



Project Management for CSSE

Lecture 1: History of project management. Modern Trends

Duration: 1 study hour

Course no: 12582

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Goals of course Project Management for CSSE

Course goal: to prepare students for managing IT projects in real life's surrounding.

Expected achievements: As a result of studying the course students shall

know:

- *basic concepts of project management in IT area;*
- *Main requirements and tools of agile methodologies in*
- *management and design sprints;*
- *structures in project management system;*
- *necessity data collecting for performing forecast accomplishing all works for*

projects;

being able:

- *to manage projects in IT area;*
- *to transform customer needs into goals for projects, to prepare commercial proposals;*
- *to prepare wide range of reports to key stakeholders of projects: clients, product owners and*

etc;

to have capabilities:

- *transformation of project goals to project stories and tasks,*
- *to evaluate of duration of project tasks,*
- *to prepare project backlog, to nominate sprint backlog, to evaluate risks.*

```

student course12582(student an_instance)
{
    lections();
    //listening
    practics();
    //checking
    hometasks();
    //study projects
    an_instance.goal_achieved =
    (exam(an_instance)==
    IT_project_manager);
    return goal_achieved;
}
  
```



Figures of course 12582 IT project management

Activities:

- 15 study hours of lection for transferring to students the knowledge, necessity for reaching the goals of the course;
- 13 study hours of practical lessons for obtaining necessity capabilities;
- 2 tests – for checking real progress of studying the course;
- 13 homework for probation of the received knowledge and capabilities in a simple test project;
- 1 exam – the final exam – presentation of final report of performing the test project.

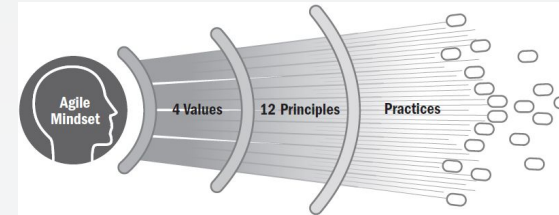
Resources:

Study book: Harold Kerzner – Project Management A System Approach to Planning, Scheduling and controlling. 10th Ed., New York: Wiley 2009

Study Book: Rubin K. - Essential Scrum A Practical Guide to the Most Popular Agile Process - 2012

Book: AGILE PRACTICE GUIDE. Published by: Project Management Institute, Inc. 2017

Ability for connecting online to study class through Microsoft Teams software.



Introduction

In purpose of increasing of efficiency of the course I ask you to send to my e-mail address n.tulekov@edu.iitu.kz your message which consists of your name, surname and your expectations from the course. After receiving the e-mails I will adjust the course towards meeting the most of the expectations.

```
typedef struct
{
    char Name[16];
    char Surname[20];
    bool went_through_management_course;
    char Expectations[255];
} student_at_start;
```

Project management history: 1945-1960 (1/2)

Before we start review our knowledge of project management methodology lets look back to whole project management history for remembering and understanding of conclusions, elaborated by practices of the management tools and modern trends of solving problems and tasks which occur in front of project managers in the modern surrounding during project execution.

1940-1960 years. In 40th often used an “over-the-fence” method, where line managers , wearing the hat of a project manager, would perform the work necessitated by their line organization, and when completed, would throw the “ball” over the fence in hopes that someone would catch it. Once the ball was thrown over the fence, the line managers would wash their hands of any responsibility for the project because the ball was no longer in their yard. If a project failed, blame was placed on whichever line manager had the ball at that time.

The problem with over-the-fence management was that the customer had no single contact point for questions. The filtering of information wasted precious time for both the customer and the contractor. Customers who wanted firsthand information had to seek out the manager in possession of the ball. Following World War II, USA entered into the Cold War, when it made it clear that the traditional use of over-the-fence management would not be acceptable to the Department of Defense (DoD) for projects, the government wanted a single point of contact, namely, a project manager who had total accountability through all project phases. The use of project management was then mandated for some of the smaller Suppliers which have to implement project management related to supply goods to DoD and NASA.

Project management history: 1945-1960 (2/2)

Projects in the aerospace and defense industries were having cost overruns in excess of 200 to 300%. Blame was erroneously placed upon improper implementation of project management when, in fact, the real problem was the inability to forecast technology. Forecasting technology is extremely difficult for projects that could last ten to twenty years.

By the late 1950s and early 1960s, the aerospace and defense industries were using project management on virtually all projects, and they were pressuring their suppliers to use it as well. Project management was growing, but at a relatively slow rate except for aerospace and defense.

Because of the vast number of contractors and subcontractors, the government needed standardization, especially in the planning process and the reporting of information. The government established a life-cycle planning and control model and a cost monitoring system, and created a group of project management auditors to make sure that the government's money was being spent as planned.

Private industry viewed these practices as an over-management cost and saw no practical value in project management. [1.page.38]



Project management history: 1960-1985 (1/5)

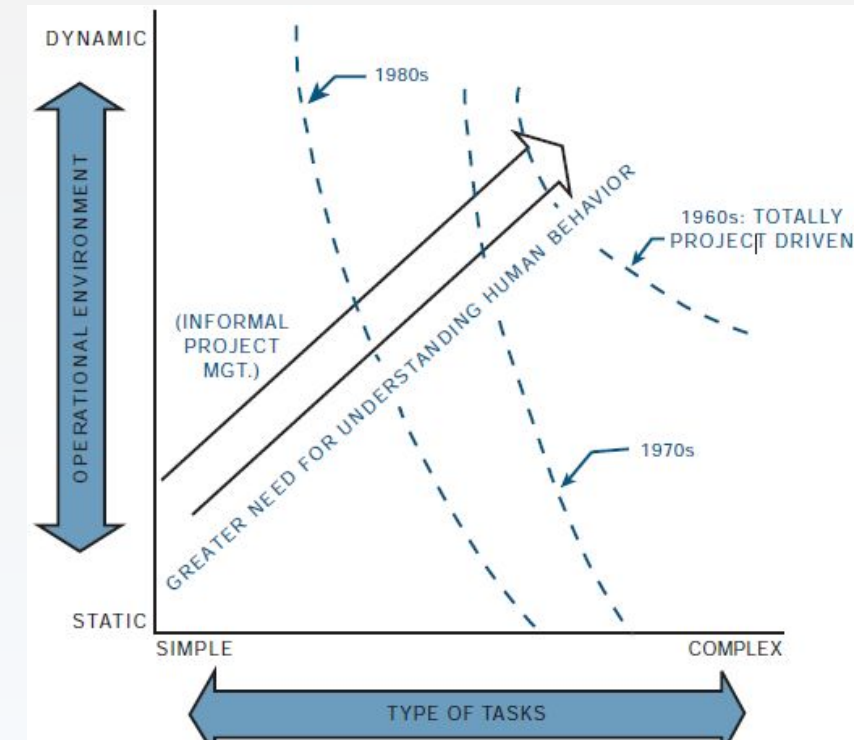
The slow growth of project management can be attributed mainly to lack of acceptance of the new management techniques necessary for its successful implementation. An inherent fear of the unknown acted as a deterrent for managers.

Between the middle and late 1960s, more executives began searching for new management techniques and organizational structures that could be quickly adapted to a changing environment. The table below and Figure 1 identify two major variables that executives consider with regard to organizational restructuring.

Almost all type C and most type D industries have project management–related structures. The key variable appears to be task complexity. Companies that have complex tasks and that also operate in a dynamic environment find project management mandatory.

It is true for such industries would include aerospace, defense, construction, high-technology engineering, computers, and electronic instrumentation.

Type of Industry	Tasks	Environment
A	Simple	Dynamic
B	Simple	Static
C	Complex	Dynamic
D	Complex	Static



Project management history: 1960-1985 (2/5)

Other than aerospace, defense, and construction, the majority of the companies in the 1960s maintained an informal method for managing projects. In informal project management, just as the words imply, the projects were handled on an informal basis whereby the authority of the project manager was minimized. Most projects were handled by functional managers and stayed in one or two functional lines, and formal communications were either unnecessary or handled informally because of the good working relationships between line managers. Many organizations today, such as low-technology manufacturing, have line managers who have been working side by side for ten or more years. In such situations, informal project management may be effective on capital equipment or facility development projects.

By 1970 and again during the early 1980s, more companies departed from informal project management and restructured to formalize the project management process, mainly because the size and complexity of their activities had grown to a point where they were unmanageable within the current structure. Figure 2-2 shows what happened to one such construction company.

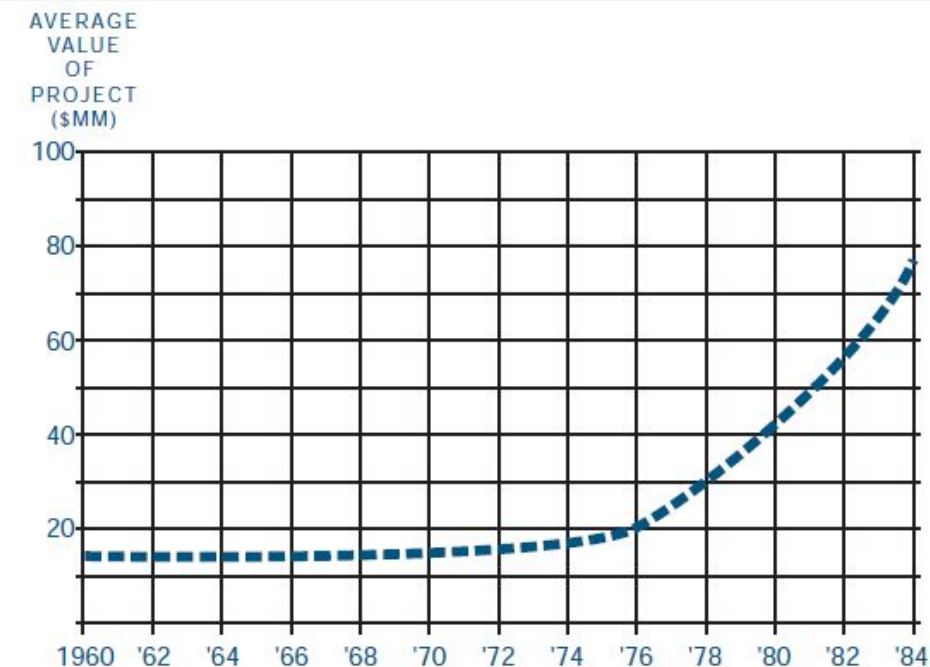


FIGURE 2-2. Average project size capability for a construction company, 1960-1984.

Project management history: 1960-1985 (3/5)

The following five questions help determine whether formal project management is necessary:

- Are the jobs complex?
- Are there dynamic environmental considerations?
- Are the constraints tight?
- Are there several activities to be integrated?
- Are there several functional boundaries to be crossed?

If any of these questions are answered yes, then some form of formalized project management may be necessary. It is possible for formalized project management to exist in only one functional department or division, such as for R&D or perhaps just for certain types of projects. Some companies have successfully implemented both formal and informal project management concurrently, but these companies are few and far between. Today we realize that the last two questions may be the most important for the company.

The moral here is that not all industries need project management, and executives must determine whether there is an actual need before making a commitment. Several industries with simple tasks, whether in a static or a dynamic environment, do not need project management. Project management requires organizational restructuring. The question, of course, is “How much restructuring?” Executives have avoided the subject of project management for fear that “revolutionary” changes must be made in the organization.



Project management history: 1960-1985 (4/5)

A major concern was that project management required upper-level managers to relinquish some of their authority through delegation to the middle managers. In several situations, middle managers soon occupied the power positions, even more so than upper level managers.

Despite this and other limitations, there were several driving forces behind the project management approach. As the driving forces overtook the restraining forces, project management began to mature. Executives began to realize that the approach was in the best interest of the company.

Project management, if properly implemented, can make it easier for executives to overcome such internal and external obstacles as:

- Unstable economy
- Shortages
- Soaring costs
- Increased complexity
- Heightened competition
- Technological changes
- Societal concerns
- Consumerism

- Ecology
- Quality of work

Project management may not eliminate these problems, but may make it easier for the company to adapt to a changing environment.

Project management became a necessity for many companies as they expanded into multiple product lines, many of which were dissimilar, and organizational complexities grew.

Project management history: 1960-1985 (5/5)

In purpose to obtain the advantages in the most companies management was “forced” into organizational restructuring; the traditional organizational form that had survived for decades was inadequate for integrating activities across functional “empires.”

By 1970, the environment began to change rapidly. Companies in aerospace, defense, and construction pioneered in implementing project management, and other industries soon followed, some with great reluctance. NASA and the Department of Defense “forced” subcontractors into accepting project management. As project management developed, some essential factors in its successful implementation were recognized. The major factor was the role of the project manager, which became the focal point of integrative responsibility.

Providing the project manager with integrative responsibility resulted in:

- Total accountability assumed by a single person
- Project rather than functional dedication
- A requirement for coordination across functional interfaces
- Proper utilization of integrated planning and control



Without project management, these four elements have to be accomplished by executives, and it is questionable whether these activities should be part of an executive’s job description. Those executives who chose to accept project management soon found the advantages of the new technique: easy adaptation to an ever-changing environment; ability to handle a multidisciplinary activity within a specified period of time; horizontal as well as vertical work flow; better orientation toward customer problems; easier identification of activity responsibilities and other. [1.page.39]

Project management history: 1985-2009 (1/3)

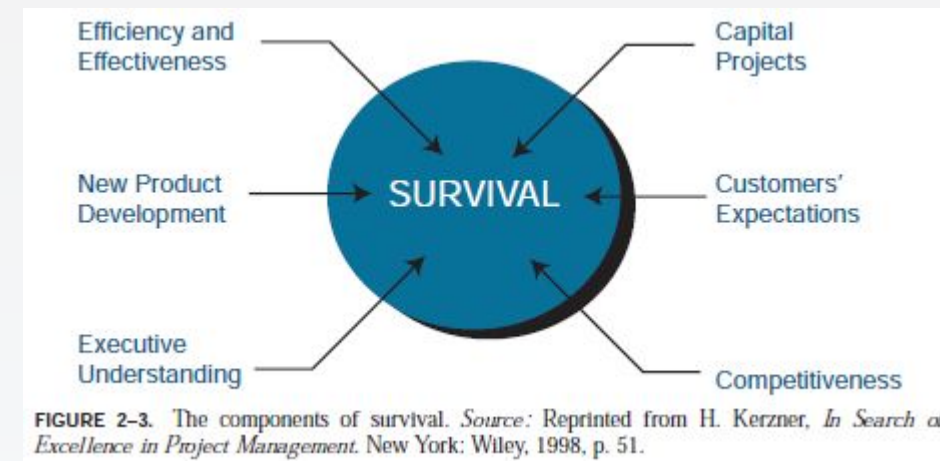
By the 1990s, companies had begun to realize that implementing project management was a necessity, not a choice. There are six driving forces that lead executives to recognize the need for project management:

- Capital projects
- Customer expectations
- Competitiveness
- Executive understanding
- New project development
- Efficiency and effectiveness

Manufacturing companies are driven to project management because of large capital projects or a multitude of simultaneous projects. Executives soon realize the impact on cash flow and that slippages in the schedule could end up idling workers.

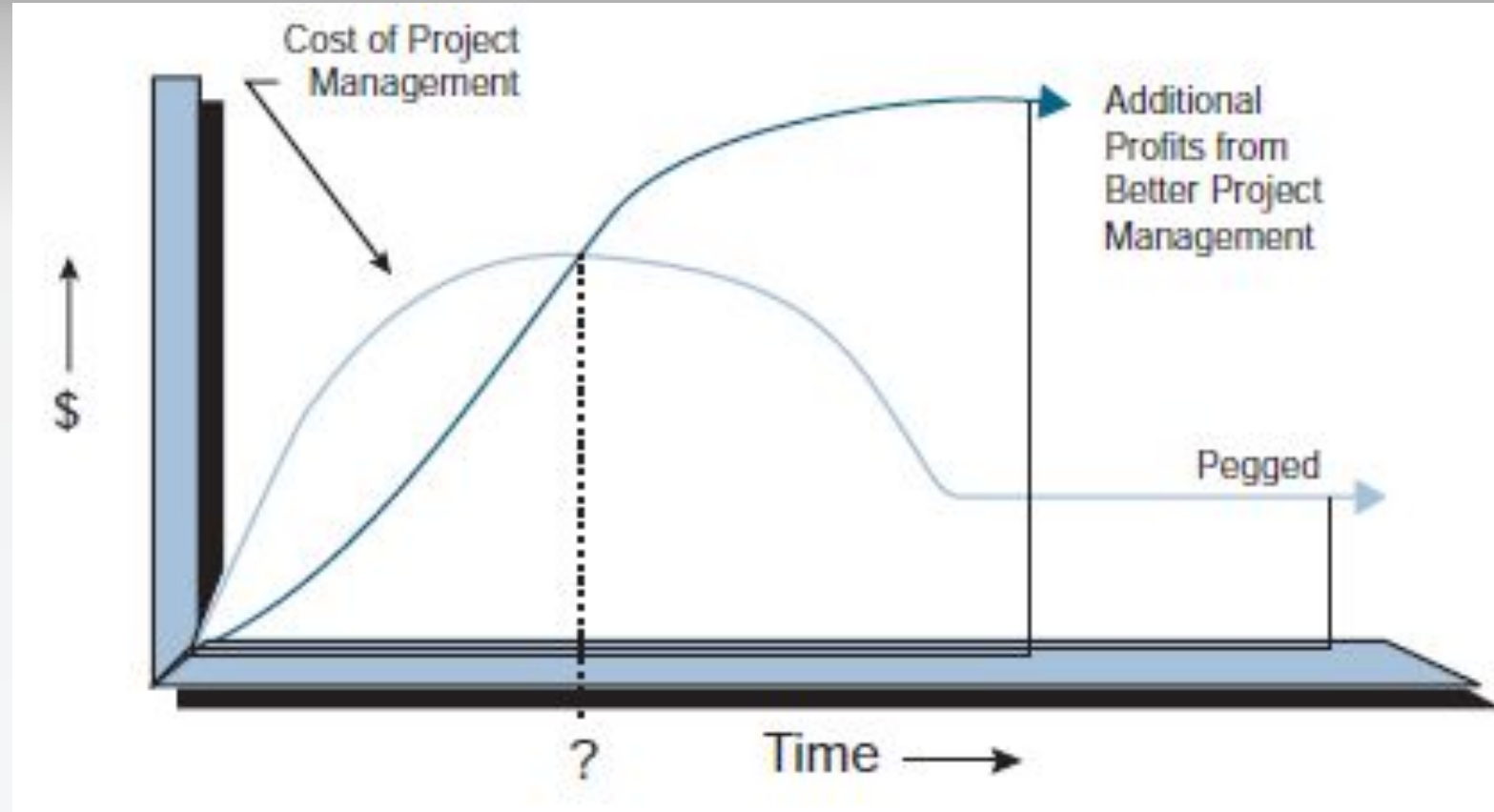
Because of the interrelatedness of these driving forces, some people contend that the only true driving force is survival. This is illustrated in Figure 2-3. When the company recognizes that survival of the firm is at stake, the implementation of project management becomes easier.

By the 1990s, companies finally began to recognize the benefits of project management.



Project management history: 1985-2009 (2/3)

Recognizing that the organization can benefit from the implementation of project management is just the starting point. The question now becomes, "How long will it take us to achieve these benefits?" This can be partially answered from Figure 2-5. In the beginning of the implementation process, there will be added expenses to develop the project management methodology and establish the support systems for planning, scheduling, and control. Eventually, the cost will level off and become pegged. The question mark in Figure 2-5 is the point at which the benefits equal the cost of implementation.



This point can be pushed to the left through training and education.

Project management history: 1985-2009 (3/3)

Table shows the benefits of project management and how our view of project management has changed.

Past View

- Project management will require more people and add to the overhead costs.
- Profitability may decrease.
- Project management will increase the amount of scope changes.
- Project management creates organizational instability and increases conflicts.
- Project management is really “eye wash” for the customer’s benefit.
- Project management will create problems.
- Only large projects need project management.
- Project management will increase quality problems.
- Project management will create power and authority problems.
- Project management focuses on suboptimization by looking at only the project.
- Project management delivers products to a customer.
- The cost of project management may make us noncompetitive.

Present View

- Project management allows us to accomplish more work in less time, with fewer people.
- Profitability will increase.
- Project management will provide better control of scope changes.
- Project management makes the organization more efficient and effective through better organizational behavior principles.
- Project management will allow us to work more closely with our customers.
- Project management provides a means for solving problems.
- All projects will benefit from project management.
- Project management increases quality.
- Project management will reduce power struggles.
- Project management allows people to make good company decisions.
- Project management delivers solutions.
- Project management will increase our business [1.page.45]

Project management history: Resume

As we can see there are several drivers:

1. Projects became multifunctional which brings necessity cross-functional interaction and managing;
2. All kind of disciplines increases it's complexity which increases unpredictability estimation of completion projects;
3. Project environment changes faster than earlier which brings more risks than before;
4. All kind of disciplines transfer it's complexity to software part of it's kind of equipment which transfer part of all kind of projects to IT type of project.

All companies under the market drivers has to implement project management methodology. Due increasing complexity of projects and constantly changing project environment projects now more stressful and unpredictability than earlier.

IT Project management history (1/2)

If we start review history of creating software to we could see several stages:

- initially creating software was not organized and it was only deal of engineers. They created a structures for main kind of the technical processes and parts;
- after that during the last 50-60 years the most of the engineers start take care of unstable quality of the created software. As a result of the care occur a range of formalizing approaches for creating the software. Also becomes a new kind of position software developer;
- at the begin of 1990th a new methodology which called Rapid Application Methodology was proposed where were combined heavy formalized engineering approaches with practical empiric tools. As a result of the combination formal and informal approaches there were occurred the first light methodologies such as “Evolutionary Development Management”(Evo)1988, Scrum 1995, Methods dynamic systems development (DSDM) (1995), Extreme programming (XP)1995 and other;
- in 2001 year leaders of “light” methodologies met and choose a term – “flexible methodologies” - Agile and created Agile manifesto of software development. The agile manifesto was considered by many primarily as a reaction against the bureaucratic nature of the formal approaches that existed at that time, which were too "ordered." But few realized that the authors of the manifesto also opposed the lack of discipline among programmers, against the "chaotic" processes and poor quality, which at that time dominated the software market. The leaders of the new movement realized that there is a middle way between structurality and lack of structure, between orderliness and chaos. In a sense, it was a heroic attempt to return to an earlier era, when the main players were pioneer programmers, but there was no anarchy.;

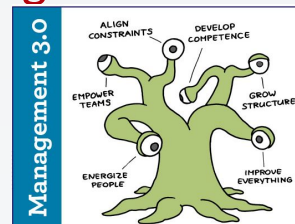
IT Project management history (2/2)

- one of big competitor of Agile is Lean software development methodology was described in 2009 [Poppendieck 2009: 193] which based in Dao of Toyota;
- there is also less size but more capable player - Movement for Programming Excellence, which is based on Manifesto of defense programming mastering. It is new fast and fearless player in a “light” methodology field.
- in the same time there were occurred a new weight player - Capability Maturity Model Integration CMMI Methodology in 1987;
- in 2009 a company VersionOne perform a quiz where respondents should name the main roadblock in a way of implementing Agile approach. After the quiz Jurgen Appelo made a conclusion that there is a conflict with traditional lime management which blocks to the flexible methodology and he described a new Management 3.0 Management system for support Agile methodology[3].

Resume:

Flexible project management become as a protest against heavy bureaucratic ineffective management methodologies and it consists of several friendly movements. The methodologies more successful in Software Development managing field in comparsion of traditional project management due several reasons, common of the reasons are: less useless activities; sharing authority with software develops; truthfulness and fairness in relationship.

We will discuss about the reasons in the next lections.



Books

1. Harold Kerzner – Project Management A System Approach to Planning, Scheduling and controlling. 10th Ed., New York: Wiley 2009
2. PMI- PMBOK. 6e Rev. PMI.
3. Jurgen Appelo - Management 3.0 Leading Agile Developers, Developing Agile Leaders Publisher: Addison-Wesley Professional 2011

Questions

That is all.