

Practical aspects of project management: case study for IT systems

Anna Kurzydłowska

Cardinal Stefan Wyszyński University in Warsaw,
Faculty of Mathematics and Natural Sciences, Poland
e-mail: a.kurzydłowska@uksw.edu.pl

DOI: 10.12846/j.em.2015.01.09

Abstract

The aim of this paper is to disseminate experimental findings, in the form of good practices, related to managing IT projects in diverse economic sectors. The best practices described here are based on rich industrial experience of the Author and as such are good supplement to the existing theoretical studies in the domain of Project Management.

Keywords

Project Management, IT project, practical aspects, project planning, risk management, quality management

Introduction

IT systems are backbones of modern commercial activities which feature increased complexity in terms of resources used, products offered and markets of interest. On the other hand implementation of a new IT system is a difficult task for both parties – the supplier and the customer. It is usually carried out in conditions of serious limitations and the lack of resources, due to the necessity of the simultaneous realization of current duties and meeting deadlines, so essential in business.

In recognition of the importance of project implementation phase, research in the area of project management practical aspects is still of great importance. Education and training that blend academic theory with real-life management skills and tools is offered by the leading world class Universities (e.g. Stanford University - apm.stanford.edu).

Despite the progress made in the education and the PM competence development, the interest in practical aspects of project management remains high and the subject attracts both theoreticians and practitioners. In this context, the aim of the present paper is to provide experimental findings (evidence) collated by the Author based on her participation as Project Manager in a number of IT system implementations. These experimental findings are structured into a set of fairly original good practices, which certainly are to be useful for industry minded readers and perhaps also for those with academic interests.

1. Literature review

According to the Standish Group (1994), 31,1% of projects are cancelled, only 16,2% of software projects are completed on time and on budget. Further results shows that 52,7% of projects will costs 189% of their original estimates and 78,4% of software projects delivers only 74% of the specified functions.

A study by Dynamic Markets Ltd. (2007) of 800 IT managers across eight countries shows that:

- 62% of organizations experienced IT projects that failed to meet their schedules;
- 49% suffered budget overruns;
- 47% had higher-than-expected maintenance costs;
- 41% failed to deliver the expected business value and ROI.

It seems that we experience crisis of software development projects.

According to Gartner Report (2014) the failure rate of IT projects is appalling. IT projects failure (missing deadlines, cost overruns and products missing or poor quality delivery) happens disregarding IT methodology applied (waterfall or agile). One of key findings in this report is that on average 59% of application development projects are completed on-time and 68% are completed within budgeted. It seems that software project failure start to be rather standard then exception.

There is a lot of research done to find out failure factors (Bennatan, 2000; Dalcher, Brodie, 2007). McConnell (1996) categorized classic project mistakes as presented in Tab. 1.

Tab. 1. Classic project mistakes

People-Related Mistakes	Process-Related Mistakes
Undermined motivation	Overly optimistic schedules
Weak personnel	Insufficient risk management
Recalcitrant problem employees	Contractor failure
Heroics	Insufficient planning
Adding people to a late project	Abandonment of planning under pressure
Noisy crowded offices	Wasted time before project actually starts —i.e., the approval and budgeting process
Friction between developers and customers	Shortchanged upstream activities — e.g., requirements analysis, etc.
Unrealistic expectations	Inadequate design
Lack of effective project sponsorship	Shortchanged quality assurance
Lack of stakeholder buy-in	Insufficient management controls
Lack of user input	Premature or too frequent convergence —i.e., release the product too early
Politics over substance	Omitting necessary tasks from estimates
Wishful thinking	Planning to catch up later Code-like-hell programming

Source: (McConnell, 1996).

On the contrary, research done by Standish Group (Standish Group, 1994) points out following project success criteria:

- user Involvement;
- executive management support;
- clear statement of requirements;
- proper planning;
- realistic expectations;
- smaller project milestones;
- competent staff;
- ownership;
- clear vision & objectives;
- hard-working, focused staff.

All these factors are of general nature. In this article, the author would like to show practical approach to specific issues that might cause project failure.

2. Research methods

The experimental observations made by the Author are based on her participation in a large number of IT projects which, among others were implemented in the companies from following industries:

Banking, Insurance, Telecommunication, Public sectors. Projects value ranges from 100 000 USD to 65 500 000 USD with average value of 3 000 000 USD.

Research methodology was based on:

- more than 40 IT projects conducted by the Author working (for over 16 years) as Project Manager and Project Director in the biggest multinational information technology and consulting corporations;
- more than 15 Lessons Learned gathered by the end of IT projects shared by other Project Managers and Projects Reviews performed while working as Programme Management Office Manager;
- about 50 Quality Assurance Reviews of IT projects done as Quality Assurance Specialist in big IT Company.

It should be noted that the details of these projects cannot be disclosed for obvious reasons, however, all of them were highly ambitious and carried a significant risk of failure.

Based on the careful analyses of the above mentioned projects the following major conclusions have been drawn.

Careful planning and correct management of a project are elements that lay foundations for its success. From the point of view of meeting deadlines, these are the key phases needing particular diligence and attention. These are also phases which are the most difficult to implement for various reasons. In this context the following phases of the implementation of the IT systems project have been discussed:

- project scope determination;
- project planning;
- system testing;
- users training.

The article is illustrated with examples of implementation of IT projects in Poland and abroad.

3. Research results

The most important factor causing project being late or over budget is poor initial scope definition (Gartner Group, 2014). Defining the project objective is an essential factor influencing its realization. We should define what we want to achieve before we decide to start actions. It should be remember that every project is an intentional action. It utilizes the knowledge, skills, techniques and tools to achieve the previously defined objectives.

Project objective should be measurable, so that one can clearly say, both in the process of its implementation and after, weather or not the objectives were met and to what extent. It is also essential that the participants of the project know objectives. Special importance should be attached in the case of large integration projects in which particular subcontractors do their job. It is essential that they fully realize what the whole project “is about”, and why their part cannot be viewed only from the perspective of “decomposed” objectives.

In summary, there is no project without objective. If we want to succeed we must stick to the SMART criteria (Specific, Measurable, Attainable, Realizable, Traceable).

It is worth to remember that some units within one organization perceive the success of a company differently, as they look from a different point of view. A manager of a company, when asked, may have problems with specifying the aim of purchasing an information system. Given examples and tips to clarify the objective (for example, enhancement of the profitability of the company while sustaining its financial fluency) he was likely to say “no”, as the growth in profits would deprive his company of subsidies.

Can an ERP (Enterprise Resource Planning) implementation in a company constitute an objective? No. The information system is a tool, never an objective. An exemplary objective: decrease in the company’s stockpile by 5% within 3 months since the implementation of the system.

Project products reflect the Customer’s requirements. Each of them should have a precisely defined scope and criteria for the recipient.

The requirements of the customer should be specified in Invitation to Tender or, at the latest, while defining the details of the project. These requirements are then reflected in the scope, time, budget and quality criteria of the project.

It is the task of Project Manager to control the Customer’s expansion of requirements once the implementation of the project has been started. Since then, the Cus-

tomer is permitted only to introduce changes by applying Change Management Procedures. However, one should be aware that any change could result in the delay of the implementation of the project and/ or an increase in the project costs.

In the Invitation to Tender in one specific project, it was clearly defined that a company would operate organizational units in every district of Poland. The supplier, accordingly, designed and presented a technical project of a LAN/WAN net and the structure (HR, facilities, technical equipment) supporting the functioning of such an organization. In the course of the implementation, the Customer decided that the criteria of the localization should be changed. It resulted in the significant change in the quantity of units, and hence the changes in the technical project of the LAN/WAN net. This request for change brought about a three-month delay and the increased the costs of project by 15%.

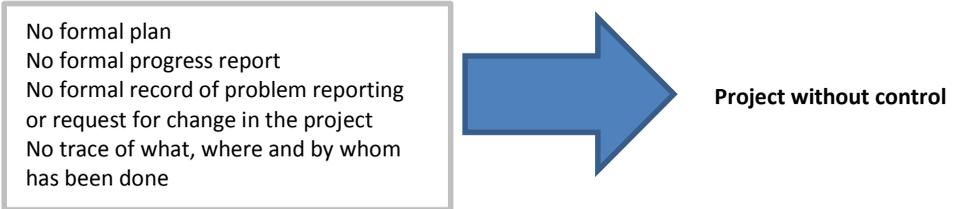
Planning of the project starts once the decision about its implementation has been taken. The internal procedures of supplier or customer usually determine the way it is implemented. The scope and documents required to start the planning phase of the project vary, according to its criticality, and are considered as either required or optional.

The document called Project Plan may vary according to the PM methodology (PMI (Duncan Haughey, 2013), PRINCE2 (Office of Government Commerce, 2009) or other), yet its informative content is very similar. Project Planning describes a series of procedures. A standard one contains, among others:

- mission and objectives;
- project scope;
- implementation plan and schedule;
- resources plan and organization of the project;
- risk management plan;
- quality management plan;
- acceptance plan;
- changes control plan;
- configuration management plan;
- communications plan.

The plan of the project should have a form of an operative document, which means it should facilitate managing the project. Up-to-now experience of the Author confirms that particularly, in critical moments it is essential to apply formal mechanisms, such as reporting a problem, communications procedures (for example regular team meetings documented with a short minutes of meetings) allow for a fast (also defined in the procedures) and objective approach, and consequently for tackling the crisis.

Project Managers that usually are under constant pressure of cutting costs and the flow of time tend to underestimate administrative work. As a result administrative tasks usually lag behind procedures defined in the project plan. Cutting back on these tasks, in the realization of the project, will not pay.



Implementation plan describes the way the project will be implemented, the method adopted and the factors that guarantee its success. It defines what will be implemented, by whom, in what way and when. For example, it specifies the process of migration of tested IT system into production environment. The schedule includes tasks needed to reach the goal of the project, including their correlations, over a period of time. It takes into account the dates of reaching milestones.

Resources plan and organization of the project includes:

- the description of the roles of project team members;
- the areas of responsibilities, duties and competencies of project team members;
- the organizational structure of the project;
- the procedure of resources management.

More information on this topic can be found in (Kurzydłowska, 2000; Kurzydłowska, 2003).

There are numerous approaches to risk management in IT projects. IT corporations possess their own methods, accompanied by tools, to evaluate the risk and estimate its influence upon a project. Since it is not enough to identify potential risks, one must manage them.

Risk analysis is not a one-time action. It constitutes a key element which must be constantly verified at each phase of the project lifecycle. The first attempt to assess the risks of the project takes place before the signing of the agreement. In order to effectively manage risks, one needs to:

- identify the risks and factors contributing to their occurrence;
- assess the probability of the risk occurrence;
- specify potential consequences of risks occurrence;

- taking into consideration also legal consequences;
- investigate possibilities of reducing or avoiding risk/s;
- define mitigation actions which need to be taken;
- attach priority to mitigation actions;
- assess the costs which need to be paid, either in case of preventing the occurrence of risk, or in applying emergency operations.

In essence, each project requires full commitment to risk management!

It is not enough to conduct this process formally by completing the risk assessment form, creating risks register, defining mitigation and emergency activities, securing required funds. Tasks that result from risk analysis should be included in the process of planning and implementing the project. Yet, very rarely project managers integrate mitigation actions in the schedule!

It should be thus reiterated that risk analysis and management are integral parts of each project, and in many cases they determine the final success.

Based on practical experience it is noted that risk management is neglected to a large extent by Project Managers being under pressure of various project works. In particular, experience shows that while:

- non-compliance with communication procedures (e.g. no minutes of meeting prepared);
- lack of adequate and frequent quality control;
- inadequate resources management (securing appropriate project team by the customer and compliance with the procedure of changes within the project team);
- Change Management (enforced by the first request for change by the customer or delay in the implementation);
- Configuration Management (which version of the document is the final one?) result in problems fairly quickly. Therefore the project lifecycle itself makes their application necessary - the risk management issue is usually overlooked.

In practice, the risk is hardly managed and once the risk has occurred, we respond with emergency actions, which - at this point – already resulted in additional cost, time and quality.

It is suggested the following risk management approach, to Project Managers overloaded with work:

Step 1. Identify maximum seven (7) risks – choose the most important ones.

Step 2. Analyze each of them to identify the source, probability of occurrence and results in costs, time, etc.

- Step 3. Decide, for each risk, who can do what, in order to prevent risk from happening or to reduce it. Specify what will have to be done to get things under control, in case it occurs. Develop a strategy consisting of mitigation and emergency tasks, including their costs.
- Step 4. Complete an appropriate Risk Form including the above data for each of identified risk. Sum it up in a Risk Register.
- Step 5. Examine risk correlations, i.e. whether the occurrence of one would lead to the occurrence of another. It may influence the total Risk Fund.
- Step 6. Assess (in line with a chosen method) the whole Emergency Risk Fund, which will constitute an element of the project budget.
- Step 7. Regularly, every 2 weeks, check the progress in the realization of the Risk Management Plan (the realization of mitigation actions that were agreed upon) and update the Risks Forms and Risk Register, respectively.
- Step 8. Before the occurrence of a risk, apply the Escalation Procedure.

The basic principle of quality management plan is the incorporation of quality-driven actions into development and management processes. It allows shifting the emphasis on quality from the process of quality control of the final product to the processes of quality assurance at all production stages.

What are the possible consequences of carrying out a project with the neglect of quality principles? What is quality? Generally speaking, it is the product compliance with the requirements of the client. To achieve it, emphasis must be put at “quality” of product production. In order to achieve this one needs a clear definition of who and how will do each task, who and how will control its realization, on what basis product quality assessment will be made (measurable quality criteria) and how the process of product acceptance, and process of product improvement, will look like.

Quality procedures and its implementation must be prepared and observed throughout the whole project to avoid situation shown in the Fig. 1.

EVERYONE



ANYONE



NO ONE



SOMEONE

There was an important job to be done and everyone was asked to do it.
Everyone supposed, that someone will do the job.
Anyone could do it, but no one did.
Someone got irritated, as this was a job for everyone.
Everyone assumed, that anyone can do it, without realizing, that no one would do it.
Eventually everyone blamed everyone, whereas no one had a right to blame anyone.
ALL were to be blamed.

Fig. 1. Quality procedures

Source: own elaboration.

Communication plan is intended to secure the flow of information in such a way that project-related information originates, is gathered, stored and accessible on time, according to the adopted quality standards. Communication plan defines the rules and tools which should be applied by project members while gathering and distributing information.

It includes, for example:

- procedures of circulation and storing information within the project structures;
- standards concerning means of transmission of information (fax, e-mail, post, others);
- way of reporting;
- organization of meetings.

There is a common saying: „Show me Your project plan and I will tell You what kind of Project Manager You are”.

A well-developed project plan is a principal project document, on the basis of which a project is executed. It is not just a document to store and present at audit. It defines all the aspects required to its execution.

Who should be the author of the project plan? Both: the solution provider, as well as the customer, should have the project plan at their disposal. The first version of the plan is usually provided by the supplier. It is prepared in two versions: one is presented to and discussed with the customer, the other one is for internal use, as it contains elements of project plan which are not to be revealed to the customer. It may contain, for instance, a full risk analysis and costs evaluation.

There is a common practice to prepare a draft of project plan before the signing of a contract. One of the reasons for it is that the contract should include some elements contained in the project plan, such as:

- Change Control Procedure;
- Preliminary Quality Plan;
- Acceptance Procedure for the project products;
- Organizational structure of the project with a description of key roles.

Gartner report (Gartner Group, 2014) points out that among three most important reasons given for projects being less than successful were functionality (35%) and quality (20%). Thus, proper application testing is very important phase of software projects.

Talking about testing in its theoretical aspect, one usually points out to steps of testing process that consist of unit tests, integration, system and finally acceptance tests. Acceptance tests are conducted at the customer's facilities to get user acceptance of the software implemented. It is a general practice that all tests should be performed following the agreed testing procedure, and software acceptance procedure that has to be defined (and consequently approved) in the Project Plan.

The following elements should be secured before test start:

- test scenarios;
- test data;
- system version installed in the test environment;
- document form to include post-testing remarks;
- testing environment (for example workstations).

Test scenarios should be prepared by analytics from the supplier's project team. They contain a list of tests and a description of steps to be taken within every test. The narrative of scenarios defines precisely the activities to be taken by persons conducting tests.

Test data should be supplied by the customer. These data are then used during testing in line with the scenarios. Test data should relate to test scenarios. For example: the admission of a fixed asset X in unit A, the transfer of an asset from unit A to unit B, the disposal of a fixed asset X, etc.

The test version of the system should be prepared by the team conducting tests. It has to be a copy of the system which is to be implemented.

The following observations are made in the context of practical aspects of system testing:

- Testing as a project task that is to be conducted in the presence of the customer.
- Acceptance procedure should define the way initial (and acceptance) tests are conducted. It should, among other things, specify when the testing is to be aborted (for instance in the case of a fatal error). Test procedure is meant to guarantee, that the testing is conducted efficiently and no scenario containing error, and/or causing subsequent errors, will be tested.
- An important element of the whole testing process is post-testing bilateral meeting of the project team engaged in tests. Each error found, should be then classified according to its validity, given priority, and the precise time and way of its correction should be specified.
- Post-testing meeting, error classification procedure, assigning priorities should all be included in the approved Project Plan.
- Apart from functional tests, efficiency tests should be conducted. In this case it is important to define measurable criteria of acceptance. They should be established and agreed before the testing starts. These criteria are to be included in tests scenarios. This is the only way to assess, whether or not the system operates to the customer satisfaction, and what type of events should be treated as an error. From the functional point of view, acceptable time of system reaction may be considerably longer in the case of weekly reports, than in the case of searching for fixed assets within a customer's unit/s.

It is not enough to introduce a completely tested system into the production environment. A fully successful implementation of a system requires appropriate training of its future users. The term "appropriate" means that the training should:

- be organized within a reasonable period of time (the training cycle should be possibly short);
- be user- and trainee-oriented;
- be adjusted to various levels of users' competencies (including their computer skills);

- provide a Help Desk for persons who, after the training, would need a repetition or further practice;
- guarantee, that the persons trained will be able to operate the system correctly and effectively (as result of adequate and systematic knowledge testing).

The phase of user training is one of the key phases of the project, as its impact upon the correct implementation of the system is vital.

Training should be conducted on the system previously tested and approved by the customer. Organizing the training before the testing process has been completed brings the risk of training users on a wrongly operating version of the system. Also it means that the users are testing the system prior to its completion. It may have a harmful effect on the credibility and users' confidence to the system.

Conclusion

As a conclusion to the above given observations on general practices in project implementation, the following "bullets points" are given:

- No goal? No project!
- If you fail to plan, you plan to fail.
- Avoiding risk results in avoiding potential advantages, this may be gained when a risky project is carried out.
- Risk is a potential problem, whereas a materialized risk is the problem. Therefore, manage risk to avoid managing problems.
- Ignoring risk is a standard approach to the risk management in projects. It is not the best approach possible.
- A project is subject to constant changes in the process of its implementation. Changes should not be avoided, but introduced formally – via Changes Control mechanism.
- Curb the customer's requirements once the project has been started.
- Information system is but a tool. How and for what we will use it depends on the knowledge and skills we acquire.
- All project users (not only the implementing team) determine its success. Each team member is as important as you, the Project Manager.

There is a commonly known and successful organization with a team of 100 people, autocratically governed by one man. It is by all means effective and efficient.

The level of satisfaction of its permanent staff is perceived as exemplary. The organization is famous for a series of unique products. Outer observers consider the source of its success in:

- very high level of professionalism of the staff;
- individual employees' awareness of their exact place in the organization and their comprehension of the objective the whole organization strives to achieve;
- understanding to what extent an individual level of task accomplishment influences the final product quality;
- system of control enabling an immediate feedback and combining the achieved result with the system of rewarding;
- its origins – the organization was developed by genuine professionals.

The organization is the great Philadelphia Symphony Orchestra. Its organization illustrates the need for managers. The leader's (Conductor) significant role cannot be underestimated. It is the leader's role to lead the entity in the desired direction (in line with the defined mission, vision and strategy, via carefully selected repertoire, distribution of tasks and arranging schedule) and to ensure that the entity plays harmoniously (appropriate task distribution, motivation, conducting) without discordant tunes (all team members cooperate).

Literature

1. Bennatan E.M. (2014), *On Time Within Budget*, John Wiley and Sons Ltd, New York
2. Carlton D. (2014), *AAA-Rated Project Failures – Abdication, Avoidance and Apathy*, Gartner Report, Stamford
3. Dalcher D., Brodie L. (2007), *Successful IT projects*. Thomson Learning, Middlesex University Press, Thomson Learning, London
4. DeMarco T. (1997), *The Deadline: A Novel About Project Management*, Dorset House Publishing, New York
5. Dynamic Markets Limited (2007), *IT Projects: Experience, Certainty, Independent Market Research Report*, Abergavenny
6. Hall L., Futela S., Gupta D. (2014), *IT Key Metrics Data 2015: Key Applications Measures: Project Measures: Current Year*, Gartner Report, Stamford
7. Haughey D. (2013), *The Project Management Body of Knowledge*, The Project Management Institute, <http://www.projectsmart.co.uk/pmbok.php> [15.01.2015]
8. Kurzydłowska A. (2000), *Przywództwo w zarządzaniu projektami*, III Konferencja Project Management Profesjonalizm, Jelenia Góra
9. Kurzydłowska A. (2003), *Zarządzanie zespołem projektowym w metodyce PMI*, Konferencja Polskiego Towarzystwa Informatycznego, Szczyrk

10. McConnell S. (1996), *Rapid Development*, Microsoft Press Redmond, Washington
11. Office of Government Commerce (2009), *Managing Successful Projects with Prince2® Manual*, Norwich
12. Standish Group International (1994), *CHAOS: Project Failure and Success Report Report*, Massachusetts

Praktyczne aspekty zarządzania projektami na przykładzie projektów z obszaru IT

Streszczenie

Celem artykułu jest upowszechnienie wyników, w formie zbioru dobrych praktyk, uzyskanych w czasie realizacji projektów IT w różnych sektorach gospodarki. Zaproponowane najlepsze praktyki sformułowano na podstawie bogatego doświadczenia przemysłowego autorki; są one dobrym uzupełnieniem teorii zarządzania projektami.

Słowa kluczowe

zarządzanie projektami, projekty IT, aspekty praktyczne, faza planowania, zarządzanie ryzykiem, zarządzanie jakością

Author information

Anna Kurzydłowska

Cardinal Stefan Wyszyński University in Warsaw
Dewajtis 5, 01-815 Warszawa, Poland
e-mail: a.kurzydowska@uksw.edu.pl