Planning delivery projects

Uppsala University 02-03-2005
by
Ola Jirlow
Prevas AB
- We develop intelligence in products and industrial systems
  - Product development
  - Industrial systems
  - IT in Life Science

- Consultants in IT
- Project oriented
- Technical systems
- Listed on Stocholm Stock Exchange
- Approx 200 employees
- ISO 9001 since 1992
Prevas core values

• To deliver on time
• To deliver high quality systems
• To be able to deliver at a fixed price
Measure of quality - To deliver on time

Delivery reliability (%)
Measure of quality - Work under guarantee

Work under guarantee (%)


Max level

Period
Customer loyalty

91% tender won by Prevas (174 st)

9% lost to competitor (18 st)
Signs of good quality

- Bug-free
- Robust
- Good error-handling
- Well-designed (easy to understand and extend)
- Good documentation
- Quality of the project implementation
- Project methodology that provides a suitable system
- The right functions delivered at the right time
- Satisfied customer
- Satisfies explicit and implicit needs
What can threaten quality?

Poor selling (selling something we are not good at)
Unclear specifications
Modifications during the course of the project
Lack of resources
Poor management
Unqualified or poorly motivated personnel
Change of personnel during the project
Pressure of time
Unsystematic testing

Good quality is built in during development.
What is a successful project?

- Satisfied customer
  - Delivered within agreed costs
  - Delivered within the agreed time
  - Satisfied end users
  - Well-documented
  - Maintenance-friendly

- Satisfied supplier
  - Carried out according to estimate
  - Delivered on time
  - Additional sales within the project
  - Project staff are developed
  - Good reference installation
  - Low guarantee costs
What does project methodology include?

- Project model
- Instructions
- Templates
- Checklists
- Uniform IT environment
- Server structure
- Office procedures
- Support system
- Aids
Prevas Quality System

- PI - Personnel instructions
- TI - Technical instructions
- MD - Method descriptions (advice)
- Q templates
- Quality announcements

Available via:
- Intranet
- Folders (one set per office)
- Microsoft Office
Prevas project model (detailed)

**Middle**

- **Planning**
  - Start report (internal)
  - Time schedule
  - Resource plan
  - Risk analysis
  - Project analysis
  - Electronic archives
  - Project plan (external)

- **System design**
  - Design description

- **M3. Design review**

- **M4. Design approval**

- **Acceptance documents**
  - Delivery test specification
  - Acceptance test specification
  - Other customer documents

- **Unit design**
  - Unit Descriptions

- **Implementation**
  - Code
  - Unit test specification
  - Unit test protocol

- **Integration**
  - Integration test specification
  - Integration test protocol
  - Internal support acceptance test

- **Delivery test**
  - Updated customer documents
  - Delivery test protocol

- **Commissioning**
  - Acceptance test protocol

- **Project Administration**
  - Change requests
  - Project tracking
  - Minutes of meetings

- **Support**
  - Analysis of warranty period
  - Customer benefit
  - Extended sales

**End**

- **M8. Acceptance**

- **M9. Completion meeting**
  - Final project report approval

- **M10. Follow up**
  - Customer benefit
  - Extended sales

**Start**

- **M1. Start up meeting**
  - Start report approval

- **M2. Functional baseline**
  - Functional description

- **M5. Customer approval**

- **M6. Project review**

- **M7. Approved delivery test**

**Requirements**

- Planning
- Implementation
- Integration
- Delivery test
- Commissioning
- Completion

- Project manager, Technical lead engineer, Project owner, Steering group, Review group
Quality audits assume the project leaves tracks.

Project result:
- Customer document
- Design docs.
- Minutes of meetings
- Plus/minus list
- Requests for modifications
- Inspection protocol
- Test protocol
- FAT/SAT
- Release notes
- SPR

Project control:
- Initial meeting + Initial report
- Monthly project follow-up:
  - Financial forecast
  - Project report (text and graphs)
- Final meeting + final report
- Delivery follow-up
# Initial report

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>Background</td>
<td>(ref. quotation and order)</td>
</tr>
<tr>
<td>Organisation</td>
<td>(also at customer)</td>
</tr>
<tr>
<td>Project model</td>
<td>(stages, documents)</td>
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<tr>
<td>Inspection</td>
<td>(documents, code, incoming deliveries)</td>
</tr>
<tr>
<td>Planning</td>
<td>(financial, timetable, resources)</td>
</tr>
<tr>
<td>Function</td>
<td>(very brief description)</td>
</tr>
<tr>
<td>Design</td>
<td>(very brief description)</td>
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<tr>
<td>Risks</td>
<td>(incl. proposed action)</td>
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<tr>
<td>Appendixes</td>
<td>(costs, milestones, resource plans)</td>
</tr>
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</table>
How do we get the requirements right?

• Interview with end-user
• Use cases
• Paper prototyping
• Prototype
• Comparison with similar systems
• Users Manual
Freezing function

How are requirements best documented? Text alone not good.

Descriptions of procedures (Use cases) recommended.

Also use graphics, prototypes and other descriptive methods.

Ensure support by end users.

Formal freezing in minutes or by signature.
What should be established with the customer early on?

- Decision process (steering group, etc.)
- Project meetings (how often, where, who attends, etc.)
- Procedures for modifications
- Plus/minus list
- Customer’s undertakings in the project
Agenda for customer meetings

• Previous minutes
• Company AB reports situation
• Prevas AB reports situation
• <Special items>
  • Risks and threats
• Modifications, additions and new ideas
• Other business
• Next meeting
Roles
• Project manager
• System architect
• Project owner
• Review group
• Steering group
• QA-manager
Running the project

Detailed planning

Break down into activities
(WBS - Work Break-down Structure)

PERT - Programme Evaluation Review Technique

Gantt chart

Appropriate tools
**Activity plan (Gantt-chart)**

<table>
<thead>
<tr>
<th>Aktivitet</th>
<th>År 2000</th>
<th>Väcka</th>
<th>Datum: 2000-08-08</th>
<th>Ansvarig: Lars Sjöström</th>
<th>Projekt: Heatnet</th>
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<td>Funktion fryst</td>
<td>Konstruktion klar</td>
<td>Lev härdvara</td>
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<td>Programmering</td>
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<td>Integration, prefAT, FAT</td>
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<td>Idrifttagning, SAT</td>
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Running the project

Design

- Design rules
- Error handling
- Design reviews
- Example programme
- Prototype code to reduce risks
- Configuration management
- Document the design
- Inspection
Running the project

How to prevent “gold plating”

Easy to get lost in the tool, and polish for too long

Don’t just add new functions automatically

Sometimes the effort must be adapted to the budget

Be clear about the assignment’s financial constraints

Follow up the work continuously with “how’s it going” visits
Running the project

Tactics

Keep a diary (hardback)

Focus on risks

Keep a list of the customer’s undertakings

A joint activity list can make things easier

Document verbal agreements

Changes for modifications should always be taken up in a positive spirit, but explain carefully the consequences for time and costs.
Project overview each month

- Current situation
- Finance and invoicing
- Problems / Proposed measures
- Risks / Proposed measures
- Project deviations
- Possibilities for additional sales

+ Two appendixes (milestones + resource diagrams)
# Milestones diagram

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<th>Projektnamn:</th>
<th>Bevakningspunkter</th>
<th>Datum</th>
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<tbody>
<tr>
<td>Handdatorer, Sandvik</td>
<td>1 Startrapport</td>
<td>2000-05-23</td>
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<td>Projektleader</td>
<td>2 Fryst funktion</td>
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<td>Lars Sjöström</td>
<td>3 Konstruktionstjänst</td>
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<td>Projektkod</td>
<td>4 Granskad konstruktionstjänstbeskrivning</td>
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<td>VF243</td>
<td>5 Fryst operatörsdialog</td>
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# Resources diagram (1)

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<th>Datum</th>
<th>Projektledare</th>
<th>Projektname</th>
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<tr>
<td>VF243</td>
<td>2000-05-23</td>
<td>Lars Sjöström</td>
<td>Handladorer, Sandvik Steel</td>
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</table>

<table>
<thead>
<tr>
<th>Person</th>
<th>vecka</th>
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<tbody>
<tr>
<td>Lars Sjöström 50%</td>
<td>20</td>
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<tr>
<td>Anders Wallén</td>
<td>X</td>
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<tr>
<td>Kennet Johansson</td>
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<tr>
<td>Jenny Sandberg</td>
<td>X</td>
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</table>
Resources diagram (2)
Verification

Requirements spec.  User level  Acceptance test

System construction  Integration test

Module construction  Module test
<table>
<thead>
<tr>
<th>Section</th>
<th>Notes</th>
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<tbody>
<tr>
<td>General</td>
<td>(history, project deviations)</td>
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<tr>
<td>Timetable</td>
<td>(comments)</td>
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<tr>
<td>Delivery on time</td>
<td>(yes/no)</td>
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<tr>
<td>Finance</td>
<td>(comments)</td>
</tr>
<tr>
<td>Supplier’s assessment</td>
<td>(approved, not approved)</td>
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<tr>
<td>Guarantee undertaking</td>
<td>(notify customer)</td>
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<tr>
<td>Archiving</td>
<td>(folders, files)</td>
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<tr>
<td>Maintenance</td>
<td>(those responsible)</td>
</tr>
<tr>
<td>Final comments</td>
<td>(reusable parts)</td>
</tr>
<tr>
<td>Appendixes</td>
<td>(milestones, resource plan, finance)</td>
</tr>
</tbody>
</table>
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www.prevas.se
Some standards and project methods

- ISO 9001
- Tick It
- CMM
- PROPS
- GAMP
- RUP
- DSDM
ISO 9001

- A family of standards. Common in Europe
- ISO 9003 gives interpretation for software

Tick IT

- UK standard based on ISO 9001
- Adapted for software development
- Instructions for supplier, orderer and auditors
- Requires certified auditors
CMM - Capability Maturity Model

- Level of maturity on a 5-point scale
- For software development
- Detailed, but more a requirement than a finished process
- Common in USA
- Everything is changing so rapidly today that CMM is of less concern
PROPS

- Ericsson’s development model
- Framework that is adapted in detail
- Quite like the Prevas model, but more comprehensive
- Tollgates
- Milestones
- The Project Model (project management)
- The Work Model (activities)
- Project Specification
GAMP
Good Automated Manufacturing Practice

- Requirement in the pharmaceutical industry (in English since 1994)
- Much inspection, testing and validation
- Document handling important
- Obligatory when doing business with the pharmaceutical industry
RUP - Rational Unified Process

- Develop software iteratively
- Manage requirements (use cases, scenarios)
- Component based architectures
- Visual model software (UML)
- Verify software quality
- Control changes to software
- Strong connection to Rational Rose
- From Objectory
RUP - Rational Unified Process
IT-projects in reality

- Investments > 250 m$ / Year
- 84% fails
- Cost for discontinued projects, 81 billions $
- 53% exceeded the budget with 189% 
- Average delay; 222%
- 94% restarted
How do we get a Project?

- Identify need at a customer
  - Contacts with customer
  - Customer issues an RFP

- Make a Quotation
  - Define scope of work
  - Estimate cost
  - Decide on a price
How do we get a Project?

• Negotiate a contract
  – Specification of delivered system
  – Time plan
  – Price, Payment plan

• Order from customer
  – Acceptance of order
How do we make a time plan? And keep it?

- Previous experience
- Work Breakdown Structure (WBS)
- Gantt charts, PERT charts, …

- Regular progress reporting
- Change time plan with changing requirements, or add resources
Quality – two definitions

• "Fitness for Use" (J. Juran)
  – i.e.: How well a product meets the needs and expectations of the user.

• "Conformance to requirements" (P. Crosby)
Word templates have field codes linked to properties.