

# RTDWD: Real-Time Distributed Wideband-Delphi for User Stories Estimation

Giovanni Aiello<sup>1</sup>, Marco Alessi<sup>1,2</sup>, Massimo Cossentino<sup>3</sup>, Alfonso Urso<sup>3</sup>,  
and Giuseppe Vella<sup>2</sup>

<sup>1</sup> Engisud S.p.A. - Research and Development Lab. - Palermo, Italy

<sup>2</sup> Engineering Ingegneria Informatica S.p.A. - Research and Development Lab. -  
Palermo, Italy

<sup>3</sup> ICAR-CNR Istituto di Calcolo e Reti ad Alte Prestazioni Consiglio Nazionale delle  
Ricerche, Palermo, Italy

{giovanni.aiello, marco.alessi, giuseppe.vella}@eng.it  
{cossentino, urso}@pa.icar.cnr.it

**Abstract.** This paper proposes RTDWD (Real-time Distributed Wideband-Delphi), a real-time collaborative web application for user stories estimation through the Wideband-Delphi method. RTDWD realizes, in a lightweight way, virtual meetings for a critical phase of the requirements management in distributed Agile development processes, such as Distributed eXtreme Programming. The web 2.0-based nature of RTDWD adds new communication modes to a distributed Agile development process, where a close real-time collaboration is needed but difficult to realize due to the geographic dislocation of team members. Features of RTDWD allow to take into consideration several scenarios where mobile devices (i.e. Pocket PCs and Smartphones) well substitute desktop and laptop computers. We present our experience in order to point out to the researcher community the usefulness of RTDWD and, generally, of the lightweight real-time collaboration underlining the need to introduce new technologies on practices of distributed Agile processes.

## 1 Introduction

In the last years, the research area on software engineering aimed at Agile development processes causing great interest both of academic and industrial companies. Moreover, recently, also the embedded software market seems to be interested in Agile methodologies, because they propose lightweight development processes aiming to carry out a logarithmic trend of the requirements change cost according to the project duration [1].

The evaluation both in academic and industrial areas of Agile methodologies has shown very good results if applied to small/medium co-localized working groups. Moreover a common principle of every agile framework is the continuous collaboration and communication among team members and the customer, preferring face-to-face conversations<sup>1</sup>. These considerations help to underline

---

<sup>1</sup> Manifesto for Agile Software Development, <http://agilemanifesto.org/>

the difficulties to apply agile methodologies in contexts where team members are geographically distributed, and to highlight the need to create tools able to support agile processes even in distributed contexts. In [2] authors propose practices and values of DXP, a distributed version of eXtreme Programming (XP). DXP examines XP practices involved when team members of a software project are geographically distributed, giving importance to the communication. DXP assumes as available certain important conditions enabling a reliable communication among distributed team members; for instance the *application sharing* imposes synchronous communication among team members. In fact, in [3] the synchronous communication is considered as a way to improve the work process of distributed teams. DXP also proposes some challenges related to the communication, highlighting benefits of web technologies in terms of low costs and close involvement of team members. In [4] the importance of having a close communication within the team and tools supporting specific Agile practices is highlighted. Agile methodologies emphasize the direct communication between customers and developers, so that the percentage of information loss, due to the lack of long communication chains within the team, is minimal. Consequently distributed Agile processes emphasize the importance of close communication and collaboration *realizing lightweight techniques for a reliable communication and distributed collaboration*.

Literature presents several works dealing with distributed versions of Agile development processes (i.e. eXtreme Programming [1]). In [6] several patterns supporting the distributed eXtreme Programming are proposed. Two of these patterns (*virtual shared location* and *multiple communication modes*) are particularly important for the communication issue. The *virtual shared location* pattern deals with the need to use collaboration software in order to asynchronously post persistent information and ideas shared among distributed team members. Nevertheless, the virtual shared location pattern does not deal with the real-time communication, on the contrary with our experience where a real-time collaboration was necessary in order to realize reliable synchronous communications between team members and customers for user stories estimation. The multiple communication modes pattern suggests making available as many communication channels as possible, in order to replace, in the best way possible, the face-to-face communication and to maintain tacit knowledge, trust and shared understanding among remote team members.

In this paper we propose RTDWD (Real-time Distributed Wideband-Delphi), a fully web based tool to effectively perform Wideband-Delphi virtual meetings between team members and the customer, also using mobile devices. As both customers and developers can participate to an estimation virtual meeting, their direct interaction minimizes the usual information loss in plan-based development processes, in fact they collaborate in real-time in a work context (a synchronous virtual shared location related to the user stories estimation practice is identified and common useful information is shared by each user) avoiding general misunderstanding. RTDWD realizes also asynchronous collaborations because the results of each virtual meeting are stored in a database. The