



The daily stand-up meeting: A grounded theory study



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ABSTRACT

The daily stand-up meeting is one of the most used agile practices but has rarely been the subject of empirical research. The present study aims to identify how daily stand-up meetings are conducted and what the attitudes towards them are. A grounded theory study with 12 software teams in three companies in Malaysia, Norway, Poland and the United Kingdom was conducted. We interviewed 60 people, observed 79 daily stand-up meetings and collected supplementary data. The factors that contributed the most to a positive attitude towards the daily stand-up meeting were information sharing with the team and the opportunity to discuss and solve problems. The factors that contributed the most to a negative attitude were status reporting to the manager and that the frequency of the meeting was perceived to be too high and the duration too long. Based on our results, we developed a grounded theory of daily stand-up meetings and proposed empirically based recommendations and guidelines on how to organize them. Organizations should be aware of the factors that may affect the attitude towards daily stand-up meetings and should consider our recommendations and guidelines to make this agile practice as valuable as possible.

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1. Introduction

Common to all agile methods is an emphasis on communication and the human side of software development (Merisalo-Rantanen et al., 2005). Conducting a *daily stand-up meeting* (DSM) is an important practice in the agile methods Scrum and Extreme Programming (XP) to improve communication in software projects. The DSM is often conducted as a 15-min morning meeting to share information that is supposed to be relevant to the teams' progress. The term DSM used in this article originates from XP. Other names of the practice are *frequent, short meetings* (Rising, 2002), *morning roll call* (Anderson, 2003), *daily huddle meeting* (Paez et al., 2005), *daily meeting* (Pikkarainen et al., 2008), and *daily Scrum meeting* (Sutherland and Schwaber, 2013a).

The software development industry has extensively adopted agile practices, many of which have been thoroughly investigated (Dingsøyr et al., 2012). However, little research has been conducted on the DSM, which may be surprising given that the DSM is the most used agile practice according to a 2014 survey (VersionOne, 2015). In that survey, the DSM was used by 85% of the organizations that employed agile development. The global cost of conducting the DSM is immense if one supposes that the majority of the

software development teams in the world daily interrupt their development tasks to spend 15 min on the DSM.

In this article, we report a study on how DSMs are conducted and what affects the attitude towards them. We propose a theory of DSMs that includes propositions among DSM constructs, with explanations grounded in data. The data was generated from 79 observations of DSMs of eight software teams in three companies and 60 interviews with team members, Scrum Masters and product owners that worked in these teams and an additional set of four teams.

A few studies have investigated the DSM as one of several agile practices. Pikkarainen et al. (2008) studied the impact of agile practices on communication and found that DSMs kept developers, project leaders and customers aware of the project status and helped the developers resolve design issues faster. Paasivaara et al. (2008) examined agile practices in global software development and found that DSMs helped reveal problems early and improved transparency between sites. Moe et al. (2010) studied the nature of self-managing agile teams and found that DSMs were mostly used by a Scrum Master to obtain an overview of the progress and ongoing project activities. McHugh et al. (2012) examined how agile practices impact trust and found that DSMs helped the teams function more cohesively. Dorairaj et al. (2012) studied dynamics in distributed teams and found that the practice promoted team interaction and the building of a “one team” mindset. Yu and Petter (2014) argue that the DSM may contribute to build

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shared mental models within a team. The results of an experiment conducted by [Hasnain et al. \(2013\)](#) suggest that introducing DSMs may be a powerful way to improve trust in agile software teams.

The DSM was the primary study topic in some of our earlier research. In a longitudinal study, DSMs led to a greater commitment to a failing course of action ([Stray et al., 2012b](#)). In another study, we investigated the proportion of time spent on different topics. The largest topic category was discussing problems and possible solutions ([Stray et al., 2012a](#)). In yet another study, we identified thirteen obstacles to efficient DSMs and suggested ways to overcome them ([Stray et al., 2013](#)).

Much can be learned from case studies by doing a secondary grounded theory analysis ([Glaser, 2001](#), p. 97). This study builds on our previous research. Among the 60 interviews of this study, 7 were reused from the study reported in ([Stray et al., 2011](#)), 17 were reused from the study reported in ([Stray et al., 2012b](#)) and 9 were reused from the study reported in ([Stray et al., 2013](#)). The remaining 27 were new interviews for this study. We reanalyzed the case study material and iteratively compared it with newly collected material. This study also contributes to increasing the understanding of the costs and benefits of DSMs, which is important for improving agile software development. Finally, our work answers a call for more empirically based theories in software engineering ([Herbsleb and Mockus, 2003](#); [Hannay et al., 2007](#); [Sjøberg et al., 2007](#)).

The remainder of this paper is organized as follows. [Section 2](#) outlines relevant background literature. [Section 3](#) describes the research methods used. [Section 4](#) reports our results. [Section 5](#) discusses the results, limitations of the study and future work. [Section 6](#) concludes.

2. Background

This section gives a brief introduction to the field of meetings in general, the DSM in agile development and daily meetings in other disciplines.

2.1. Meetings

Meetings are necessary for teamwork to be successful ([Kauffeld and Lehmann-Willenbrock, 2012](#)). They provide a venue for information exchange, decision making, coordination, planning and monitoring progress, each of which is an essential component of the team processes associated with team performance ([O'Neill and Allen, 2012](#)). According to [Boden \(1994, p. 84\)](#), a meeting is “a planned gathering, whether internal or external to an organization, in which the participants have some perceived (if not guaranteed) role, have some forewarning (either longstanding or quite improvisatorial) of the event, which has itself some purpose or ‘reason,’ a time, [a] place, and, in some general sense, an organizational function.”

Employees spend a lot of time in meetings, and the amount seems to increase ([Rogelberg et al., 2006](#)). A great portion of meeting time is perceived as ineffective, and over one third of the time is wasted, with annual losses up to USD 37 billion in the United States alone ([Elsayed-Elkhouly et al., 1997](#)). Furthermore, meeting demands also affect employee productivity beyond the meeting setting ([Allen et al., 2012](#)). For example, a meeting is a particular kind of interruption ([Rogelberg et al., 2006](#)), which may affect employees' subsequent readiness to perform by influencing their psychological state ([Zijlstra et al., 1999](#)). After an interruption, people have to scan and evaluate all new information that they have encountered; several short interruptions have a greater effect than one long interruption ([Zijlstra et al., 1999](#)). [Parnin and Rugaber \(2011\)](#) analyzed 10,000 programming sessions and found that in

57% of the sessions, the developers needed 15 min or more to collect their thoughts and make the first edit after an interruption, such as a meeting.

Very few empirical research studies have specifically focused on team meetings; most studies use meetings only as a context for studying other variables of interest ([Scott et al., 2012](#)), although there are exceptions: [Anderson et al. \(2007\)](#) explored the nature of communication in virtual team meetings. They found that the communication was influenced by the way in which the technologies were used. For example, the person controlling the keyboard dominated cross-site communication even though the audio facility made contributions from any team member perfectly audible at either site. [Sonntag and Volmer \(2009\)](#) studied how individuals in software design teams contributed to teamwork processes during team meetings. They found expertise to be a strong predictor of individuals' contributions. Team members with a high level of expertise were more involved in problem analysis and goal specification than those with less expertise. [Kauffeld and Lehmann-Willenbrock \(2012\)](#) analyzed videotaped team meetings and linked their observations with objective data on team productivity and organizational success. Their findings show that team meeting interaction processes affect meeting satisfaction, team productivity and organizational outcomes.

2.2. DSM in agile software development

The DSM in agile software development is supposed to be a brief gathering of team members that is planned and has a pre-arranged time and place, and a purpose and thus satisfies the definition of a meeting given in the previous section. Based on [Boden's \(1994, p. 84\)](#) division of formal and informal meetings, DSMs may be characterized as informal because they are task and decision oriented, have casual conversation styles and are generally unrecorded, and members are gathered for a narrow organizational goal. Often, the purpose of the DSM is that every team member should share their response to a set of questions. A survey ([VersionOne, 2009](#)) reported that 69% of agile practitioners adhered to the three questions:

1. What have you done since we last met?
2. What are you planning to do until we meet again?
3. What, if any, impediments are you encountering that are preventing you from making forward progress?

In software engineering, conducting DSMs in development teams became popular with the introduction of agile methods, in particular Scrum, where it is a mandatory practice. Scrum describes the DSM as a 15-min time-boxed event for the team to synchronize activities and create a plan for the next 24 h ([Sutherland, 2013a](#)). [Schwaber and Beedle \(2002, p. 40\)](#) claim that “the Daily Scrum meeting gets people used to team-based, rapid, intense, co-operative, courteous development. Daily Scrums improve communication, eliminate other meetings, identify and remove impediments to development, highlight and promote quick decision-making, and improve everyone's level of project knowledge.”

The DSM is not a mandatory practice in Kanban. Nevertheless, many teams that practice Kanban use DSMs; for example, the Kanban teams reported in [Sjøberg et al. \(2012\)](#) and the Kanban teams in our study. According to [Kniberg and Skarin \(2010\)](#), Kanban teams tend to use a more board-oriented format in which they focus on bottlenecks on the Kanban board instead of a format in which every person reports one by one.

[VersionOne \(2015\)](#) conducts an annual survey where agile practitioners state which agile practices they employ. [Fig. 1](#) shows that there is an increase in the use of the DSM and a decrease in the use of test-driven development and pair programming from 2007 to 2014. Still, the two most thoroughly investigated agile

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