



PROJECT MANAGEMENT CENTER FOR EXCELLENCE

A.J. CLARK SCHOOL OF ENGINEERING
Civil & Environmental Engineering Department



THE IMPACT OF PROJECT TEAM CHARACTERISTICS AND CLIENT COLLABORATION ON PROJECT AGILITY: AN EMPIRICAL STUDY

Drs. Abirami Radhakrishnan & Dessa David
2018 Project Management Symposium



Agenda

- Introduction
- Summary of prior research
- Research Question
- Theoretical Foundations
- Research Methodology
- Data Analysis
- Results
- Contributions of the Study



Introduction

- Agile project management is an emerging and prominent approach in the industry (Schwalbe, 2015).
- The agile project management practices have gained importance (State of Agile survey, 2017).
- Even the latest edition of Project Management Body of Knowledge emphasizes on processes, tools and techniques for agile projects (Project Management Institute, 2017).
- However, the agile project management literature is largely anecdotal, prescriptive and lack empirical validation.
- There is very little research on project agility, its determinants, and effects on project performance.



Project Agility Definition

- The term “agility” refers to the project’s team ability to quickly change the project plan as a response to customer or stakeholders’ needs, market or technology demands in order to achieve better project performance in an innovative and dynamic environment (Conforto et al., 2016, p.667).



Summary of Prior Research

- Agile Alliance (2001) came up with the Agile Manifesto and stressed the importance of four values in agile IT projects:
 1. Individuals and interactions,
 2. Development of working software,
 3. Very high level of customer collaboration, and
 4. Frequently responding to changes in requirements.
- They also outlined that these values are more important than use of processes and tools, comprehensive documentation, strict adherence to plans and contract negotiations.



Summary of Prior Research contd...

- Several researchers have brought out agile principles, practices, and values. But many of these studies are prescriptive (e.g. Conboy, 2009; Thummadi et al., 2011; Dingsøyr et al., 2012)



Summary of Prior Research contd...

- Some researchers conducted surveys to examine critical success factors in agile software projects (Misra et al., 2009; Zulkefi et al., 2010; Claudia et al., 2011).
- Some researchers emphasized on use of certain tools, techniques, and methods related to agile software development. For instance, researchers discuss about use of SCRUM, Kanban, eXtreme Programming (XP), dynamic systems development method (DSDM), and Feature Driven Development (FDD). (e.g. Stapleton, 1997; Coad et al., 1999; Beck and Andres, 2005).



Summary of Prior Research contd...

- Some prior studies have identified some factors that affect agile project performance (e.g. Maruping et al., 2009; Vidgen and Wang, 2009; Lee and Xia, 2010; Recker et al., 2017).
- In summary, the critical review of the prior studies reveals the following limitations:
 1. Many of the prior studies are anecdotal or prescriptive in nature. There have been very few empirical field studies that have rigorously examined if, how, and why project agility is effective. To fill this gap, researchers have called for structured, rigorous empirical studies that have solid theoretical underpinnings (Lee and Xia, 2010; Conforto et al., 2016).
 2. There is very little research on agile projects other than software projects.



Research Question and Hypotheses

- How does project team characteristics (team autonomy, team diversity, adaptive performance of team members) and client collaboration affect project agility and project success?
- Hypotheses in Null form:
 - H_0 1: There is no relationship between project team autonomy and project agility
 - H_0 2: There is no relationship between project team diversity and project agility
 - H_0 3: There is relationship between adaptive performance of team members and project agility
 - H_0 4: There is no relationship between client collaboration and project agility
 - H_0 5: There is no relationship between project agility and project success (measured along three dimensions – on-time completion, on-budget completion, and achieved project specifications).



Theoretical Foundations

- Complex Adaptive Theory as the theoretical lens to explain the working of a agile project team. “Complex adaptive system” (CAS) refers to a system that emerges over time into a coherent form, and adapts and organizes itself without a singular entity deliberately managing or controlling it (Holland, 1995).



Theoretical Foundations contd...

- Important aspects of complex adaptive system:
 1. Agent – They have the ability to intervene meaningfully in the course of events (Giddens, 1984).
 2. Self-organization and emergence: CAS “self-organizes and undergoes a process whereby new emergent structures, patterns and properties arise without being externally imposed on the system” (Goldstein, in Zimmerman et al., 1998, p. 270).
 3. Dimensionality: The dimensionality of a CAS is defined as the degree of freedom that individual agents have to enact autonomous behavior (Dooley and Van de Ven, 1999).
 4. Environment of a CAS is dynamic.
 5. Co-evolution: A CAS both reacts to and create its environment.



Research Methodology

- Measurement items for the various constructs were developed based on prior studies (Charbonnier-Voirin et al., 2010, Lee and Xia, 2010; Stare, 2014; Conforto et al., 2016).
- The empirical data used in this research study is based on a web-survey sent to project managers (members of PMI).
- We used snowball sampling methodology (Goodman, 1961).
- Pilot test – Data collected from 22 project managers
- Final large scale survey
- We collected 189 responses from project managers that are involved in agile projects.
- We will control for factors such as industry, project size, project type, country where the project is undertaken, offshored / outsourced project and firm size (revenue in dollars).



Data Analysis

- 9 responses had missing data. We used data imputation techniques to take care of missing data.
- We screened for univariate and multivariate outliers. We had to discard 3 responses.
- The remaining 186 responses were used for further data analysis.
- We used AMOS software to test the measurement models and structural model.



Results

- Validities and reliability were established.
- Composite reliabilities for all constructs were over 0.7.
- AVE for all constructs were greater than 0.5 and ensured that construct validity was sound for all factors.
- For each factor, we found that AVE was less than MSV and this ensured that discriminant validities were sound for all factors.
- Measurement model fit indices were good. Chi sq = 1501.75, df = 774, $p=0$, cmin / df = 1.94, CFI = 0.94, RMSEA = 0.07, SRMR = 0.04.
- The structural model fit indices were good. Chi Sq = 1549.30, df = 789, cmin/df = 1.96, CFI = 0.94, RMSEA = 0.07, SRMR = 0.04.
- Structural model parameters do not change after addition of control variables



Results

Statistically Significant Relationships between Factors (at 0.01 level of significance)

Factors and Outcomes

Project Team Diversity and Project Agility

Project Team Autonomy and Project Agility

Client Collaboration and Project Agility

Adaptive Performance of Project Team and Project Agility

Project Agility and Project On-Time Completion

Project Agility and Project On-Budget Completion

Project Agility and Project Achieved Specifications



Contributions of the Study

- This study is the first empirical study to examine the impact of adaptive performance of project team members on project agility and project success.
- This study will be a ground-breaking study as it examines the role of few project team characteristics in agile projects in a wide variety of industries and involve different types of projects.