Chapter 67
Measuring Software Development Project Performance:
A Case Study on Agıle KPI's for Software Start-Ups

Nihan Yildirim
Istanbul Technical University, Turkey

Semih Ersöz
Aalto University, Finland

Bilal Altun
Karlsruher Institut für Technologie, Germany

ABSTRACT

Adopting agile methodologies to software development processes helps software companies to sustain their growth through efficiency for long term. In the digital transformation era, Industry 4.0 as part of High-Tech Strategy 2020 for Germany involves agile principles and brings the latest technological trends in production process. The purpose of this chapter is to design a proper agile project management performance measurement model for start-up software companies. First, all key performance indicators related to agile development in the literature have been listed. Then KPIs that are provided from literature review with content analysis have been reviewed and categorized by expert opinions that were collected through in-depth interviews. Seven strategic KPIs and their data collection systems are defined and designed. Lastly, process and data collection improvements are recommended in order to sustain agile development measurement model.

INTRODUCTION

Managing projects with high obscurity level is one of the most strenuous tasks in software project management. Since it has been clearly understood that traditional methodology undercuts the efficiency of software projects, a more iterative and flexible project management methodologies started to proliferate in the industry. The implementation of agile methods to IT project management approach produced compelling results of the outputs of the companies. In recent decades, adopting agile methodologies to software development process helps software companies to sustain their growth through efficiency for the long term. On the other hand, in digital transformation era, Industry 4.0 which involves agile principles brought the agility topic into the research agenda again by raising the need for case studies on applying agile principles in SMEs. As agile approach is interdisciplinary and brings flexibility to organizations, it becomes an aid tool to be utilized for converging processes for higher performance in transformation periods.

In the digital transformation era, software development projects face the challenge of rapidly changing user requirements, increasing technology push, time pressure on product delivery and frequent releases. Hence, effective performance measurement in agile software development has become a significantly rising topic where researchers and practitioners intensely explore feasible and adaptable approaches.

However, flexible and chaotic nature of agile methods refrains companies from measuring the performance as successful as they used to do. Consequently, taking actions becomes harder without clear performance monitoring. Especially during digital transformation projects, agility and lean approaches in project management are expected to be utilized for rapid convergence to new technologies, and hence will require high-level monitoring and performance measurement methodologies of projects.

The purpose of this study is to design a proper Agile Project Management performance measurement model for start-up companies in software business by defining strategic KPIs, measuring defined KPIs and evaluating the results.

As a case study, a midsized software company which evolved in ITU innovation and entrepreneurship ecosystem and operates like a startup in ITU Teknokent, a technology development zone in Turkey, is going through a transformation stage from being a start-up to an important corporation in the international market. Having a structured, well designed agile project management performance measurement model is one of the most pivotal steps for this kind of company. On one hand, it is necessary for staying competitive in the global market on the other hand; technology development zone administration requires performance measurement data to evaluate the companies' performances periodically. Research Model is presented in Appendix A.

In summary, the introduced Agile Project Management Performance Measurement Model aims to support start-up software companies' efforts of growing in the global market with a well-structured and sustainable infrastructure. In addition to that, this chapter aims to help to create an Agile Project Management Performance Measurement Framework for the midsized software companies that operate in developing countries with scarce resources.

BACKGROUND

Theoretical background is presented in the following sections. Background section has two parts: (i) Project Management Methodologies in Software Development and (ii) Performance Measurement in

Related Content

TCP/IP Protocol-Based Model for Increasing the Efficiency of Data Transfer in Computer Networks
S.N. John, A.A. Anoprienkoand C.U. Ndujiuba (2013). *Integrated Models for Information Communication Systems and Networks: Design and Development (pp. 116-134).*
www.irma-international.org/chapter/tcpip-protocol-based-model-for-increasing-the-efficiency-of-data-transfer-in-computer-networks/79661

A Simulation Model for Application Development in Data Warehouses
Nayem Rahman (2022). *Research Anthology on Agile Software, Software Development, and Testing (pp. 819-834).*
www.irma-international.org/chapter/a-simulation-model-for-application-development-in-data-warehouses/294496

Predicting Bug Priority Using Topic Modelling in Imbalanced Learning Environments
Jayalath Bandara Ekanayake (2021). *International Journal of Systems and Service-Oriented Engineering (pp. 31-42).*
www.irma-international.org/article/predicting-bug-priority-using-topic-modelling-in-imbalanced-learning-environments/272543

Voice of Startups: What Technology Business Incubators Are Expected to Offer and Differences Between Korea and China
Li Wangand SungMin Bae (2022). *International Journal of Software Innovation (pp. 1-13).*
www.irma-international.org/article/voice-of-startups/309963

Reengineering and Wrapping Legacy Modules for Reuse as Web Services: Motivation, Method, Tools, and Case Studies
Harry M. Sneed (2013). *Migrating Legacy Applications: Challenges in Service Oriented Architecture and Cloud Computing Environments (pp. 71-101).*
www.irma-international.org/chapter/reengineering-wrapping-legacy-modules-reuse/72213