Distributed Agile Development

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Agenda

• Distributed / offshore Development
• Agile Methods
• Distributed Agile Development
Goals of this presentation

• Assumption
  - Knowledge of software development process
  - Open to ideas and emerging methodologies

• At the end of this session, you should get an overview of
  - Distributed agile development
  - Challenges posed by distributed agile projects
  - Possible remedies/guidelines

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Context

- **Software Development Teams**
  - Collocated
  - Geographically distributed

- **Processes**
  - Conventional
  - Agile Methods

- **Focus of this presentation**
  - Distributed Development
    - *Conventional*
    - *Agile*
Distributed/offshore Development
What is Distributed Development?

- A distributed development project is defined as a group of members actively collaborating on a common software/systems project separated by
  - Distance
  - Time zone
  - Culture

- What makes distributed development interesting?
  - Specialized Talent
  - Cost differentials
  - Advantage of “Follow-the-Sun” approach
  - Global Presence
  - Virtual Organization etc.
Agile Methodologies
Agile Manifesto

We* are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- **Individuals and interactions**  
- **Working software**  
- **Customer collaboration**  
- **Responding to change**

That is, while there is value in the items on the right, we value the items on the left more.

*Kent Beck, Mike Beedle, Arie van Bennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Ron Jeffries, Jon Kern, Brian Marick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, Dave Thomas, Andrew Hunt

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Value #1

• Individuals and interactions over processes and tools
Value #2

• Working software over comprehensive documentation
Value #3

- Customer collaboration over contract negotiation
Value #4

• Responding to change over following a plan
Agile Principles
Agile Principles

• Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

• Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

• Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
Agile Principles

- Business people and developers must work together daily throughout the project
- Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation
Agile Principles

• Working software is the primary measure of progress
• Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely
• Continuous attention to technical excellence and good design enhances agility
• Simplicity - the art of maximizing the amount of work not done - is essential
Agile Principles

- The best architectures, requirements, and designs emerge from self-organizing teams
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly
Agile Development Process
Agile Development Process

Analysis  Development  QA
Agile Development Process

Analysis  Development  QA

Iteration n+1  Iteration n  Iteration n-1
Agile Development Process

- **Roles on Agile Teams**
  - Business Analyst aka Proxy Customer
  - Developer
  - Quality Analyst
  - Database Administrator
  - Build Master
  - Iteration Manager
  - Project Manager etc.
Agile Development Process

- **Agile Umbrella**
  - eXtreme Programming (XP)
  - SCRUM
  - Feature Driven Development
  - Crystal
  - DSDM (Dynamic System Development Method) etc
Distributed Agile Development
Distributed Agile Development

- **Who likes it?**
  - Business - sees value as the project progresses
  - Development teams - iterative development and continuous integration

- **May not be for all types of projects**
  - Identify what can be built offshore
What is it different?

- **Quality standards are harder to reach**
  - In a co-located team, you can reach quality standards by pair programming, coding standards
  - Knowledge diffuses easily by spontaneous communication, you can build shared values just by walking around and talking

- **In a distributed setting it’s harder:**
  - less identification with the project
  - less identification with the employer
  - less responsibility, and may be less team work
Application of agile to offshore

• How can agile make it better?
  - Do collocated agile first, then distribute it. It takes time to learn this new practice, as it is different from the traditional model

• Allow several weeks for getting used to self-organization
  - If you’re used to “command & control”
    • you want detailed work lists
    • you don’t estimate yourself
    • you want to be left alone for some time
    • you don’t want to give others visibility into your way of working
    • Command and control hides a lot of things and fosters the "blame game". If something is not how you like it to be, you just do whatever you like and blame someone else
Faculties of Distribute Agile

- Management
- Planning
- Analysis and Design
- Development
- Testing
- Configuration Management etc
Management

- **Role of Project Managers**
  - No Micro Management
  - Project schedules, task breakdowns, work assignments, and progress reports
  - Organize teams by functionality, but not by activity

- **Role of Iteration Managers**
  - Run iterations effectively
  - Live on the floor
  - Create excitement, enthusiasm in the team
  - Facilitate among various stakeholders
  - Communicate, communicate and over communicate
Management

![Diagram showing project management structure with distinguished onsite/offshore teams and roles: BA, Dev, QA, Iteration Manager, and Project Manager. The diagram illustrates a comparison between traditional onsite/offshore models and a more integrated approach.]
Planning

• **Release Level Plans**
  - Master Story List
  - Split into iterations
  - Identify stakeholders
  - Release level estimation
  - Establish timelines and release dates
  - Short releases

• **Iteration level plans**
  - 2 week Iterations
  - Iteration Planning Meeting
  - Elaborated requirements / story cards
  - Estimates
  - Accommodate changes
  - Manage Hangover cards
  - Manage cards being pushed to subsequent iterations
Analysis and Design

- Requirements Management: formal requirement specifications, dependencies, responsibilities, and change history
- Involvement of development resources in Design to provide continuity into Development or disciplined empowerment on Design
- Business Analysts - Proxy Customers
- Pairing on Story Cards
- Functional Tests
- Feedback to Customers
Development

- Source Code Management: versioned file assets such as design documents, source code, and binary files
- Test-first approach
- Continuous integration across multiple locations
- Senior - Junior pairing
- Pairing, not just pair programming
- Explicit communication
- Progress check via daily stand ups / conference calls
- Refactoring
Testing

- **Use (automated) test cases to specify requirements**
  - Written specifications can hide details
  - Test cases make the details and the flow of events (dynamics) explicit.

- **Write functional test cases before development starts**
  - Helps transfer business knowledge
  - Easy way to know requirements have been understood
  - Can then be scripted/automated by testing team

- **Functional Testing**
  - FIT: define acceptance tests in HTML tables
  - FitNess: tests defined in a Wiki
  - Selenium: web testing inside the browser
Configuration Management

• **Use common tools:**
  - Integrated development environment (e.g. eclipse)
  - Source Code Repository (e.g. CVS)
  - Build environment (e.g. Maven)
  - Unit test framework (e.g. Junit)
  - Acceptance test framework (e.g. FIT)
  - Centralized build server (e.g. CruiseControl)
  - Bug tracking system (e.g. Bugzilla)

• **Integrate early and often**

• **Automate builds**

• **Use Continuous Integration**

• **Environment identical at both places**
Key Challenges

- Multiple Implementation Partners
- Cultural Differences
- Project Continuity & knowledge retention
- Project Methodology & Processes
- Solution architecture/Partition
- Client Visibility
- Infrastructure
- Client Buy-in
- Communication

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Key Challenges

- **Client Buy-in**
  - Developing a partnership with the client in delivering the geographically distributed projects

- **Project Continuity and knowledge retention**
  - Knowledge of the earlier phase (if any) or specifications

- **Solution architecture/Partition**
  - Selection of the appropriate multi-site model, for otherwise it could lead to a failure in distributed approach
Key Challenges

- **Defined Deliverables**
  - It is the most important factor for successful delivery. If the deliverables are not clear then the Project could very well go into a whirlpool

- **Formalized Tracking**
  - Accurate documentation and continuous tracking of issues/assumptions and communication threads
Key Challenges

- Project Methodology & Processes
  - Issue resolution
  - Communication
  - Change management
  - Quality measures
  - Standards
  - Working times
  - Team roles and responsibilities
  - Project KPI’s
  - Project time reporting
  - Expenses and similar other logistical activities
  - Development & testing approach
Key Challenges

- **Client Visibility**
  - Use short iterations
  - Show prototypes to user
  - Deliver software frequently
  - Build up common understanding of what is necessary for shipping software
    - Kinds of tests
    - Levels of quality
  - Have customer participate in Daily Status Meetings
  - Show Progress Charts publicly
  - Use Test-Driven Development At the Acceptance-Test Level
Key Challenges

- **Communication**
  - Communication issues because of varied time zones, dispersed teams and cultural issues
  - Expect a lot of difficulty understanding each other
    - English may be nobody’s native tongue
    - We usually don’t say “no”, and politeness can hide misunderstanding
  - Use direct communication and instant messaging rather than emails
    - Avoid the misunderstanding
    - Reach consensus, check whether the other parties really have understood what you mean, check again and again
    - Avoid the time lag
Success Lessons

• Require good mediators/coordinators
  - To solve communication issues due to language and cultural differences
  - To suggest improvements continuously
  - To act as “neutralizers”

• Lots of discipline
  - The Build Must Pass! (requires developing a build culture)
  - Weekly meetings
  - Issues trackers and training

• Dedicated offshore support persons in each team to minimize question round trips
Success Lessons

- Share activities between onsite/offshore
  - Not just development, but also Business Conception, Detailed Design, Testing, etc
  - Improve team spirit/job satisfaction
  - Allow offshore people to progress
  - Share the global knowledge and thus improve efficiency

- Have Project Leads do the business conception

- Have Project Leads do the detailed design

- Ideally, send functional tests along with use cases
  - Have a separate team script and automate them
Success Lessons

• Cross Pollination
  - Plan in place
  - Both ways - works better
  - Long term projects, plan rotation

• Lots of travels/exchanges
  - Hard to work with someone you haven’t seen and leads to misunderstandings
  - Help share knowledge at all levels
    - Managers, Project Leads, Developers
Success Lessons

• **Estimates**
  - Have the developers select and estimate their tasks.
  - Have the developers update their estimates regularly (e.g. every day at Stand up).
  - Post charts of status / effort remaining publicly.

• **Communication**
  - Use Collaborative Tools
    - Phone, Wiki, Email, Chat
    - Threaded discussions, Web Conferencing etc
  - Have Daily Status Meetings (“Daily Stand-ups”)
Success Lessons

- Seeing is Believing
  - Release Plan Walls
  - Story Card Walls
  - Iteration Management Walls
  - Retrospectives
  - Colorful Post Cards
  - Build Tree etc
Why does it work?

- Today the main driver is cost...
- Exchange of knowledge in both directions
  - On how to develop software
  - On cultures / languages
- Broadening of vision for all participants
- Key skill for participants: working in an international team
- Organization are more and more distributed
  - Will require practices for working from a distance
    - Ex: Mars/Earth
- Ability to find talents/skills
  - Ex: Open Source (pushed to the extreme)
Questions to be answered

• What is the best cross pollination strategy?
• What is the best induction program for new comers on large and complex projects?
• How best to implement a light weight issue tracking system?
• How to keep the story cards up-to-date when stories change?
• Pairing between onsite - offshore teams
• How can we make client sit with developers at the offshore location?

  blah blah blah ....
Summary

- Distributed Development has its own challenges
- Agile principles, practices, tools can help to address the issues of distributed development.
- There are a lot of lessons and experiences with Distributed Development and Offshore Development, so you don‘t have to take all the pitfalls yourself.
References

- Brown, J. S. & Gray, E. S. (1995). The people are the company. Fast Company
References

• [http://www.agilemanifesto.org/](http://www.agilemanifesto.org/)
• Distributed Agile, Dr. Christoph Steindl
• [http://www.agilealliance.org/articles](http://www.agilealliance.org/articles)
• [http://www.martinfowler.com/articles/newMethodology.html](http://www.martinfowler.com/articles/newMethodology.html)
• And various other sources from internet 😊

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