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# GROUNDED THEORY FOR TRANSITION TO AND ADOPTION OF AGILE SOFTWARE DEVELOPMENT

TAGHI JAVDANI GANDOMANI

FSKTM 2014 2

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TAGHI JAVDANI GANDOMANI

DOCTOR OF PHILOSOPHY
UNIVERSITI PUTRA MALAYSIA

2014

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# GROUNDED THEORY FOR TRANSITION TO AND ADOPTION OF AGILE SOFTWARE DEVELOPMENT

By

**TAGHI JAVDANI GANDOMANI**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

**July 2014**

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**DEDICATION**

Dedicated to my late father, God rest his soul, who has been my constant source of inspiration.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

**GROUNDED THEORY FOR TRANSITION TO AND ADOPTION OF AGILE SOFTWARE DEVELOPMENT**

By

**TAGHI JAVDANI GANDOMANI**

**July 2014**

**Chairman: Hazura Zulzalil, PhD**
**Faculty: Computer Science and Information Technology**

Successful migration from traditional software development methods to Agile methods, as an organizational mutation, requires enough understanding of Agile transformation process and its related issues. Reviewing the literature revealed that software companies are struggling with many challenges during Agile transition process. However, there was no large-scale research study to elucidate various aspects and dimensions of the transition process. Also, less effort has been devoted to investigate the whole transition process.

A Grounded Theory study with participation of 49 Agile experts from 13 different countries, mostly from USA and West Europe countries, and some from Asia and Australia, has been carried out to investigate the realities of Agile transformation. Adopted research methodology provided a systematic approach to discover various aspect of the transformation through a multi-level data analysis including open coding, selective coding, and theoretical coding. Following a high disciplined approach, various concepts and categories have been identified and finally, the main concern of the participants, known as core category, has been discovered as the theory of Agile transition and adoption comprising four major parts: (1) *Agile Transition Key Prerequisites, (2) Agile Transition Challenges,* (3) *Agile Transition Facilitators,* and (4) *Agile Transition and Adoption Framework.*

This study discovered the most important prerequisites that software companies need to provide before starting their transition to Agile approach including having convincing reason for change, defining business values, initial training, etc. Software companies have to do a preparation phase to provide these prerequisites before starting Agile transformation. It also identified the major challenges that software teams and companies are facing with when moving to Agile, including negative human aspects, inadequate and dysfunctional training, technical challenges, etc. These challenges have different roots and acts as impediments to the change. Also, this study discovered various change facilitators, including training, getting buy-in from practitioners, good coaching service, etc. Providing these facilitators help software teams to deal with the transformation challenges and increase chance of



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success. Finally, it proposed a substantive framework for transitioning to Agile approach. The proposed framework has particular features, discipline, and activities which promise usefulness for Agile transformation process in software companies regardless of size and project type. This framework particularly aims to promote sustainable change and being Agile instead of doing Agile.

In general, this study developed the theory of Agile transition and adoption and discovered various aspects of the transformation. The findings of this study will serve to inform all software practitioners about transitioning to Agile software development.



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Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**TEORI ASAS PERALIHAN DAN PENERIMAAN KE PEMBANGUNAN PERISIAN *AGILE***

Oleh

**TAGHI JAVDANI GANDOMANI**

**Julai 2014**

**Pengerusi:** **Hazura Zulzalil, PhD**
**Fakulti:** **Sains Komputer dan Teknologi Maklumat**

Berjaya berhijrah dari kaedah pembangunan perisian tradisional kepada kaedah *Agile*, sebagai sesebuah organisasi yang ingin berubah, memerlukan kefahaman yang cukup berkenaan proses transformasi *Agile* dan isu-isu yang berkaitan. Kajian literatur mendedahkan bahawa syarikat-syarikat perisian bergelut dengan pelbagai cabaran semasa proses peralihan *Agile*. Walau bagaimanapun, tiada kajian penyelidikan berskala besar untuk menjelaskan pelbagai aspek dan dimensi proses peralihan. Juga, tidak banyak usaha telah ditumpukan untuk mengkaji proses peralihan secara menyeluruh.

Satu kajian teori asas dengan penyertaan 49 pakar *Agile* dari 13 negara yang berbeza, kebanyakannya dari Amerika Syarikat dan negara-negara Eropah Barat, dan beberapa dari Asia dan Australia, telah dijalankan untuk mengkaji realiti transformasi *Agile*. Kaedah penyelidikan yang diguna pakai ini menyediakan kaedah yang sistematik untuk menerokai pelbagai aspek transformasi melalui analisis data pelbagai peringkat termasuk pengekodan terbuka, pengekodan terpilih, dan pengekodan teori. Berikutan pendekatan yang berdisiplin tinggi, pelbagai konsep dan kategori telah dikenal pasti dan akhirnya, kebimbangan utama para peserta, yang dikenali sebagai kategori teras, telah ditemui sebagai teori peralihan dan penerimaan *Agile* yang terdiri daripada empat bahagian utama: (1) *Prasyarat Utama Peralihan Agile*, (2) *Cabaran Peralihan Agile*, (3) *Pemudah cara Peralihan Agile*, dan (4) *Rangka Kerja Peralihan dan Penerimaan Agile.*

Kajian ini mendapati prasyarat utama peralihan *Agile* perlu ada sebelum memulakan peralihan *Agile* termasuk mempunyai sebab yang meyakinkan untuk perubahan, menentukan nilai-nilai perniagaan, latihan awal, dan lain-lain. Syarikat-syarikat perisian perlu melaksanakan fasa persediaan untuk menyediakan prasyarat ini sebelum memulakan transformasi *Agile*. Kajian juga mengenal pasti cabaran utama yang dihadapi oleh pasukan perisian dan syarikat-syarikat apabila beralih ke *Agile*, termasuk aspek-aspek negatif manusia, latihan yang tidak mencukupi dan tidak berfungsi, cabaran teknikal, dan lain-lain. Cabaran-cabaran ini mempunyai latar belakang yang berbeza dan menjadi halangan kepada perubahan. Selain itu, kajian ini mengenalpasti pelbagai pemudah cara perubahan, termasuk latihan, melibatkan



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pengamal, perkhidmatan bimbingan yang baik, dan lain-lain. Penyediaan pemudah cara ini membantu pasukan perisian untuk menangani cabaran transformasi dan meningkatkan peluang untuk berjaya. Akhirnya, kajian ini mencadangkan rangka kerja yang substantif peralihan kepada pendekatan *Agile*. Rangka kerja yang dicadangkan mempunyai ciri-ciri tertentu, disiplin, dan aktiviti-aktiviti yang menjanjikan kegunaan proses transformasi *Agile* dalam syarikat-syarikat perisian tanpa mengira saiz dan jenis projek. Rangka kerja ini bertujuan terutamanya untuk menggalakkan perubahan yang berterusan dan menjadi *Agile* daripada melakukan *Agile*.

Secara umum, kajian ini membina teori peralihan dan penerimaan *Agile* dan menerokai pelbagai aspek transformasi. Hasil kajian ini akan memaklumkan kepada semua pengamal perisian mengenai peralihan kepada pembangunan perisian *Agile*.

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*"They replied, 'we have no knowledge except that which you have taught us. You are indeed the knowing, the wise.' "* AL-BAQARA-Ayah 32.

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I certify that a Thesis Examination Committee has met on 21 July 2014 to conduct the final examination of Taghi Javdani Gandomani on his thesis entitled "Grounded Theory for Transition to and Adoption of Agile Software Development" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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