

# **Thesis Report**

## **Using SCRUM Effectively in Global Software Development**



### **Submitted To:**

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In Partial Fulfillment of the Requirements

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## FINAL APPROVAL

It is certified that the research work presented in this thesis entitled “Using SCRUM Effectively in Global Software Development” was conducted by Hassan Khan Salari under the supervision of Dr. Muhammad Shoaib Farooq at the University of Management and Technology, Lahore, Pakistan, and completed in December 2017 to fulfill the requirements of the degree of MS Software Engineering.

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## DECLARATION

I, Hassan Khan Salari ID# 15007114009 Session 2015-2017, hereby certify that this thesis is being submitted in partial fulfillment of the requirements for the MS degree in Software Engineering. This thesis is my original work and the data/material presented here has not been used for the acquisition of any other degree from any institution.

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## **PREFACE**

This thesis was prepared as partial fulfillment of the requirements of acquiring the degree, Master of Science in Software Engineering MS (SE) in the School of Systems and Technology (SST) at the University of Management and Technology (UMT), Lahore, Pakistan.

This research document is containing seven chapters. In the first chapter, the introductory information and content have been written. The second chapter describes the Research Design of the current topic. Chapter three describes the Scrum in Global software development. Chapter four includes the literature review of my topic. The literature review significantly describes the previous research on Scrum in GSD. After the Literature Review, chapter five describes the benefits of Scrum in GSD. Chapter six describes information collected through online survey and analysis process. Chapter seven is Conclusion and Future Work.

## ABSTRACT

The use of Global Software Development (GSD) is accelerating with each day. The main advantages of using GSD by leading organizations to the development of software are; less time to develop software, notable reduction in costs, A high degree of software quality, intelligent resource management. Processes are well defined leaving no space for ambiguities and orderly documentation. However, few challenges were also found in Global Software Development. Agile practices have been used to overcome these challenges. The whole project is controlled and managed by SCRUM.

This thesis includes the investigation of the benefits achieved as well as the challenges faced by the management in implementing Scrum in Global Software Development projects. As a consequence of this study SCRUM is being practiced, when organizations implemented SCRUM Agile Methodology only then, they knew of its benefits and problems.

A literature review was conducted to study how Scrum practices have been used to overcome the project management challenges in the implementation of Scrum. An online survey was also conducted to support the literature review, the questionnaire was floated among the professionals in the field of project management who uses the Scrum practices in GSD projects.

A lot of new project management challenges in global software development and several Scrum practices have been found in this study. Every respondent of the survey found SCRUM beneficial for GSD projects, few of the practices were found very important in SCRUM implementation. It is found that SCRUM is very adaptive and innovative in GSD projects.

**Keywords:** Software Engineering, Agile, SCRUM, Scrum benefits, Global Software Development, SCRUM practices, Project Management Challenges, Scrum Implementation.

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# Chapter 1: Introduction

## **CHAPTER 1: Introduction**

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Agile software development lifecycle is the combination of iterative and incremental process models. It follows an iterative approach by breaking down the product into small incremental builds. These Iterations focus on process adaptability and customer satisfaction through rapid delivery of functional software product. These iterations have a specific period, and cross-functional teams work simultaneously on areas like requirement analysis, design coding, and testing, etc. When an iteration ends, a working build is presented to the customer. The agile approach is different from traditional software development in the sense that it does not ceases the customer requirements but gives the customer the flexibility to change his mind and make changes accordingly. SCRUM is a popular agile framework for managing the product development process with a focus on requirement volatility and team's ability to overcome the challenges of evolving technologies. It allows and enables self-organization of development teams by physical co-location or a close collaboration. It involves regular daily face to face meetings with team members and entities.

The phenomenon of GLOBAL SOFTWARE DEVELOPMENT has gained tremendous popularity in the recent past. The basic idea is to achieve the benefits of multi-skilled, low-cost labor from different geographical regions of the world. The members of the software development team are scattered geographically in different time zones. Some of the major countries that are a source of providing skilled labor in GSD process are India, China, Brazil, etc.

Global software development (GSD) has become one of the emerging areas of software engineering [1]. In GSD we have multiple Stakeholders distributed and located geographically in different places. The geographical distribution of the stakeholders makes the activities of coordination and collaboration more challenging as compared to the typical software development process in which teams are physically located in the same geographical region. As already discussed, Scrum is one of the widely practiced agile methodologies and has become the first choice of various software development organizations. It has proved to be a useful methodology to cope with the coordination and communication problems among teams during software development process [1]. There are many software development models that can be used in GSD, but there is a growing interest of companies to use SCRUM practices for globally distributed projects [25]. However, when it comes to Global software development, companies