

The Use of Systems Development Methodologies (SDM's) in the Telecommunication Industry

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Abstract

The telecommunication industry is widely known as a highly competitive industry, which also has many challenges to face. In light of these challenges, companies are charged with the task of continuously adapting to the ever-changing nature of the industry. It is for this reason that companies operating in the telecommunication industry strive to identify new and more efficient ways of realizing an objective in a shorter time period. Therefore this research aims to identify the systems development methodologies used in the telecommunication industry, and ascertain whether or not the methodology – or collection thereof – can be adapted to be more agile, and hence address the issue of quick but efficient systems development.

Introduction

The telecommunication industry encompasses a wide variety of companies, ranging from Internet Service Providers (ISP's), Mobile Network Operators (MNO's) and Fixed-Line Network Operators (FLNO's), as well as Television and Radio broadcasters. The purpose of these companies, amongst other things, is to stay afloat with the ever-changing nature of the industry. In all these environments, software are developed and used. Although the use and development of software is vital for the survival of organizations in the 21st century, software development is problematic (Fitzgerald, 1996). For purposes of this research, focus will be placed on systems development methodologies in the telecommunication industry because of the great importance that a comprehensive and timeous methodology could have on an organization. According to Patel (2002), the problem with telecommunication systems is that they have specific needs that cannot be handled properly by existing software engineering tools. It is therefore vital that software development team(s) need to be mindful of the complexities inherent in a telecommunication system.

Systems development methodologies in the telecommunication industry

A systems development methodology (SDM) refers to the framework that is used to structure, plan and control the process of developing and information system. In another definition by Avison and Fitzgerald (2006), an information systems development methodology is defined as “a collection of procedures, techniques, tools and documentation aids which help the systems developers in

their efforts to implement a new information system”. Yet another definition by Olerup (1991) states that a methodology “is defined as a strategy which implies a subdivision of the development process”. These definitions show that there is no general definition of what an SDM is, and it is for this reason that there is alot of confusion when it comes to implementing an SDM in an organization (Olerup, 1991). For purposes of this research the definition by Huisman and Iivari will be used, which states that an SDM is a “combination of a systems development approach, a systems development process model, a systems development method and systems development techniques” (Huisman & Iivari, 2005). The prescriptive nature of SDMs aims to ensure success of the project if it is deployed effectively and with the required skills and experience (Fitzgerald, 1996). Early SDMs relied on unsystematic and random methods (Olerup, 1991) and were influenced by technical and engineering disciplines (Dumdum & Klein, 1986). Also their use was seen as a way to improve the track record of Information Systems development (Avison & Fitzgerald, 2002)

There are many methodologies that were developed specifically for the telecommunication industry. The aim of these methodologies, amongst other things, is to mitigate the risks of developing systems that do not represent the processes and models found in telecommunication organizations. If a system is found to be inadequate, the repercussions could mean the organization will not be able to compete effectively. Therefore a systematic approach needs to be adopted, although in practice that is not always the case (Avison & Fitzgerald, 2002).

Some SDM's developed specifically for the telecommunication industry are:

- MODA-TEL
- Mansurov's Accelerated Development Methodology
- Mobile-D (Specifically for MNO's)

These mentioned methodologies all possess similar traits which are that:

1. They are all Object-Oriented methodologies, meaning that before a system is built the mission critical components are identified as objects
2. They all have a strong emphasis on documentation throughout the entire lifecycle
3. They possess an iterative nature which runs between the different phases in the lifecycle
4. They all require a considerable amount of time in the planning (initial) phase

According to Mansurov (2000), there are certain barriers in the adoption of formal methods in industry, namely “a significant gap between mathematical-based formal methods and design practice at the early phases of the software development process the existence of legacy software”.

In light of the traits mentioned earlier, the SDM's used in the telecommunication industry need to be adaptable to change and flexible, and hence afford organizations a very low time-to-market ratio. This is due to the competitive nature that the industry is widely known for.

Also, Koutsoukos *et al* (2001) state that object-oriented techniques, which are widely accepted techniques, limits the ability to build systems that “exhibit the agility required by the volatility of business domains”. During a literature study, three previous papers were identified that linked SDMs with the telecommunication industry. Table 1 follows which highlights the main findings of these papers.

	Study by Otto (2007)	Study by Theunissen & Kourie (2003)	Study by Koutsoukos <i>et al</i> (2001)
Telecommunication Environment	Mobile Telecommunication environment	Telkom	The entire telecommunication industry
Methodology Used	It was identified that most companies used in-house developed methodologies	A tailored version of RUP	A contract-based methodology which aims to address the pitfalls of object-oriented methodology
Pitfalls of Methodology Used	Otto identified that there was a need for a methodology that was more flexible and agile	The authors identified a need for and agile SDM	None. This methodology supports an agile approach and hence reduces time-to-market

Table 1: Previous studies linking SDMs with the telecommunication industry

Planned Research

This section briefly describes the planned research that the authors intend on undertaking. Taking into consideration the recommendations of the studies identified in the previous section, the authors propose that the research will:

- Identify, analyze and interview cases in the telecommunication industry in order to have more conclusive work with an emphasis on the SDM's being more agile.

- Develop a systems development framework that could be used when developing systems for the telecommunication industry

The research questions to be asked will be:

- Can agile SDM's be applied in the telecommunication environment?
- How agile are current SDM's in the telecommunication industry?

These questions have been informed by the table in the previous section. As it can be seen, there is a need for and use of more agile SDM's that aim to address the barriers identified by Mansurov (2000).

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