Application of Methodology Evaluation System on Current IS Development Methodologies

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ABSTRACT

This article focuses on IS development methodologies, especially on new agile scaling frameworks. A significant need for large-scale agile is presented together with the evidence of its usage in companies. The aim of this article is to examine selected agile scaling methodologies and frameworks, and compare them to each other and with other IS development methodologies. To do so, the Methodology Evaluation System METES is utilized for the assessment and comparison. Assessed IS development methodologies can be then used by companies for the selection of the appropriate methodology. Furthermore, presenting the results of the assessment especially in the graphical form supports better understanding of these methodologies.

KEYWORDS

Comparison, Evaluation, IS Development, Methodology, Scaled Agile, Selection, System, Criteria

INTRODUCTION

Although software systems play a key role in today’s society, the process of their development cannot be regarded as satisfactory. According to the recent Standish Group’s CHAOS Report (The Standish Group, 2015), only 29% of all application development projects did satisfy the criteria of successfulness (on time, on budget and with satisfactory results). Even though the success rate of agile IT projects (IT project managed by an agile methodology) is higher (39%), numerous projects are facing challenges. The Standish Group analyses also the factors that are key to a project success. Among 10 key success factors are also the Standard Architectural Management Environment (practices, services, and products for developing, implementing, and operating software applications) and Agile Process. Confirming that software processes are an integral part of a software project success with a significant need for an improvement. This fact is demonstrated through the Software Process Improvement (SPI) initiative. We recognize two different SPI approaches. The first one is represented by the usage of international standards like ISO/IEC 12207, ISO/IEC 15504, ISO/IEC 29110 or CMMI (Capability Maturity Model Integration) whereas the other one promotes an advancement of IS development (ISD) methodologies, especially agile methodologies and a development of brand new scaled agile methodologies and frameworks. As the number of existing IS development methodologies and approaches increases, selecting the appropriate methodology becomes a challenge.

To support companies in their methodology selection and customization process, the Methodology Evaluation System METES was defined in 2009 (Buchalcevova, 2009), based on an analysis of existing systems for ISD methodologies selection. In a comparison to other systems for ISD methodology evaluation and selection, the METES system enriches the methodology selection process by...
introducing the Support criteria group. This group evaluates the availability and accessibility of the methodology and other factors influencing the implementation of the methodology.

The METES was validated in 2009 by its utilization as an assessment system for selected ISD methodologies. For the assessment, the most utilized methodologies at that time, both prescriptive and agile, were selected, i.e. Rational Unified Process (RUP), OpenUP, Feature Driven Development (FDD), Scrum, Extreme programming (XP) and MSF for CMMI development. Detailed results of this assessment were published in (Buchalcevova, 2009) and selected results then in (Buchalcevova, 2011).

The results of conducted assessments of ISD methodologies are stored and are available to companies for the selection of an appropriate methodology for a concrete project. Moreover, the METES has an educational potential as it represents a conceptual tool for understanding and mutual comparison of ISD methodologies. In this way it is used within Software Engineering and Software Process Improvement university courses at the Prague University of Economics, both at the undergraduate as well as at the graduate level.

With the aim to reflect the evolution of ISD methodologies over time, a brand new assessment was conducted in 2017. Selected ISD methodologies were reassessed with the aim to address their evolution and changes. In addition, newly emerged methodologies such as Kanban, Discipline Agile Delivery (DAD), Large-scale Scrum (LeSS) and Scaled Agile Framework (SAFe) were assessed.

The aim of this paper is to present the results of the assessment of new scaled agile methodologies and frameworks. The rest of the paper is organized as follows. First, the research methodology is presented followed by the evolution of agile methodologies. Then, the Methodology Evaluation System METES is introduced and all the evaluation criteria are presented. Next section describes selected results of the assessment of ISD methodologies conducted in 2017 with a focus on scaled agile methodologies and frameworks. Finally, concluding remarks are discussed.

RESEARCH METHODOLOGY

The objective of this research is to examine newly emerged ISD methodologies, especially scaled agile methodologies and frameworks.

The research question is defined as follows: What are the differences in characteristics and implementation support of individual scaled agile methodologies and how these characteristics differ from other ISD methodologies?

To answer the research question, the Methodology Evaluation System METES was utilized. The METES was developed by the author in 2009 using Design Science Research (Hevner et al., 2004; Gregor & Hevner, 2013), specifically Design Science Research methodology (Pfeffers et al., 2008). The validation of the METES system was performed in 2009 by the assessment of the most utilized methodologies at that time. To address the evolution of ISD methodologies and emergence of new methodologies, further assessment was needed, performed then in 2017. The sample of ISD methodologies selected for this assessment was defined according to the following rules:

- All previously assessed methodologies, except of MSF for CMMI development that is of low utilisation, were selected.
- Newly emerged agile methodologies were selected based on a level of their usage reported in the State of Agile Survey (VersionOne, 2016).

Based on these rules, the final sample of ISD methodologies was as follows: Rational Unified Process (RUP), OpenUP, Feature Driven Development (FDD), Scrum, Extreme programming (XP), Kanban, Discipline Agile Delivery (DAD), Large-scale Scrum (LeSS) and Scaled Agile Framework (SAFe).
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