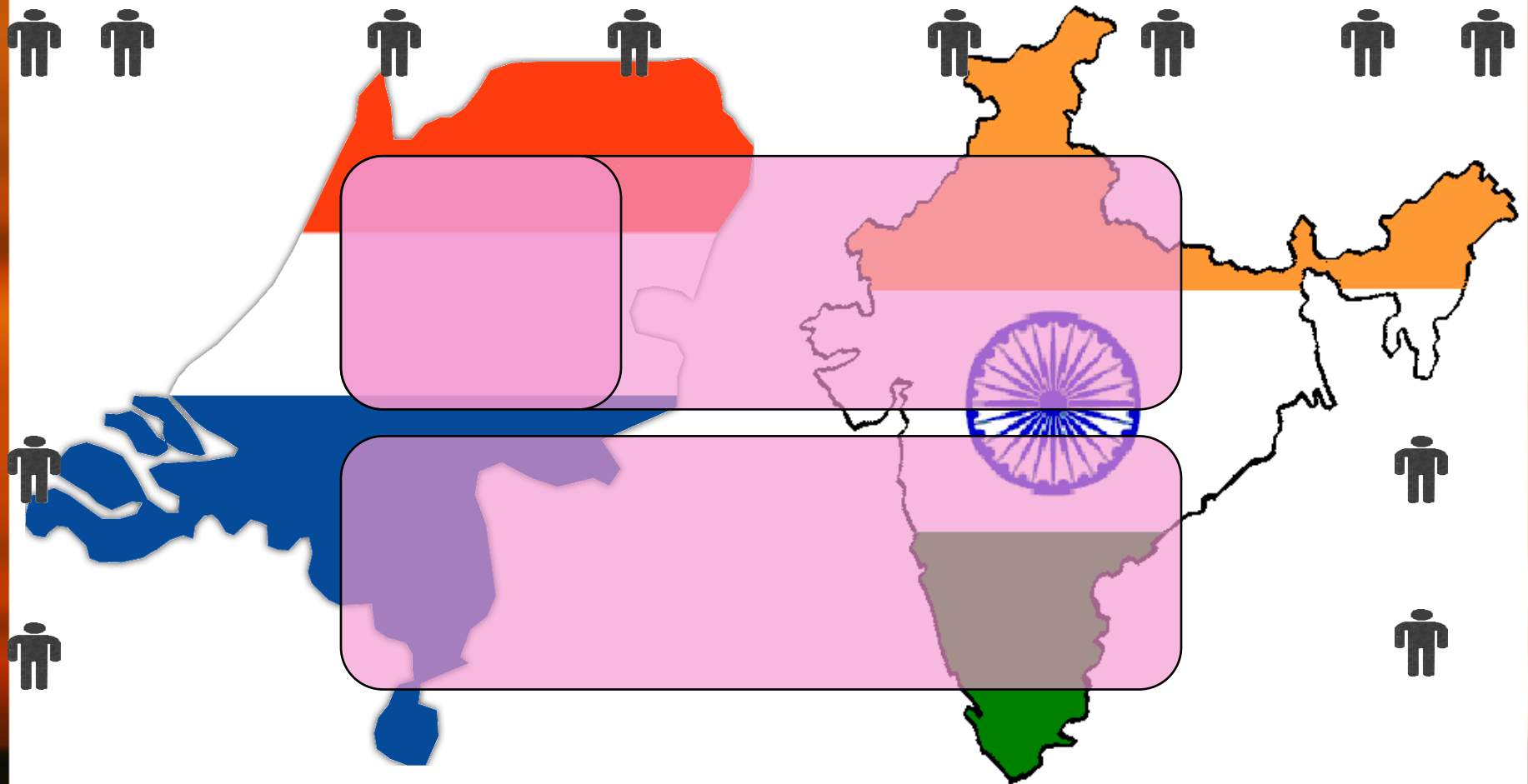


Dutch Velocity vs. Russian Velocity

	SirsiDynix[2]	Xebia[3]
Person Months	827	125
Lines of Java	671,688	100,000
Function Points	12673	1887
Function Points per Dev/Month	15.3	15.1

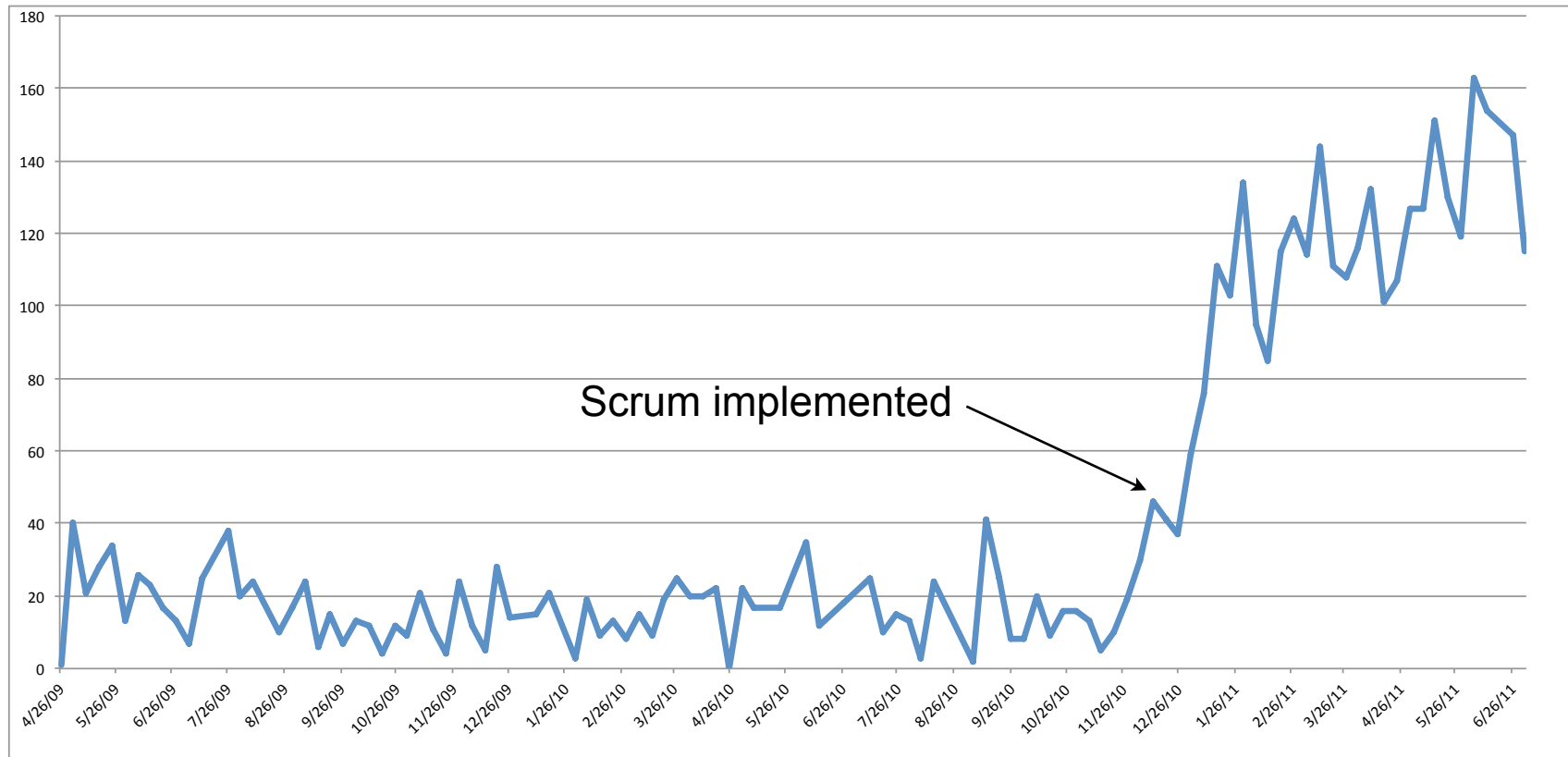
1. M. Cohn, User Stories Applied for Agile Development. Addison-Wesley, 2004
2. J. Sutherland, A. Viktorov, J. Blount, and N. Puntikov, "Distributed Scrum: Agile Project Management with Outsourced Development Teams," in HICSS'40, Hawaii International Conference on Software Systems, Big Island, Hawaii,
3. J. Sutherland, G. Schoonheim, E. Rustenburg, M. Rijk. Fully Distributed Scrum: The Secret Sauce for Hyperproductive Outsourced Development Teams. Agile 2008, Toronto, Aug 4-8 (submission, preliminary data)

Xebia Fully Distributed Scrum



Investors want team performance

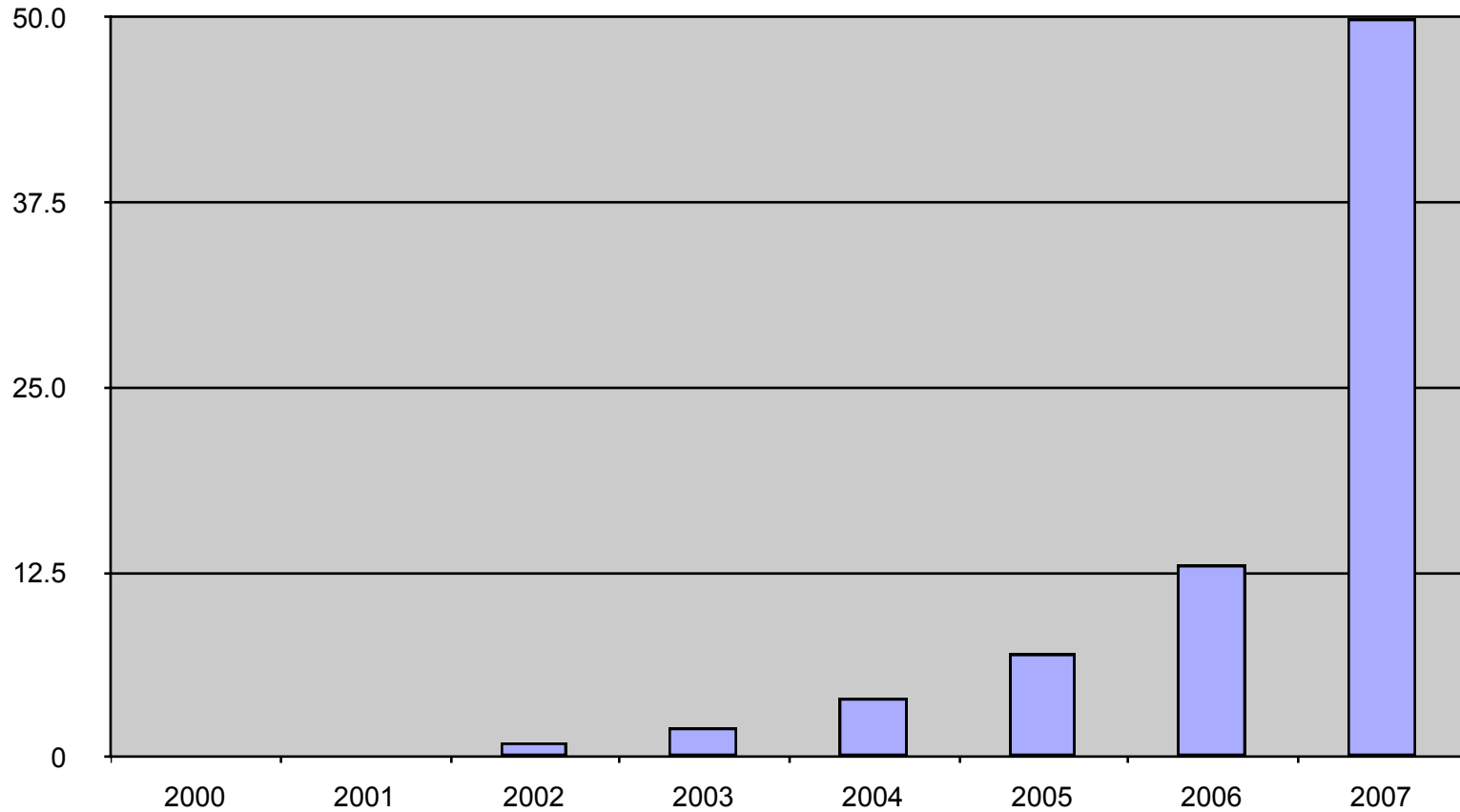
How ScrumInc quadrupled velocity



Investors want revenue performance

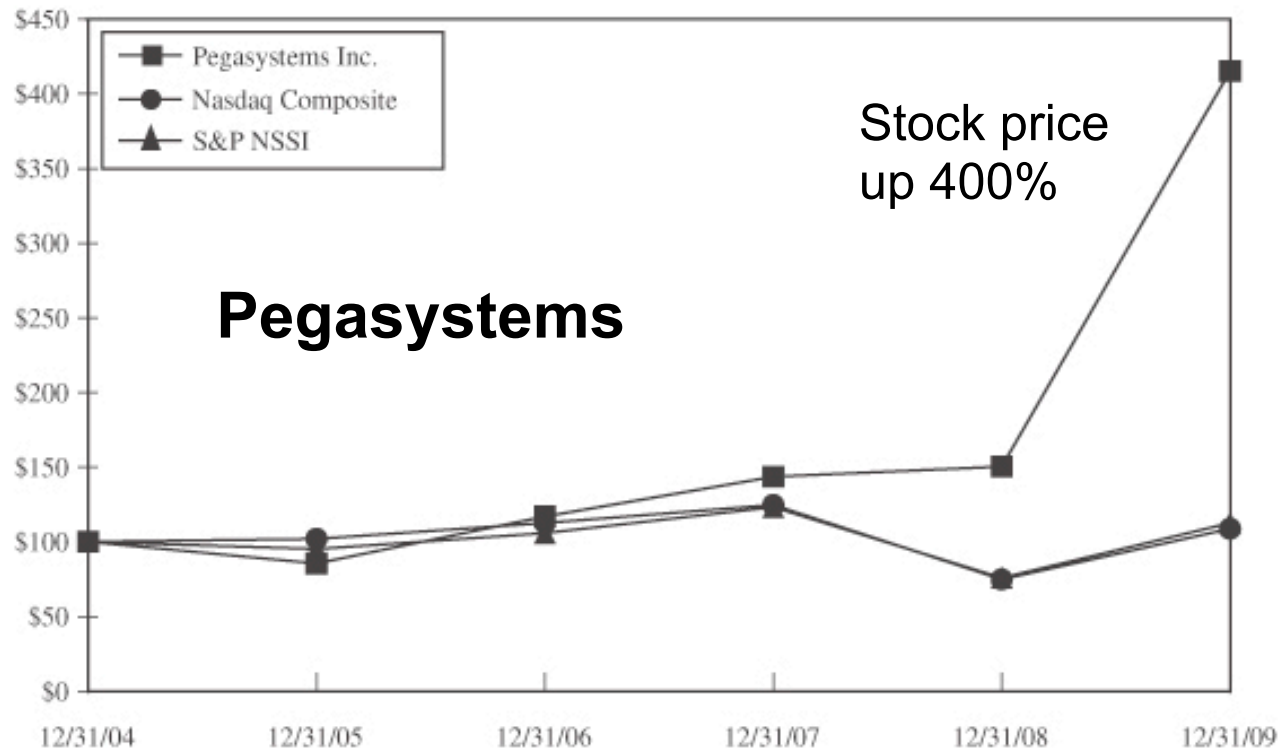
How PatientKeeper quadrupled revenue

PatientKeeper Revenue (millions USD)



Investors want stock performance

How Pegasystems quadrupled stock price



	12/31/04	12/31/05	12/31/06	12/31/07	12/31/08	12/31/09
Pegasystems Inc.	\$100	\$85.70	\$117.01	\$143.46	\$150.17	\$414.98
Nasdaq Composite	\$100	\$102.12	\$112.73	\$124.73	\$74.87	\$108.83
S&P NSSI	\$100	\$95.36	\$105.88	\$123.08	\$76.05	\$112.48

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

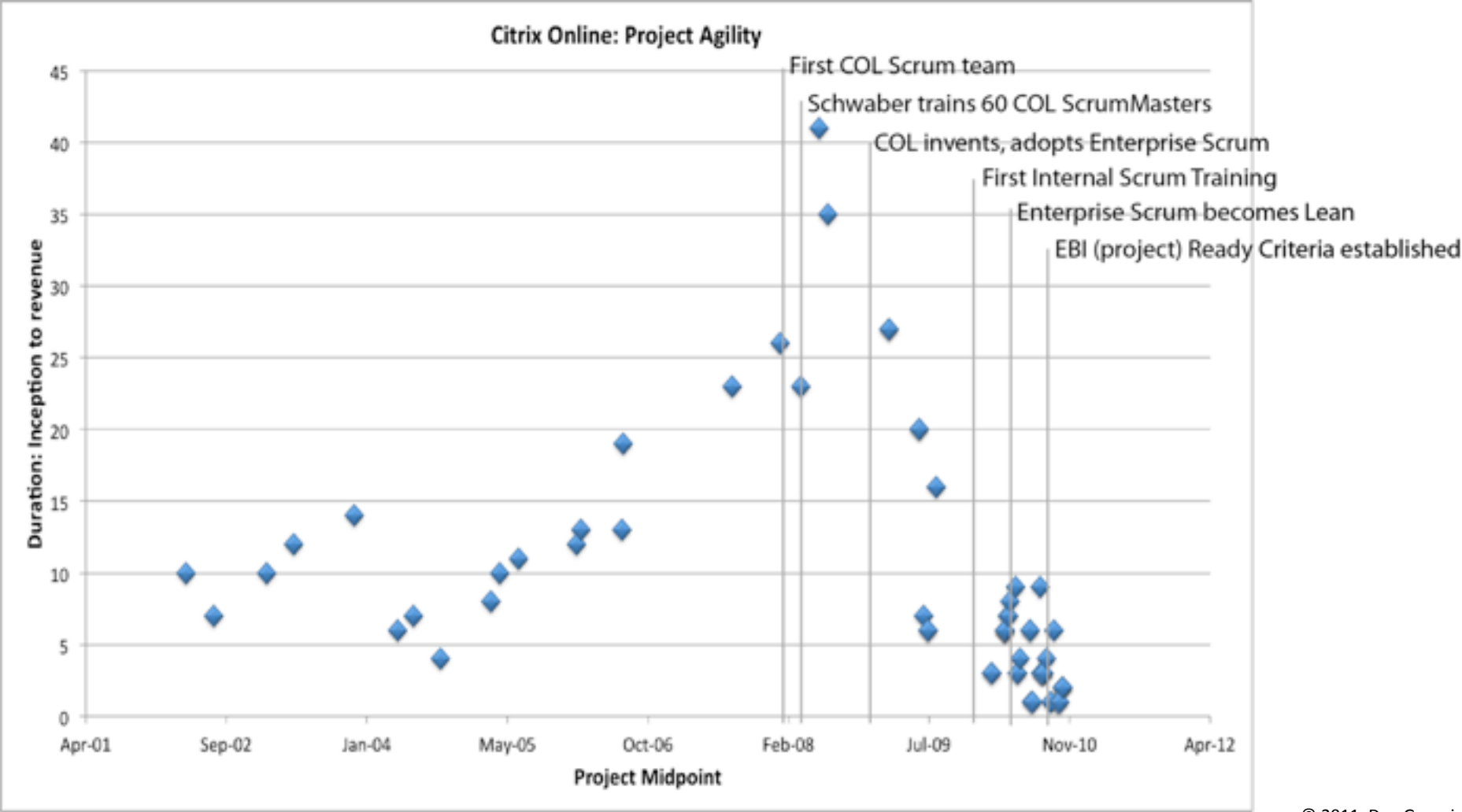
FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2009
TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission File No. 333-15899

PEGASYSTEMS INC.
(Exact name of Registrant as specified in its charter)

Investors want market share

How Citrix Online beat Microsoft



© 2011, Dan Greening

The wise leader implements

Scrum

- Idealistic and pragmatic
- Based on transparency, trust, community
- Managers become leaders
- Innovation accelerates
- Workplace is transformed
- Common good is achieved



Agile Leadership



New Zealand All Blacks