Management of Software Projects – Selected Topics

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Cons

Renamed. Redefined.
Reborn as Accenture.
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Agenda

- Introduction and Background
- Project management and Software Engineering
- Business Case based project management
- The art of estimating a project
- The Life of a project manager in eCommerce

Introduction and background

Background of the lecturer

- Studies of Computer Science (minor in Economics) at TU München 1983-89

- March 1990 until now: Employee / Partner with Andersen Consulting (to be known as Accenture from 01.01.2001) in the area of technology and Financial services

- Project management experience in medium to large systems integration projects since 1991

Our Mission and Core Values

Andersen Consulting is the leading global management and technology consulting organization. Our mission is *to become one of the world's leading companies, bringing innovation to improve the way the world works and lives.*

- ✦ *Client Service*
- ✦ *Stewardship*

- ✦ *One Global Firm*
- ✦ *Best People*

- ✦ *Integrity*
- ✦ *Respect for the Individual*

Business Integration

Organization & Human Performance

- **Organization Design and Development**
- **Technology Assimilation**
- **Knowledge Transfer and Education**

Process

- **Business Process Design and Implementation**
- **System Design and Developm**
- **Information Planning**

Strategy

- **Business Strategy**
- **Information and Technology**
- **Logistics Strategy**
- **Organization Strategy**

Technology

- **Tech. Assessments**
- **Specialized Tech. Applications**
- **Tech. Design and Deployment**
- **Network Solutions and Management**

Strategy

People

Technology

Business Integration

Processes

Technology Capability

✦ *The Mission*

  ▪ **Enable our clients to gain significant competitive advantage through innovative technology**

✦ *The Work*

  ▪ **Develop and implement technology solutions**
  ▪ **Develop IT strategy**
  ▪ **Design technical architectures**
  ▪ **Develop leading applications**
  ▪ **Integrate complex technologies**
  ▪ **Manage complex systems development projects**
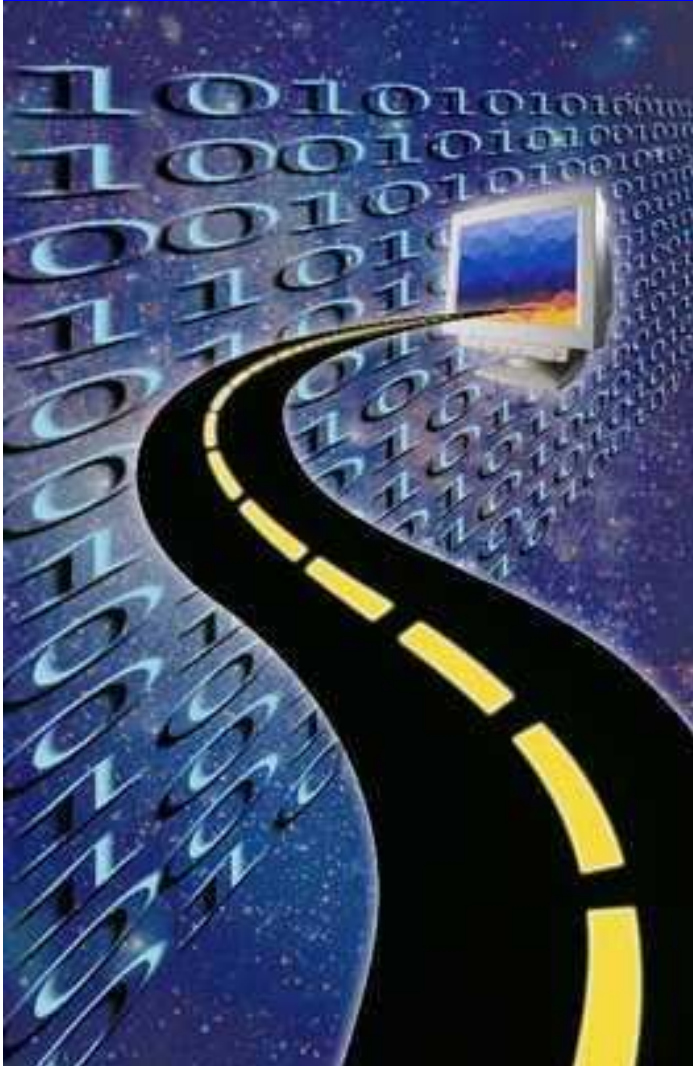
Business Integration Methodology

Managing

- Direct and monitor the change initiative to achieve improved business results

Planning

- Identify organization's most valuable opportunities
- Formulate plans to make the most of those opportunities

Delivering

- Put plans into action
- Build and deploy new business capabilities

Operating

- Achieve and sustain desired business performance targets

Project management and Software Engineering

Software Engineering (SE) and Software Project Management (PM) have close link, but are not the same

- Both areas deal with software projects
- Goal is to make software projects predictable
- Both try to change Software developers from artists to engineers
- Both have excellent ideas and tools which are well known but rarely used in real life...
- PM has to cover more project areas than software development only!

Definition „Encyclopedia Britannica"

- **Project** –
  here, as opposed to the ongoing activity found in batch or continuous systems, **resources are brought together for a period of time**, **focused on a particular task**, such as the development of a new product, and then **disbanded and reassigned**. The **management of such projects requires a special type of organization** to administer project resources in an effective manner and maintain clear accountability for the progress of the project.

Definition „ Lientz/Rea“:
Breakthrough Technology Management

A **project** consists of work that is **focused on specific purposes** within in the boundaries of a **defined scope**. Projects can be of any size or type.

A purpose of a project can be a narrow goal related to a specific system or technology, or it can be more extensive to include improvements in a business process.

Definition „Andersen Consulting"

A project:

- Contains a number of „one-time" activities
- Will be conducted within a given financial and time budget
- Used to support defined business goals
- Supports the overall strategy of the business

Key attributes are:

- A Business Case (incl. Cost/Benefit Analysis)
- Top Management support for efficient control
- Defined project organization incl. Roles definitions for project members
- Based on project phases
- Regular milestones with reviews of the project results (incl. the Business Case)
- Defined Project team with responsible project manager

What is so special about Software projects? (Lientz/Rea)

- Project goals are not clearly defined at the beginning of the project
- Scope of the project is not clearly defined
- Complex Interfaces
- New, fast developing technologies
- High expectations of the buyer
- Significant effort in integrating different technologies

From: Lientz/Rea: Breakthrough Technology Project Management

What is so special about Software projects?

- Software developers are artists, not engineers
- „Not invented here" syndrome (methods, procedures)
- High innovation results in limited comparability of projects
- Integration of technology, organization, business processes and strategy necessary
- Software projects have significant non-software related subtasks
- Project results are sometimes not clear to buyers
- Problems concerning time and budget are expected

SE and PM work hand in hand to resolve the problems in dealing with projects

- Close link from SE methods to PM approaches
- SE focuses on the design, implementation and testing of the software
- PM adds overall tasks to deliver successful business results (more than successful software)

Business Case based project management

Goals of a Business Case (BC)

- Will be developed during the project planning phase
- Transforming a vision into a justifiable project (based on business needs)
- Used to get approval for the start of a project (and the budgets, resources etc.)
- Basis for measuring the success of a project

Content of a BC

- Content and structure depend on standards and expectations of the buyer
- The following three main areas will be covered in all cases:
  - Business context and requirements for necessary changes
  - Analysis of expected benefits
  - Long term goals and next steps

Business Context

Goal:
Present the current situation of the company in the market as well as the market itself

Content:

- Situation of the market: current and trends
- Situation of the competition: current and trends
- Overall value chain
- Other important areas for the company (social, legal, technical)

Requirements for necessary changes

Goal:
- Present the necessity for changes and potential options

Content:
- Solutions for trends and competition in the market
- Change potential within the company
- Alternative Strategies to increase income
- Recommended Change approach
- Reasoning for recommended approach

Analysis of expected returns

Goal:

- Quantify expected effort and expected results

Content:

- Documentation of assumptions
- Present and evaluate Alternatives/Scenarios
- Document risks
- Document potential long term opportunities

Long term goals and next steps

Goal:

- Present feasibility and approach for project

Content:

- Goals for the project
- Scope and approach
- Key success factors

What is a BC used for?

- Justify the necessary budgets and resources for a project (project start)
- Evaluate the requirements from the users with the business needs and results (strong link to requirement analysis)
- Scope and feature management (during the project)
- Measure the results of the project (after the project)

The art of estimating a project

Andersen Consulting

Why estimates?

- Statement about costs and timing for a project is required early in the project's lifecycle.
- Estimates are basis for deciding about a project (see BC)
- Quality of the estimate needs to be improved over the lifecycle of a project
- Estimates are the basis for the complete project planning (staff, budget, other resources) as well as for following activities after finishing the project (market entry, promotional activities)

  → Key task for project management

General approach during estimation

- Document the assumptions
  - Which estimating method/approach
  - Assumptions about scope, resources etc.
- Definition of the level of confidence for the estimate (according to the project phase) – Definition of a range
- Cooperation with experienced project managers (reviews)

Components of a project estimate

- Cost
  - Personnel (in person days or cost)
  - Material (Computers, Tools etc.)
  - Other project cost (travel cost, rent, etc.)
- Time
  - Overall timeline
  - Timely dependencies
- Team members (number of people, skills, availability)
- Infrastructure requirements (rooms, technical infrastructure etc.)

General approach for Cost estimate

- Define estimated person days
- Distribute among different skill groups
  - Common cost rates for all skill groups
  - Different cost rates for skill groups (based on experience,roles etc.)
- Cost of personnel = no of person days x cost
- Approaches are very different across companies

Define estimated person days

- Most difficult part in estimating
- General approach:
  Based on historic experiences evaluate existing information about the project and transform in effort
- Solid basis (scope), reusable project approach (which steps need to be performed, which results are necessary) and lots of experience are key
- Problem can be the different productivity of project members: assumption of standard productivities

Possible approaches: top-down or bottom-up

- Top Down approach
  Estimate overall project and calculate the effort for the different steps and results from there (% of overall effort)

- Bottom Up approach
  Calculate the effort for the low level results and aggregate to overall effort (adding integration effort)

→ mixed effort is normally used!

Common approaches

Several approaches have been developed based on this general approach:

- Expert estimates (find comparable projects)
- Lines of Code estimates
- Function Point approach
- COCOMO

Alternative approach

- Mix of Top-Down and Bottom-Up components
- Define the key components of a project (infrastructure, number of users/developers, kind of technology used etc.) and define weights based on complexities
- Define major components of a system (number of Windows, classes, tables, DB access programs, lists document and define weights based on complexities
- Use additional factors for common tasks (reviews, migration etc.)
- Aggregate to overall project effort

Alternative approach: Prerequisites

- Base for this approach is a common methodology and a significant number of experience from previous projects
- Must be used by experienced project managers (due to parameterization, evaluation of complexities)
- Calculate bottom-up and compare with top-down approach as cross check
- Re-estimate at the end of the project to further develop the parameters and approach for next phases/projects)

Management of eCommerce Projects

Attributes for eCommerce Projects

- High division of labor, virtual companies
- Physical values less important
- High economies of scale / high income expectations
- Perfect information about market and participants
- High time pressure / time to market
- High risk concerning technology and market
- Unconventional Business Cases (not based on „old-economy" values but mainly stock price)

Impact on project management

- Not all existing best practices (structured approach, tools etc.) are useless
- Risk of failing in projects is increasing, but this should not be an excuse for the project manager
- Project managers are usually better prepared for this type of business (compare to division heads) as:
  - New business requires project approaches
  - Time pressure common in „normal" projects also
  - Changes in scope are also common for projects
- → Don't worry, eCommerce projects are also projects...

Major areas of changes

- Project organization
  - Significant impact on non-software related tasks for a project (market launch, alliances, ...)
- Methodologies
  - „victory" for „newer" approaches (Prototyping, iterative development)
  - Focus on „good enough software"
  - High value for reuse and standard software
- Business Case
  - Focus on factors difficult to quantify (customer retention, first mover advantage)
  - High impact of external factors (market capitalization)
  - Even more important for external financing

Major areas of changes (cont.)

- Project execution
  - Faster cycles (specification, implementation, test, rollout) → iterative development
  - High impact of issue and risk management
  - Change control highly dynamic
  - High parallelism for sub-projects
- Project end
  - High focus on lessons learned
  - End of one project is start of next

General lessons learned from eCommerce projects

- eCommerce project do not need to be chaotic (general principles are the same)
- Higher skills requirements for project members (mainly technical skills) due to higher risk and uncertainty
- Closer contact to buyer necessary (short term changes with significant impact on results are usual)
- Business Cases are even more important and need to be maintained on a regular basis
- Common vision is at the beginning of the project more important than detailed understanding (but details become important...)

Summary

Anders Cons

Software Engineering and Project management are two important parts of a successful software project

- SE provides guidance and tools how to proceed in software projects and deliver
- PM adds overall guidance for the complete project
- Successful projects are based on sound business cases
- Estimating software projects is key for success and major problems
- eCommerce projects still require sound SE and PM skills, despite what is presented in the market currently...

More Information

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