

# Agile Methods Adoption on Software Development - a Pilot Review

Caio Cestari Silva  
IPT  
São Paulo, Brazil  
caiocestarisilva@gmail.com

Alfredo Goldman  
IME-USP  
São Paulo, Brazil  
gold@ime.usp.br

**Abstract**— Scientific publications throughout the years describe study cases and experience reports from organizations that have been through the agile adoption process. At the same time, frameworks and generic methods for adoption have also been published intending to obtain some predictability on the steps of this transition. However, when disposing of either generic or specific inputs to help them on their way towards agility, companies do not know how or where to start their changes. This short paper describes the current investigation state of a systematic review that aims to understand better how organizations effectively adopt agile methods, trying to find a correlation between the characteristics of an organization and the way it effectively transitions to agile.

**Keywords**—*agile methods; agile methods adoption; organizational characteristics; systematic review*

## I. MOTIVATION AND RESEARCH GOALS

Since the Agile Manifesto was published in 2001, the number of organizations that have been trying to adopt agile methods as a way to deal with software development has increased. However, many of them have not reached their adoption goals, which include fast and high-quality software deliveries, software products that better satisfy users' needs and flexibility to deal with scope changes throughout the project. The results, on the other hand, are restricted to the adoption of few practices, yielding low value to the developed software products and also to people's potential on delivering them [1].

Assuming that an agile transformation is actually an organizational change [2], companies have been trying to find out from the existing ways to adopt agile methods one (or more) that consider or exhibit similar organizational characteristics as theirs [1]. On this context, many of the published academic papers do not consider organizational perspectives, presenting results from controlled environments or specific projects and teams. From the studies that consider agility as an organizational change, there are two distinct groups: generic steps – independent from company context – or specific steps (empiric) – related to an existing organization and its transformation process.

No published study that proposed to evaluate the effective use of generic adoption steps by the industry was found. Also, it is not known if there is any guideline that can emerge from specific (empiric) agile method adoption studies and can then be used by other similar organizations.

Our research aims to investigate, by means of a systematic review, how organizations adopt agile methods and, from those findings, aims to also identify common ways of empiric adoption based on the characteristics of the analyzed organizations. We also want to investigate if companies are considering generic ways of adoption on their search for agility. This paper presents the current state of the research – and is declared as a pilot review. It also follows the recommendations made by Kitchenham and Charters, widely applied by systematic reviews on agile [3].

## II. PERFORMED SYSTEMATIC REVIEW PROTOCOL

### A. Research Question

**“Is it possible to relate characteristics of organizations to the steps they take to adopt agile methods empirically?”**

We also defined three secondary research questions needed to help answering the main question:

1. What are the existing generic ways to guide an organizational agile adoption?
2. What are the main steps taken by organizations that adopted agile methods empirically?
3. Is it possible to relate steps from empiric agile adoptions in organizations to any of the existing generic ways?

### B. Search Strategy

Our search strategy included published studies from electronic databases (searched by customizing the query below) and also a complimentary hand search on the proceedings of Agile and XP Conferences.

**(KEYWORD (agile) AND (software) AND (agile OR scrum OR xp OR kanban OR (lean AND development) OR (extreme E programming)) AND (adopt OR adopted OR adopting OR adoption OR migrate OR migrated OR migrating OR migration))**

The results were 4062 publications, distributed as follows:

- ACM – 207 publications
- Compendex – 572 publications
- Elsevier – 71 publications, within Computer Science
- IEEE – 470 publications

- SpringerLink – 1642 publications, within Computer Science, without KEYWORD (agile) term
- AGILE – 455 publications
- XP – 663 publications

### C. Primary Acceptance Phase

A study was primarily accepted if its title and its abstract (or conclusion) were related to an organizational adoption of agile methods, including advantages/challenges, survey results and other perspectives. On this phase, 3966 articles were rejected – among them we found mostly irrelevant content from SpringerLink (due to restrictions on the research query).

TABLE I. REJECTED PUBLICATIONS ON PRIMARY ACCEPTANCE PHASE

Rejection Reason	N	Rejected by
Duplicated	732	Title
Not related to agile adoption	3126	Title
Agile adoption by specific projects or teams	38	Abstract or Conclusion
Agile adoption by organization focused on specific perspective (eg. distributed teams)	24	Abstract or Conclusion
Scenario pre-adoption or post-adoption	19	Abstract or Conclusion
Practical tutorial conducted on conference	9	Abstract or Conclusion
Agile x Plan-Driven	5	Abstract or Conclusion
Other reason	13	Abstract or Conclusion

The remaining 96 publications were accepted on the primary acceptance phase and forwarded to the quality acceptance phase (still undergoing).

### III. BRIEF QUALITATIVE ANALYSIS

We have already found some contributions for our defined research questions by classifying the primary approved studies and assessing five experience reports (Gap Inc., Amazon.com, Yahoo! Music, BabyCenter.com and Gale) and assessing two frameworks for adoption (Agile Adoption Framework and Agile Adoption Motivation Framework).

#### A. Existing Frameworks and Methods

There are at least 17 generic ways that can be reused by organizations to help them adopt agile methods. This number can increase during the quality acceptance phase, when studies will be assessed in detail. The real number of existing frameworks or methods can be bigger due to some articles that cover more than one of them.

TABLE II. ACCEPTED PUBLICATIONS ON PRIMARY ACCEPTANCE PHASE

Study Type	N	Study Type	N
Experience Report	63	Framework	17
Study Case	2	Generic Analysis	6
Survey	3	Uncertain Study	5

#### B. Main Steps Taken by Organizations

Scrum was selected by Amazon.com [4], Yahoo! Music [5] and BabyCenter.com [6] as the way to emerge agility, although they had different motivations. All these adoptions started with a pilot-project or a pilot-team and expanded to the entire organizations after successful results were observed.

The traditional culture of the companies could be seen as their main motivation to move to agility, expressed by a command-and-control management style at Yahoo! Music [5], by the use of a waterfall model at Gap Inc. [7] and Gale [8], and by the inability to deliver on the desired pace by BabyCenter.com [6].

#### C. Relation Between Empiric and Generic Adoptions

Both assessed frameworks considered the organizational perspective as a restriction to the agile adoption. The Agile Adoption Framework [9] proposes a go/no-go phase where the ability of the organization to move towards agility is assessed by its real necessity, its available budget and its executive support. This is strictly connected to the agile adoption steps taken by Gale [8] and BabyCenter.com [6], where the executive support was the basis for the organizational changes needed.

### IV. PRELIMINARY CONCLUSIONS AND NEXT STEPS

There are consistent contributions to answer the secondary research questions provided by our brief qualitative analysis. The quality acceptance phase, not yet concluded, will make possible to gather the data needed for the quantitative/qualitative analysis and the discussion of the results, aiming to answer our main research question. We believe the findings will be helpful for organizations that want to move towards agility and want to be guided from existing (and combined) experience from industry and academia.

#### REFERENCES

- [1] Z. Šochová, “Hidden gap in agile methods adoption” Proceedings of the 2010 conference on New Trends in Software Methodologies, Tools and Techniques, IOS Press, 2010, pp. 346-356.
- [2] M. Lacey, “Agile & Organizational Culture”, Agile Alliance, <http://agile2009.agilealliance.org/culture> (accessed Nov 2009).
- [3] A. Sidky, J. Arthur and S. Bohner, “A disciplined approach to adopting agile practices: the agile adoption framework” Innovations in Systems and Software Engineering, vol. 3, n. 3, 2007, pp. 203-216.
- [4] D. Goodman and M. Elbaz, “‘It’s Not the Pants, it’s the People in the Pants’ Learnings from the Gap Agile Transformation What Worked, How We Did it, and What Still Puzzles Us”, Proceedings of the 2008 Agile Conference – AGILE, 2008, pp. 112-115.
- [5] B. Kitchenham and S. Charters, “Guidelines for performing systematic literature reviews in software engineering” School of Computer Science and Mathematics, Department of Computer Science, United Kingdom, 2007.
- [6] A. Atlas, “Accidental Adoption: The story of scrum at amazon.com” Proceedings of the 2009 Agile Conference – AGILE, 2009, pp. 135-140.
- [7] G. Cloke, “Get your agile freak on! Agile adoption at Yahoo! Music” Proceedings of the 2007 Agile Conference – AGILE, 2007, pp. 240-248.
- [8] K. Nottonson and K. Delong, “Baby Steps: Agile Transformation at BabyCenter.com”, IT Professional, vol. 10, n. 5, 2008, pp. 59-62.
- [9] P. O’Connor, “Anatomy and Physiology of an Agile Transition” Proceedings of the 2011 Agile Conference – AGILE, 2011, pp. 302-306.