Project Management

Jan Hornwall, Director Project Management, Siemens PLM Software
Key Objectives of this Lecture

• You know more about the Project Management areas

• We have looked at some Best Practices in Project Management

• We have had a discussion on working in software development projects and managing projects
Agenda

- Introduction of the Speaker & Siemens PLM Software
- Introduction to Projects and Project Management
- The Project Management Knowledge Areas and Processes
  - including best practices
- Discussion on main challenges with working in projects and together with a Project Manager
- Key Take Aways
Introduction of the Speaker

- From Sweden, living in Switzerland since 1992
- Master of Science in Physics Engineering, Chalmers University, Gothenburg
- Background as Software Engineer in Telecom; Unix, C++
- Working internationally in Project-, Program- and Team management since 1994
- In current role as Director Project Management, Siemens PLM Software since 2007
- Certified Project Management Professional by PMI & Senior Project Manager IPMA
- Founder of PMI chapter Switzerland (www.pmi-switzerland.ch)

- Privately:
  - Family: proud father of three lovely daughters, aged 25, 23 and 5
  - Passionate ski mountaineer, windsurfer, mountain biker and Lindy Hop dancer

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LinkedIn: www.linkedin.com/in/jan-hornwall

Please feel free to contact me for any questions on this material or any other Project Management questions!
Siemens PLM Software
Product Lifecycle Management (PLM) Software Products

Product Engineering: NX
Lifecycle Collaboration: Teamcenter
Simulation & Test: LMS

Manufacturing Engineering: Tecnomatix
Mainstream Engineering: Solid Edge
Specialized Engineering: Vistagv
### The Largest, Broadest and Most Successful Deployments in the Industry
77’000 Customers and 9 Million Licensed Seats

<table>
<thead>
<tr>
<th>AEROSPACE</th>
<th>AUTOMOTIVE</th>
<th>CONSUMER</th>
<th>ELECTRONICS</th>
<th>ENERGY</th>
<th>MACHINERY</th>
<th>MARINE</th>
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<td>GM</td>
<td>Kraft</td>
<td>Lam Research</td>
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<td>PZ Cussons</td>
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<td>Lam Research</td>
<td>Mori Seiki</td>
<td>Shipbuilding</td>
<td>Smith &amp; Nephew</td>
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<td>United Aircraft</td>
<td>Suzuki</td>
<td>The Jones Group</td>
<td>Ricoh</td>
<td>Lam Research</td>
<td>Sany</td>
<td>Rolls Royce</td>
<td>St Jude Medical</td>
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<td>Corporation</td>
<td>TATA</td>
<td>Tiffany &amp; Co.</td>
<td>Samsung</td>
<td>Lam Research</td>
<td>Windmoeller &amp;</td>
<td>Marine</td>
<td>Symmetry Medical</td>
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<td>ULA</td>
<td>Volkswagen</td>
<td>Toys R Us</td>
<td>Ricoh</td>
<td>Lam Research</td>
<td>Hoelscher</td>
<td>Warship</td>
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<td>Unilever</td>
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<td>Yuchai Group</td>
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<td>Visteon</td>
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<td>Ricoh</td>
<td>Lam Research</td>
<td>Yarmar</td>
<td>Grower</td>
<td>Zimmer</td>
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</table>
Digital Enterprise with Digital Twins
Connecting the Digital Twin Product to the Digital Enterprise

Collaboration platform: Teamcenter

Continuous improvement

Virtual product

Specification

Verification

Virtual production

Validation

Commissioning

Real production

Automation

Ideal delivery

Real product

Insights from performance with MindSphere

Siemens PLM Software
## PwC Global 100 Software Leaders (2016)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Country HQ</th>
<th>2014 Software revenue (US$M)</th>
<th>2014 Total revenue (US$M)</th>
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<tr>
<td>1</td>
<td>Microsoft</td>
<td>USA</td>
<td>$62,014</td>
<td>$93,456</td>
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<td>2</td>
<td>Oracle</td>
<td>USA</td>
<td>$29,881</td>
<td>$38,828</td>
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<td>3</td>
<td>IBM</td>
<td>USA</td>
<td>$29,286</td>
<td>$92,793</td>
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<td>4</td>
<td>SAP</td>
<td>Germany</td>
<td>$18,777</td>
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<td>5</td>
<td>Symantec</td>
<td>USA</td>
<td>$6,138</td>
<td>$6,615</td>
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<td>6</td>
<td>EMC</td>
<td>USA</td>
<td>$5,844</td>
<td>$24,439</td>
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<td>7</td>
<td>VMware</td>
<td>USA</td>
<td>$5,520</td>
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<td>Hewlett Packard</td>
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<td>Salesforce.com</td>
<td>USA</td>
<td>$4,820</td>
<td>$5,274</td>
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<td>Intuit</td>
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<td>$4,324</td>
<td>$4,573</td>
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<td>Adobe</td>
<td>USA</td>
<td>$4,061</td>
<td>$4,183.5</td>
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<td>12</td>
<td>CA Technologies</td>
<td>USA</td>
<td>$4,053</td>
<td>$4,410</td>
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<td>SAS</td>
<td>USA</td>
<td>$2,884</td>
<td>$3,084</td>
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<td>14</td>
<td>Cisco Systems</td>
<td>USA</td>
<td>$2,836</td>
<td>$47,823</td>
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<td>15</td>
<td>Dassault Systèmes</td>
<td>France</td>
<td>$2,695</td>
<td>$3,038</td>
</tr>
</tbody>
</table>

| 16   | Siemens            | Germany    | $2,613                      | $95,542                   |
| 17   | Fujitsu            | Japan      | $2,527                      | $43,526                   |
| 18   | Autodesk           | USA        | $2,413                      | $2,486                    |
| 19   | Citrix             | USA        | $2,376                      | $3,143                    |
| 20   | Google             | USA        | $2,273                      | $66,001                   |
| 21   | Hitachi            | Japan      | $2,159                      | $91,246                   |
| 22   | Apple              | USA        | $2,110                      | $199,800                  |

[https://www.pwc.com/gx/en/industries/technology/publications/global-100-software-leaders.html](https://www.pwc.com/gx/en/industries/technology/publications/global-100-software-leaders.html)
Trends in our Market

Development Production

In the past: 8 Years | 11 Years
Now: 3 Years | 6-8 Years

IoT = Internet of Things
SaaS = Software as a Service
Outcome Engineering
Industry 4.0
Digitalization
Digital Twin
Additive Manufacturing (3D Printing)

Innovation cycles are getting shorter

Smart phone evolution process
Introduction to Project Management

• What is a Project?

  A project is a temporary endeavor to create a unique product, service or result. (PMI)

• Why Project Management?

  • Almost all software products are obtained via projects, as opposed to manufactured products.
  • Enterprise Software is deployed and customized to customer business through projects

• The challenge with many projects is to manage the “triple constraints”:
  - Deliver on time
  - Deliver within budget
  - Deliver agreed functionality to agreed quality = performance
Introduction to Project Management

• What is a Program?
  A group of related projects and program activities that are managed in a coordinated way to obtain benefits not available from managing them individually (PMI)

• What is not a project or a program?
  Examples:
  • Monthly magazine
  • Maintenance / bug fixing of released product
  • Yearly contract for manage data servers
Introduction to Project Management

A typical lifecycle of a Project:

- = Stress level of the Project Manager

Diagram:
- Project Charter: Customer Order
- Project Management Plan
- Carrying out the work
- Closing the project

Time:
- Accepted Deliverables
- Archived Project Documents

Cost and Staffing Level:
- Starting the project
- Organizing and preparing

Diagram indicating stress levels and key phases in a project lifecycle.
The Project Management Knowledge Areas & Processes

Project Management Institute (PMI) is the world's leading not-for-profit professional membership association for the project, program and portfolio management profession. Founded in 1969. It publishes PMBOK Guide. Over 700’000 members world wide.

We will today review:

The Project Management Processes

The Project Management Knowledge Areas:

1. Project Integration Management
2. Project Scope Management
3. Project Schedule Management
4. Project Cost Management
5. Project Quality Management
6. Project Resources Management
7. Project Communications Management
8. Project Risk Management
9. Project Procurement Management
10. Project Stakeholder Management
The 5 main process areas are:
Agile Methods follows the same principle

The Agile: Scrum Framework at a glance

Inputs from Executives, Team, Stakeholders, Customers, Users

- Product Owner
- The Team
- Scrum Master

Daily Scrum Meeting

Every 24 Hours

1-4 Week Sprint

Sprint Backlog

Sprint Planning Meeting

Team selects starting at top as much as it can commit to deliver by end of Sprint

Burndown/up Charts

Sprint Review

Finished Work

Sprint Retrospective

Ranked list of what is required: features, stories, ...

1 2 3 4 5 6 7 8
Let’s Start with Your Project

• This year we will build a ‘Event management platform’ as a web application where service providers such as venue owners, caterers can post their service offers, and end-users can search and order a specific service.

• Students/participants will be divided into small groups (each group will have roughly 3-4 students). Each group will build the software independently. One student from each group will act as a Product Owner (PO), to which we will release the requirements. PO will then describe the requirements to his/her fellow developers.

• The total duration for the project is 12 weeks. First 4 weeks will be given to learn technologies and clear concepts, also to start developing. The project will be developed as a series of features. Project will have three milestones at each milestone we will evaluate and retrospect the progress made. Total 8 features will be built by students, out of which one will be a surprise feature by students.

For this presentation, imagine that you have a contract with a price with the customer
Agile Methods

Projects using agile methods are in two different situations:

1. **In-house software development**, or customer is flexible on scope and costs

2. Software is developed by a **supplier with a contract** with the customer:
   - fixed price / estimated price
   - fixed scope / functionality
   - milestones with deliverables and invoice dates

We will look at this situation
How did you start?
**Project Scope Management** is about ensuring that the project includes all the work required, and only the work included, to complete the project successfully.

- Plan Scope / Statement of Work
- Collect Requirements / Use Cases / Scenarios
- Define Objectives / Scope / Deliverables / Acceptance Criteria
  - Establish Scope Baseline
  - Define out-of-scope and assumptions
- **Create the Work Breakdown Structure (WBS)**

Scope covers:
- Product Scope – e.g. specifications, functions, features
- Project Scope – e.g. testing, data migration, training
Project Schedule Management is about getting the project done on time.

- Define Activities
- Sequence Activities / Dependencies
- Estimate Activity Resources & Duration
- Develop Schedule
- Define Milestones and Gates
- Control Schedule

Planning is iterative; monitor and revise schedules during the project.

Agile methodologies influence this area of course.
Estimation Techniques:
A good Work Breakdown Structure (WBS) is the base for any estimation, down to task level of 1-2 weeks duration.

1. Three-Point Estimating (PERT) uses three estimates to define an approximate range for an activity’s duration:
   - Most likely (M): given the resources likely to be assigned, their productivity, known dependencies and normal interruptions.
   - Optimistic (O): Based on the best-case scenario for the activity
   - Pessimistic (P): Based on the worst-case scenario for the activity

   Duration = (O + 4*M + P) / 6  (beta distribution)

Example; Estimate of 8 days with 4 days as optimistic and 20 days as pessimistic results in 9.5 days

Note: it’s pointless to use 4, 8, 12...
2. **Expert Judgment**: consult experts and compare estimates
   --> challenge: do they know the skill level of resources available?

3. **Estimation by analogy**: compare with past projects in the same application domain
   --> challenge: limited applicability

4. **Algorithmic cost modelling**: use historical data, e.g., lines of code or Function Points
   --> challenge: requires strict procedures to capture data, can be very effective

5. **Pricing to win**: the project costs whatever the customer has to spend on it
   --> very risky if fix price contract (unlikely) if not scope is flexible (agile)
   --> trust is required if Time & Material contract

6. **Planning Poker**, used by Agile teams

   - Each method has strengths and weaknesses
   - Estimation should ideally be based on several methods
   - If these do not return approximately the same result, more effort is required to get to one estimate
The Project Management Knowledge Areas
- Project Schedule Management

Best Practice - Estimation: Build company specific estimator tools:

• Covering time needed for documentation, meetings, review, tests, assist customer tests, travel

• Covering company specific tasks and experiences
Let's look at an example:

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration (days)</th>
<th>Dependencies</th>
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<tbody>
<tr>
<td>T1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>15</td>
<td>T1</td>
</tr>
<tr>
<td>T4</td>
<td>10</td>
<td></td>
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<tr>
<td>T5</td>
<td>10</td>
<td>T2, T4</td>
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<tr>
<td>T6</td>
<td>5</td>
<td>T1, T2</td>
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<td>20</td>
<td>T1</td>
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<td>25</td>
<td>T4</td>
</tr>
<tr>
<td>T9</td>
<td>15</td>
<td>T3, T6</td>
</tr>
<tr>
<td>T10</td>
<td>15</td>
<td>T5, T7</td>
</tr>
<tr>
<td>T11</td>
<td>7</td>
<td>T9</td>
</tr>
<tr>
<td>T12</td>
<td>10</td>
<td>T11</td>
</tr>
</tbody>
</table>

What is the minimum total duration of this project?
The Project Management Knowledge Areas
- Project Schedule Management

Build Network Diagram

Analyze the Critical Path:

The Critical Path is the sequence of activities that represents the longest path through a project – this determines the shortest duration

**Answer is 55 days.**

Identify also activities that are close to becoming critical path, ensure those are not delayed.
The Project Management Knowledge Areas
- Project Schedule Management

The same example in a Scheduling tool (MS Project) – Gantt Chart view:
The Project Management Knowledge Areas  
- Project Schedule Management

Highlight of Critical Path in Gantt Chart view:
The Project Management Knowledge Areas
- Project Schedule Management

Changing Task 6 from 5 days to 9 days creates a new critical path, and delays the finish one day:

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Predecessors</th>
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<tbody>
<tr>
<td>Start</td>
<td>0 days</td>
<td>Tue 18/11/14</td>
<td>Tue 18/11/14</td>
<td></td>
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<tr>
<td>Task 1</td>
<td>8 days</td>
<td>Tue 18/11/14</td>
<td>Thu 27/11/14</td>
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<tr>
<td>Task 2</td>
<td>15 days</td>
<td>Tue 18/11/14</td>
<td>Mon 08/12/14</td>
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<tr>
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<td>0 days</td>
<td>Thu 27/11/14</td>
<td>Thu 27/11/14</td>
<td></td>
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<tr>
<td>Task 3</td>
<td>15 days</td>
<td>Fri 28/11/14</td>
<td>Thu 18/12/14</td>
<td></td>
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<tr>
<td>Task 4</td>
<td>10 days</td>
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<tr>
<td>Milestone 2</td>
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<td>Mon 08/12/14</td>
<td></td>
</tr>
<tr>
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<td>Mon 08/12/14</td>
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<td>10 days</td>
<td>Mon 08/12/14</td>
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<td>9 days</td>
<td>Tue 09/12/14</td>
<td>Fri 19/12/14</td>
<td></td>
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<tr>
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<td>20 days</td>
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<tr>
<td>Milestone 5</td>
<td>0 days</td>
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<td>Mon 01/12/14</td>
<td></td>
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<tr>
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<td>25 days</td>
<td>Tue 02/12/14</td>
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<td>Task 9</td>
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<tr>
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<td>Fri 09/01/15</td>
<td>Fri 09/01/15</td>
<td></td>
</tr>
<tr>
<td>Milestone 7</td>
<td>1 day?</td>
<td>Fri 26/12/14</td>
<td>Fri 26/12/14</td>
<td></td>
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<tr>
<td>Task 10</td>
<td>15 days</td>
<td>Mon 29/12/14</td>
<td>Fri 16/01/15</td>
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<td>Task 11</td>
<td>7 days</td>
<td>Mon 12/01/15</td>
<td>Tue 20/01/15</td>
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<td>Tue 20/01/15</td>
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<td>Finish</td>
<td>0 days</td>
<td>Tue 03/02/15</td>
<td>Tue 03/02/15</td>
<td>14,18,21</td>
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</table>
Question: you have estimated **five days** to implement and test a certain function. After **three days** you are finished, it is tested and it works! You face three options now:

A. Review and improve the code for two days to see if you can make it of higher quality and more structured. It will also make it easier to re-use and maintain later. Total effort is 5 days.

B. Develop a cool feature that you came up with, spending two days on this. Total effort is 5 days.

C. Report back to the project manager to start working on another task. Total effort is 3 days.

What would you do?

**Parkinson's law** is the adage that "work expands so as to fill the time available for its completion".
The Project Management Knowledge Areas
- Project Resource Management

Project Resource Management is about organizing, managing, developing and leading the project team.

• Plan and acquire Project Team
  • Project Organization
  • Define roles and responsibilities
  • Skills and experiences required
• Manage & Develop Project Team
  • Adding and on-boarding team members
  • Plan and develop skills
  • Provide Feedback on performance
  • Manage conflicts & Motivate Team

• Administration:
  • Manage & negotiate internal resource agreements
  • Manage & negotiate contracts of external resources
  • Manage work permits
Team Organization - Teams should be relatively small (< 8 members)

- minimize communication overhead
- team quality standard can be developed
- programs are regarded as team property ("egoless programming")
- members can work closely together
- continuity can be maintained if members leave

- Break big projects down into multiple smaller projects
- Small teams may be organized in an informal, democratic way
Best Practice: Resource Management and Levelling in Scheduling Tool

Any over-allocation is shown in tool:

Task 7 assigned to Jim:
The Project Management Knowledge Areas
- Project Procurement Management

**Project Procurement Management** is about purchase or acquire products, services and resources needed in the project.

Examples:
- Resources from external suppliers
- Specialist services
- Hardware, computers, storage
- Cloud services, apps

This also includes **evaluation of suppliers** and **contracting** these products and services.
The Project Management Knowledge Areas
- Project Cost Management

**Project Cost Management** is about getting the project done within budget.

- Estimate Costs and Determine Project Budget
- Control Cost - the Project Manager needs to determine *actual cost* incurred and also make a *forecast* of total cost.

The Project Manager will ask how much have you spent on an activity and also how much will you need to complete it.

Reserves also affect cost management:
- Risk contingency reserve
- Management reserve
The Project Management Knowledge Areas
- Project Quality Management

**Project Quality Management** is about ensuring that the project will satisfy the needs for which it was undertaken.

- Document review; peer reviews, formal review meetings (plan time for this!)
- Code review (also plan time for this!)
- Usability test lab / Prototyping
- Testing:
  - Unit tests
  - User tests
  - Performance / Stress tests
  - Acceptance tests
- Pilot usage
- Root cause analysis
- Project Retrospectives

Cutting back in testing and reviewing is a recipe for disaster!
Best Practice: Project Retrospective

A project retrospective review is an in-depth discussion that happens after the completion of a project, event or activity. It is structured to help the people involved reflect on the project in detail.

Lessons Learned and Best Practices are collected and shared afterwards.

Agile Retrospective approach; short retrospective after each sprint.
Project Risk Management is about identifying, assessing and controlling risk on a project.

The objectives are to increase the likelihood and impact of positive risks (opportunities) and decrease the likelihood and impact of negative risks in the project.

Risk response strategies (negative risks):
- Avoid
- Transfer
- Mitigate
- Accept
- Escalate

Risks are assessed in terms of Probability and Impact.
<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk Response</th>
<th>Probability</th>
<th>Impact</th>
<th>Score</th>
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Values:
Probability: 1-99%
Impact: 1-5 (5 highest)
## The Project Management Knowledge Areas
### Project Risk Management

Examples of typical Risks:

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<tr>
<th>Risk</th>
<th>Risk Response</th>
<th>Probability</th>
<th>Impact</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lack of skilled resources creates a delay</td>
<td><em>Mitigate:</em> Staffing with top talent and experts, build team, assign resources well in time. <em>Transfer:</em> Out-source some well defined work packages</td>
<td>50%</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>2. Users will not accept application’s user interface</td>
<td><em>Mitigate:</em> Invest in Usability Test <em>Avoid:</em> review early and get more time and/or cut functionality</td>
<td>30%</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>3. Developing wrong functions leads to unsatisfied customer</td>
<td><em>Mitigate:</em> Agile development, sign-off on requirements</td>
<td>20%</td>
<td>5</td>
<td>1.0</td>
</tr>
<tr>
<td>4. Unknown data in customer’s DB</td>
<td><em>Mitigate:</em> analyze data upfront <em>Escalate:</em> ask customer to provide sample dataset to test against and do acceptance against</td>
<td>40%</td>
<td>5</td>
<td>2.0</td>
</tr>
</tbody>
</table>
The Project Management Knowledge Areas
- Project Risk Management

**Best Practice: Risk Assessment Workshop**

- Brain-storm risks on Post-It notes
- Sort into risk categories
- Group similar risks together
- Assess Probability and Impact
- Start identify risk responses for the top risks

In addition, this is a great exercise for project members from different areas to understand the whole project and the risks.
But even companies with the most rigorous risk management in place fail, example:
Mars Climate Orbiter 1999 crashed
Root cause: Metric vs US units
The Project Management Knowledge Areas
- Project Communications Management

**Project Communications Management** is about ensuring that the project team has the necessary information and resources to complete the job.

- Project Kick-Off
- Meetings, stand-up meetings
- Project Progress reporting
- Repositories, keeping documents up to date
- Code sharing
- Sharing knowledge, internal social media, social collaboration
- Newsletters

**Quote:**
*Project teams often detest progress reporting because it manifests their lack of progress.*

Communication is key, make sure you communicate on all levels!
The Project Management Knowledge Areas
- Project Communications Management

**Best Practice:** Track deliverables, also specifications and use cases in excel:

This is an excellent way to spot delays early and to communicate plan and progress to project team and to management.

Software development is tricky for management, hard to see progress; make transparent.
The Project Management Knowledge Areas
- Project Integration Management

**Project Integration Management** is about managing all parts of the project to ensure that the project’s objectives are met. It spans across all other nine knowledge areas and processes.

Mainly it is about leadership, driving decisions and negotiate, enabling the project team to work effectively.

- Develop Project Charter / Customer Contracts
- Develop Project Management Plan
- Manage, Monitor and Control Project Work
- Coordination
- **Change Control**
- Close Project or Phase

At any instant, the Project manager must know what is the most important **now** while at the same time looking into the **future**.
Key Take Aways

• Project Management is about managing all parts of the project to ensure that the project’s objectives are met, on time and within budget.

• Project Management is about leadership, driving decisions and negotiate, enabling the project team to work effectively.

• Project Management is a team effort; it requires the support of all team members, even though the benefits of some project management processes are not obvious to all

• Typically, the Project Management effort is 10-15% of total project effort
References, Links

- Agile Retrospectives: [www.funretrospectives.com](http://www.funretrospectives.com)

- Project Management Institute (PMI) [www.pmi.org](http://www.pmi.org)
- PMI Switzerland [www.pmi-switzerland.ch](http://www.pmi-switzerland.ch)


- Siemens PLM Software: [www.plm.automation.siemens.com](http://www.plm.automation.siemens.com/)
Questions?
Appendix – Additional Information

Literature

Sources

Recommended Reading
> The Mythical Man-Month, F. Brooks, Addison-Wesley, 1975
> Succeeding with Objects: Decision Frameworks for Project Management, A. Goldberg and K. Rubin, Addison-Wesley, 1995
Appendix – Additional Information

Chief Programmer Teams (example)

> Consist of a kernel of specialists helped by others as required
  – chief programmer takes full responsibility for design, programming, testing and installation of system
  – backup programmer keeps track of CP’s work and develops test cases
  – librarian manages all information
  – others may include: project administrator, toolsmith, documentation editor, language/system expert, tester, and support programmers …

> Reportedly successful but problems are:
  – Can be difficult to find talented chief programmers
  – Might disrupt normal organizational structures
  – May be de-motivating for those who are not chief programmers
Directing Teams

Managers serve their team
> Managers ensure that team has the necessary information and resources

1. “The manager’s function is not to make people work, it is to make it possible for people to work”
   — Tom DeMarco

Responsibility demands authority
> Managers must delegate
   — Trust your own people and they will trust you.

Directing Teams ...

Managers manage
> Managers cannot perform tasks on the critical path
   — Especially difficult for technical managers!

Developers control deadlines
> A manager cannot meet a deadline to which the developers have not agreed
Appendix – Additional Information

What you should know!

> How can prototyping help to reduce risk in a project?
> What are milestones, and why are they important?
> What can you learn from an activity network? An activity timeline?
> Why should programming teams have no more than about 8 members?

Can you answer these questions?

> What will happen if the developers, not the customers, set the project priorities?
> What is a good way to measure the size of a project (based on requirements alone)?
> When should you sign a contract with the customer?
> Would you consider bending slip lines as a good sign or a bad sign? Why?
> How would you select and organize the perfect software development team?