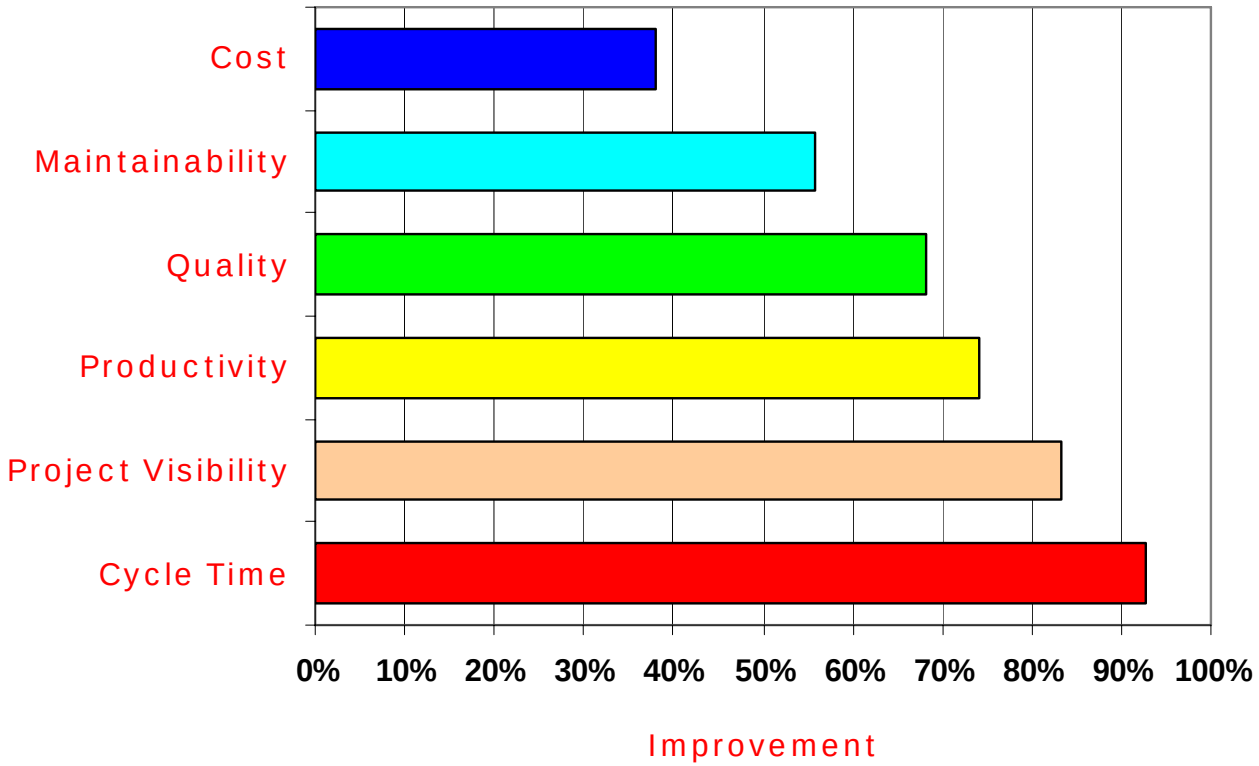
Version One

- 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.

Agenda

- Introduction
- Sources of Business Value
- Planning for Business Value
- Surveys of Business Value
- ☞ **Measures of Business Value**
- Models of Business Value
- Estimation of Business Value
- Comparison of Business Value
- Summary of Business Value

Measures of Business Value

- A major principle of Agile Methods is creating value
- ROI is the measure of value within Agile Methods
- There are seven closely related ROI measures

Metric	Definition	Formula
Costs **Sum of Costs**	Total amount of money spent	$\sum_{i=1}^{n} Cost_i$
Benefits **Sum of Benefits**	Total amount of money gained	$\sum_{i=1}^{n} Benefit_i$
B/CR **Benefit to Cost Ratio**	Ratio of benefits to costs	$\frac{Benefits}{Costs}$
ROI **Return on Investment**	Ratio of adjusted benefits to costs	$\frac{Benefits - Costs}{Costs} \times 100\%$
NPV **Net Present Value**	Discounted cash flows	$\sum_{i=1}^{Years} \frac{Benefits_i}{(1+Discount\ Rate)^{Years}} - Costs_0$
BEP **Breakeven Point**	Point when benefits exceed costs	$\frac{New\ Costs}{Old\ Costs / New\ Costs - 1}$
ROA **Real Options Analysis**	Value gained from strategic delay	$N(d_1) \times Benefits - N(d_2) \times Costs \times e^{-Rate \times Years}$

$d1 = [\ln(Benefits \div Costs) + (Rate + 0.5 \times Risk^2) \times Years] \div Risk \times \sqrt{Years},\ d2 = d1 - Risk \times \sqrt{Years}$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Costs

- Total amount of money spent on Agile Methods
- Includes training, coaching, automated tools, etc.
- Minimally, includes the dev. effort of Agile Methods

$$\sum_{i=1}^{n} Cost_i$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Benefits

- Total amount of money gained from Agile Methods
- Includes economic benefit from using new system
- Minimally, includes maintenance rework savings

$$\sum_{i=1}^{n} Benefit_i$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Benefit to Cost Ratio

- Ratio of total benefits to total costs of Agile Methods
- Includes development, maintenance, and business
- Minimally, benefits should be larger than all costs

$$\frac{Benefits}{Costs}$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Return on Investment

- Ratio of adjusted benefits to costs of Agile Methods
- Benefits are adjusted downward using total costs
- Minimally, benefits should be larger than costs

$$\frac{Benefits - Costs}{Costs} \times 100\%$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Net Present Value

- Discounted benefits of using Agile Methods
- Future benefits are discounted due to inflation
- Minimally, future benefits should exceed all costs

$$\sum_{i=1}^{Years} \frac{Benefits_i}{(1+Discount\ Rate)^{Years}} - Costs_0$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Breakeven Point

- Point when benefits exceed costs of Agile Methods
- Point where slope of benefits and costs intersect
- Minimally, old costs should exceed new costs

$$\frac{New\,Costs}{Old\,Costs / New\,Costs - 1}$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Real Options Analysis

- Iterative benefits gained from using Agile Methods
- Future benefits are increased because of risks
- Minimally, benefits should exceed costs

$$N(d_1) \times Benefits - N(d_2) \times Costs \times e^{-Rate \times Years}$$

$$d1 = [ln(Benefits \div Costs) + (Rate + 0.5 \times Risk^2) \times Years] \div Risk \times \sqrt{Years}$$

$$d2 = d1 - Risk \times \sqrt{Years}$$

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

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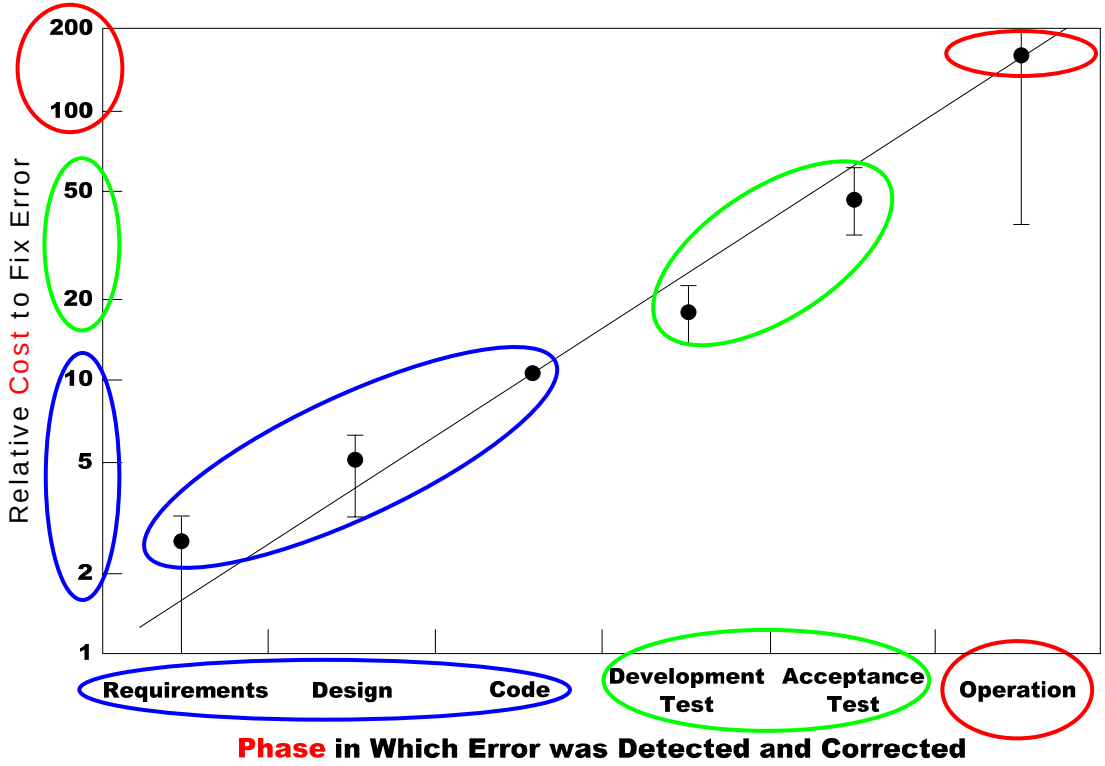
Software Lifecycle Costs

- 1:10:100 is a classical ratio of *dev*. to *maint*. hours
- Defects have negative multiplicative effect on cost
- A *conservative* and *contemporary* ratio is 1:6:30



Boehm, B. W. (1981). *Software engineering economics*. Englewood Cliffs, NJ: Prentice-Hall.
Highsmith, J. A. (2002). *Agile software development ecosystems*. Boston, MA: Addison-Wesley.

Software Cost Models

- Cost estimation models still in use today
- Used to estimate effort of Traditional Methods
- Adjusted average of 5,088 used for ROI estimation

Source	Model	LOC	Months	Hours	Years
COCOMO-O	$\text{Months} = 2.4 \times \text{KLOC}^{1.05}$	10,000	26.93	4,667.60	2.24
COCOMO-S	$\text{Months} = 3.0 \times \text{KLOC}^{1.12}$	10,000	39.55	**6,854.94**	3.30
COCOMO-E	$\text{Months} = 3.6 \times \text{KLOC}^{1.20}$	10,000	57.06	9,889.73	4.75
COCOMO-II	$\text{Months} = 2.9 \times \text{KLOC}^{1.10}$	10,000	36.51	6,328.20	3.04
Walston-Felix	$\text{Months} = 5.2 \times \text{KLOC}^{0.91}$	10,000	42.27	**7,326.31**	3.52
Bailey-Basili	$\text{Months} = 5.5 + 0.73 \times \text{KLOC}^{1.15}$	10,000	15.81	**2,740.66**	1.32
Doty	$\text{Months} = 5.288 \times \text{KLOC}^{1.047}$	10,000	58.92	**10,213.48**	4.91
Average			**39.58**	**6,860.13**	**3.30**

* $(\mathbf{6{,}854.94} + \mathbf{7{,}326.31} + \mathbf{2{,}740.66} + \mathbf{10{,}213.48}) \div 4 \times 0.75 = \mathbf{5{,}087.89}$

Benediktsson, O., & Dalcher, D. (2005). Estimating size in incremental software development projects. *Journal of Engineering Manufacture, 152*(6), 253-259.

Total Lifecycle Costs

- 0.51 hours/line of code for Traditional Methods
- 10% defect inject rate (1,000 defects/10 KLOC)
- 67% of defects in test (33% in maintenance)

Step	Total Lifecycle Cost Model
1.	$0.51 \times Size + 30 \times IR \times Size - 30 \times IH - 5.47 \times TH + IH + TH$
2.	$0.51 \times Size + 30 \times 10\% \times Size - 30 \times IH - 5.47 \times TH + IH + TH$
3.	$0.51 \times Size + 3 \times Size - 30 \times IH - 5.47 \times TH + IH + TH$
4.	$0.51 \times Size + 3 \times Size - 29 \times IH - 4.47 \times TH$
5.	**$3.51 \times Size - 29 \times IH - 4.47 \times TH$**
6.	$3.51 \times 10{,}000 - 0 - 4.47 \times 3{,}651.48$
7.	**18,751.48*** *hours* or **$1,875,148**

* 5,087.89 *Development Hours* + 3,651.48 *Test Hours* + 10,012.11 *Maintenance Hours*

Rico, D. F. (2004). *ROI of software process improvement: Metrics for project managers and software engineers*. Boca Raton, FL: J. Ross Publishing.
In, H. P., et al. (2006). A quality-based cost estimation model for the product line life cycle. *Communications of the ACM*, *49*(12), 85-88.
McCann, B. (2007). The relative cost of interchanging, adding, or dropping quality practices. *Crosstalk*, *20*(6), 25-28.

Agile Productivity Studies

- Productivity data found in 26 Agile Methods studies
- Studies conducted from 2002 to the present time
- Average productivity 21.2374 LOC per hour

No.	Author(s)	Year	Method	Type	LOC/Hour
1.	Abrahamsson	2003	XP	Case Study	19.2550
2.	Abrahamsson & Koskela	2004	XP	Case Study	16.9000
3.	Back, Hirkman, & Milovanov	2004	XP	Experiment	8.0000
⋮	⋮	⋮	⋮	⋮	⋮
24.	Cohn	2008	Scrum	Case Study	5.9050
25.	Jones	2008	Scrum	Case Study	5.7400
26.	Sutherland	2006	Scrum	Case Study	4.6858
Average					21.2374

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Agile Productivity Models

- Based on 13 studies of Extreme Programming (XP)
- Also based on 7 studies of pair programming (PP)
- "Pair programming" had highest productivity

No.	Method	Low	Median	High	Pts.	Productivity
1.	XP	3.5000	16.1575	43.0000	13	LOC ÷ 16.1575
2.	TDD	12.3800	29.2800	46.1800	2	LOC ÷ 29.2800
3.	PP	15.4667	**33.4044**	86.4502	8	LOC ÷ 33.4044
4.	Scrum	4.6858	5.4436	5.9050	3	LOC ÷ 05.4436
5.	**Agile**	**3.5000**	**21.2374**	**86.4502**	**26**	**LOC ÷ 21.2374**

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Agile Quality Studies

- Defect density found in 21 studies of Agile Methods
- Studies conducted from 2002 to the present time
- Average quality 1.7972 defects per KLOC

No.	Author(s)	Year	Method	Type	Def/KLOC
1.	Abrahamsson	2003	XP	Case Study	2.1450
2.	Abrahamsson & Koskela	2004	XP	Case Study	1.4300
3.	Back, Hirkman, & Milovanov	2004	XP	Experiment	0.7000
⇝	⇝	⇝	⇝	⇝	⇝
19.	Cohn	2008	Scrum	Case Study	2.9000
20.	Jones	2008	Scrum	Case Study	8.5000
21.	Schatz & Abdelshafi	2005	Scrum	Case Study	0.4350
Average					1.7972

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Quality Models

- Based on 10 studies of Extreme Programming (XP)
- Also based on 6 studies of pair programming (PP)
- "Extreme Programming" had the highest quality

No.	Method	Low	Median	High	Pts.	Quality
1.	XP	0.0032	0.7466	2.1450	10	0.7466 × KLOC × 30
2.	TDD	0.6100	2.1550	3.7000	2	2.1550 × KLOC × 30
3.	PP	0.3250	2.3550	5.8500	6	2.3550 × KLOC × 30
4.	Scrum	0.4350	3.9450	8.5000	3	3.9450 × KLOC × 30
5.	**Agile**	**0.0032**	**1.7972**	**8.5000**	**21**	**1.7972 × KLOC × 30**

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

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Agile Lifecycle Costs

- Costs based on productivity and quality models
- Development costs based on *LOC* ÷ *productivity* rate
- Maintenance costs based on *defects* × *KLOC* × *MH*

No.	Method	Agile Lifecycle Cost Models	Costs
1.	XP	(10,000 ÷ **05.3858** + **0.7466** × 10 × 30) × 100	**$208,069**
2.	TDD	(10,000 ÷ **09.7600** + **2.1550** × 10 × 30) × 100	**$167,109**
3.	PP	(10,000 ÷ **11.1350** + **2.3550** × 10 × 30) × 100	**$160,459**
4.	Scrum	(10,000 ÷ **05.4436** + **3.9450** × 10 × 30) × 100	**$302,052**
5.	Agile	(10,000 ÷ **07.9311** + **1.7972** × 10 × 30) × 100	**$180,002**

* *XP, TDD, and PP reduced by two-thirds to moderate effects of laboratory conditions*

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Agile Lifecycle Benefits

- Benefits based on total traditional less agile costs
- Traditional costs based $LOC \times dev. + maint.$ effort
- Traditional costs credited testing effort applied

No.	Method	Agile Lifecycle Benefit Models	Benefits
1.	XP	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 - \$208{,}069$	$1,667,079
2.	TDD	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 - \$167{,}109$	$1,708,039
3.	PP	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 - \$160{,}459$	$1,714,690
4.	Scrum	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 - \$302{,}052$	$1,573,096
5.	Agile	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 - \$180{,}002$	$1,695,146

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Extreme Programming

- Costs based on *avg*. productivity and quality
- Productivity moderated from 16.1575 to 5.3858
- Costs were $208,069, benefits were $1,667,079

Metric	Formula	Value
Costs	$(10{,}000 \div \mathbf{5.3858} + \mathbf{0.7466} \times 10 \times 30) \times 100$	$208,069
Benefits	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 -$ $208,069	$1,667,079
B/CR	$1,667,079 ÷ $208,069	8:1
ROI	($1,667,079 − $208,069) ÷ $208,069 × 100%	701%
NPV	$(\sum_{i=1}^{5} (\$1{,}667{,}079 \div 5) \div 1.05^5) - \$208{,}069$	$1,235,446
BEP	$208,069 ÷ ($1,875,148 ÷ $208,069 − 1)	$10,064
ROA	*NORMSDIST* (2.24) × $1,667,079 − *NORMSDIST* (0.59) × $208,069 × *EXP* (−5% × 5)	$1,529,066

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Test Driven Development

- Costs based on *avg*. productivity and quality
- Productivity moderated from 29.2800 to 9.7600
- Costs were $167,109, benefits were $1,708,039

Metric	Formula	Value
Costs	(10,000 ÷ **9.7600** + **2.1550** × 10 × 30) × 100	**$167,109**
Benefits	(10,000 × 3.51 − 3,651.48 × 4.47) × 100 − **$167,109**	**$1,708,039**
B/CR	**$1,708,039** ÷ **$167,109**	10:1
ROI	(**$1,708,039** − **$167,109**) ÷ **$167,109** × 100%	922%
NPV	$(\sum_{i=1}^{5}$ (**$1,708,039** ÷ 5) ÷ 1.05^5) − **$167,109**	$1,311,874
BEP	**$167,109** ÷ ($1,875,148 ÷ **$167,109** − 1)	$6,430
ROA	*NORMSDIST* (2.76) × **$1,708,039** − *NORMSDIST* (1.58) × **$167,109** × *EXP* (−5% × 5)	$1,580,490

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International*, *10*(4), 9-18.

Pair Programming

- Costs based on *avg*. productivity and quality
- Productivity moderated from 33.4044 to 11.135
- Costs were $160,459, benefits were $1,714,690

Metric	Formula	Value
Costs	$(10{,}000 \div \mathbf{11.1350} + \mathbf{2.3550} \times 10 \times 30) \times 100$	**$160,459**
Benefits	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 -$ **$160,459**	**$1,714,690**
B/CR	**$1,714,690** ÷ **$160,459**	11:1
ROI	(**$1,714,690** − **$160,459**) ÷ **$160,459** × 100%	969%
NPV	$(\sum_{i=1}^{5}$ (**$1,714,690** ÷ 5) ÷ $1.05^5) -$ **$160,459**	$1,324,283
BEP	**$160,459** ÷ ($1,875,148 ÷ **$160,459** − 1)	$5,919
ROA	*NORMSDIST* (2.95) × **$1,714,690** − *NORMSDIST* (1.86) × **$160,459** × *EXP* (−5% × 5)	$1,590,927

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International*, *10*(4), 9-18.

Scrum

- Costs based on *avg*. productivity and quality
- Productivity data remained the same at 5.4436
- Costs were $302,052, benefits were $1,573,096

Metric	Formula	Value
Costs	$(10{,}000 \div \mathbf{5.4436} + \mathbf{3.9450} \times 10 \times 30) \times 100$	$302,052
Benefits	$(10{,}000 \times 3.51 - 3{,}651.48 \times 4.47) \times 100 -$ $302,052	$1,573,096
B/CR	$1,573,096 ÷ $302,052	5:1
ROI	($1,573,096 − $302,052) ÷ $302,052 × 100%	421%
NPV	$(\sum_{i=1}^{5} (\$1{,}573{,}096 \div 5) \div 1.05^5) - \$302{,}052$	$1,060,084
BEP	$302,052 ÷ ($1,875,148 ÷ $302,052 − 1)	$21,682
ROA	*NORMSDIST* (1.97) × $1,573,096 − *NORMSDIST* (-0.27) × $302,052 × *EXP* (−5% × 5)	$1,441,741

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Agile Methods

- Costs based on *avg*. productivity and quality
- Productivity data resulted in average of 7.9311
- Costs were $180,002, benefits were $1,695,146

Metric	Formula	Value
Costs	(10,000 ÷ **7.9311** + **1.7972** × 10 × 30) × 100	**$180,002**
Benefits	(10,000 × 3.51 − 3,651.48 × 4.47) × 100 − **$180,002**	**$1,695,146**
B/CR	**$1,695,146** ÷ **$180,002**	9:1
ROI	(**$1,695,146** − **$180,002**) ÷ **$180,002** × 100%	842%
NPV	$(\sum_{i=1}^{5}$ (**$1,695,146** ÷ 5) ÷ 1.05^5) − **$180,002**	$1,287,817
BEP	**$180,002** ÷ ($1,875,148 ÷ **$180,002** − 1)	$7,483
ROA	*NORMSDIST* (2.52) × **$1,695,146** − *NORMSDIST* (1.16) × **$180,002** × *EXP* (−5% × 5)	$1,562,126

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

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Data for Agile Methods

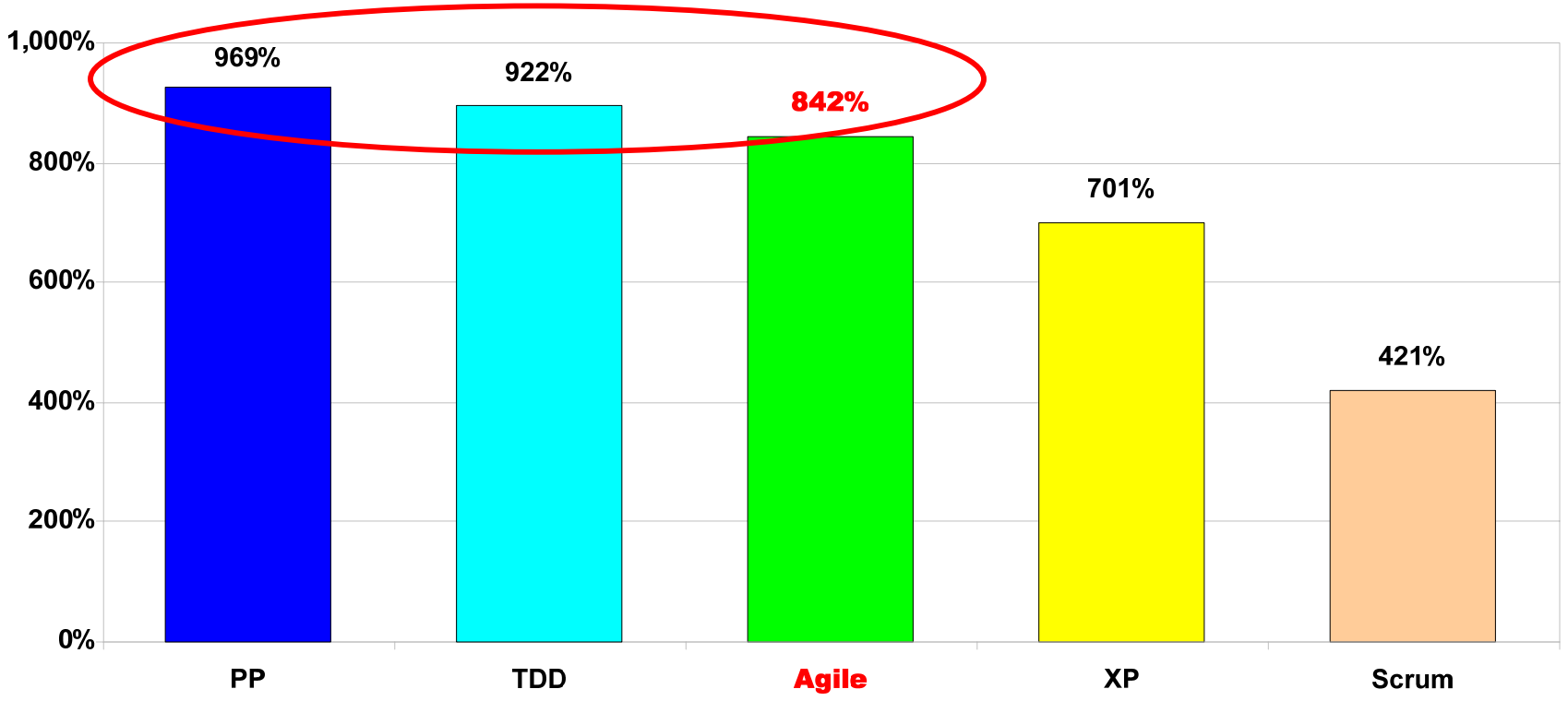
- Agile Methods were ranked based on ROI
- Agile Methods with high quality had lower ROI
- Agile Methods with high productivity had high ROI

Method	Costs	Benefits	B/CR	ROI	NPV	BEP	ROA
PP	$160,459	$1,714,690	11:1	969%	$1,324,283	$5,919	$1,590,927
TDD	$167,109	$1,708,039	10:1	922%	$1,311,874	$6,430	$1,580,490
Agile	**$180,002**	**$1,695,146**	**9:1**	**842%**	**$1,287,817**	**$7,483**	**$1,562,126**
XP	$208,069	$1,667,079	8:1	701%	$1,235,446	$10,064	$1,529,066
Scrum	$302,052	$1,573,096	5:1	421%	$1,060,084	$21,682	$1,441,741

Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

ROI of Agile Methods

- Agile Methods were ordered based on ROI
- Agile Methods had a high ROI value of 969%
- Agile Methods yielded an average ROI of 842%



Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

Data for Traditional Methods

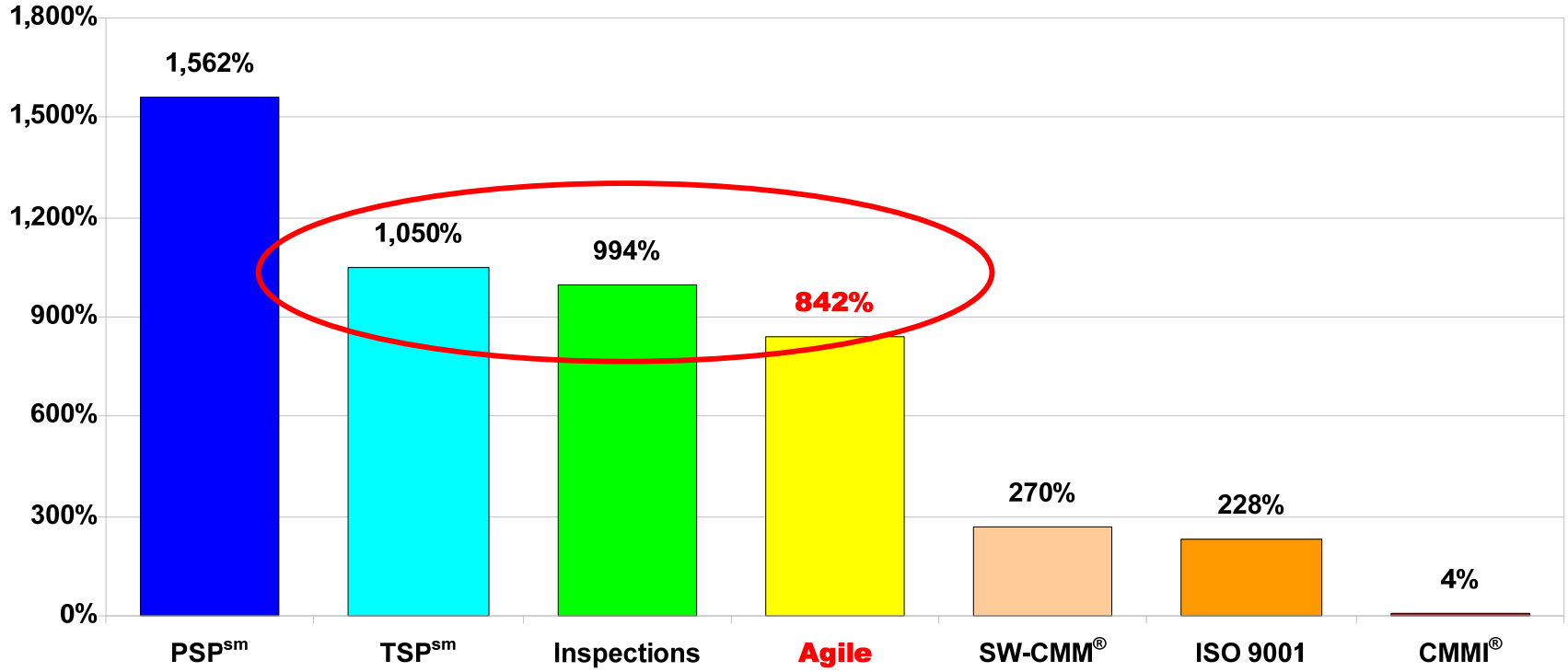
- Traditional Methods were ranked based on ROI
- Methods with good cost and quality had higher ROI
- Agile Methods had better ROI than heaviest methods

Method	Costs	Benefits	B/CR	ROI	NPV	BEP	ROA
PSP℠	$105,600	$1,755,148	17:1	1,562%	$1,414,174	$945	$1,672,907
TSP℠	$148,400	$1,706,648	12:1	1,050%	$1,329,379	$5,760	$1,591,127
Inspections	$82,073	$897,499	11:1	994%	$695,067	$51,677	$833,681
Agile	**$180,002**	**$1,695,146**	**9:1**	**842%**	**$1,287,817**	**$7,483**	**$1,556,997**
SW-CMM®	$311,433	$1,153,099	4:1	270%	$687,030	$153,182	$998,013
ISO 9001	$173,000	$566,844	3:1	228%	$317,828	$1,196,206	$486,750
CMMI®	$1,108,233	$1,153,099	1:1	4%	-$109,770	$545,099	$891,412

Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

ROI of Traditional Methods

- Traditional Methods were ordered using ROI
- Traditional Methods had high ROI value of 1,562%
- Agile Methods had better ROI than heaviest methods



Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

Data for All Methods

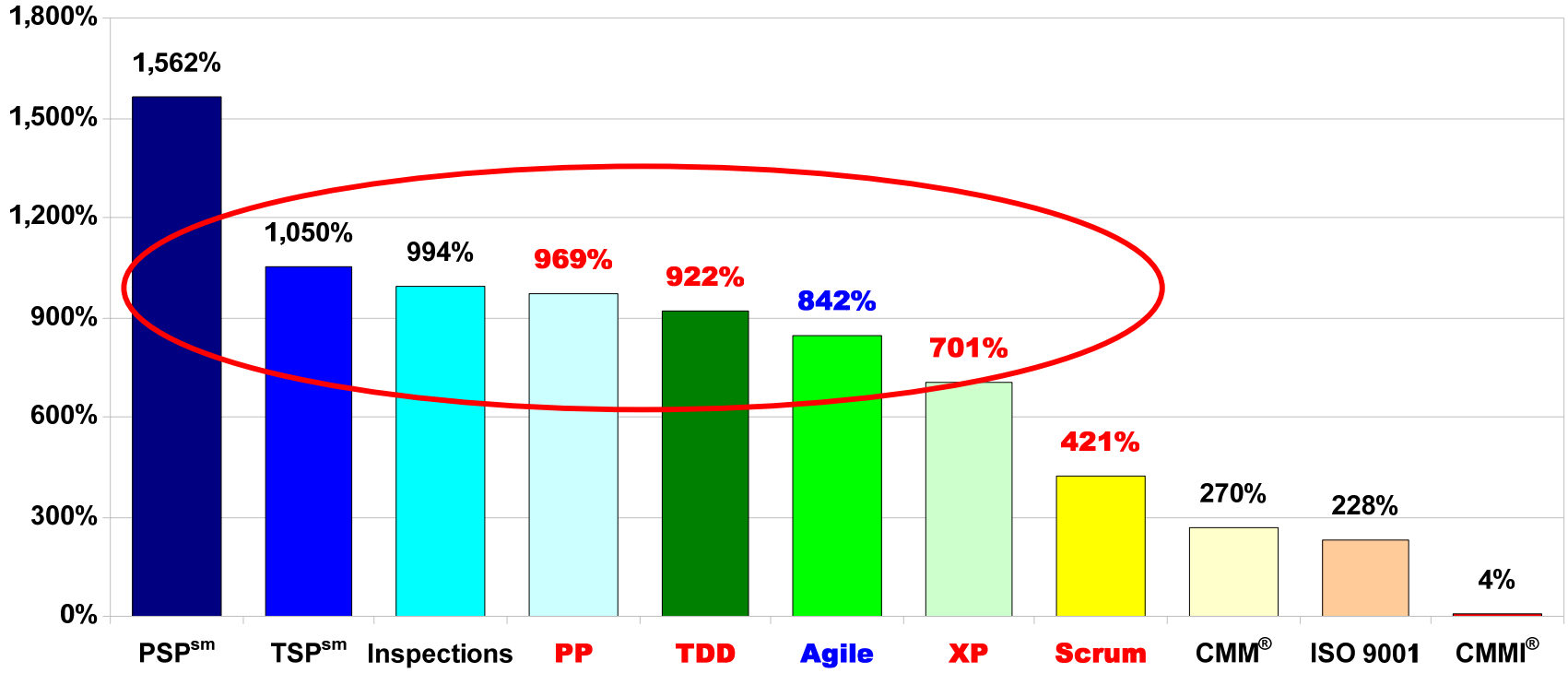
- Software methods were ranked based on ROI
- Methods with good cost and quality had best ROI
- Best Agile and Traditional Methods had similar ROI

Type	Method	Costs	Benefits	B/CR	ROI	NPV	BEP	ROA
Traditional	PSP℠	$105,600	$1,755,148	17:1	1,562%	$1,414,174	$945	$1,672,907
Traditional	TSP℠	$148,400	$1,706,648	12:1	1,050%	$1,329,379	$5,760	$1,591,127
Traditional	Inspections	$82,073	$897,499	11:1	994%	$695,067	$51,677	$833,681
Agile	PP	$160,459	$1,714,690	11:1	969%	$1,324,283	$5,919	$1,590,034
Agile	TDD	$167,109	$1,708,039	10:1	922%	$1,311,874	$6,430	$1,578,575
Agile	Agile	$180,002	$1,695,146	9:1	842%	$1,287,817	$7,483	$1,556,997
Agile	XP	$208,069	$1,667,079	8:1	701%	$1,235,446	$10,064	$1,513,332
Agile	Scrum	$302,052	$1,573,096	5:1	421%	$1,060,084	$21,682	$1,389,810
Traditional	SW-CMM®	$311,433	$1,153,099	4:1	270%	$687,030	$153,182	$998,013
Traditional	ISO 9001	$173,000	$566,844	3:1	228%	$317,828	$1,196,206	$486,750
Traditional	CMMI®	$1,108,233	$1,153,099	1:1	4%	-$109,770	$545,099	$891,412

Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

ROI of All Methods

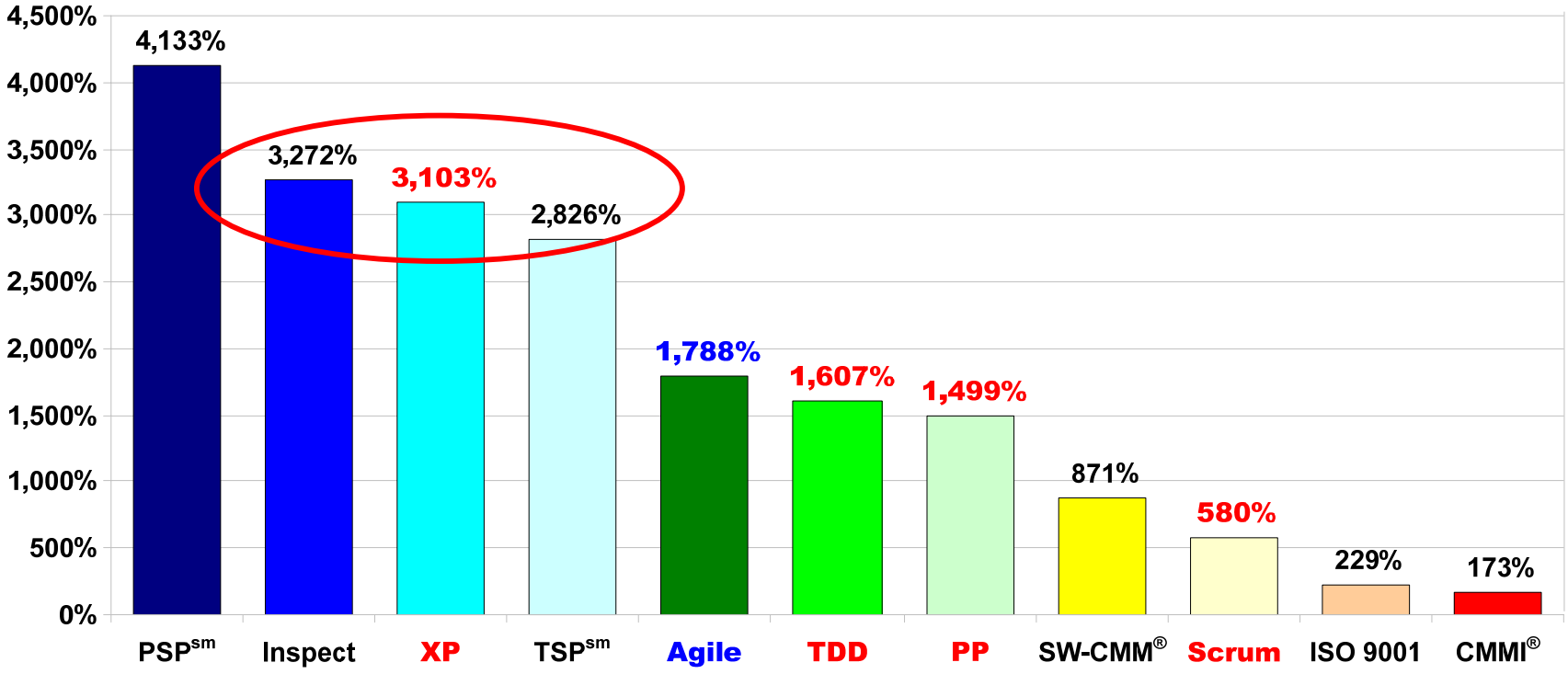
- Software methods were ordered by ROI
- Agile Methods had a high ROI value of 969%
- Traditional Methods had high ROI value of 1,562%



Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

Unadjusted ROI of All Methods

- Are data based on unrealistic laboratory conditions?
- Are productivity data from lab studies optimistic?
- Are total lifecycle costs closer to 1:10:100?



Rico, D. F. (2008). *What is the ROI of agile vs. traditional methods*? Retrieved September 3, 2008, from http://davidfrico.com/agile-benefits.xls

Agenda

- Introduction
- Sources of Business Value
- Planning for Business Value
- Surveys of Business Value
- Measures of Business Value
- Models of Business Value
- Estimation of Business Value
- Comparison of Business Value
- ☞ Summary of Business Value

Benefit Summary

- Agile (138 pt.) and Traditional Methods (99 pt.)
- Agile Methods fare better in all benefits categories
- Agile Methods 459% 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%**

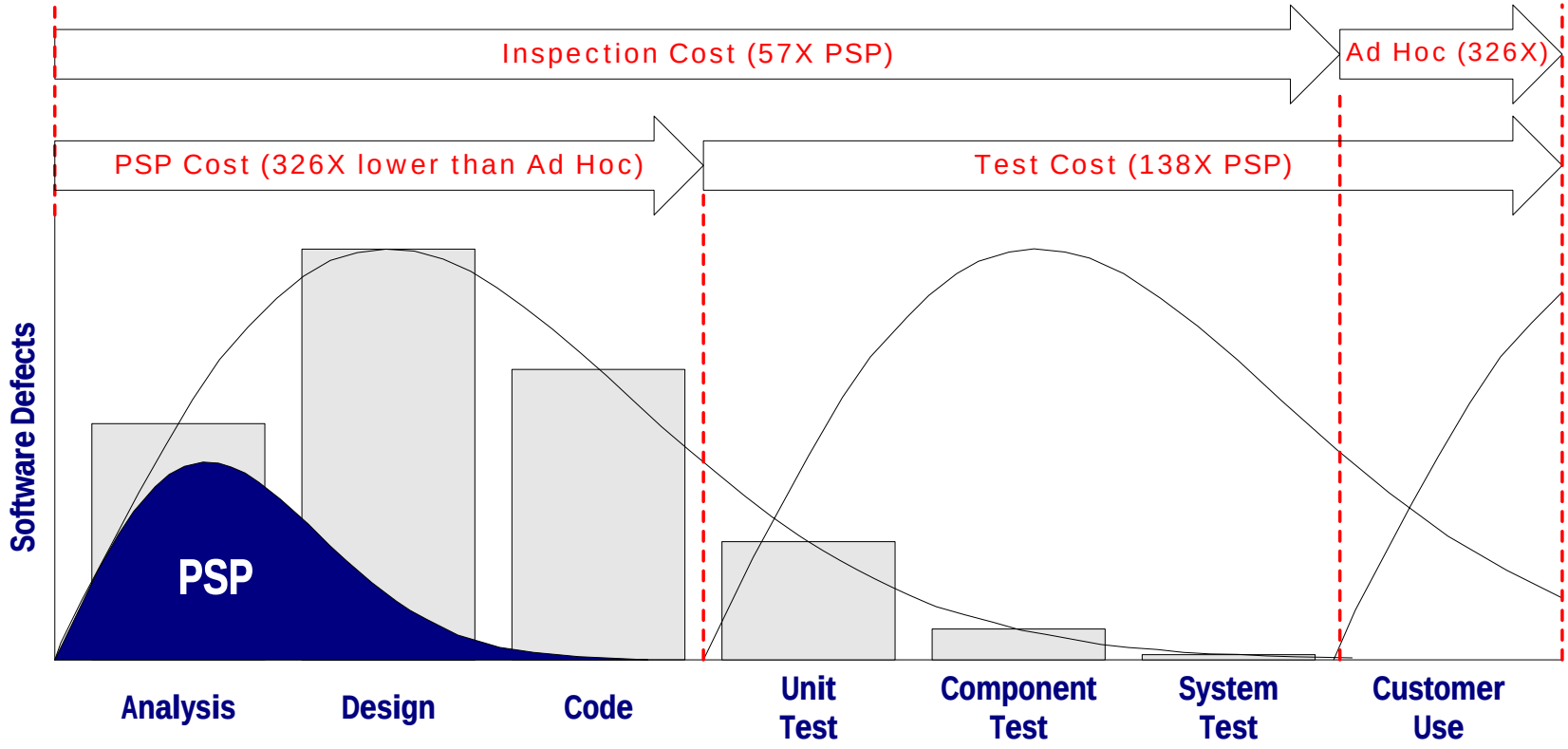
Traditional Methods

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%**

Rico, D. F. (2008). What is the ROI of agile vs. traditional methods? *TickIT International, 10*(4), 9-18.

Cost of Quality

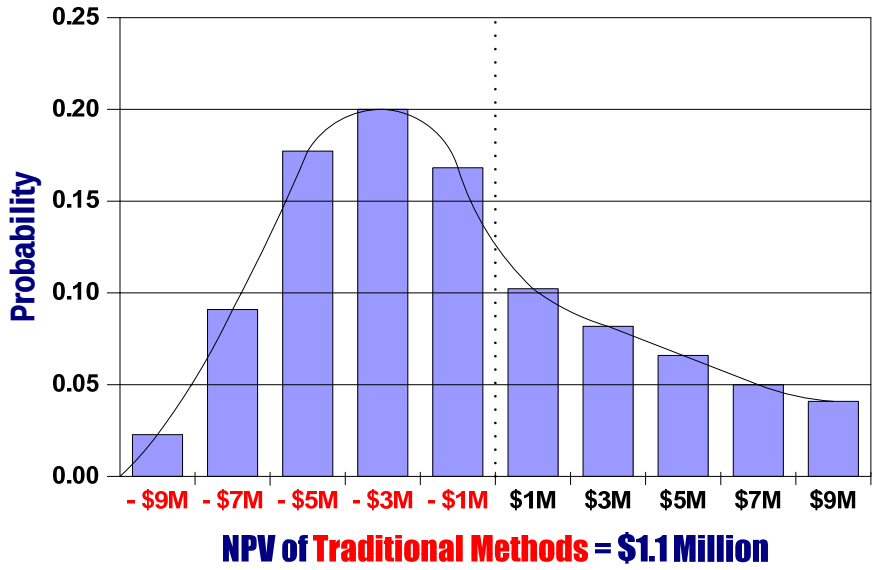
- Apply traditional reliability and quality theory
- Defects are inexpensive to remove early in cycle
- Late bug removal has negative, multiplicative effect

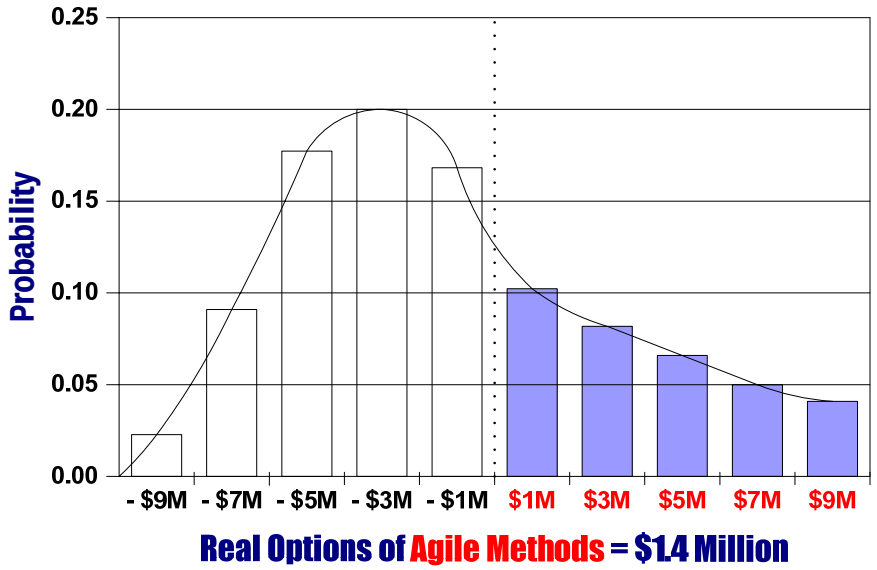


Rico, D. F. (2000). *Using cost benefit analyses to develop software process improvement (SPI) strategies*. Rome, NY: DACS.

Real Options

- NPV models losses of Traditional Methods
- Real options model profits from Agile Methods
- Agile Methods incur less initial risk and higher ROI





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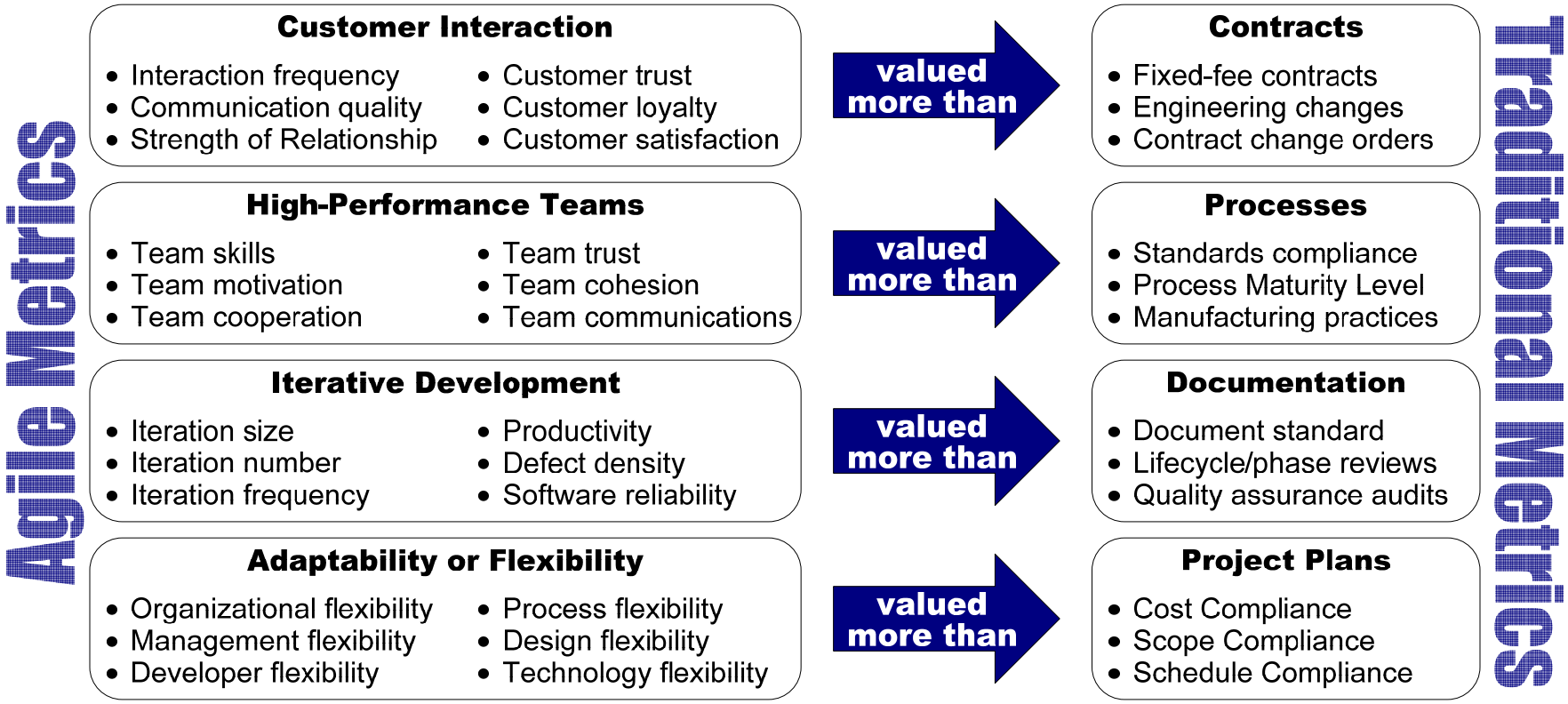
Agile vs. Traditional Metrics

- Agile Methods are a fundamentally new paradigm
- Agile Methods are “not” lighter Traditional Methods
- They should not be viewed through a Traditional lens



Rico, D. F. (2009). *Metrics for agile methods.* Retrieved February 7, 2009, from http://davidfrico.com/agile-metrics.pdf

New Book

- Guide to Agile Methods for business leaders
- Communicates business value of Agile Methods
- Rosetta stone to Agile Methods for Traditional folks

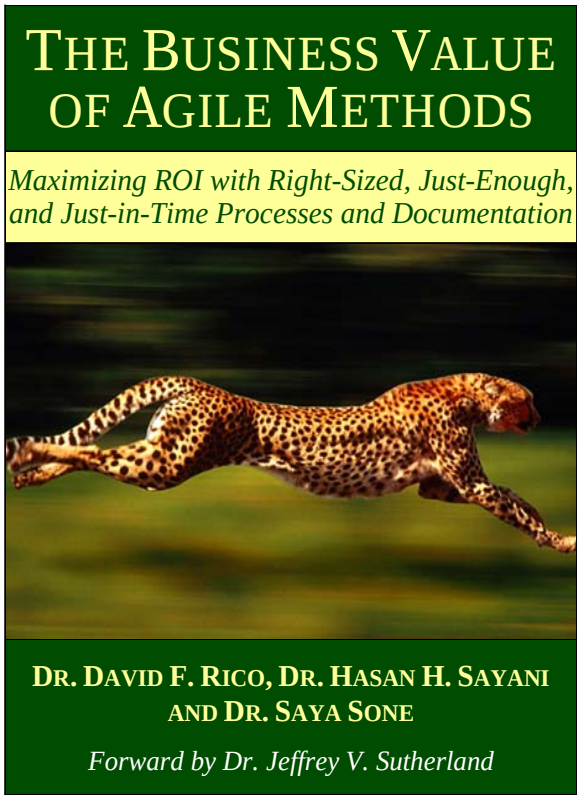


Table of Contents

** Rosetta stone to the business value and culture of Agile Methods for executives, managers, and thought leaders in the field of software methods.*

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ROI • NPV • Breakeven Pt. • Real Options
Agile Methods • Six Sigma • CMMI • ISO 9001
System Lifecycles • Policies & Procedures • IDEF0

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