

Business Value of Agile Software Methods

Maximizing ROI with Just-in-Time Processes and Documentation

by Dr. David F. Rico, Dr. Hasan H. Sayani, and Dr. Saya Sone

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J. Ross (\$44.95): <http://www.jrosspub.com/Engine/Shopping/catalog.asp?item=14200>

About the Book

The Business Value of Agile Software Methods is a comprehensive methodology for quantifying the costs and benefits of using agile methods to create innovative software products. Using cost of quality, total cost of ownership, and total life cycle costs, the authors estimate return on investment and net present value of agile methods. For the first time, the use of advanced measures such as real options is utterly simplified. This book disarms explosive issues related to the adoption of agile methods. It provides a broad survey of cost and benefit data from an analysis of hundreds of projects. It then introduces the industry's first top-down parametric models for estimating the costs and benefits of agile methods. Furthermore, it contains numerous examples on how to estimate the costs and benefits of the major types of agile methods such as Scrum and Extreme Programming, among others.

Key Features

- Identifies the major types and kinds of agile methods, along with the major best practices, as a pretext for mixing and matching them to create super-hybrids.
- Introduces a complete family of metrics and models specially designed for agile methods, rather than saddling projects with traditional industrial-age measures.
- Provides one of the first and only comprehensive compilations of the costs and benefits of agile methods from an analysis of hundreds of real-world projects.
- Presents a suite of top-down metrics, models, and measurements for estimating the costs, benefits, return on investment, and net present value of agile methods.
- Illustrates the first simple-to-use parametric models of real options for agile methods since the inception of the Nobel-prize winning Black-Scholes formulas.

Web Value Added

WAV Offers free downloadable ROI spreadsheet models for Scrum, Extreme Programming, Pair Programming, Test-Driven Development, and Agile Methods (with detailed metrics, models, measurements on the costs, benefits, benefit/cost ratio, breakeven point, net present value, return on investment, and real options of agile methods).

- **Agile Methods Cost & Benefit Summary Brief:** A briefing designed for the CEO of a leading agile methods consulting firm to successfully win new business even in today's stingy economy. This briefing is a comprehensive compilation of the costs and benefits of agile methods. It includes data for Extreme Programming, Scrum, Test-Driven Development, Pair Programming, and Agile Methods in-general. It summarizes the costs and benefits as reported by the leading surveys of agile methods. It then summarizes the findings of more than 80 of the most quantitative studies on the costs and benefits of agile methods (and compares and contrasts these results to one of the most comprehensive studies of traditional methods). It also summarizes the results of one of the first comprehensive studies on the costs and benefits of agile methods (expressing these results in terms of return on investment, net present value, and real options). As an added bonus, this briefing summarizes late-breaking data on the costs and benefits of agile methods. In particular, it compares the costs and benefits of over 20 projects using agile methods to an economic database of over 7,500 traditional projects. Some of the factors examined are cost, quality, productivity, time-to-market, and scalability of projects using agile versus traditional methods. Finally, it summarizes the costs and benefits of nearly 30 projects using advanced automated workflow tools.

Business Value of Agile Methods

Cost and Benefit Analysis

Dr. David F. Rico, PMP, CSM

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Enablers of Business Value

Surveys of Agile Methods

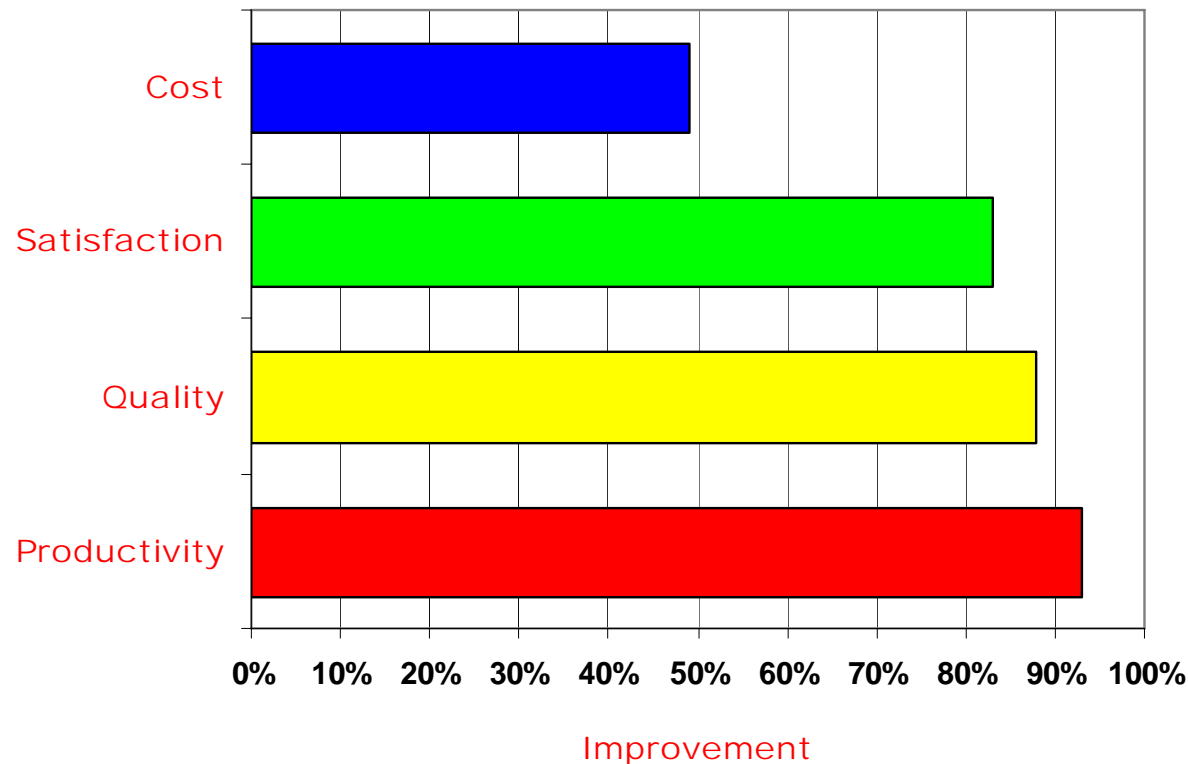
- Numerous surveys of agile methods since 2003
- AmbySoft and Version One collect annual data
- Generally include both hard and soft benefits

Year	Organization	Author	Size	Productivity	Quality	Cost
2003	Shine	Johnson	131	93%	88%	49%
2006	Agile Journal	Barnett	400	45%	43%	23%
2007	Microsoft	Begel, et al.	492	14%	32%	16%
2007	UMUC	Rico, et al.	250	81%	80%	75%
2008	AmbySoft	Ambler	642	82%	72%	72%
2008	IT Agile	Wolf, et al.	207	78%	74%	72%
2008	Version One	Hanscom	3,061	74%	68%	38%
Average				67%	65%	49%

Rico, D. F. (2008). *What is the return-on-investment of agile methods?* Retrieved February 3, 2009, from <http://davidfrico.com/rico08a.pdf>

Shine Technologies

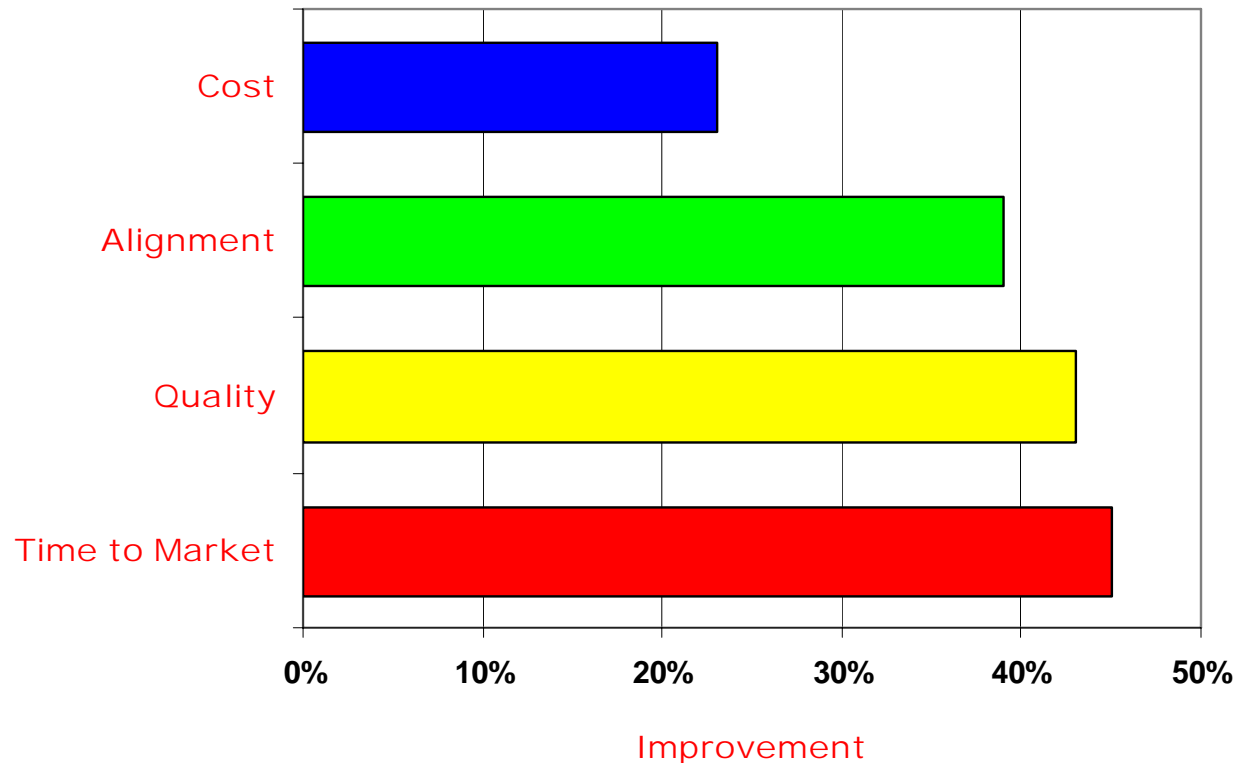
- Survey of 131 international respondents
- Extreme Programming (58%) and Scrum (8%)
- 85% of respondents were experts in agile methods



Johnson, M. (2003). *Agile methodologies: Survey results*. Victoria, Australia: Shine Technologies.

Agile Journal

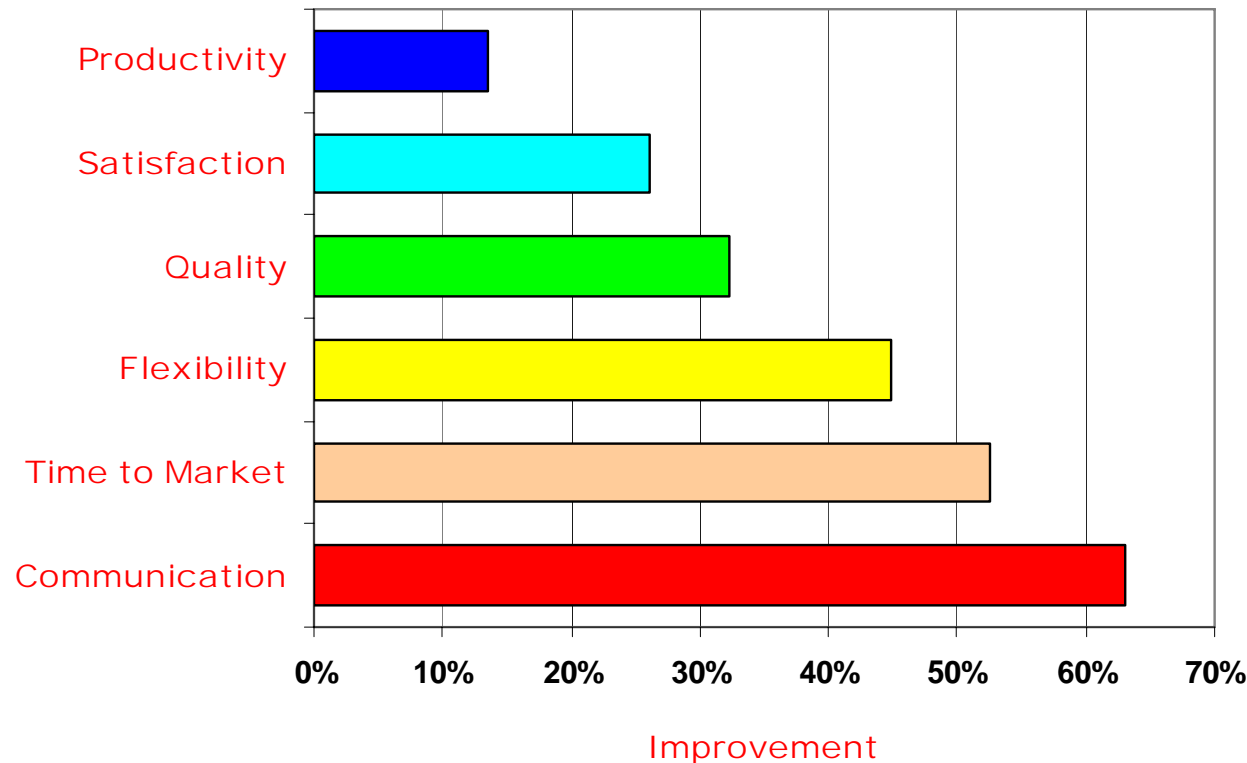
- Survey of 400 international respondents
- Extreme programming (28%) and Scrum (20%)
- 80% using agile methods to deliver maximum value



Barnett, L. (2006). And the agile survey says. *Agile Journal*, 1(1).

Microsoft

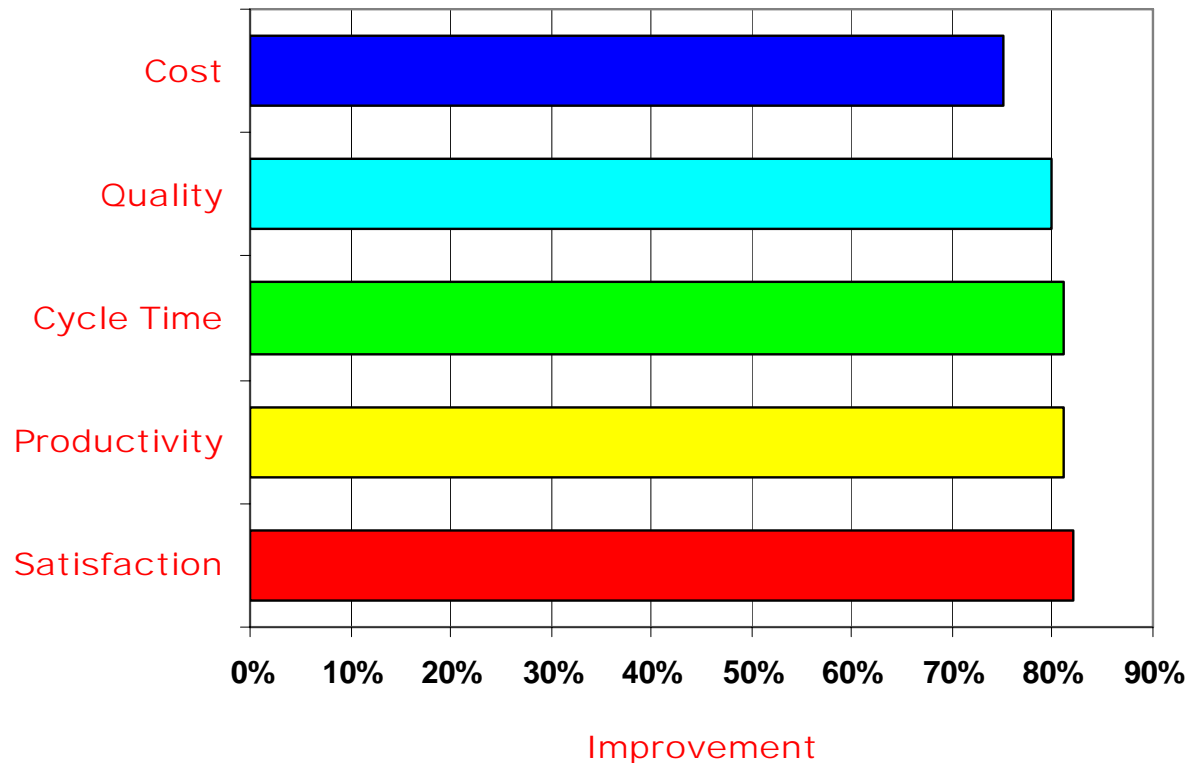
- Survey of 492 Microsoft respondents
- Scrum (65%) and Extreme Programming (5%)
- 65% using agile methods in virtual distributed teams



Begel, A., & Nagappan, N. (2007). Usage and perceptions of agile software development in an industrial context: An exploratory study. *Proceedings of the First International Symposium on Empirical Software Engineering and Measurement, Madrid, Spain*, 255-264.

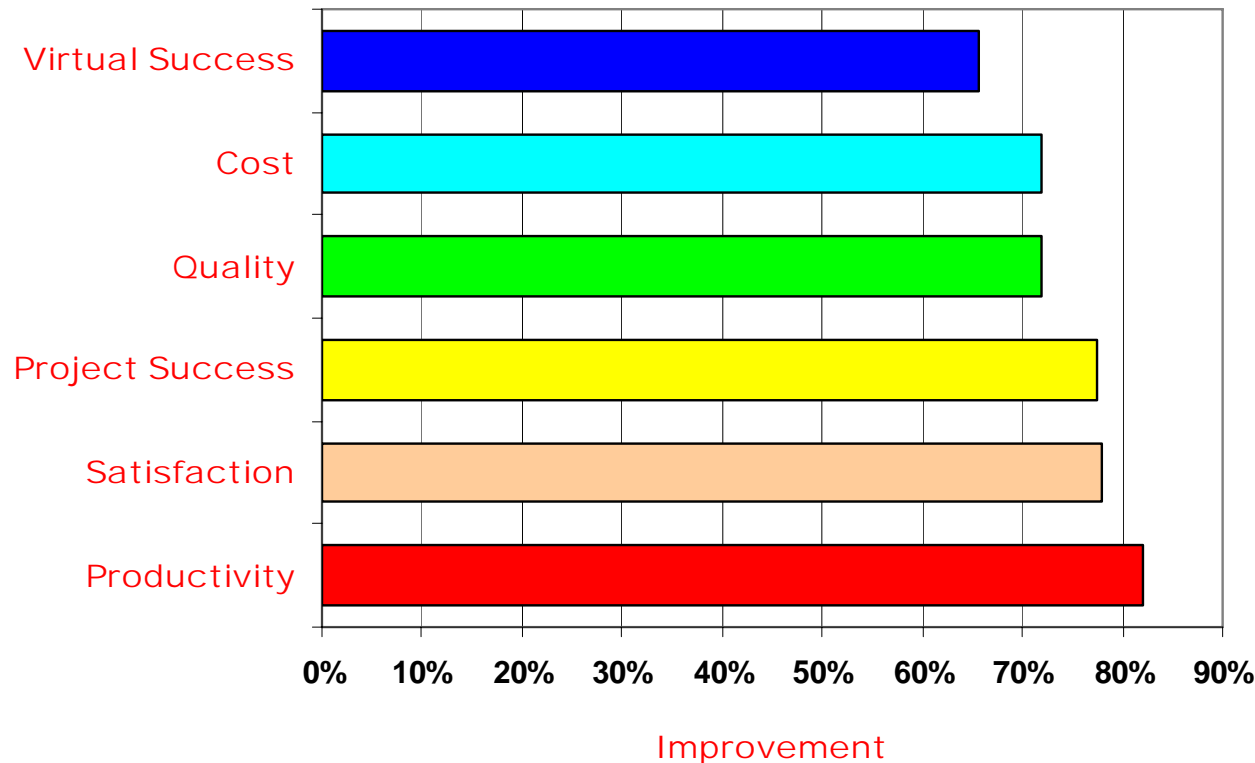
UMUC

- Survey of 250 international respondents
- 70% of respondents using agile methods
- 83% of were from small-to-medium sized firms



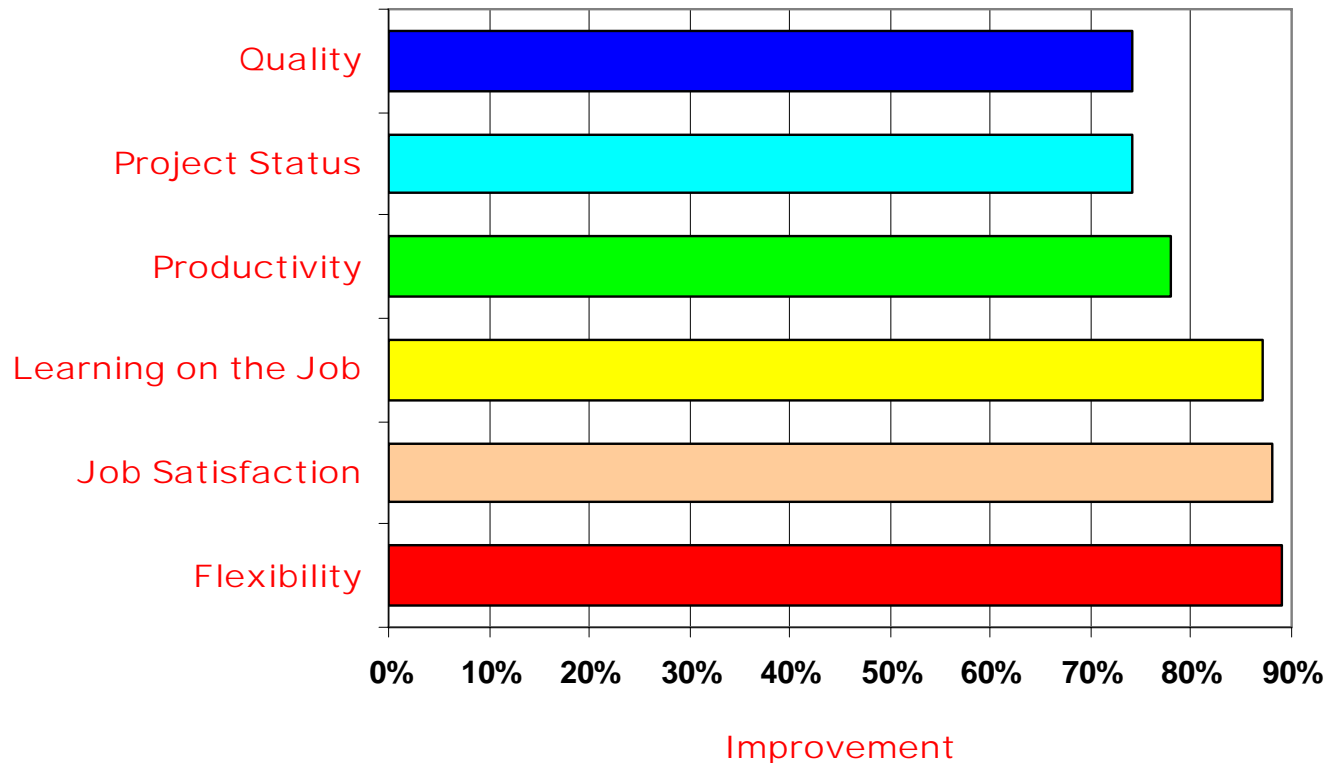
AmbySoft

- Survey of 642 international respondents
- 69% of firms had adopted an agile method
- 62% were from firms with less than 1,000 people



IT Agile

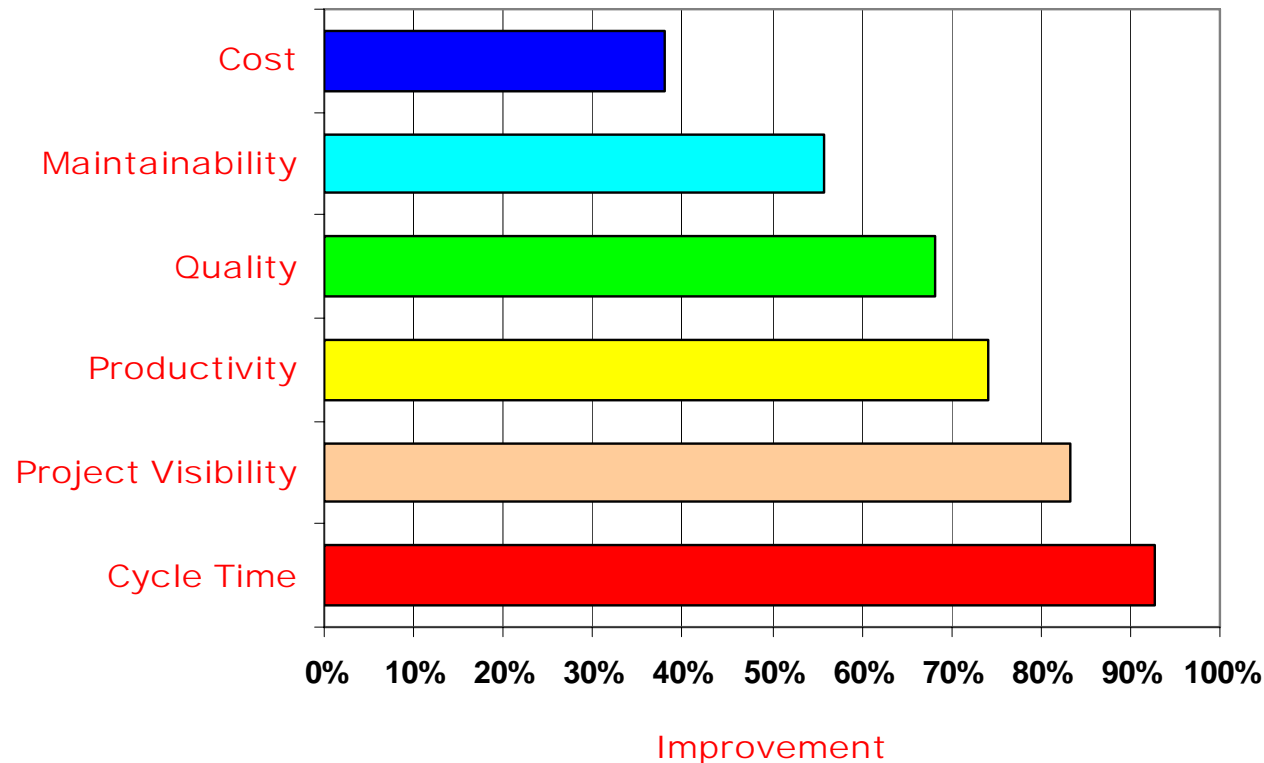
- Survey of 207 respondents in Germany
- Scrum (21%) and Extreme Programming (14%)
- 97% of respondents are satisfied with agile methods



Wolf, H., & Roock, A. (2008). Agile becomes mainstream: Results of an Online Survey. *Object Spektrum*, 15(3), 10-13.

Version One

- Survey of 3,061 respondents from 80 countries
- Scrum (49%), Scrum/XP (22%), and XP (8%)
- 68% from small firms and 57% distributed



Version One. (2008). *The state of agile development: Third Annual Survey*. Alpharetta, GA: Author.

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Surveys of Business Value

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Studies of Business Value

- Agile (138 pt.) and traditional methods (99 pt.)
- Agile methods fare better in all benefits categories
- Agile methods 359% better than traditional methods

Agile Methods

Category	Low	Median	High
Cost	10%	26%	70%
Schedule	11%	71%	700%
Productivity	14%	122%	712%
Quality	10%	70%	1,000%
Satisfaction	70%	70%	70%
ROI	240%	2,633%	8,852%



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

Pair Programming

- PP (49 pt.) and traditional methods (99 pt.)
- PP fares better in most benefits categories
- PP 470% better than traditional methods

Pair Programming

Category	Low	Median	High
Cost	n/a	n/a	n/a
Schedule	11%	34%	70%
Productivity	14%	76%	201%
Quality	10%	69%	1,000%
Satisfaction	n/a	n/a	n/a
ROI	542%	2,303%	4,893%



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

Scrum

- Scrum (11 pt.) and traditional methods (99 pt.)
- Scrum fares better in most benefits categories
- Scrum 332% better than traditional methods

Scrum

Category	Low	Median	High
Cost	n/a	n/a	n/a
Schedule	n/a	n/a	n/a
Productivity	29%	305%	712%
Quality	30%	267%	700%
Satisfaction	n/a	n/a	n/a
ROI	240%	837%	1,785%



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

Test Driven Development

- TDD (26 pt.) and traditional methods (99 pt.)
- TDD fares better in most benefits categories
- TDD 584% better than traditional methods

Test Driven Development

Category	Low	Median	High
Cost	n/a	n/a	n/a
Schedule	n/a	n/a	n/a
Productivity	18%	64%	172%
Quality	16%	50%	153%
Satisfaction	n/a	n/a	n/a
ROI	916%	2,120%	4,540%



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

Extreme Programming

- XP (32 pt.) and traditional methods (99 pt.)
- XP fares better in most benefits categories
- XP 602% better than traditional methods

Extreme Programming

Category	Low	Median	High
Cost	10%	18%	28%
Schedule	53%	53%	53%
Productivity	20%	143%	384%
Quality	13%	60%	89%
Satisfaction	n/a	n/a	n/a
ROI	1,290%	3,546%	8,852%



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

General

- Gen. (20 pt.) and traditional methods (99 pt.)
- Gen. fare better in most benefits categories
- Gen. 107% better than traditional methods

General

Category	Low	Median	High
Cost	10%	36%	70%
Schedule	12%	147%	700%
Productivity	17%	42%	78%
Quality	17%	84%	250%
Satisfaction	70%	70%	70%
ROI	n/a	n/a	n/a



Traditional Methods

Category	Low	Median	High
Cost	3%	20%	87%
Schedule	2%	37%	90%
Productivity	9%	62%	255%
Quality	7%	50%	132%
Satisfaction	-4%	14%	55%
ROI	200%	470%	2,770%

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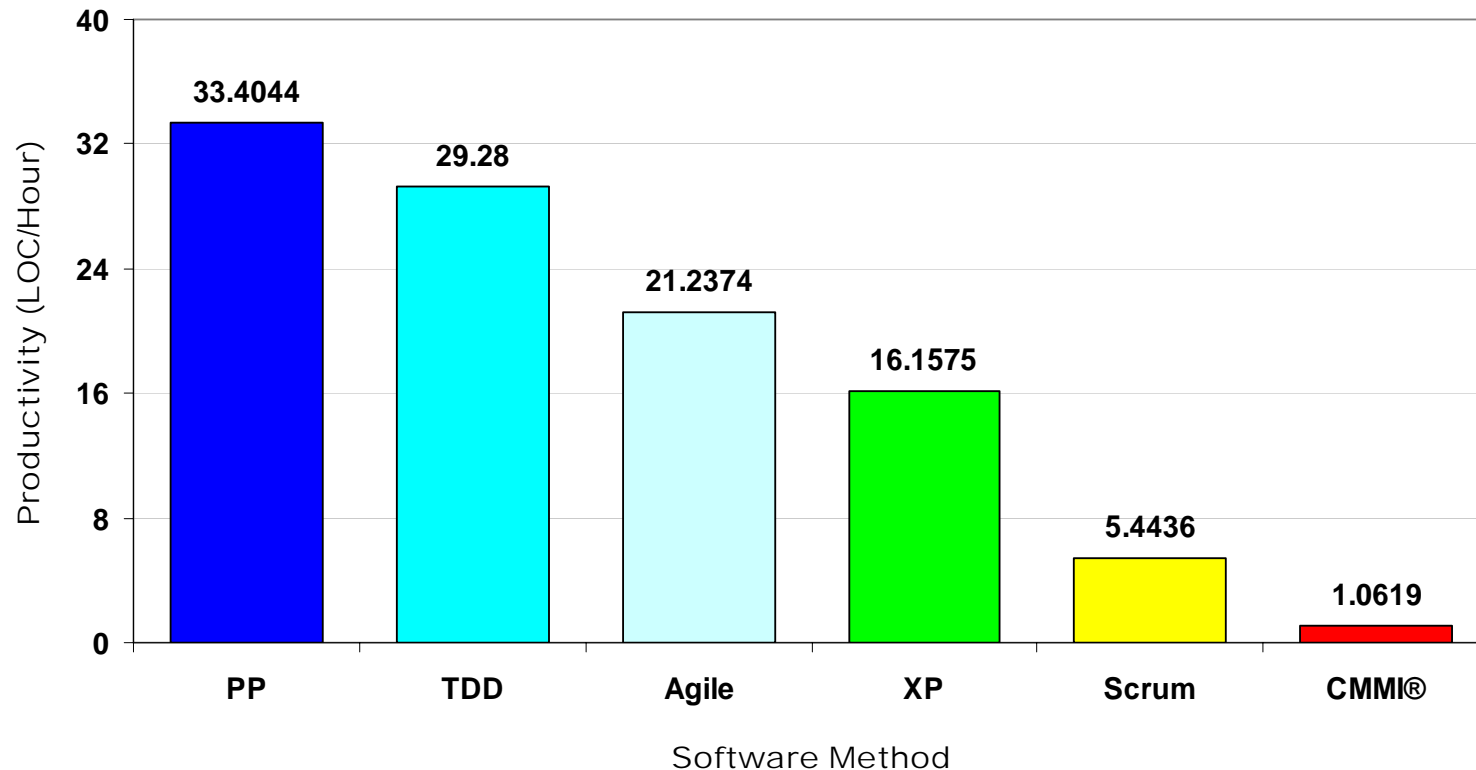
- Analysis of 29 agile projects involving 839 people
- Agile projects are 550% better than traditional ones
- XP (753%) and Scrum (148%) better than traditional

Agile vs. Traditional Benefits

Method	Productivity	Quality	Cost	Benefits	ROI	NPV	Real Options
XP	1,422%	1,195%	712%	45%	1,695%	142%	62%
Agile	1,900%	438%	389%	42%	935%	131%	56%
TDD	2,657%	349%	344%	41%	830%	128%	54%
PP	3,046%	310%	318%	40%	767%	126%	53%
Scrum	413%	145%	92%	30%	236%	87%	37%

Productivity of Agile Methods

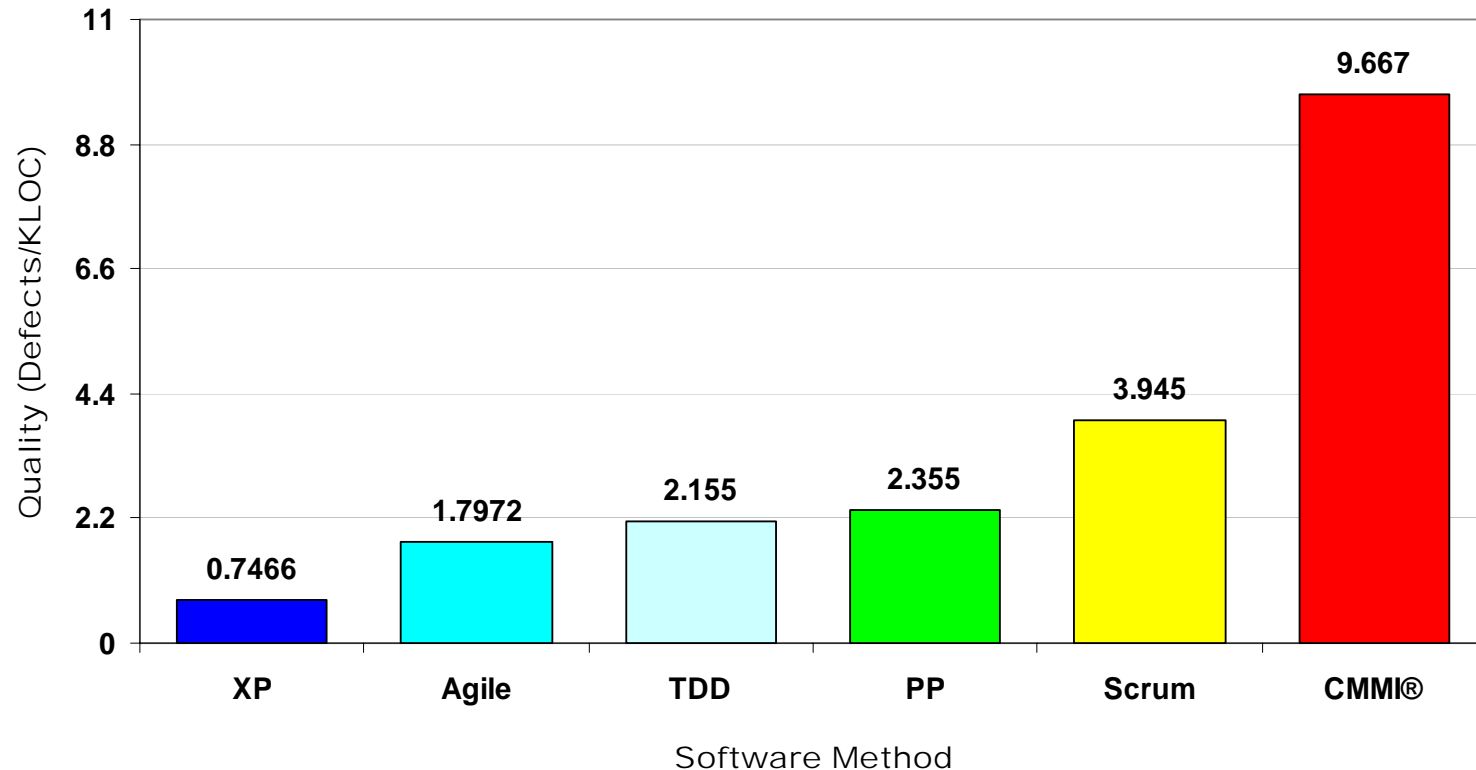
- PP productivity 32X more than trad. methods
- Scrum productivity 5X more than trad. methods
- Agile methods productivity 20X more than traditional



Rico, D. F., Sayani, H. H., & Sone, S. (2009). *The business value of agile methods*. Ft. Lauderdale, FL: J. Ross Publishing.

Quality of Agile Methods

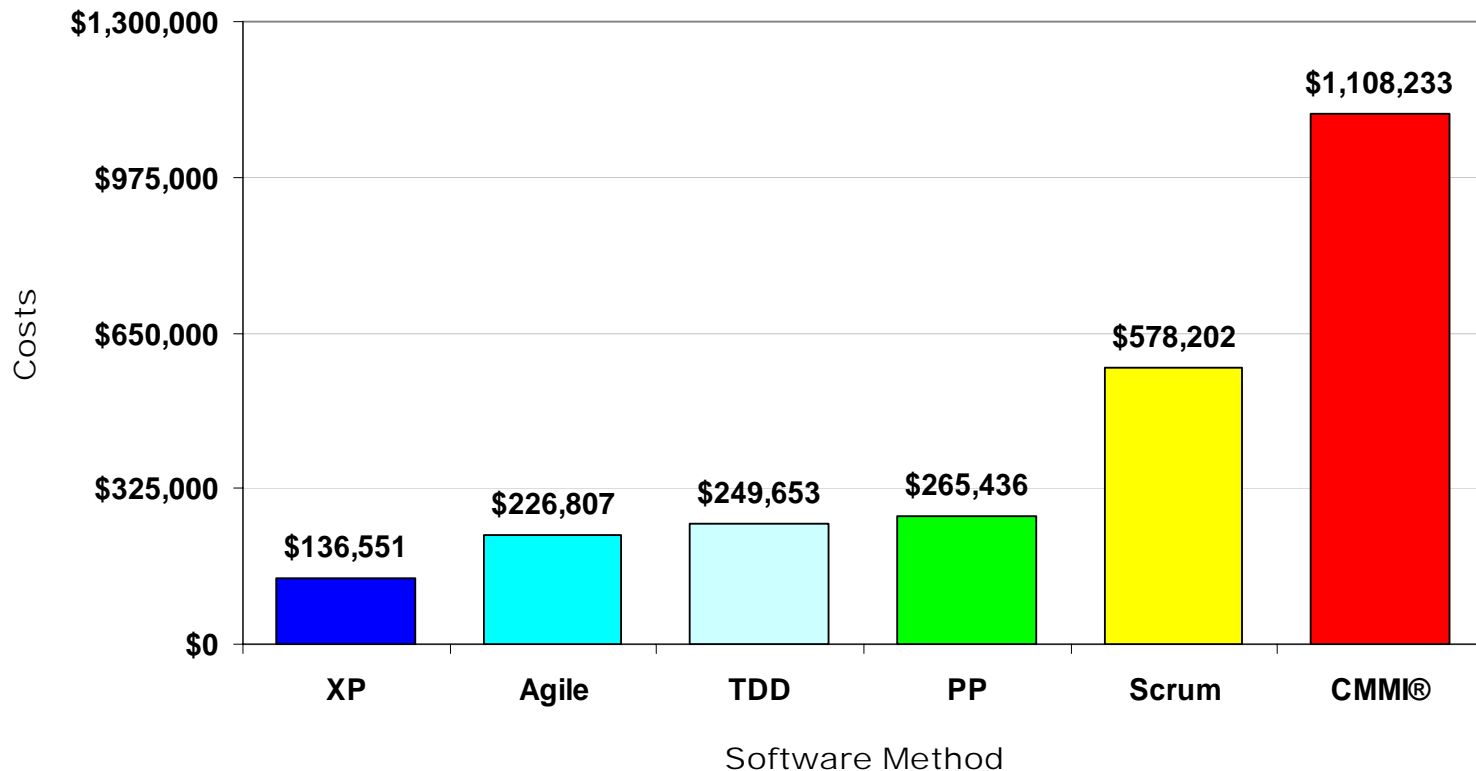
- XP quality 13X better than trad. methods
- Scrum quality 3X better than trad. methods
- Agile methods quality 5X better than traditional



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Costs of Agile Methods

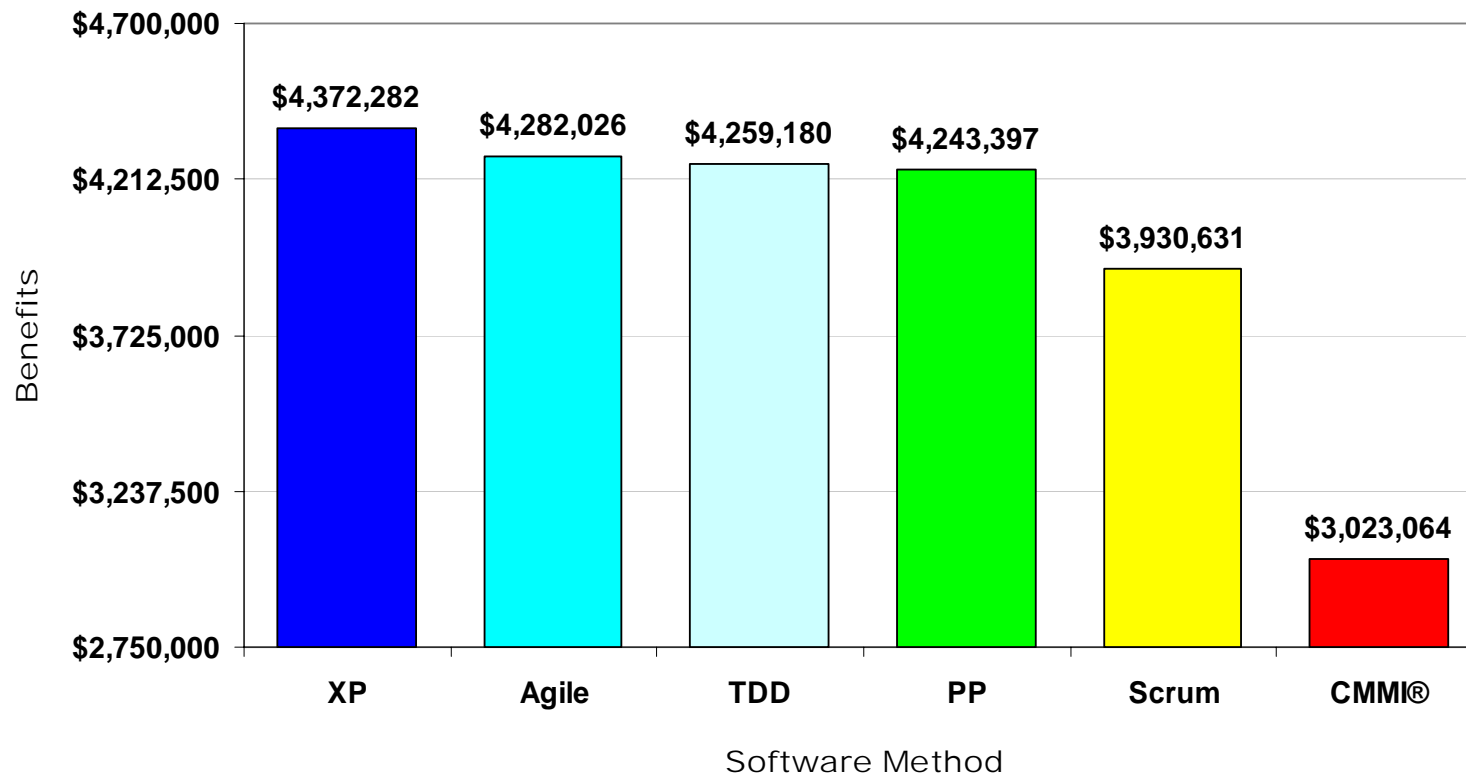
- XP costs 8X less than traditional methods
- Scrum costs 2X less than traditional methods
- Agile methods cost 5X less than traditional methods



Rico, D. F., Sayani, H. H., & Sone, S. (2009). *The business value of agile methods*. Ft. Lauderdale, FL: J. Ross Publishing.

Benefits of Agile Methods

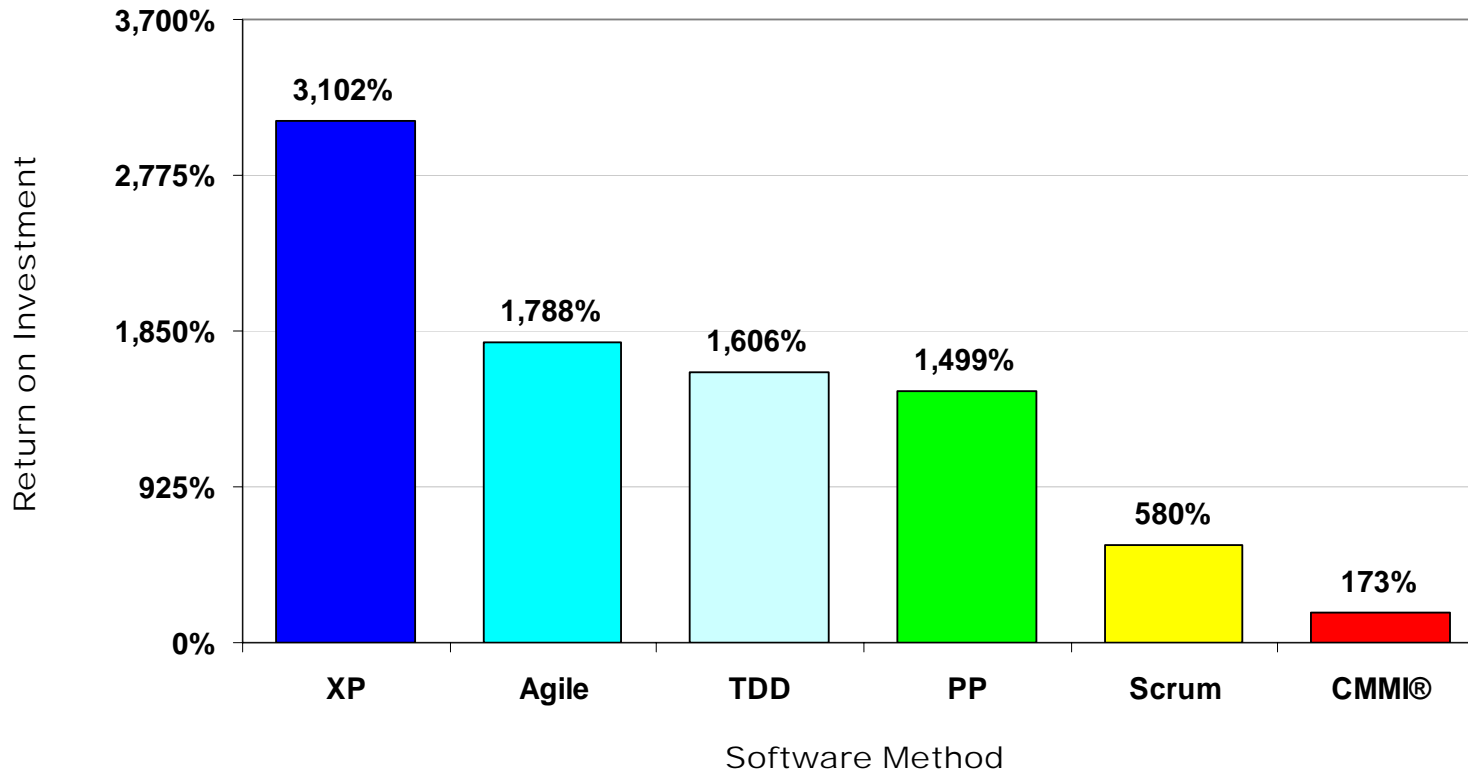
- XP benefits 1.5X more than traditional methods
- Scrum benefits 1.3X more than traditional methods
- Agile methods benefits 1.4X more than trad. methods



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ROI of Agile Methods

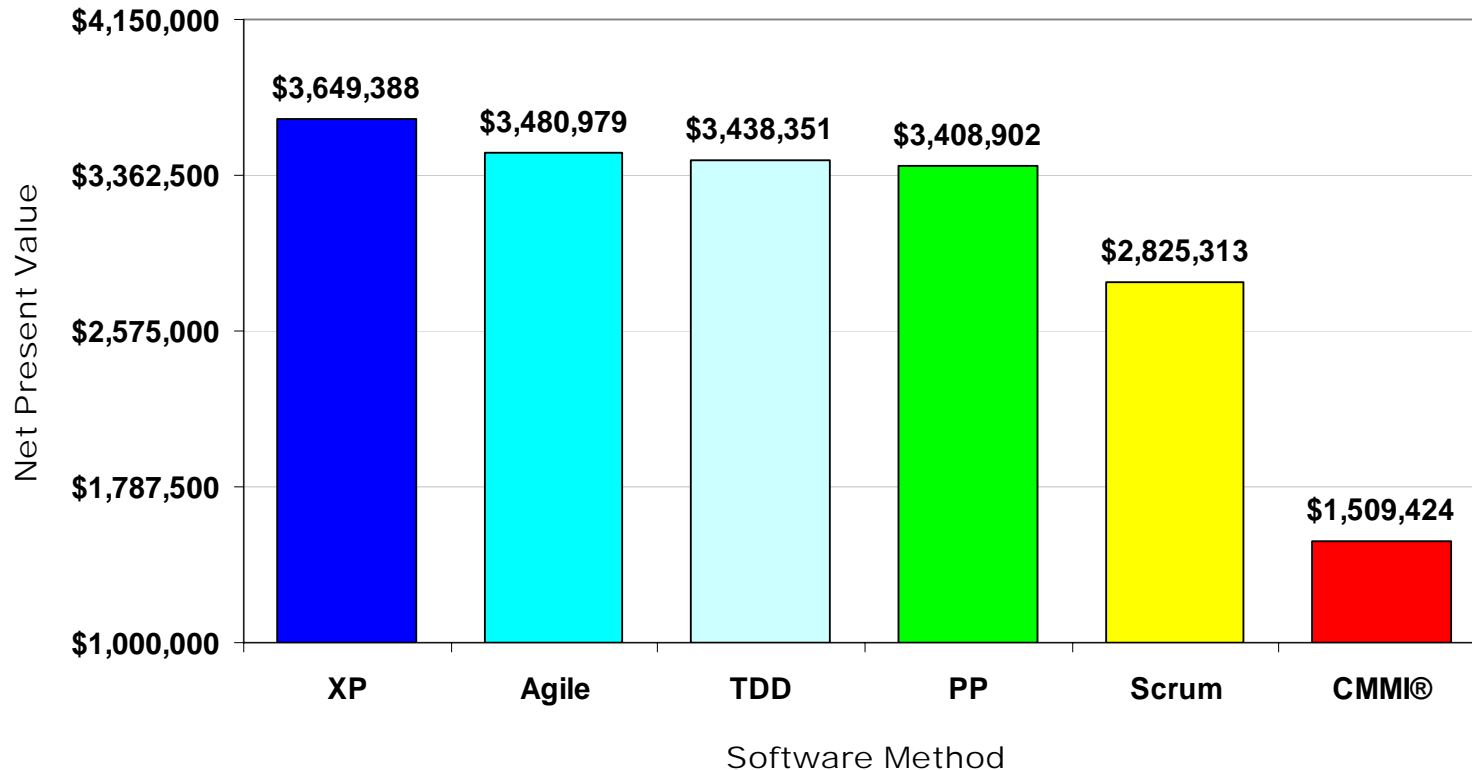
- XP ROI 18X more than traditional methods
- Scrum ROI 3.4X more than traditional methods
- Agile methods ROI 10X more than trad. methods



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NPV of Agile Methods

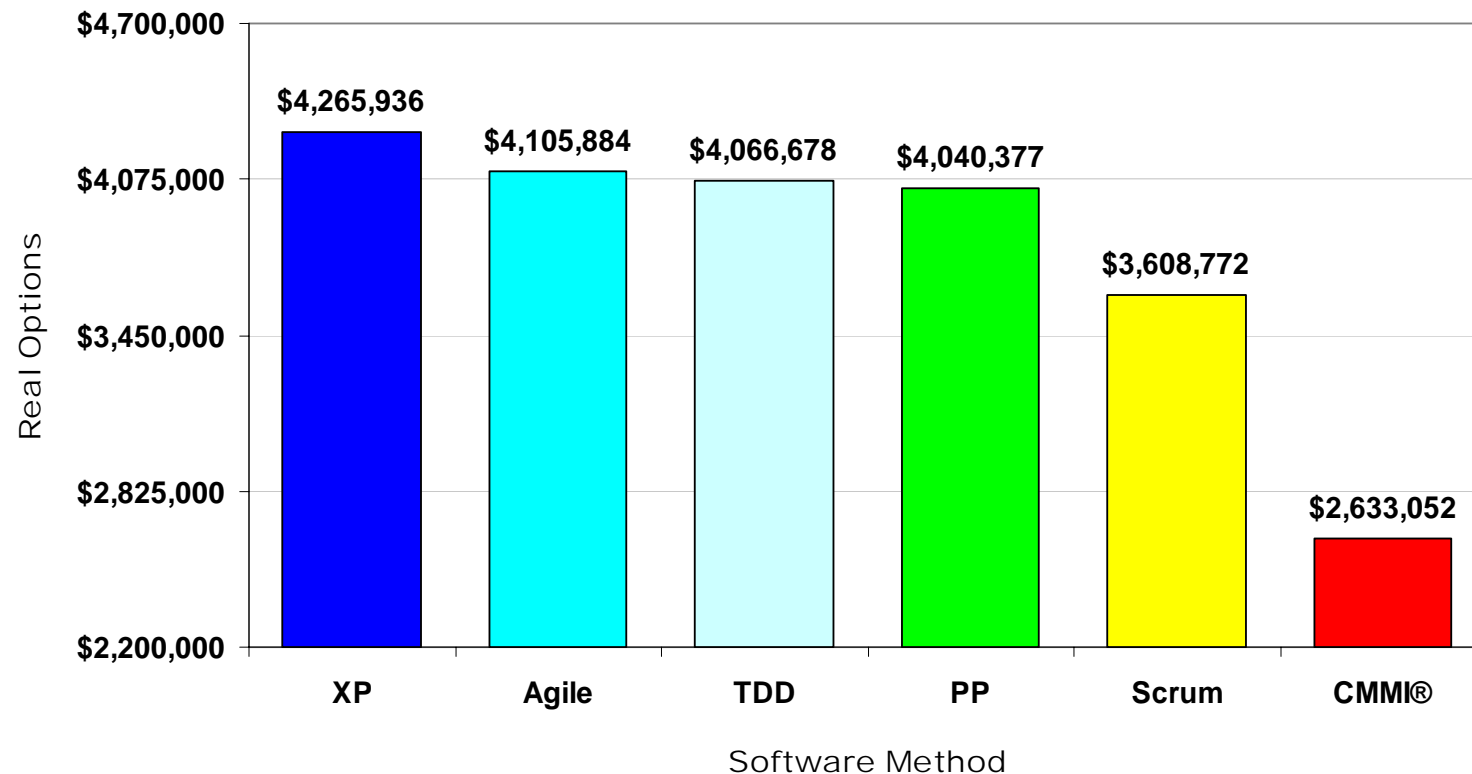
- XP NPV 2.4X more than traditional methods
- Scrum NPV 1.9X more than traditional methods
- Agile methods NPV 2.3X more than trad. methods



Rico, D. F., Sayani, H. H., & Sone, S. (2009). *The business value of agile methods*. Ft. Lauderdale, FL: J. Ross Publishing.

Real Options of Agile Methods

- XP ROA 1.6X more than traditional methods
- Scrum ROA 1.4X more than traditional methods
- Agile methods ROA 1.6X more than trad. methods



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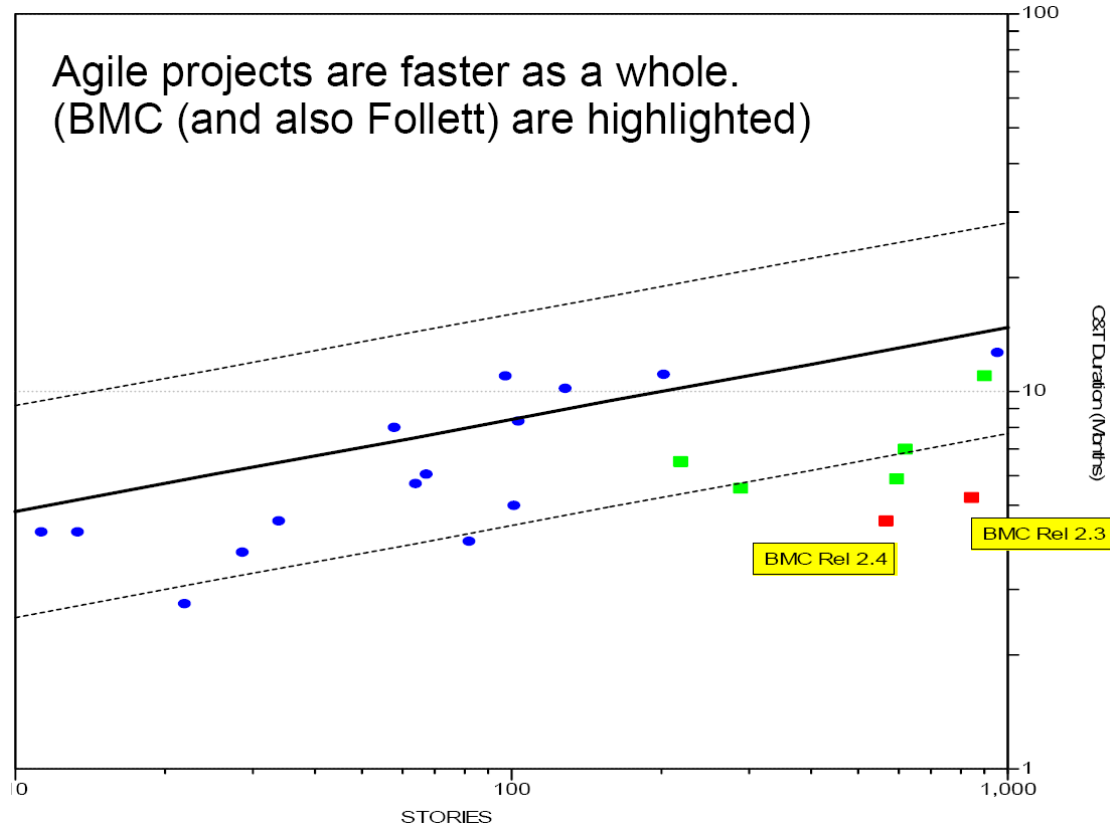
- Analysis of 23 agile vs. 7,500 traditional projects
- Agile projects are 41% better than traditional ones
- XP (56%) and Scrum (26%) better than trad. projects

Agile vs. Traditional Benefits

Category	XP	Scrum	Agile
Time-to-Market	62%	138%	100%
Quality	100%	12%	56%
People	40%	-57%	-8%
Cost	21%	30%	26%
Productivity	59%	6%	32%

Agile Time-to-Market

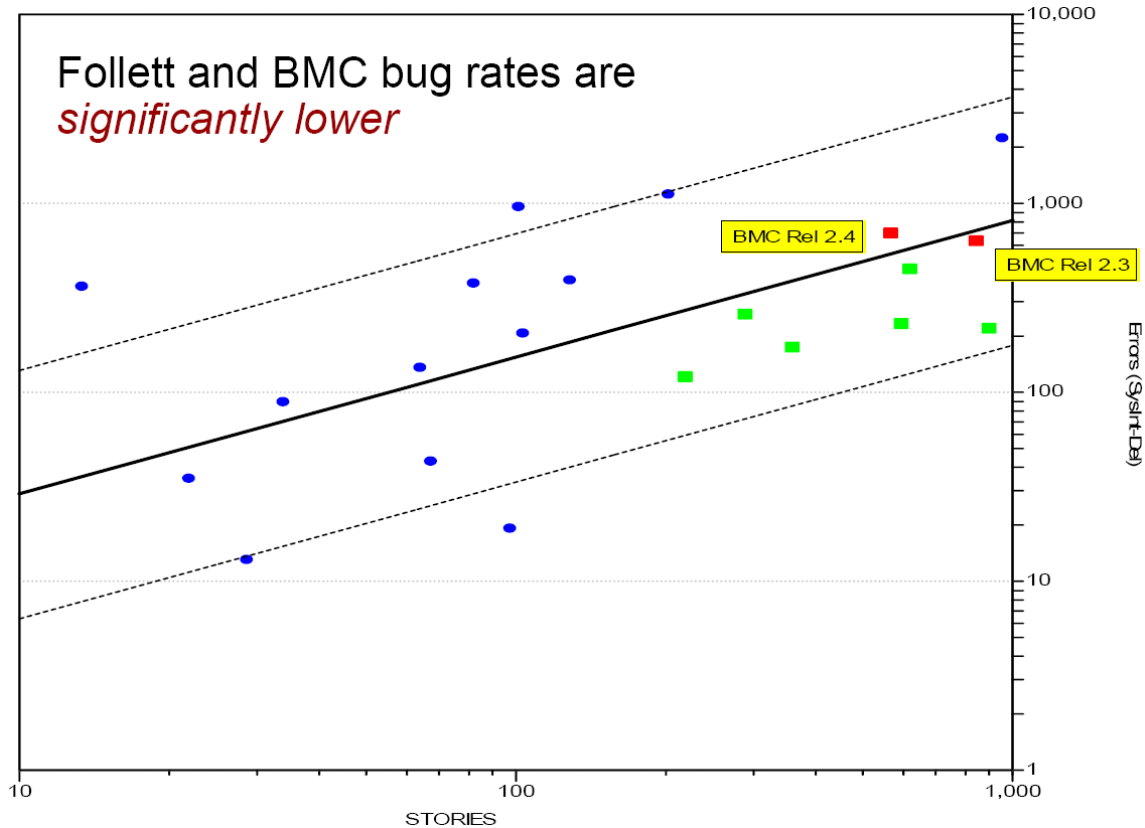
- 83% of agile projects faster than traditional ones
- XP projects are 62% faster than traditional ones
- Scrum projects are 138% faster than trad. ones



Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

Agile Quality

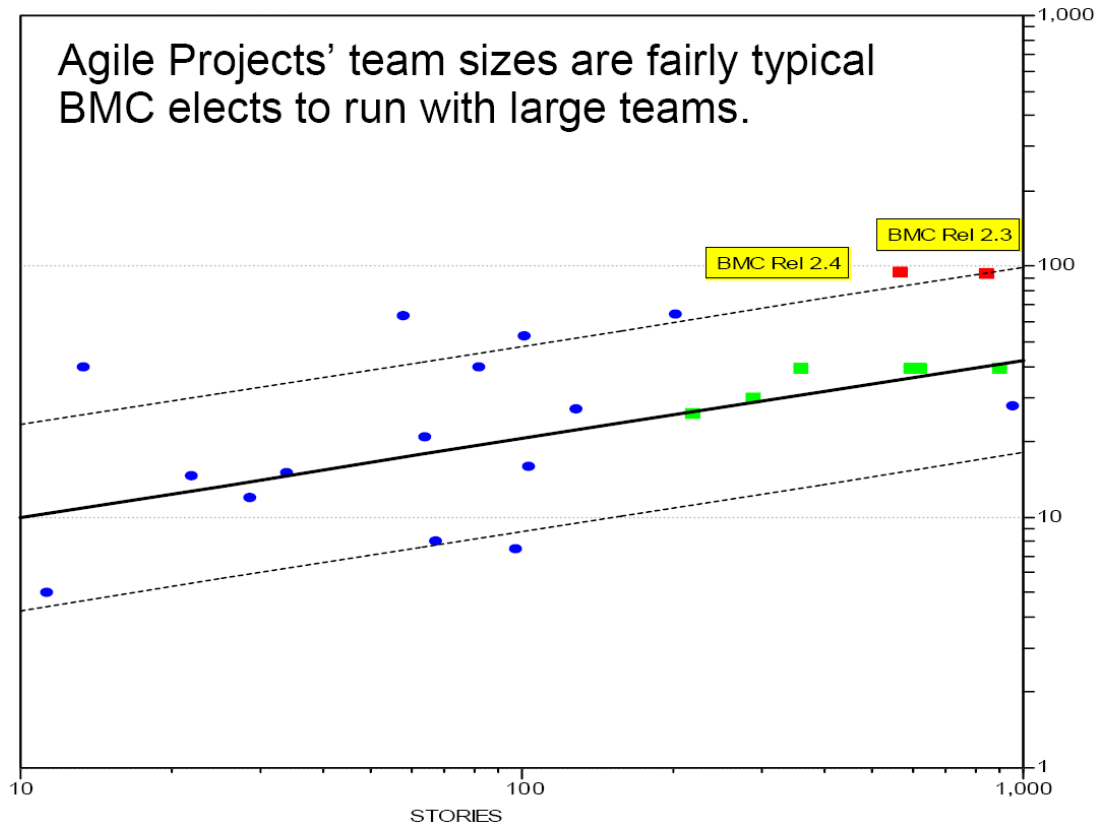
- 50% of agile projects higher quality than trad.
- XP projects have 100% higher quality than trad.
- Scrum projects have 12% higher quality than trad.



Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

Agile Scalability

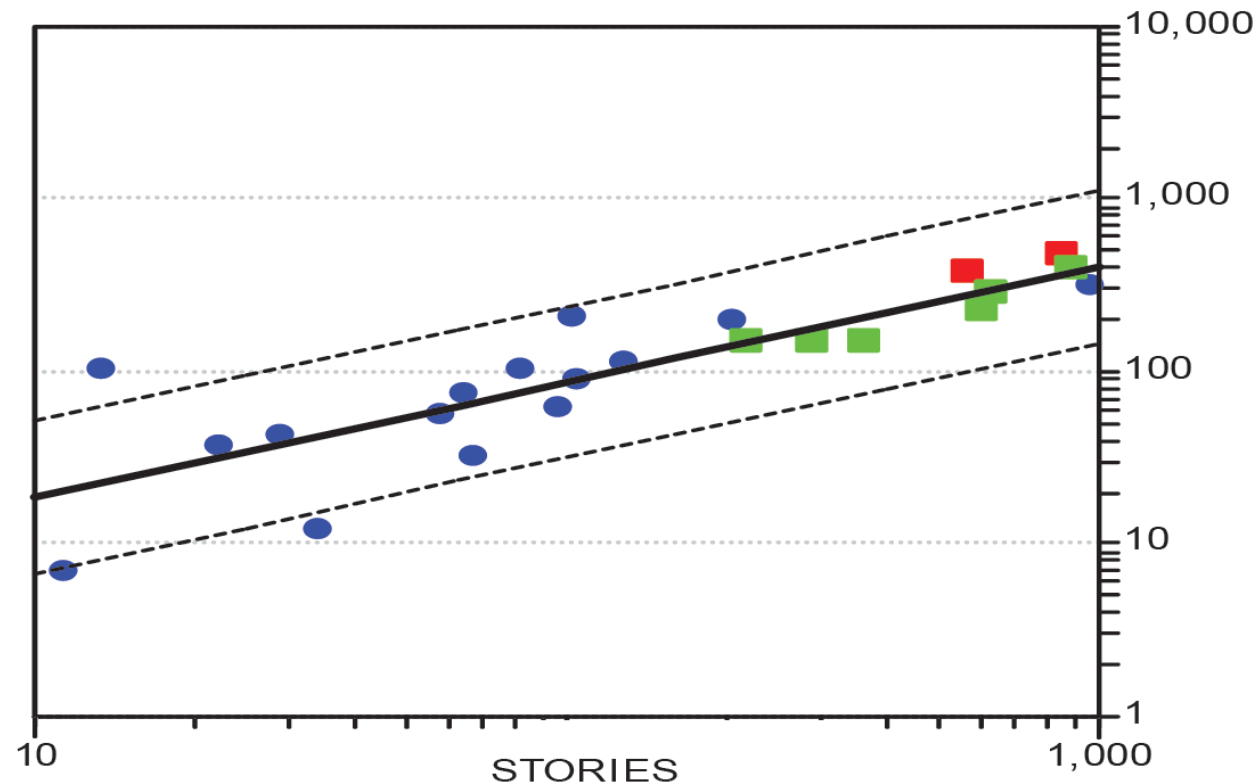
- 65% of agile projects larger than traditional ones
- XP uses 40% less people than traditional ones
- Scrum uses 130% more people than trad.



Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

Agile Cost

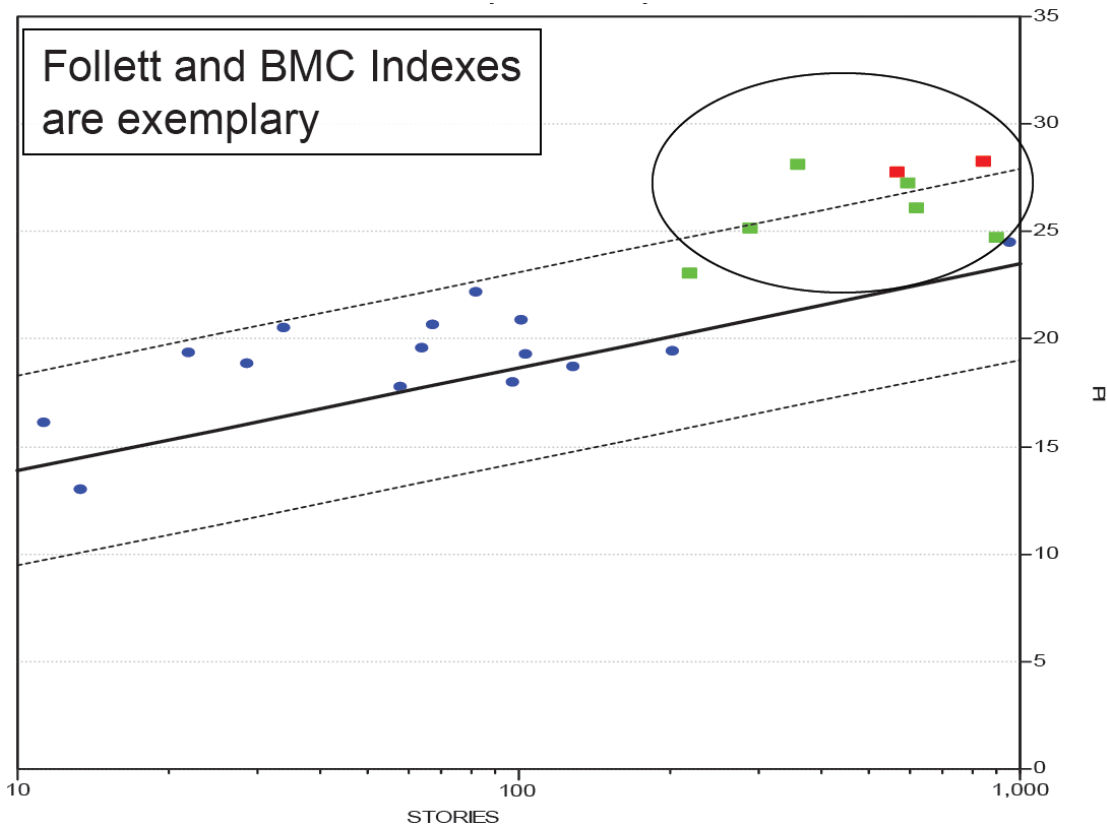
- 50% of agile projects cost less than trad. ones
- XP projects cost 59% less than traditional ones
- Scrum projects cost 6% less than traditional ones



Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

Agile Productivity

- 83% of agile proj. more productive than trad.
- XP projects are 21% more productive than trad.
- Scrum projects are 30% more productive than trad.



Mah, M. (2008). Measuring agile in the enterprise: *Proceedings of the Agile 2008 Conference, Toronto, Canada.*

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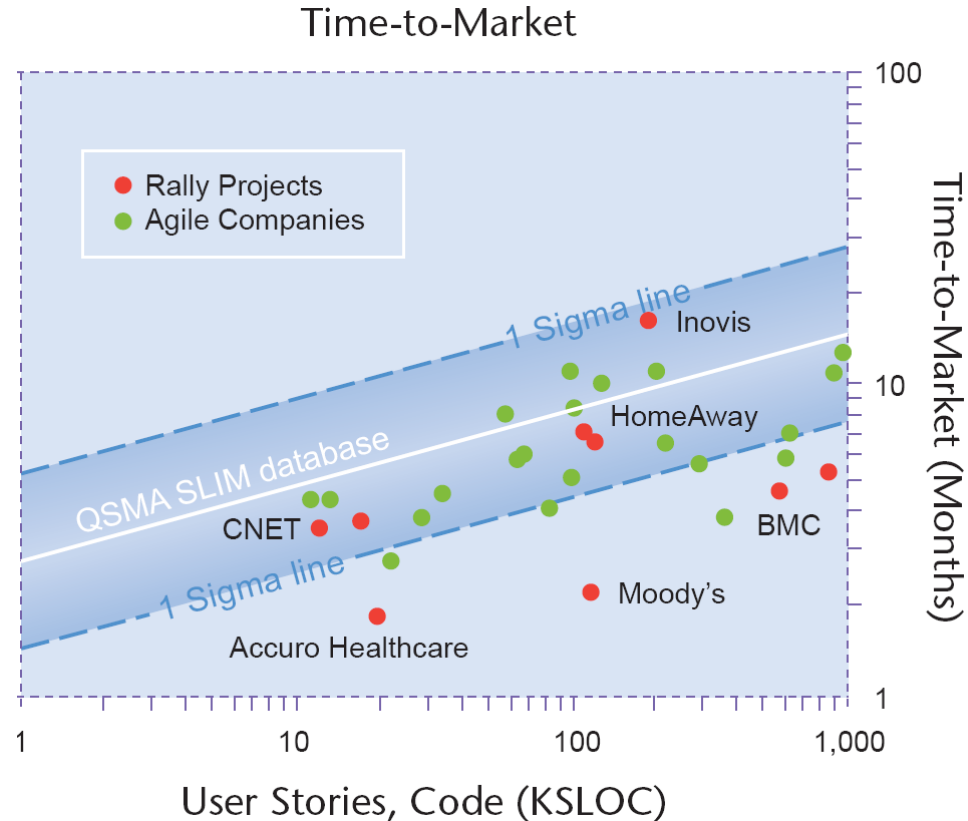
- Analysis of 29 agile vs. 7,500 traditional projects
- Agile projects are 33% better than traditional ones
- Rally projects are 28% better than traditional ones

Agile vs. Traditional Benefits

Category	Agile	Rally	Total No.
Time-to-Market	37%	50%	80%
Productivity	16%	25%	33%
Quality	33%	8.3%	40%

Agile Time-to-Market

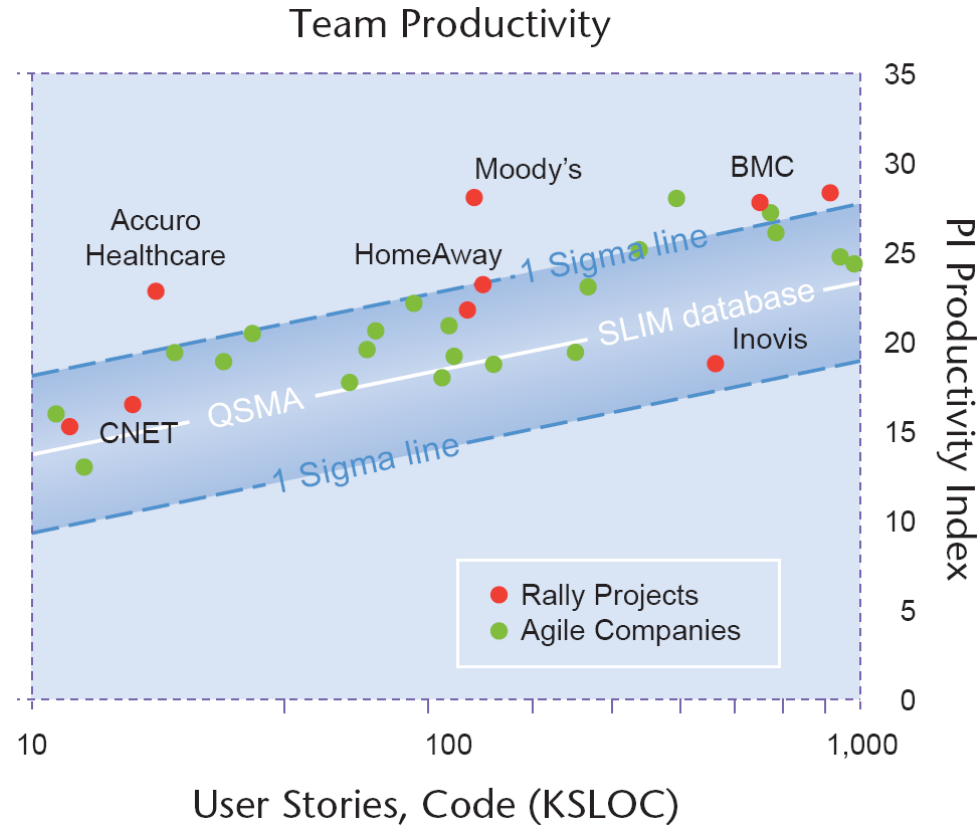
- 80% of agile projects faster than traditional ones
- Agile projects are 37% faster than traditional ones
- Rally projects are 50% faster than traditional ones



Rally Software. (2009). *The agile impact report*. Boulder, CO: Author.

Agile Productivity

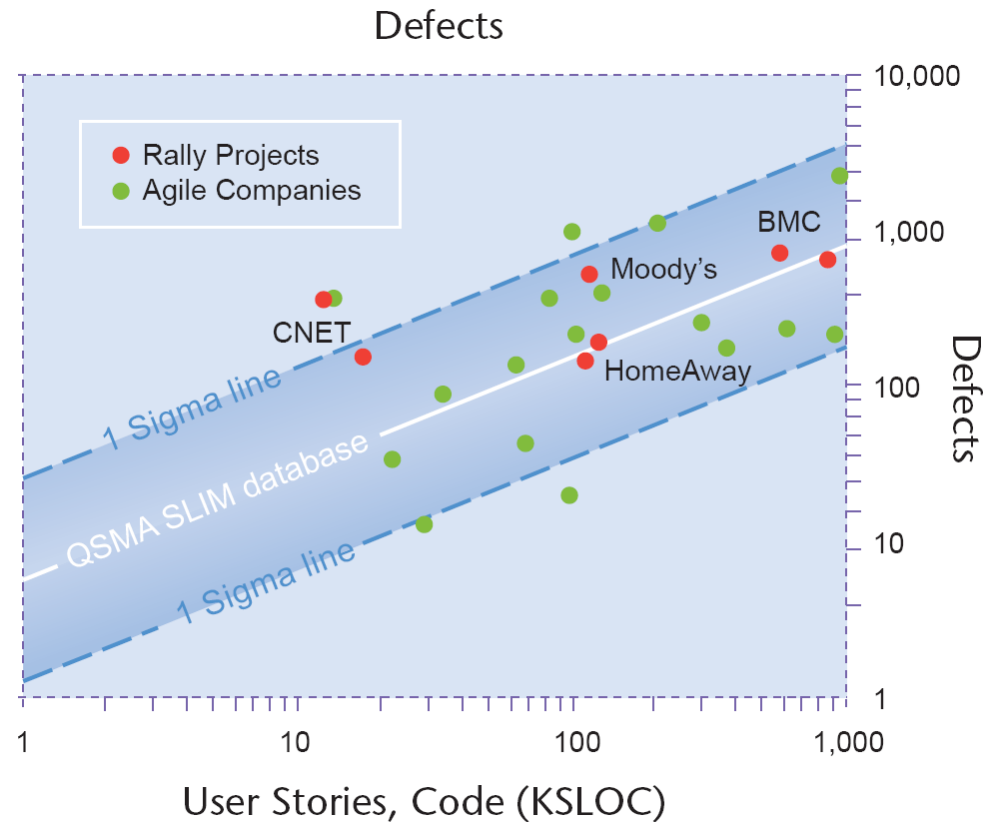
- 83% of agile proj. more productive than trad.
- Agile projects are 16% more productive than trad.
- Rally projects are 25% more productive than trad.



Rally Software. (2009). *The agile impact report*. Boulder, CO: Author.

Agile Quality

- 40% of agile projects higher quality than trad.
- Agile projects have 33% higher quality than trad.
- Rally projects have 8.3% higher quality than trad.



Rally Software. (2009). *The agile impact report*. Boulder, CO: Author.