

Agile Experience: Communication and Collaboration in Agile Software Development Teams

Study by Elizabeth Whitworth and Robert Biddle

Introduction

This research explored aspects of agile development teamwork initiatives associated with positive socio-psychological phenomena, with a focus on phenomena outside the scope of traditional management, organizational, and software engineering research. The motivation for this research was to better explore the animation and excitement observed in practitioners of agile software development. We hoped that examination of positive experiences in agile teams would yield a deeper understanding of the aspects of agile methods that support cohesive team activity.

Theoretical Framework

The theoretical framework for this study defines agile software development teams as complex adaptive socio-technical systems. Exploration of system properties, such as feedback and feedforward loops, was valuable in that it supported an understanding of invariant relationships that remained constant despite complex and evolving systems, and would be difficult to obtain through use of simple cause and effect paradigms. The socio-technical perspective was also valuable in that it highlights the importance of considering agile teams as systems comprised of both social and technological components, where human and technical subsystems interact and mutually adjust, often with dramatic effect.

The framework for this study involved the conceptualization and observation of agile teams as comprised of individuals, the group as a whole, agile practices, and the socio-psychological characteristics and relationships between them. The basic question explored was: What is the experience of being in an agile software development team?

Method – Grounded Theory

Grounded theory is a research methodology that provides a set of procedures for the systematic collection and analysis of qualitative data. Twenty-two participants were recruited through networking with members of the agile software development community. Participants included a variety of roles, including developers, interaction designers, project managers, coaches, and quality assurance specialists. All but two of the participants had previously worked in non-agile teams. There were sixteen male participants, and six female participants. Participant interviews investigated the subjective experiences of individuals in agile software development teams. Semi-structured interviews were chosen in order to maintain focus on the theoretical framework, while still leaving room for phenomena significant to participants to emerge.

Each interview was audio recorded and transcribed. The transcriptions were broken down into discrete parts and incidents were identified, conceptualized, and named in the process of open coding. Open coding was conducted line by line to ensure thorough grounding and critical thinking about the data. Axial coding was then used to examine the relationships between data. Open and axial coding were performed in parallel as data were gathered, analyzed, and reanalyzed in light of the emerging theory or concepts. An emphasis was put on developing valuable analytical categories to explain phenomena, as

opposed to a tightly woven theory.

Glaser (1992) offers two major criteria for an emerging theory: that it fits the situation, and that it helps people in the situation make sense of, and manage their experience better. The first criteria was ensured by 'purposeful grounding' in data. Abstract concepts were tested against data, and only validated concepts appear in final study results. Secondly, feedback elicited from participants regarding study results suggests that findings are accessible, relevant, and useful to software development practitioners, in accordance with requirements for credibility in grounded theory studies.

Results

Results included a deeper understanding of the socio-psychological forces present in agile teams, and in the link between agile practices and positive team outcomes such as motivation and cohesion. A full write up of the study and results can be found here: http://hot.carleton.ca/~ewhitworth/documents/Thesis_final.pdf