

# The need for Project Management in Telecommunications

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**Abstract** — In this paper the need for project management in telecommunications, as well as the most frequently used project management methodologies are presented. The telecommunications industry value chain is used to explain the need for existence of such methodology. Advantages and possible drawbacks of frequent project management methodologies are listed.

**Keywords** — project management, PRINCE2, SixSigma, telecommunications.

## I. INTRODUCTION

THE use of project management is becoming crucial when it comes to the need for meeting the time, budget, and other resources constraints for telecommunication projects. This is becoming a real issue considering the fact that the number of telecommunication companies increases and consequently, the competition escalates. Additionally, there is an even more significant challenge, the customer satisfaction, which is closely related to producing what the customer wants, within the required cost and time. At the same time, for the telecommunication company, the satisfaction of the employees is also a priority. So, more and more telecommunication oriented companies are looking for proper project management tools and techniques to successfully meet these requirements [1].

Speaking about the customer satisfaction and business efficiency, there is also need of a proper business process management (BPM) method, so the companies can efficiently align the organization with the wants and needs of the clients. It is a holistic management approach that promotes business effectiveness while striving for innovation, flexibility and integration with technology.

The telecommunications industry consists of many types of companies, offering different products, having different objectives, and modes of operation. People in these companies work in number of functional areas, in various organization structures and environments. Some

telecommunication operators are traditional wired telephone service providers, some provide long distance, and others offer wireless services, data communications or video. There are also combinations of the above mentioned services offered on the market. Regarding the regulatory issues, some markets are heavily regulated while others are completely open and competitive. Customer profiles also vary from single line residential telephone subscribers to multinational business customers asking for complex voice/data/video services on which their whole business depends.

## II. THE NEED FOR PROJECT MANAGEMENT

To better understand the need of managing a project in telecommunications, a description of the telecommunications industry value chain is shown on Figure 1, [2].

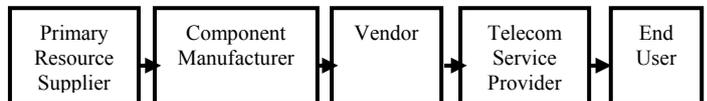


Fig 1. Telecommunication industry value chain, [2]

Starting the analysis from the right hand side, the end user is first encountered. It can be a residential consumer or a huge multinational business company using voice, data, video and multimedia services in a business environment which needs to be secure and consistent in multiple countries around the world. A wide range of end users can be found in between. It can be easily noticed that from both a telecommunications and also a project management perspective, big variety of projects can be identified with very different customer needs. There is a variety of services and equipment that the end users buy, which can be of different size and complexity. They might have need of a service that is specifically within one technology area, for example a wireless service, or it can involve many technology areas that may or may not need to interact with each other. An example of a project can be setting up a new LAN if we speak about company, implementing e-commerce, or maybe offering audio and video streaming, especially to the radio and TV stations, so they can broadcast their program online. Another type of project is setting up video surveillance which is becoming popular not only for companies but for

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residential users also. When it comes to residential users, a project can be an implementation of VoIP, IPTV or the whole triple play service in the house.

The telecom service providers are next to the end users in the value chain. Telecom providers are usually complex business organizations that have to deal with different areas of activities:

- selling services to end users
- providing services to end users
- improving customer satisfaction
- maintaining complex networks of different types (voice, data, mobile networks infrastructure)
- improving business processes, back-office and front-office IT systems
- taking care of employees expertise, career development and satisfaction, etc.

Moving further left to the equipment vendors (Fig.1), obvious differences among them can be easily noticed again. Some vendors sell their products in one area, while others can work in many areas of telecommunication business, for example, selling equipment for wireless, broadband and optical networks. Some vendors are local or regional, while many offer products nationally or internationally. Projects in this field can be related to purchasing, planning corporate marketing, building and maintaining customer relation etc.

Lately, there is a growing trend for many equipment vendors to cooperate in joint projects for product development. The reason for this is the need of interoperability which is crucial for the new technologies. To accomplish the goal, they work through the product design cycle from the beginning to the end, including user needs and market assessment, requirements definition, product design and definition, product development, product testing, market plan development, marketing information preparation, customer relations building, the sales process, and follow-up support. So, the projects might be undertaken in some or many of these areas.

Component manufacturers deal with projects that are nearly the same as the ones that vendors encounter. They will differ depending on whether they are related to the development or the manufacturing processes. Also, there can be projects related to the production itself. Example for a project in this field can be introducing new microchip that will replace a part of some product which will result in the final product with smaller size. Here also, as already mentioned for the telecom service providers, the project can be related to investing in the company itself, i.e. in the employees and their knowledge in new technologies, or introducing new product lines in the factory and training the employees to maintain and work with them for improving efficiency and production.

The primary resource industry is beginning to get far aside from the telecommunications focus and the products themselves are regarded as commodities.

According to [2], a project is defined as an activity that has a distinct beginning and end, has a defined desired

outcome, and involves a sequence of activities that is different from those in other projects. In addition of the time constraint mentioned in this definition, we must consider also the limited budget and human resources. The telecommunications industry is dynamic, so innovative project management is more than crucial for this business environment [2].

### III. METHODOLOGIES

There are number of project management methodologies used by companies in order to meet the requirements discussed in the previous section. For example, V-Model [3] is a project management method developed in Germany, while HERMES [4] method is a Swiss general project management method used in Luxembourg and international organizations. On the other hand, there is Organizational Project Management Maturity Model (OPM3) [5] which is developed by volunteers, owned by the Project Management Institute (PMI) and used world wide.

In this paper we focus on two methodologies, Prince2 [6,7] and SixSigma [8], i.e. their advantages and potential pitfalls because of their widespread use and an increasing popularity in the telecom business world. However, here a simple overview is given, without detailed insight.

#### A. Prince2

Projects in Controlled Environments (PRINCE) is a project management methodology. It covers the management, control and organization of a project. "PRINCE2" is a registered trademark of the U.K.'s Office of Government Commerce (OGC) [6].

PRINCE2 is derived from the earlier PRINCE project management methodology, which was initially developed in 1989 by the Central Computer and Telecommunications Agency (CCTA) as a UK Government standard for information systems project management. Now it can be also applied outside of the IT field. Prince2 was released in 1996 as a generic project management method and has become increasingly popular in the following years. Currently it is used by over 150 companies in more than 50 countries [7].

There are two Prince2 qualification levels: Prince2 Foundation and Prince2 Practitioner [6].

Prince2 Foundation level is for professionals with a requirement to learn the basics and terminology of Prince2.

Prince2 Practitioner is the highest level qualification and is suitable for professionals with the need to manage projects within a Prince2 environment.

Prince2 is a structured and scaleable method for management of all types of projects. Structured project management means managing the project in a logical, organized way, following defined steps. A structured project management method is the written description of this logical, organized approach. It describes how to coordinate people and activities in a project, how to design

and supervise the project, and what to do if the project has to be adjusted if it doesn't develop as planned. In the method each process is specified with its key inputs and outputs and with specific goals and activities to be carried out, which gives an automatic control of any deviations from the plan. An efficient method for control of the resources is dividing the project into more stages that can be managed individually. On the basis of close monitoring the project can be carried out in a controlled and organized way. It is a methodology that is widely recognized and easy to be understood, so it provides common language for all participants in the project. Responsibilities of the participants on the project are fully described and they are adaptable to suit the complexity of the project and skills of the organization [9].

Prince2 defines 45 separate sub-processes organized into eight processes as follows [6]:

- Starting Up a Project (SU): the project team is appointed and a project brief is prepared
- Planning (PL): designing a plan, defining and analyzing products, identifying activities and dependencies, estimating, scheduling, analyzing risks, completing a plan
- Initiating a Project (IP): planning quality, planning a project, refining the business case and risks, setting up project controls, setting up project files, assembling a project initiation document
- Directing a Project (DP): authorizing initiation, authorizing a project, authorizing a stage or exception plan, giving ad hoc direction, confirming project closure
- Controlling a Stage (CS): Prince2 suggests that projects should be broken down into stages and these sub-processes dictate how each individual stage should be controlled
- Managing Product Delivery (MP): covers the way in which a work package should be accepted, executed and delivered
- Managing Stage Boundaries (SB): dictates what should be done towards the end of a stage,
- Closing a Project (CP): decommissioning a project, identifying follow-on actions, project evaluation review

Besides its numerous advantages, Prince2 has some potential pitfalls. It is considered by some professionals as inappropriate for small projects, due to the work required for creating and maintaining documents, logs and lists. This is often a misunderstanding of the scalability that Prince2 offers. Additionally, because of the various roles and responsibilities involved, participants in the project can easily blame each other when something goes wrong.

### B. SixSigma

Six Sigma is a business management strategy, originally developed by Motorola that today has found wide-spread application in many sectors of industry.

Six Sigma is a disciplined, data-driven approach and methodology for eliminating defects in any process, from manufacturing to transactional and from product to service. The purpose is to identify and remove the causes

of defects and errors in manufacturing and business processes. It uses a set of quality management methods, including statistical methods. Each Six Sigma project follows a defined sequence of steps and has quantified financial targets (cost reduction or profit increase).

Six Sigma was originally developed as a set of practices designed to improve manufacturing processes and eliminate defects. But later its application was extended to other types of business processes [8]. In Six Sigma, a defect is defined as anything that could lead to customer dissatisfaction [10].

The basic principals of Six Sigma are:

- Continuous efforts to achieve stable and predictable process results (i.e. reduce process variation) that are of vital importance to business success.
  - Manufacturing and business processes have characteristics that can be measured, analyzed, improved and controlled.
  - Achieving sustained quality improvement requires commitment from the entire organization, particularly from top-level management.
- Features that set Six Sigma apart from previous quality improvement initiatives include [10]:
- A clear focus on achieving measurable and quantifiable financial returns from any Six Sigma project.
  - An increased emphasis on strong and passionate management leadership and support.
  - A special infrastructure of "Champions", "Master Black Belts", "Black Belts" etc. to lead and implement the Six Sigma approach.
  - A clear commitment to making decisions on the basis of verifiable data, rather than assumptions and guesswork.

For the sake of better understanding Six Sigma, its statistical background is briefly presented. Sigma (the lower-case Greek letter  $\sigma$ ) is used to represent the standard deviation (a measure of variation) of a statistical population. The term "six sigma process" comes from the notion that if one has six standard deviations between the mean of a process and the nearest specification limit, there will be practically no items that fail to meet the specifications [11]. This is based on the calculation method employed in a process capability study. In a capability study, the number of standard deviations between the process mean and the nearest specification limit is given in sigma units. As process standard deviation goes up, or the mean of the process moves away from the center of the tolerance, fewer standard deviations will fit between the mean and the nearest specification limit, decreasing the sigma number [11].

Six Sigma has two key methodologies: DMAIC (Define, Measure, Analyze, Improve, Control) and DMADV (Define, Measure, Analyze, Design, Verify), both inspired by Deming's Plan-Do-Check-Act Cycle [12] as explained below. DMAIC is used to improve an existing business process; DMADV is used to create new product or process designs [13].

The basic DMAIC methodology consists of the following five steps:

- Define process improvement goals that are consistent

with customer demands and the enterprise strategy.

- **Measure** key aspects of the current process and collect relevant data.

- **Analyze** the data to verify cause-and-effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered.

- **Improve** or optimize the process based upon data analysis using techniques like Design of Experiments.

- **Control** to ensure that any deviations from target are corrected before they result in defects. Set up pilot runs to establish process capability, move on to production, set up control mechanisms and continuously monitor the process.

The basic DMADV methodology consists of the following five steps:

- **Define** design goals that are consistent with customer demands and the enterprise strategy.

- **Measure** and identify CTQs (characteristics that are Critical To Quality), product capabilities, production process capability, and risks.

- **Analyze** to develop and design alternatives, create a high-level design and evaluate design capability to select the best design.

- **Design** details, optimize the design, and plan for design verification. This phase may require simulations.

- **Verify** the design, set up pilot runs, implement the production process and hand it over to the process owners.

When comparing Six Sigma and Prince2, the first thing that has to be outlined is that they have different approach. Six Sigma is more business process oriented, while Prince2 is a project management methodology. Six Sigma is driven by the customers, while Prince2 is driven internally. Six Sigma targets variation, focuses on processes and it is attentive to total business. Prince2, on the other hand, focuses on outcomes and production.

#### IV. CONCLUSION

Telecommunications are a very complex and fast developing industry, so the use of proper project management tools is crucial in every segment of the value chain. Every organization from this industry must apply a consistent and effective project management methodology in order to successfully accomplish the projects regarding the time and budget constraints. Today there are a number of methodologies used for these purposes, but most popular ones are Prince2 for project management and Six Sigma for business process management.

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