Presentation of the research paper
”Adopting Agile in a large organization: balancing the old with the new”

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Introduction

Why the interest of adopting agile methodologies in large organizations?

1. Failure in the application of traditional software development methodologies: Charting the Seas of Information Technology report (1998). 23000 projects analyzed: top reasons for project failure were associated with the waterfall model.[LB03]

2. Claims from agile advocates: Kent Beck: *XP is a software discipline that addresses risk at all levels of the development process*. Risks include schedule slips, cancellation of the project, high number of defects, misunderstood requirements

Combination of 1. and 2. makes agile methodologies an interesting alternative for decision makers!
Introduction - The old vs. the new

- Old: Traditional software development (waterfall, spiral models)
  - Extensive upfront planning to predict, measure and control the development process
  - Large amount of documentation about the process itself
  - Customer is involved during contract negotiation but not during development

- New: Agile methodologies (XP, Scrum, Rational Unified Process (RUP))
  - Rely on people and their creativity
  - Deliverable of each iteration is working code not documentation about the code
  - Collaborative decision making involving the customer
Introduction - Challenges for adoption

- Development process conflicts: due the need of agile integration with the existing environment

- Management/organizational conflicts: command-and-control vs. leadership-and-collaboration styles

- People conflicts: misunderstandings about role and day-to-day practice of the new technology

Abdelnour-Nocera’s paper [ANS07] focus on the identification of people conflicts
Paper overview

• Sociological study about the adoption of an agile methodology in a large organization

• Main objective was to identify the conflicts in understanding and day-to-day practice of agile values among different groups within the organization
  – Identified conflicts can provide hints about likely sources of problems in other large organizations adopting agile

• Research methodology based on data gathering and analysis phases
The organization studied

• Worldwide voice and data services provider. 100000 staff, approx. 7500 software developers

• Agile adoption process running for about 2 years

• Process mandated by the CEO

• Software development business main thrust for adoption
Stakeholder\textsuperscript{1} groups

- Project Z team: has shown willingness and interest in adopting agile values
- Agile team: follows XP practices to deliver internal systems for the organization
- Agile advocates and coaches: guide teams to understand the values stated in the Manual of Agile Development (written by them)
- The Business (Marketing division): division closest to the customer

\textsuperscript{1}Person who influences or is influenced by the adoption of agile in the organization
Methodology

• Data gathering: interviews, participant observational accounts, documents

• Data analysis: use of the concept of Technological Frames (TF)
Data gathering - Interviews

- Who was interviewed?
  - Project Z members: release manager, user experience manager, technical architect and outside contractor
  - 4 members from the agile development team
  - 3 agile coaches
  - No opportunity to interview members of the marketing division!

- Objectives of the interviews
  - Know what an individual understands by the term *agile* (interpretation)
  - Know what it means to an individual to apply agile principles in their daily work (practice)
Data gathering - Observations

• What was observed?
  – Project Z user stories\(^2\) meeting: customer representatives, developers and coaches negotiate which user stories will get done in the next iteration
  – Telephone conferences with off-shore contractor (user interface design and delivery meetings)

• What were the researchers looking for?
  – Use of agile terminology $\rightarrow$ evidence an agile approach had been adopted (interpretation)
  – Whether the push to adopt agile impacted work patterns (practice)

\(^2\)User story: user-visible functionality that can be developed in one iteration[CH02]
Data gathering - Documents

- Manual of Agile Development: captured the particular flavour of agile being adopted. Written by the agile advocates and coaches. Lists five agile values:
  - Customer involvement
  - User stories
  - Iterative development
  - Automated testing
  - Continuous integration

- Wiki from the agile software development team

- Marketing Requirements Documents (MRDs) from the marketing team
Data analysis - Technological Frames (TFs) (1)

- Assumptions, expectations and knowledge about
  - The nature and role of a technology: elements of interpretation
  - Practical use of a technology on a day-to-day basis: elements of practice

- Also known as mental models or interpretations of technology
  - Designer values might influence the kind of system designed
  - Users expectations of a not-yet released information system shapes the user’s attitudes toward it [OG94]

- Different groups in an organization (users, software developers/architects and managers) may have different TFs. If the TFs are sufficiently different difficulties and conflicts arise
Data analysis - Technological frames (TFs) (2)

How does a TF look like? Orlikowski\cite{OG94} identifies TFs around the adoption Lotus Notes (a groupware application) in a large organization:

<table>
<thead>
<tr>
<th>Domain (or element)</th>
<th>Technologists</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of technology</td>
<td>Focus on technological capabilities in isolation. CIO: &quot;I knew in an hour that it was a breakthrough product, a revolution. I played with it for just two days and was really impressed.&quot; &quot;Lotus Notes gives us a competitive advantage.&quot;</td>
<td>Confusion about the technology. ”I know nothing about it.” ”It is a new version of 1-2-3?” ”It’s big email” ”Notes will do to fax what fax did to telex, replace it.”</td>
</tr>
</tbody>
</table>

Table 1: An element of interpretation and two TFs
Data analysis results

• Elements of interpretation
  – Value of agile for each individual
  – Applicability of agile
  – Project scope
  – Increased collaboration for a better product

• Elements of practice
  – How to be agile
  – Tools and artifacts
  – User input
  – Problem locus construction: in case of problems blame old production process or new agile practices?
  – Workarounds on adoption
## Results - Elements of interpretation (1)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer satisfaction, re-use, responding to changing needs of business and market</td>
<td>Customer satisfaction, business value, continuous delivery</td>
<td>Faster delivery, structure to what we do, re-use</td>
<td>Redundant</td>
</tr>
</tbody>
</table>

Table 2: The value of Agile
**Results - Elements of interpretation (2)**

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire business process</td>
<td>Software engineering</td>
<td>Entire product process</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Table 3: Applicability of Agile
## Results - Elements of interpretation (3)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible</td>
<td>Flexible</td>
<td>Fixed (but understand rationale for flexibility)</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

Table 4: Project scope
Results - Elements of interpretation (4)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>Agree</td>
<td>Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

Table 5: Increased collaboration for a better product
## Results - Elements of practice (1)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>In negotiation:</td>
<td>Highly defined</td>
<td>Ad Hoc: willing to bring Agile for</td>
<td>Highly defined user research</td>
</tr>
<tr>
<td>coaching,</td>
<td></td>
<td>structure</td>
<td></td>
</tr>
<tr>
<td>workshops, training</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: How to be agile
## Results - Elements of practice (2)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agile manual, wikis,</td>
<td>Phone conferences,</td>
<td>Ad Hoc: excel sheets,</td>
<td>Phone conferences,</td>
</tr>
<tr>
<td>Marketing Requirements</td>
<td>user story cards</td>
<td>phone conferences,</td>
<td>MRDs</td>
</tr>
<tr>
<td>Documents (MRDs)</td>
<td></td>
<td>MRDs</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Tools and artifacts
## Results - Elements of practice (3)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshops and meetings before and during production process</td>
<td>Continuous they should be part of the team</td>
<td>Only before production processes. Then deadlines more important - but want to change</td>
<td>Only before production process. Then deadlines more important</td>
</tr>
</tbody>
</table>

**Table 8: User input**
## Results - Elements of practice (4)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agile will improve production. CEO confirms this</td>
<td>Agile will improve production. CEO confirms this</td>
<td>Agile will improve production but do not know how</td>
<td>Agile is not adequate for our product research processes. On the contrary it is redundant</td>
</tr>
</tbody>
</table>

Table 9: Agile vs. existing production process
## Results - Elements of practice (5)

<table>
<thead>
<tr>
<th>Coaches</th>
<th>Agile team</th>
<th>Project-Z team</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extracting user stories from MRDs</td>
<td>Retrospective writing of detailed documents about the software</td>
<td>Extracting user stories from MRDs</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Table 10: Workarounds on adoption
Conclusions

• The identified elements of practice and interpretation provide a snapshot of the state of the agile adoption process in a large organization.

• The snapshot shows areas of conflict between different stakeholder groups regarding the understanding and application of agility.

• Results probably valuable for decision makers involved in agile adoption processes:
  – Make efforts to bring the different stakeholder groups to a common understanding of agility.
  – Realize that a full adoption of agility is not feasible for their organization.

  What most organizations really need is a balance between traditional and agile methodologies.[NMM05]
Related work

• Several papers on agile adoption in the Agile 2008 conference. One research-in-progress session *Evaluating and adopting agile methods*³

  – Pinheiro[?] : Case study about the transition from a waterfall process to the IBM’s Rational Unified Process (RUP). Qualitative and quantitative data. Statistical analysis of measures like bug density (number of bugs per KLOC changed)

• Already mentioned in previous slides: Orlikowski[OG94] work on technological frames and the adoption of groupware software in a large organization

³http://www.agile2008.org/program.html
Future work

• Identify when a balance between agile and traditional methods has been achieved in an organization
References


[NMM05] Sridhar Nerur, RadhaKanta Mahapatra, and George Mangalaraj.

Questions?