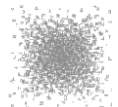


Fachhochschule Frankfurt am Main
Fachbereich 2: Informatik
SS 2008

IT Project Management

Lecture 1:
Introduction into IT Project Management
Dr. Erwin Hoffmann

E-Mail: it-pm@fehcom.de



Organisation

The course:

- Lectures will be held every Friday; except for bank holidays (12 sessions in total).
- The lectures will be presented in English or German language, depending on the course; however the slides are English only.

The material:

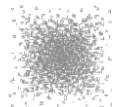
- The lectures will be accompanied by a comprehensive script (PDF) in English.
- The material provided and made on-line available, is language 'mixed' depending on the source.

The courses' home-page:

- Common for all: <https://www.fehcom.net/itpm/>
- Here, I will place all material and the script (no *elearning* space ?)

How to communicate:

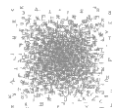
- I will be available on Friday morning in the lecturer's office.
- You can reach me via email: *it-pm@fehcom.de*
- You can subscribe to the mailing list: *itpm@mail.fehcom.net*



About me

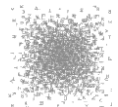
My name is Erwin Hoffmann.

- I carry a PHD in Physics (experimentell Elementary Particle Physics) and been deeply involved in IT since about 1980.
- I was working since then for Israelian, US, and of course German companies as consulter and project manager for a lot of different projects.
- Since about 10 years I am freelancing, in particular involved in software development for mail systems.
- Additionally, I give courses at different "FH"s (Darmstadt, Fulda, and now Frankfurt) about networking, network administration, system management, and IT Security and supervised some diploma thesises.
- You will find some books from me in the bookshops, which have been written together with Prof. Badach (FH Fulda).
- Currently, I work as consulter for T-Mobile in Bonn.
- My professional home page is: <http://www.fehcom.de>



Scope of the course

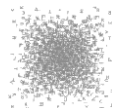
- This course summarises my experience of now almost 10 years in Project Management (PM)
- It will provide an outline of today's established methods and standards used to manage IT projects - successfully.
- While in particular two distinct frameworks for Project Management exist (PMI and PRINCE2), I rather will focus on practical issues which are specific for IT projects.



Outline of the course

The course is organised in five parts:

- Part one shall provide an overview of IT-PM (today).
- Part two deals with the fact, that IT projects are typically set up in an existing landscape and PM has to consider this heritage which can be beneficially but occasionally but a heavy burden a new project.
- Part three considers Team Management as probably the most important factor for the success or failure of a project.
- Part four provides an overview of general Project Management methods and existing frameworks.
- Part five, finally, is dedicated to the specifics of IT projects, including Software Modelling, Defect, Quality, and Release/Delivery Management.

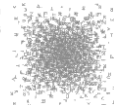


Historic projects: The Cheops pyramid (1)

- By today's knowledge, the Cheops pyramid at Gizeh (one of the Seven Worldwonder) has been started to get build 2467 BC (according to stellar constellations).
- It should serve as tomb for the pharaoh Cufu., which gave order to build the "big pyramid" shortly after his father Snofru died.
- The building was completed 30 years after this order was received.
- It is estimated that about 10 years were used to establish the (absolute plain) platform and 20 years were enough to complete the whole building.

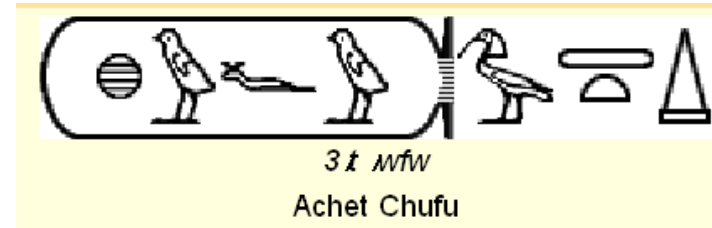


- Not only that the tiptop is missing today (10 m) but in addition the big pyramid was originally equipped with additional tura lime stones painted snow white and stood as tallest member among the Chephren and the Mykernios pyramid in the valley of Gizeh.

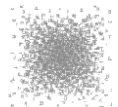


Historic projects: The Cheops pyramid (2)

- During those 30 years, not only the architecture of the pyramid had to be designed, but in addition
 - the necessary material and
 - the labour force had to be organised and sustained over this period.
- 2.5 million limestones had to be broken downside the Nile and
 - transported (by ship) to the building place, each of them had a weight of 2.5 tons (in average)
 - to be finally lifted up to an altitude of 150 m.
- Probably, even with today technologies, we would no be able to complete such a building (in the required quality standard) in that time. Without an almost perfect Project Management, this task would be never achievable.

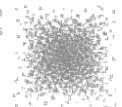
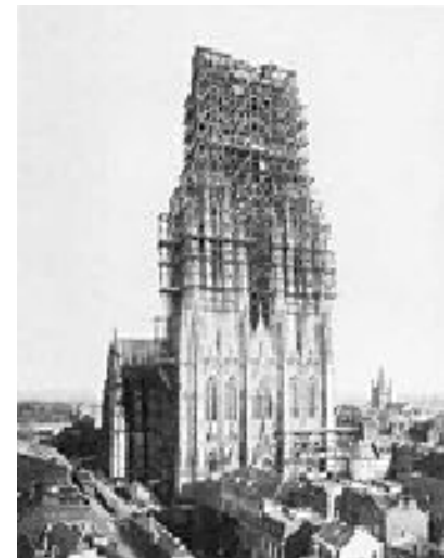
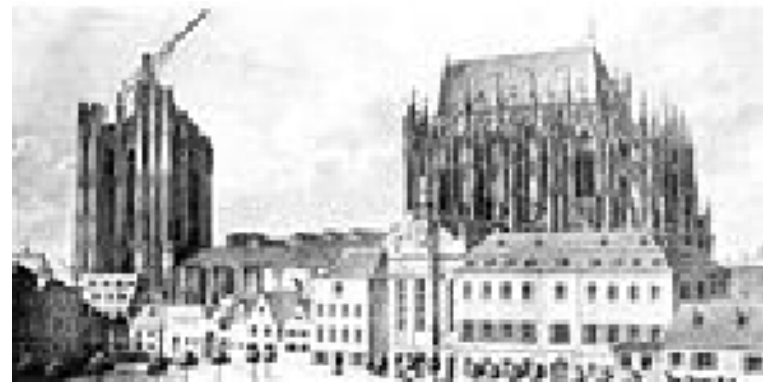


- We have to consider that not only all the material had to be transported here, but also
 - special tools and wooden and perhaps copper lever arms needed to be constructed.
 - Several thousand partially high skilled people had to be fed;
 - they needed hosting as well.
 - Additional care had to be taken that they are substituted and that the overall economy is still working.



Historic projects: The Cathedral of Cologne (1)

- The Cathedral of Cologne was planned to be build in the year 1248 in order to serve as tomb for the remnants (reliques) of the Holy Three Kings.
- The trachyt stones are gathered from the nearby 'Siebengebirge' down the river Rhine and shipped to the building place.
- The first part of the 146 m tall building was finished in 1322.
- However, constructing the South Tower was not completed until 1880 using the original plans



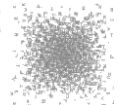
Historic projects: The Cathedral of Cologne (2)

- Due to environmental influences, the trachyt stones age significantly and the Cathedral needs permanent repair and fixing.
- Apart from Cathedral specific civil constructions, a new underground line touches the Cathedral closely and needs extensive drilling.
- Last year (2007), due to the same construction, the tower of the St.-Johann-Baptist church was heavily impacted.



- Building of the Cathedral of Cologne will probably never stop in order to keep this building as "UNESCO world heritage".
- A common phrase of the citizens of Cologne is: "Once the Cathedral is finished, the world is at it's end."

Q: Is this a project ?



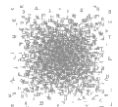
What is a Project ?

Probably the first modern (and actually written down) definition for a 'project' originates from R.L. Martino [Martino1964]:

- "A project is any task which has a definable beginning and definable end and requires the expenditure of one or more resources in each of the separate but interrelated and interdependent activities which must be completed to achieve the objectives for which the task was instituted."

In Germany, the "Deutsche Industrie Norm" DIN 69 901 provides a precise definition of the term 'project':

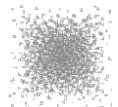
- "A project is task defined by the uniqueness of it's all-over realisation conditions, in particular a (1) defined aim or goal, (2) defined conditions regarding time-frame of realisation, financial, personal, and other conditions, (3) is distinct against other tasks, and (4) provides a project-specific organisation."



Basic characteristics of a Project

Projects are organised by companies, Government Organisations (GOs) or even among friends or your family.

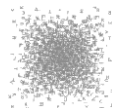
- A 'project' is understood as the opposite of 'general operation', thus
 - it is something special and
 - requires particular attention
 - and funding.
- A 'project'
 - neither requires a certain complexity,
 - nor is a 'project' characterised by virtue of its 'technical' character.



Specific characteristics of a Project

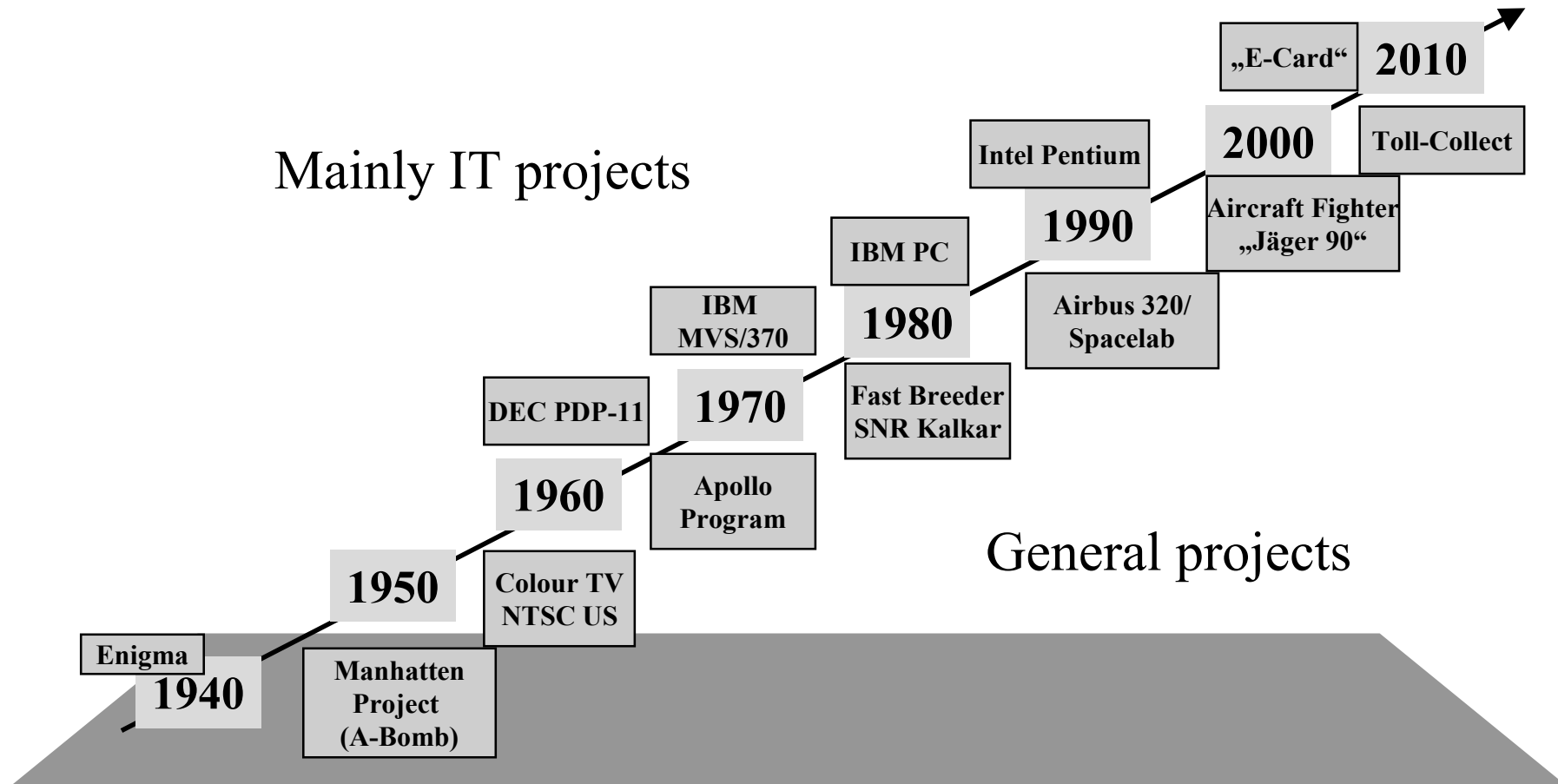
According to [Litke2007] a project can be characterised as:

- Limited task with defined start and end (goal)
- New horizons: Touching the limits of current technologies
- Risky in terms of technology, economical impact, and time-frame
- Complexity:
 - Lots of participants of different disciplines; perhaps third party organisations
 - Interdependencies not standardised; organisational structure not (yet) established
- Moving organisational requirements during the project phases
- Substantial impact for the company or organisation
- Time to market dependencies

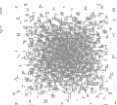


Samples of modern Projects

Mainly IT projects



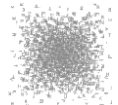
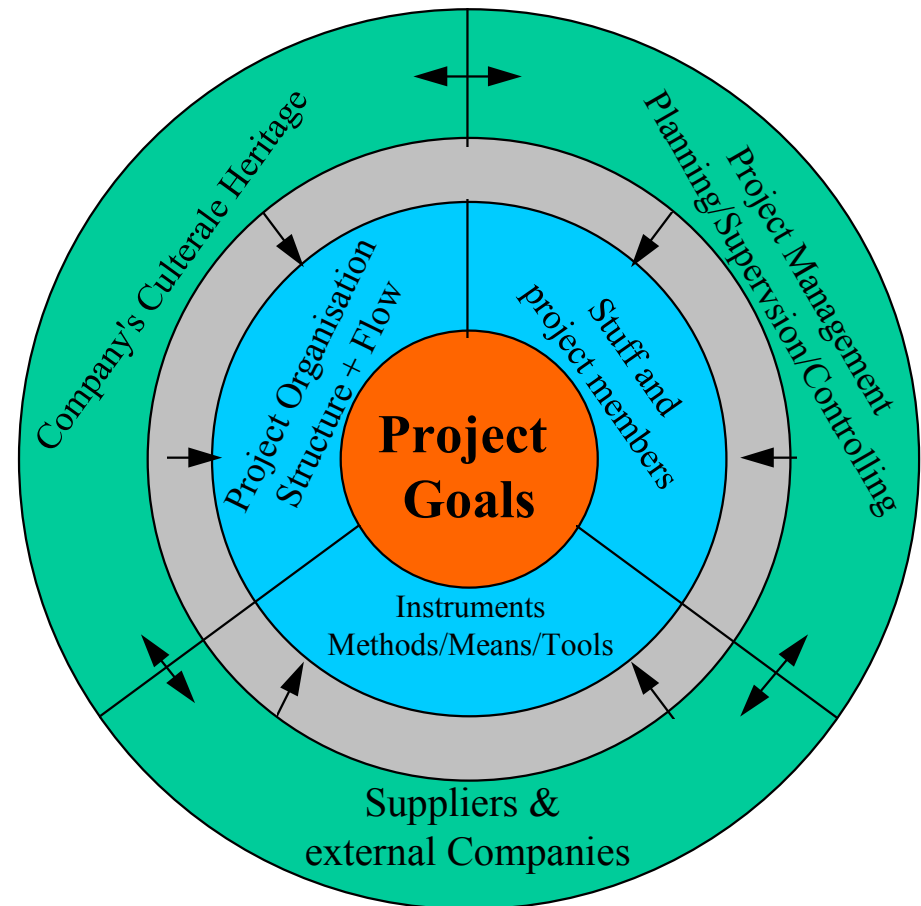
General projects



Why Project Management ?

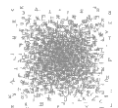
There is a general understanding, that complex tasks needs some special organisation in order to succeed and meet the project goals. The driving factors for a dedicated PM are:

- Reduced 'time to market' for new products.
- Estimate the amount of resources (budget, people, and other conditions) needed.
- Control the project in every phase and allow a reasonable risk management.



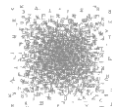
Why do Projects fail ?

- *The project runs out of scope*
The original aim of the project can not be reached. This happens, if no realistic business plan was established.
- *The project runs out of business*
The market conditions have been changed substantially during the running project, thus it became more or less obsolete.
- *The project runs out of time*
This may happen, if the complexity of the project was underestimated, or the funding was insufficient, or people "dilute" from the project.
- *The project runs out of budget*
Sadly to say, that most of the projects have to suffer from that fate.
 - One of the last prominent projects to mention is the German lorry maut system finally realised by Daimler-Chrysler and T-Systems (T-Collect consortium), though it was a successful project regarding all other issues.



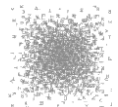
Project Commitments and Decommittments

- In order to partially complete a project successfully (in time and in budget) it might be necessary to reduce the original stated aims such they fit into the current situation of the project.
- This situation may become apparent at virtually any phase of the project.
 - In case the project depends on a third party delivery, the supplier has to actually decommit parts of the announced functionalities.
- Of course, this requires to change the original project plans in order to re-evaluate the dependencies and estimate the consequences for the whole project.
 - In case of a substantial impact, a common procedure is to have already considered alternative solutions (plan 'B'), i.e. having a different potential supplier in 'stand-by' mode.
- It is important to be able to distinguish between 'essential' (absolutely necessary), 'important' (but substitutable) and 'nice to have' (can be left out) features of the project.
 - For all important and in particular essential goals of the project initially, a so-called 'critical path analysis' has to be carried out as part of the risk management.



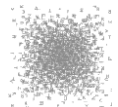
The don'ts of Project Management

- IT Project Management is part of the general PM, however due to the nature of the delivered product - the software - special tools and frameworks can be used to guide, manage, and measure the quality of the product and finally to deliver the product in a well-suited form ready to use in an easy way.
- Further, occasionally upper management believes that IT projects can be carried out solely by IT:
 - *General Management by Powerpoint* (or equivalent) - this is a bad habit, and often staff and project members are fed reading those slides.
 - *Document Management by Word* (or equivalent) - any complex document structure to be consistently maintained needs a special system; systems based on binary representation simply don't work.
 - *Project Management by Outlook* (or equivalent) - neither communication nor deadline management should use extensively email communication; email by construction is unreliable.
 - *Problem/Incident/Defect Management by Excel* (or equivalent) - these tools are good for reporting numbers, but incapable to allow a content-driven analysis.



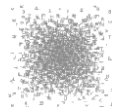
The ingredients of Project Management (1)

- Management is part of the human society and culture.
 - Actually even animals manage their inter-relations and their common search for nutrition. Ants, bees, dolphins, zebras, all these species are highly organised and partly well managed.
 - Management results as part of Darwin's law to react upon external circumstances and to optimise their behaviour in order to survive as species.
 - Management can be described in this sense as leadership (active management) and common, instinctive behaviour (self management or self organisation).
 - Human 'management' is not free from those elements, but we believe that cultural and civil progress is based on the fact that human beings substitute those elements with intellectual leadership and rational self-organisation, though the history of the last hundred years seems sometime to be in opposite of this opinion [Reich1933].
- Project (management) in today's understanding is an organised way to approach a projection.
 - Probably since the first scientific articles on Project Management were written down [Martino1964], it became evident, that concerning the finite duration of a projects, it's evolution can be characterised in terms of life-cycle or project-phase models.
 - How to describe those phases in detail and how to deal with them is part of different Project Management schools.



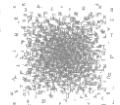
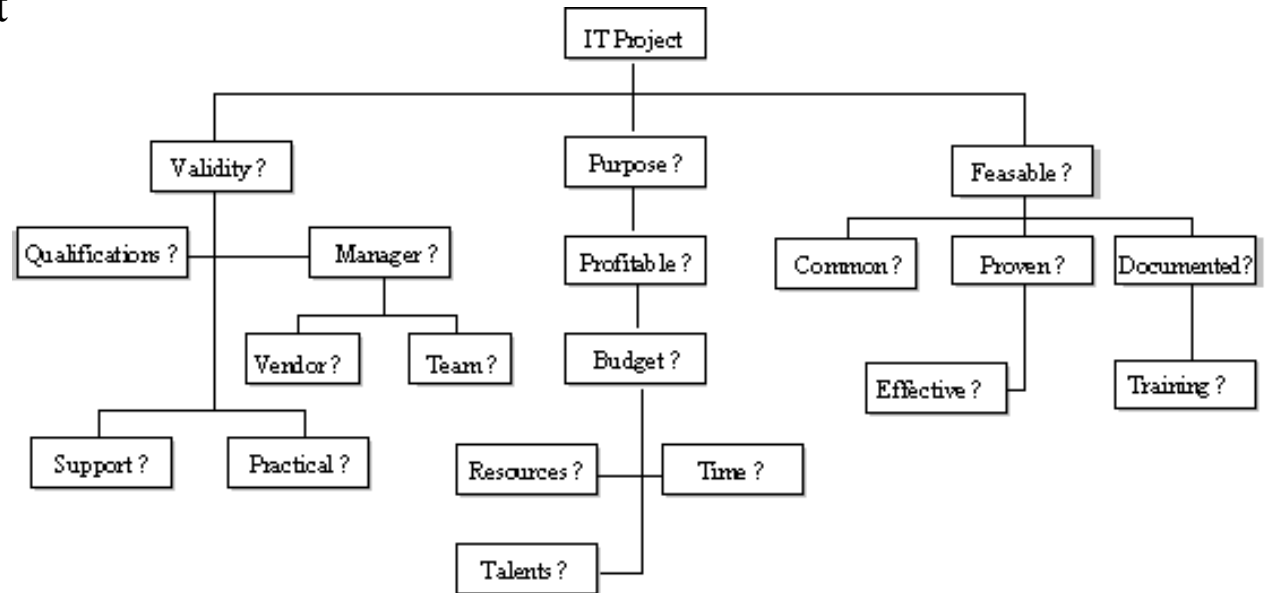
The ingredients of IT Project Management (2)

- Information Technology. Information Technology is based on a *Computer* as a *hardware device* and a *Program* specifically build for that Computer, which we reference as *software*.
- For today's understanding of IT Project Management the elements
 - UNIX with it's scientific background, standardisation of the OS (not to forget POSIX DIN/EN/ISO/IEC 9945 compatibility),
 - reduction of computer languages and hardware, and of course
 - the rapid introduction of the Internetare all equally important.
- Practically, no IT project can be set-up 'confined' to service one platform only, but rather has to interact with lots of external systems by means of (more or less) standardised interfaces.
 - Naturally, this yields a certain amount of complexity to IT projects and requires specific management skills and tools.



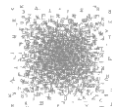
The Rôle of the Project Manager

- Duties and responsibilities of a project manager or a Project Leader (PL) depend of course on the tasks upper management has assigned to him or her.
 - Starting as a PL, the first and most important task is, to ask questions.
 - The second most important aspect is, whether you - as a PL - have already experience in the technical field described and/or any project management experiences.
 - The third - but in practice often neglected - item is, whether you are capable to personally guide and manage a team of people.



The Rôle of the Stakeholders

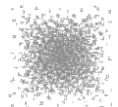
- In general, all parties which have an interest on the project should be considered as *Stakeholders* and consulted frequently.
 - Stakeholders are in return important for the final success of the project and can act as friends or foes in particular during critical phases of the project.
 - Thus, it is import not only to report the progress (and/or problems) to those, but also to take their concerns serious and to react on those.
 - Certainly, it is a good idea to document the project's progress and phases transparently, i.e.. on an Intranet Web site.
- Who is a stakeholder?
 - (Upper) Management
 - The project manager (PL)
 - The project team
 - Project sponsors
 - Customers
 - End users
 - The community



Project Management Standards (PMI)

Project Management Institute (PMI)

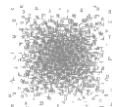
- *Project Management Institute (PMI)* founded in 1969 published in Project Management Journal 1983 a special report containing the results of the so-called ESA project.
- This is considered to the predecessor of the *Project Management Body of Knowledge* [PMBok2004] and used as a framework for PMI in order to set-up a program for further accreditation and certification.
- The **PMBok** is a knowledge based Project Management approach and acts as one of today's PM references and is filed as ANSI standard ANSI/PMI 99-001-2004.



Project Management Standards (PRINCE2)

PRINCE2

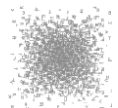
- **PRINCE2** is the synonym for "*PRojects IN Controlled Environments*", Version 2. It has been developed by the British "Office of Government Commerce" OGC which is also founder of ITIL (IT Infrastructure Library) recommendations.
- While it is in use since almost 25 years now, unlike PM it follows a more easy and process-oriented project management approach known as "Management by Exception".
- It provides a framework of "what to do" in specific situations, unlike PMI's "how to do". PRINCE2 can be adopted to any projects - not just for IT projects - and is widely used in industry.
- Potential project managers can be certified by accredited organisations. Comparable with ITIL, the first degree is "Foundation" while the more advanced user may achieve a "Practitioner".



Project Management Standards (SEI)

SEI

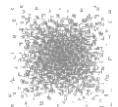
- The *Software Engineering Institute SEI* at the Carnegie Mellon University is one of the most experienced organisations regarding process management and quality of software, and publishing their results since 1986.
- Not only, that they introduced the famous SEI process maturity levels, but rather, today they promote the Capability Maturity Model Integration (CMMI), which is another cornerstone in software engineering and stands as synonym for continuous process improvement.



Project Management Standards (ISO 10006)

ISO 10006 / DIN 69901

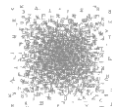
- The German DIN ("Deutsche Industrie Norm") 69901 is the predecessor of the DIN 69900 which introduced the so-called "Netzplantechnik" and
 - defines in it's first part the basic terminology for project management.
 - The third part however, introduces a work breakdown structure (WBS; german "Projektstrukturplan") and finally the "Netzplantechnik".
 - Part four provides the framework for organising a project, regarding leadership (PL) and teams.
 - Finally, part five gives a definition of project phases and how to report completed projects.
- The companion standard ISO 10006 has been published in January 2004 additionally as DIN "norm".
 - It's scope is to provide a guideline for quality management in projects, broken down in eight chapters and comparable to the standard DIN ISO 9001.



Project Management Standards (ISO 12207)

ISO/IEC 12207

- This standard, published in 1995, introduces the idea of a "*Software Life Cycle Process*", in particular suited for tailored software (unlike standard software).
 - Here, the terminology primary processes (ordering, delivery, development, operation, and maintenance), the complementary processes (documentation, configuration and quality management, verification, validation, and audit) and finally the organisational processes (management, infrastructure) is introduced.



Project Management Standards (Spice)

ISO/IEC 15504 (Spice)

- The *Software Process Improvement and Capability Determination Spice* model has been poured into the standard ISO/IEC 15504.
 - Spice does not only provide a Process Reference Model (PRM) but in addition also allows to assess they achieved quality by means of a Process Assessment Model (PAM) and thus is able to determine the maturity level of a process, comparable to SEI's definitions.
 - In particular, the automotive industry uses Spice as quality framework.

