Global Software Project Management
A Case Study

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Outline

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  - Key Challenges of Global Software Development
- Method
- Result
  - Projects Studied
  - Reported Challenges
  - Risk Handling/Mitigation Strategies
- Future Work
- Summary
Global Software Project Management
Walking the Talk: Our Globally Distributed Team

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Global Software Project Management

Background in ABB

- The ABB group of companies (www.abb.com) is a world leader in power and automation technologies
- Operates in 100 countries, sells products all over the world
- Increasing number of products with software components
- Increasing number of globally distributed software projects:
  - Specialists
  - Acquisitions
  - Reduction in development cost
  - Reduction in time to market
  - Proximity to customers
- High-quality GSD performance is a key concern for ABB
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Research Goal

- Evaluate collaborative tools and paradigms for global software development (GSD) which can measurably improve speed and quality for specific lifecycle tasks and geographic/cultural combinations

- Mitigation of risks present in GSD projects requires extra insight, skill, and attention by the project manager
  - How best to support the project manager in a GSD project?
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Key Challenges of Global Software Development

Distributed development:

- Communication
- Trust
- ‘Coordination over distance’

Globally distributed development:

- Temporal separation (time zones)
- Culture
- Language

J. Herbsleb, D.J Paulish, M. Bass Global software development at Siemens: Experience from nine projects. ICSE 2005
J.Herbsleb, A Mockus, T.A. Finholt, R.E. Grinter Distance, dependencies, and Delay in a global collaboration. CSCW 2000
I.Vessey, A. Sravanapudi, Case Tools as Collaborative Support Technologies, Communications of the ACM 1995
S. Teasley, Li. Covi, M. Krishnan Rapid Software Development through Team Collocation. IEEE Transactions on Software Engineering 2002
Global Software Project Management Method

- **Surveyed** state of the art of GSD, both in literature and ABB (experiences, tools, theories)
- **Defined a set of metrics** for GSD collaboration
- **Developed data gathering instruments:**
  - Structured Survey Questionnaire, to guide project interviews
  - Online Distributed Meeting Questionnaire, for assessing specific situations, e.g. GSD team meetings
- **Conducted exploratory/formative studies:**
  - 4 projects were followed, 26 interviews
  - Complemented with data from 3 more projects and 5 more interviews, with more specific focus around the project manager’s tasks and responsibilities
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Projects studied

- Have been working with six projects from five different parts of ABB
- Collaboration with one GSD project in another large global company, meeting challenges in GSD

- Project locations:
  - Involving people working from sites in: China, Finland, Germany, India, Norway, Sweden, and US

- Project Management approaches:
  - Conventional, Waterfall model
  - Three GSD projects were using agile project management methods (eg own adaptations of Scrum)
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**Reported challenges & some consequences – 1**

<table>
<thead>
<tr>
<th><strong>Communication</strong></th>
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</thead>
<tbody>
<tr>
<td>Misunderstandings</td>
<td>Rework or low quality deliverables</td>
</tr>
<tr>
<td>Hard to create a common view</td>
<td>Not working towards same goal</td>
</tr>
<tr>
<td>Cannot ‘put a face to a voice’</td>
<td>Telephone conferences less efficient and less effective</td>
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<tr>
<td>Too little communication</td>
<td>Takes longer to discover misunderstandings</td>
</tr>
<tr>
<td>(infrequent)</td>
<td></td>
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<tr>
<td><strong>Coordination</strong></td>
<td></td>
</tr>
<tr>
<td>Dependencies between sites</td>
<td>One problem → more problems</td>
</tr>
<tr>
<td>Requirements not detailed</td>
<td>Misunderstandings/ double work</td>
</tr>
<tr>
<td>enough</td>
<td></td>
</tr>
<tr>
<td>All sites do not follow same</td>
<td>Extra work</td>
</tr>
<tr>
<td>processes</td>
<td></td>
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</tbody>
</table>
### Global Software Project Management

**Reported challenges & some consequences – 2**

<table>
<thead>
<tr>
<th><strong>Trust</strong></th>
<th></th>
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<tbody>
<tr>
<td>Competence and/or experience questioned</td>
<td>Double-check others’ work</td>
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<table>
<thead>
<tr>
<th><strong>Culture</strong></th>
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</thead>
<tbody>
<tr>
<td>Understanding management hierarchies/styles</td>
<td>Unclear who to talk to and involve in order to secure meaningful commitments for project work</td>
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<table>
<thead>
<tr>
<th><strong>Language</strong></th>
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<tbody>
<tr>
<td>Hard to understand what others say (and mean)</td>
<td>Less communication</td>
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<tr>
<th><strong>Temporal barriers</strong></th>
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<tr>
<td>Few or no overlapping office hours</td>
<td>Hard to arrange meetings – questions go unanswered, assumptions are made</td>
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</tbody>
</table>
## Global Software Project Management

### Risk handling / mitigation tactics – 1

<table>
<thead>
<tr>
<th>Communication</th>
<th>Coordination</th>
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</thead>
<tbody>
<tr>
<td>Misunderstandings</td>
<td>Dependencies between sites</td>
</tr>
<tr>
<td>MoM</td>
<td>Specify borders, reduce coupling, track dependencies</td>
</tr>
<tr>
<td>Hard to create a common view</td>
<td>Requirements not detailed enough</td>
</tr>
<tr>
<td>Meet F2F during project startup;</td>
<td>Tighter collaboration with stakeholders (product owners)</td>
</tr>
<tr>
<td>connect dedicated project rooms</td>
<td></td>
</tr>
<tr>
<td>Cannot ‘put a face to a voice’</td>
<td>All sites do not follow same processes</td>
</tr>
<tr>
<td>Meet and/or use video conferencing</td>
<td>Agree on shared processes from the beginning</td>
</tr>
<tr>
<td>Too little communication (infrequent)</td>
<td></td>
</tr>
<tr>
<td>Short meetings every day; more chat (instant messaging)</td>
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</tbody>
</table>
## Global Software Project Management

### Risk handling / mitigation tactics – 2

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<tbody>
<tr>
<td><strong>Trust</strong></td>
<td></td>
</tr>
<tr>
<td>Competence and/or experience questioned</td>
<td>Communicate competence and experience; job-rotate</td>
</tr>
<tr>
<td><strong>Culture</strong></td>
<td></td>
</tr>
<tr>
<td>Understanding management hierarchies/styles</td>
<td>Learn about each other, make use of differences</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td></td>
</tr>
<tr>
<td>Hard to understand what others say</td>
<td>Use videoconference, use written slides, write MoM</td>
</tr>
<tr>
<td><strong>Temporal barriers</strong></td>
<td></td>
</tr>
<tr>
<td>Few or no overlapping office hours</td>
<td>Dedicate certain hours for communication</td>
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Global Software Project Management
Some proposed GSD project start-up tactics

- Get everyone acquainted
- Increase cultural awareness
- Train everyone on team tools
- Hold a Whole Team kickoff (video supported or F2F)
- Define rationale for work distribution
- Establish communication strategy
- Provide training on communication tools and processes
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Some proposed GSD project execution tactics

- Video for day-to-day team communications
- Video for day-to-day communications with Product Owners
- Video for daily cross-site team meetings
- Monthly distributed sprint demos and retrospectives, with video
- Visual distributed collaboration tool (e.g. smartboard) for sprint planning
- Distributed ‘planning poker’ for estimation
Future work

- Ongoing: next steps started to prove/validate the proposed tactics
  - Following projects over time
  - Periodic (before and after) measures using data gathering instruments and GSD metrics
  - Support to the project manager (guidelines and feedback)
Global Software Project Management Summary

- Distributed development in a large international company
  - Recognize the problems reported
- There are possibilities to take actions
  - Increase awareness
  - More knowledge to project managers/team
  - Share knowledge
- Strategies to help GSD projects, valuable for many others too