EXAMINING THE RELATIONSHIP BETWEEN AGILE ADOPTION MOTIVATION FACTORS AND AGILE PRACTICE CLUSTERS USED BY SOFTWARE STARTUPS IN KINGDOM OF SAUDI ARABIA

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Abstrak

Metodologi pembangunan perisian agil (ASDM) semakin banyak diterima pakai dalam organisasi. Walaupun banyak manfaat yang ditawarkan oleh ASDM, penggunaan ASDM yang berjaya merupakan cabaran besar bagi organisasi. Kebanyakan kajian menunjukkan bahawa kaedah yang diterima pakai ini sebahagiannya adalah dengan cara memilih satu set amalan agil. Oleh itu, adalah sukar bagi penerima baharu memilih set amalan agil yang sesuai dengan keperluan kerana ASDM mempunyai amalan atau kelompok yang meluas. Amalan agil perlu dipilih berdasarkan faktor-faktor motivasi termasuklah keperluan organisasi untuk memaksimumkan manfaat penerimaannya. Tujuan kajian ini adalah untuk mengenal pasti hubungan antara faktor motivasi penggunaan ASDM organisasi dengan amalan kelompok agil. Kajian ini menggunakan pendekatan kuantitatif untuk menilai hubungan antara pemboleh ubah. Soal selidik dengan 76 pengamal perisian daripada pemula perisian (software startups) Kerajaan Saudi Arabia (KSA) telah dijalankan. Dapatan kajian akan membantu organisasi untuk memilih kelompok amalan agil yang sesuai dengan memadankan faktor motivasi yang mempengaruhi kejayaan penggunaan ASDM. Analisis menghasilkan 4 kelompok yang mana setiap satunya dikaitkan dengan senarai amalan. Kelompok-kelompok ini dilabel sebagai pengurusan projek, jaminan kualiti, proses perisian, serta kelompok tambahan dan berterusan. Kajian ini mendapati bahawa tiga faktor motivasi penggunaan (motivasi untuk peningkatan kualiti perisian, peningkatan kecekapan, atau peningkatan keberkesanan) berkaitan dengan jaminan kualiti, proses perisian, serta kelompok tambahan dan berterusan. Dengan memahami faktor-faktor ini dari segi penggunaan ASDM dan jenis amalan, pemilihan kelompok agil yang lebih sesuai akan membantu meningkatkan kejayaan proses penerimaan amalan agil. Tambahan lagi, kajian ini akan membantu untuk memahami cara pemula memilih amalan agil yang digunakan. Selain itu, kajian itu boleh membantu syarikat baharu untuk memilih amalan agil yang sesuai dengan mudah berdasarkan motivasi dan keperluan mereka.

Kata kunci: Kaedah perisian agil, Kelompok amalan agil, Penggunaan agil, Faktor motivasi penggunaan.

Abstract

Agile software development methodology (ASDM) has been increasingly adopted in organizations. Despite many benefits offered by ASDM, successful ASDM adoption is a big challenge for organizations. Many studies show that these methods were adopted partly by selecting a set of agile practices. Therefore, it is difficult for new adopters to choose agile practice sets that fit their organization needs as ASDM has a big pool of available practices or clusters. Agile practices should be selected based on motivation factors that include the organization needs in order to maximize the benefit of adopting them. The aim of this study is to identify the relationships between organization's ASDM adoption motivation factors and the agile practices clusters. This study used a quantitative approach to evaluate the relationships between these variables. The study was conducted using a questionnaire with 76 software practitioners from software startups in the Kingdom of Saudi Arabia (KSA). The analysis generated 4 clusters; each is associated with a list of practices. These clusters are labeled as project management, quality assurance, software process, and incremental and iterative clusters. This study finds that three adoption motivation factors (a motivation for increased software quality, increased efficiency, or increased effectiveness) are associated with the quality assurance, software process, and incremental and iterative clusters. By understanding these factors in terms of ASDM adoption and which types of agile practice cluster is more suitable will help to increase the success of the agile adoption process. Furthermore, the study will help to understand how the startups selected the practices used. Also, the study could help new startups to easily choose the proper agile practices based on their motivation and needs. The findings will help the organization to select suitable agile practices cluster by matching the motivation factors that correspondingly affect the ASDM successful adoption.

Keywords: Agile software methodology, Agile practice cluster, Agile adoption, Adoption motivation factors.

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List of Abbreviations

ASD	Agile Software Development
ASDM	Agile Software Development Methodology
BDD	Behavior-Driven Development
CA	Cluster Analysis
CEO	Chief Executive Officer
CTO	Chief Technology Officer
DSDM	Dynamic Software Development Method
FDD	Feature-Driven Development
HCA	Hierarchical Cluster Analysis
SBIN	Saudi Business Incubator Network
SPSS	Statistical Package for the Social Sciences
SE	Software Engineering
SME	Small and Medium Enterprise
TDD	Test-Driven Development
KSA	Kingdom of Saudi Arabia
MENA	Middle East and North Africa
MVP	Minimum Viable Product
XP	eXtreme Programming

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Agile software development methodologies (ASDM) have become very effective for software development (Campanelli & Parreiras, 2015; West & Grant, 2010). They differ from traditional methodologies in the same way that they have less documentation, fast delivery, increase customer satisfaction, accept requirement changing, improve quality, and provide more transparency to customers (Pikkarainen, Salo, Kuusela, & Abrahamsson, 2012). ASDM are also more flexible and can bring benefits such as handling requirements changes, productivity gains, and business alignment (Campanelli & Parreiras, 2015). Among well-known ASDM are Extreme Programming (XP), Scrum, Lean software development, Featured-Driven Development (FDD), Dynamic software development method (DSDM), and Crystal methodologies (Dybå & Dingsøyr, 2008). Yet they share many of the core values and principles defined in the Agile Manifesto (Beck et al., 2001).

Agile adoption is a term used to describe a process of adopting and implementing agile practices, processes and values in software development. The practices to be implemented may either correspond to just one agile method or to a combination of multiple agile methodologies (O'Connor & Duchonova, 2014). The agile adoption process is dependent on organizational environment, agile methodologies, and practices where they often have to be tailored to be integrated into existing processes (Rohunen, Rodriguez, Kuvaja, Krzanik, & Markkula, 2010). Agile adoption is a continuous and interactive activity, which includes adaptation and customization of the development method throughout the execution of the project (Krasteva, Ilieva, & Dimov, 2010). Furthermore, agile adoption is a complex process because of many factors including

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