

APSEC 2010, Sydney, Australia

Customization of Scrum Methodology for Outsourced E-commerce Projects

Nayoung Hong^a, Junbeom Yoo^b, Sungdeok Cha^a

^aDepartment of Software Engineering, Graduate School of Computer
Information & Communication, Korea University

^bDivision of Computer Science and Engineering, Konkuk University
h4022@nate.com, jbyoo@konkuk.ac.kr, scha@korea.ac.kr

Index

- Introduction
 - Motivation
 - Problems with Original Scrum
 - Related Work
 - Trend of Software Development Methods
 - Effects of agile methodology
 - The Original Scrum
 - Our Customized Scrum
 - Initial Stage
 - Sprint Planning Stage
 - Sprint Review Stage
 - Quantitative & Qualitative Evaluation
 - Conclusion
 - References
-

1. Introduction - Motivation

Problems of Project in E-commerce Industry

| Project Success Rate | Project | Success | Delayed | Failure |
|----------------------|------------|---------|---------|---------|
| | Outsourced | 60 % | 20 % | 20 % |
| Internal | 89 % | 11 % | 0 % | |

| Defect Ratio | Project | Defect Ratio | Fatal Ratio |
|--------------|------------|--------------|-------------|
| | Outsourced | 43.3 % | 8.7 % |
| Internal | 16.8 % | 0.5 % | |

Characteristics of Projects

| | Internal | Outsourced |
|-------------|-----------------|----------------|
| Scale | Small (<12M/M) | Large (12>M/M) |
| Staff | In-house | Specialists |
| Requirement | Known | Unknown |
| Due date | Fixed sometimes | Fixed |

137 Projects

Current Status

<Status of Outsourced E-commerce Projects>

- Success and defect ratio have decreased and increased respectively.
- Because, **waterfall method** is unsuitable for outsourced e-commerce projects, which the size is large and requirements are unknown.

Solution

- Use the Scrum method instead of the Waterfall model

1. Introduction – Problems with Original Scrum

Problems of the Original Scrum

• Initial Phase

Roles & responsibilities are not clear.

• Planning Phase

Original Scrum does not allow a clear picture of the overall project schedule.

• Review Phase

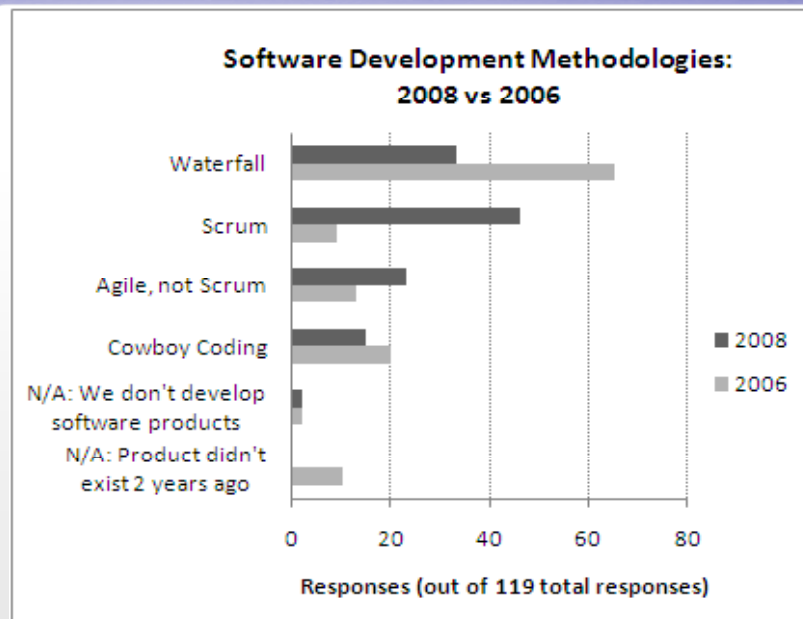
Burndown chart is inconvenient.

Solution

- Roles & responsibilities are clearly presented in an initial phase.
- Additional planning stage is added to plan and outline the project as a whole.
- Project progress is reported based on the number of completed web pages, reflecting features of E-commerce projects

2. Related work - Trend of Software Development Methods

Trend of Software Development Method [1]



Why Agile ? [2]

What was the MOST IMPORTANT reason for adopting Agile within your team or organization?

| | |
|--|-----|
| Accelerate Time-to-Market | 22% |
| Enhance Ability to Manage Changing Priorities | 21% |
| Increase Productivity | 12% |
| Enhance Software Quality | 10% |
| Improve Alignment Between IT and Business | 9% |
| Improve Project Visibility | 6% |
| Reduce Risk | 6% |
| Simplify Development Process | 4% |
| Other | 3% |
| Improved/Increased Engineering Discipline | 2% |
| Reduce Cost | 2% |
| Enhance Software Maintainability/Extensibility | 2% |
| Improved Team Morale | 1% |

※ Ref : [1] Poll Results: Software Development Methodologies (Agile vs Waterfall) by The Cranky Product Manager on October 10, 2008 in Agile/Scrum, Polls & Surveys

[2] 3rd Annual Survey:2008 "The State of Agile Development" sponsored by VersionOne

2. Related Work - Effects of agile methodology

Research Reports

| Items | Forrester Research('05)[3] | IBM('06)[4] | Yahoo('07)[5] |
|-----------------------|----------------------------|------------------------|--|
| Research | 21 Company | 4,232 IT Professionals | 50 Teams, 600 Members (In EU,US,Asia-Pacific Yahoo) |
| Productivity | 60% | 60% | 68% |
| Cost | 48% | - | - |
| Quality | 43% | 66% | 54% |
| Business Satisfaction | - | 58% | 64% |
| Responsibility | - | - | 52~63% |
| Cooperation | - | - | 89% |

Overseas : HP, IBM, Yahoo, Google Search, MS, Motorola, Nokia, Ericsson, Philips, SAP, Siemens, BBC, Salesforce.com, British Telecom [6]

Korea : Mobigen, Daum Communications, Neowiz, NHN, MGame, Openmaru, MAIET entertainment, TMax

*Ref: [3] Carey Schwaber, Richard Fichera "Corporate IT Leads The Second Wave of Agile Adoption", November 30, 2005. Forrester Research

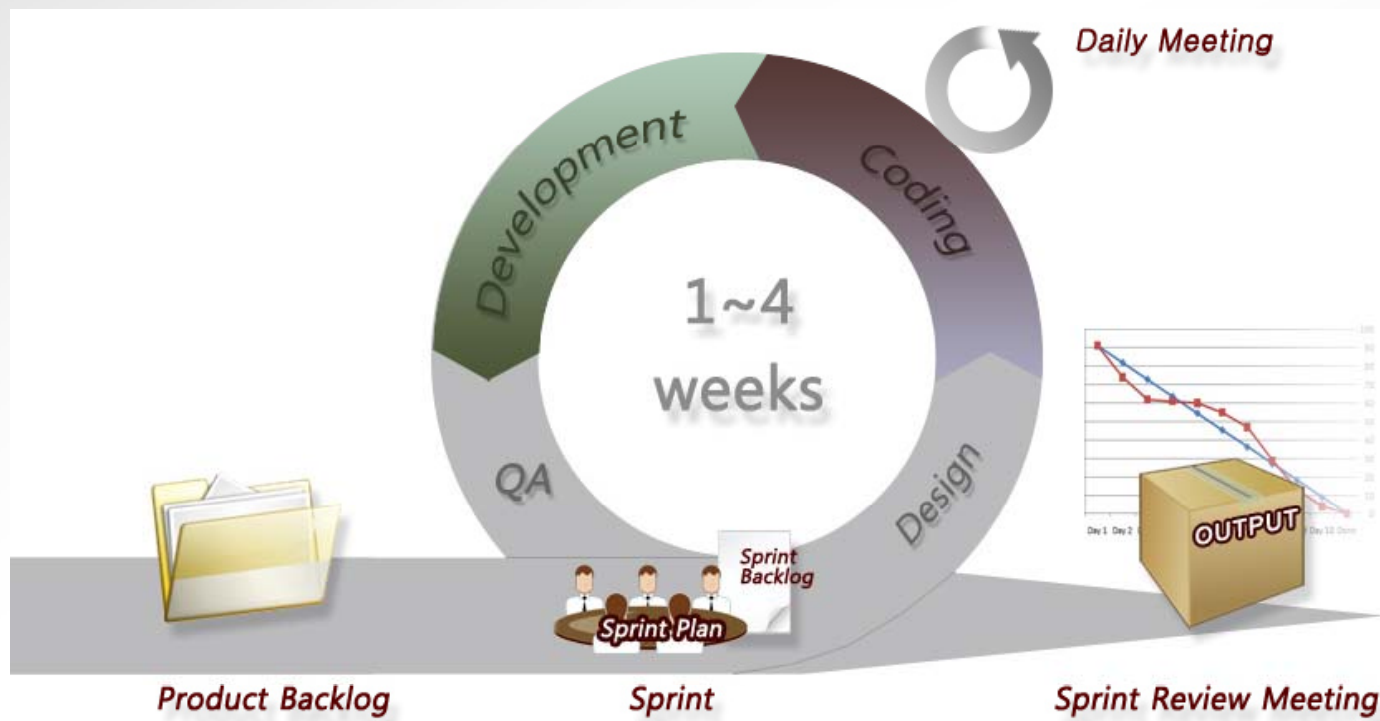
[4] Scott Ambler, "Survey Says: Agile Works in Practice Agile Software development methods and techniques are gaining traction", 2006, www.ddj.com

[5] Gabrielle Benefield, "Rolling out Agile at a large Enterprise", The Scrum Paper:Nuts,Bolts, and Origins of an Agile Process, 2007

[6] xpert.org, <http://xpert.org/wiki/xp>, Website

2. Related Work – The Original scrum

- Iterative and incremental development method
- Conceptualized in Japan firstly in 1986 by Hirotaka Takeuchi and Ikujiro Nonaka
- Provides increased speed and better flexibility in the development

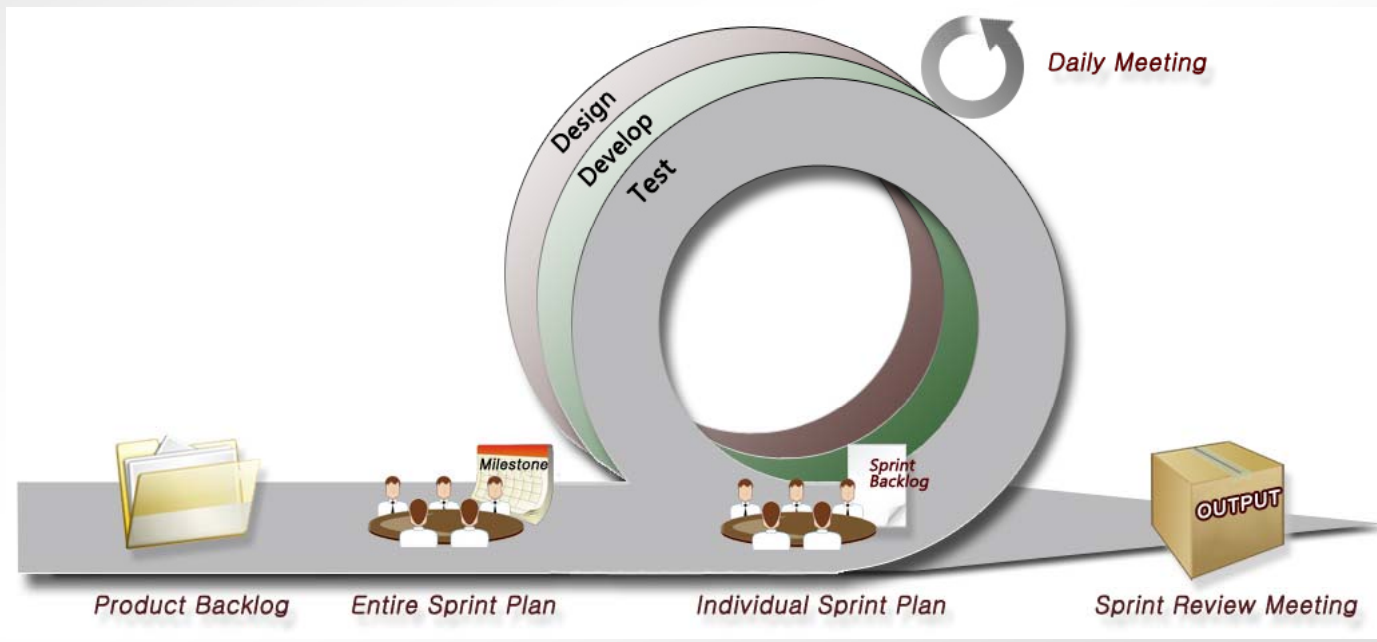


* Ref : [7] Ken Schwaber, "Agile Software Development with Scrum", 2002

[8] Henrik Kinberg, "Scrum and XP from the Trenches How we do Scrum", 2007

3. Our Customized Scrum

- We added a master sprint planning phase, which aims to plan the milestone for the entire project.
- During individual sprints, goals are set for a particular sprint to minimize stand-by time of each unit in the team.
- In Sprint review meeting, we report project progress using completed web pages.



3.1 Initial Stage

Role Mapping

| Scrum | Waterfall | Roles |
|----------------------|---|--|
| Scrum Master | PM | Helps the team familiarize. Responsible for resolving and eliminating any complications |
| Product Owner | Service Planner | Chief responsibility of the products Responsible for prioritizing product functions Re-prioritize these functions Maximize return-on-investment |
| Scrum Team Member | Designer /Coder /Developer /QA | Responsible for the actual development and delivery of the product |
| Users & Stakeholders | | No responsibility |

3.1 Initial Stage

Scrum Team Setup & Role Definition by Stage

| | Product backlog Review | Master Sprint Planning | Individual Sprint Planning | Daily meeting | Sprint review |
|---|----------------------------------|--|--|--|--|
| Goal | Review and share product backlog | -Measure estimated scoring for product backlog -Determine the number of sprint -Set the milestone | -Set the goal for individual sprint planning -Produce Work progress table | -Share daily progress and updates -Check & resolve issues | -Demonstrate Sprint deliverables -Update the progress |
| Scrum Master | Review product backlog | -Hold meetings -Review entire product backlog -Determine the total number of Sprint -Review the milestone | -Hold meetings -Review work progress | -Manage progress -Manage issues -Manage schedules | -Update progress -Maintain issues -Maintain schedule |
| Product Owner | Delivery product backlog | -Measure estimated scoring for entire product backlog -Set goals for the entire Sprint | -Select backlog to execute during individual Sprint -Review work progress chart | Support issue resolution | -Check product -Check requirements that are missing in implementation |
| Scrum Team (Designer/Coder/Developer/QA) | Review product backlog | -Measure estimated scoring for entire product backlog -Set the goals for entire Sprint | -Set the goals for individual Sprint by each operation process -Produce work progress chart | -Completed tasks -Planning tasks -Issues | -Demonstrate deliverables |

3.2 Sprint Planning Stage

Master Sprint Planning










- Introduced as a way to plan the goal of the project as a whole
- Estimate the time and number of sprints which it will take to complete the entire project
- Set the goals of each sprint and determine the milestones of the entire project

| ID | Level1 | Level2 | Level3 | SBD Page | Page | employee | Sprint | Effort | Done |
|-------|-------------|-----------------|-----------------|---------------------|------|----------|--------|--------|------|
| FO1_1 | Home | Recommend Items | | Shopping main 8~9 p | 1 | | 1 | 24 | |
| | | New Items | | | | | 1 | 8 | |
| | | Global Shopping | Best Items | | | | 1 | 16 | |
| FO2_1 | Category | Main categories | | Shopping main 10p | 1 | | 2 | 16 | |
| FO2_2 | | Sub categories | Show Lists | Shopping main 11p | 1 | | 2 | 8 | |
| FO2_3 | | | Show thumbnails | Shopping main 12p | 1 | | 3 | 8 | |
| BO1_1 | Back Office | Managing Items | | Administrator 3 | 1 | | 3 | 24 | |

3.2 Sprint Planning Stage

Individual Sprint Planning

- Held at the beginning of each sprint cycle
- Selects the product backlog to develop for the current sprint
- Assigns the selected backlog into work units
- Produce the progress dashboard and the task card
 - Post the expected start date on the dashboard
 - Accurately plan their schedule to minimize stand-by time

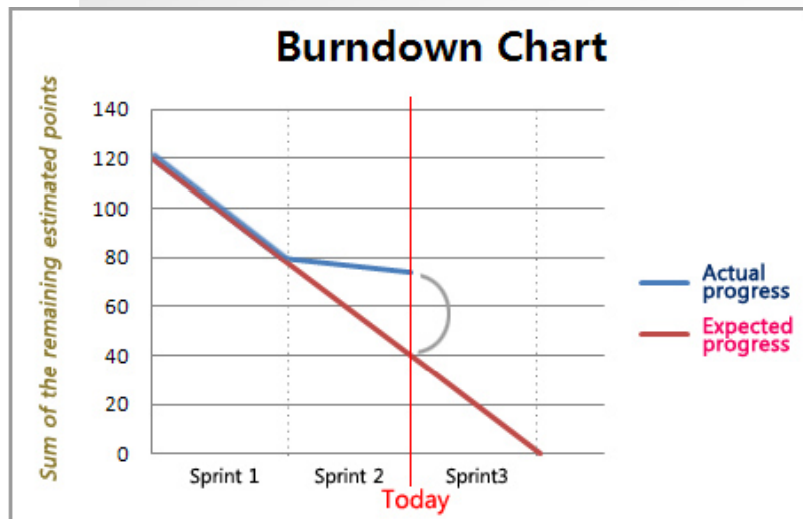
| Story | To do | | In progress | Done | |
|---------------|--|---|-------------|----------------------------|------|
| # No Story | 2/1 Expected Start Date | 2/8  | Mon | 2/1 Actual Completed | 2/8 |
| # No Story | 2/2  | 2/10  | Tue | 2/2 | 2/10 |
| # No Story | 2/3  | 2/11  | Wed | 2/3 | 2/11 |
| | 2/4  | 2/12  | Thu | 2/4 | 2/12 |
| | 2/5  | 2/13  | Fri | 2/5 | 2/13 |

| | |
|---------------|----------------------|
| # No | Expected End Date |
| Task Content | |
| Name of emplo | The Time Required |

3.3 Sprint Review Stage

🔵 Sprint Review Stage

- Remind the goals for each unit within the current Sprint plan
- How much of the product they have completed up to that point
- Progress is monitored based on the number of web pages completed



| # of Sprint | Total # of pages | # of Fully Developed | Actual Completion | Expected Completion |
|-------------|------------------|----------------------|-------------------|---------------------|
| 1 | 1 | 1 | 20% | 20% |
| 2 | 2 | 1 | 40% | 60% |
| 3 | 2 | | | 100% |

$$\text{Actual progress rate} = \frac{\sum \text{number of completed pages}}{\sum \text{total number of pages to build}} * 100$$

$$\text{Expected progress rate} = \frac{\sum \text{total number of pages to build} * \text{current Sprint}}{\sum \text{total number of pages to build}} * 100$$

4. Quantitative Evaluation

Defect Ratio : Total 23.3%, Critical 7.8% reduced

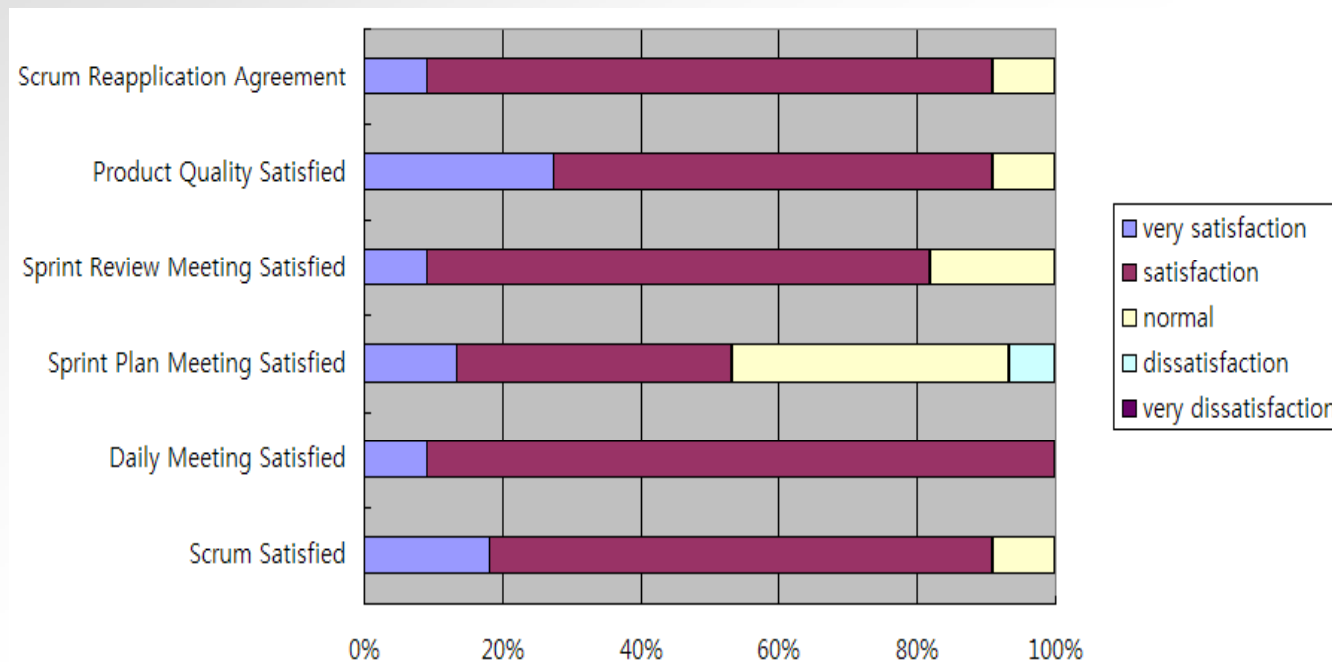
| Projects | #Test Case | #Defect | #N.Case | #Abn.Case | Defect | Critical | Major | Minor |
|----------------|------------|---------|--------------|-----------|--------------|-------------|-------|-------|
| A (Outsourced) | 1951 | 605 | 33.4% | 3.3% | 31.0% | 4.6% | 31.9% | 64.5% |
| B (Outsourced) | 764 | 474 | 57.2% | 94.1% | 62.0% | 8.4% | 46.4% | 45.1% |
| C (Outsourced) | 331 | 122 | 26.1% | 100% | 36.9% | 13.1% | 58.2% | 28.7% |
| I (Scrum) | 278 | 79 | 12.4% | 70.1% | 28.4% | 0.0% | 68.4% | 31.6% |
| II (Scrum) | 1232 | 259 | 18.8% | 64.4% | 22.1% | 1.9% | 55.2% | 42.9% |
| 1 (Internal) | 375 | 100 | 22.2% | 37.6% | 27.0% | 1.0% | 65.0% | 34.0% |
| 2 (Internal) | 122 | 8 | 5.3% | 25.0% | 6.6% | 0.0% | 75.0% | 25.0% |

Stand-by time : Design 18.5 days, Developed 11.5 days earlier

| Projects | Design | Coding/Flash | Development | QA |
|----------------|--------|--------------|-------------|-----|
| A (Outsourced) | 0 | -8 | -15 | -30 |
| B (Outsourced) | 3 | -10 | 7 | -30 |
| C (Outsourced) | 38 | -6 | 38 | 3 |
| I (Scrum) | -15 | -3 | -12 | -30 |
| II (Scrum) | -22 | -7 | -11 | -56 |
| 1 (Internal) | 26 | 10 | 21 | 2 |
| 2 (Internal) | -15 | -2 | -1 | -1 |

4. Qualitative Evaluation

- More than 80% of software engineers also expressed satisfaction of the proposed approach.



5. Conclusion

Conclusion

- **Customized Scrum methodology**
 - Decrease defect rates successfully
 - Reduce waiting time and enable on-time delivery of the product
 - Use resources more efficiently
- **Surveys conducted**
 - More than 80% satisfaction rate
 - Respondents said that the proposed method is helpful for on-time delivery of quality product
- **Suitability of the customized scrum method was verified for outsourced projects in Korean e-commerce industry.**

Further Study

- **Verify how SW productivity is affected**
- **How it can be efficiently applied if the outsourced company is in different locations?**

Reference

- Poll Results: Software Development Methodologies (Agile vs Waterfall) by The Cranky Product Manager on October 10, 2008 in Agile/Scrum, Polls & Surveys
- 3rd Annual Survey:2008 "The State of Agile Development" sponsored by VersionOne
- Carey Schwaber, Richard Fichera "Corporate IT Leads The Second Wave of Agile Adoption", November 30, 2005. Forrester Research
- Scott Ambler, "Survey Says: Agile Works in Practice Agile Software development methods and techniques are gaining traction", , 2006, www.ddj.com
- Gabrielle Benefield, "Rolling out Agile at a large Enterprise", The Scrum Paper:Nuts,Bolts, and Origins of an Agile Process, 2007
- xpert.org, <http://xper.org/wiki/xp>, Website
- Ken Schwaber, "Agile Software Development with Scrum", 2002
- Henrik Kinberg, "Scrum and XP from the Trenches How we do Scrum", 2007