

Presence-Based Real-Time Communication

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INTRODUCTION

Presence-based real-time communication (RTC) presents itself as a new and emerging technology in the E-collaboration arena with a wide range of new products currently entering the market. Originally created through the integration of instant messaging, with its text chat functionality and presence awareness information, with voice-over IP (VoIP) communication RTC has been maturing over the past three years. Further information and communication channels have been added and RTC technology shows significant potential for integration with other collaborative application as well as general purpose systems like office software. By introducing RTC, its features, potential usage scenarios, and the main players and future trends, this article names several aspects which might inspire future research in this area.

BACKGROUND

Today's work practices have been undergoing significant changes, leading to new forms of organizing and collaborating. The virtualization of organizations and work contexts on the one hand, and the emergence of new information and communication devices on the other hand, are potential causes for this development. These two drivers lead to an all but perfect communication situation from the point of view of the user, as well as those organizations that rely heavily on dispersed collaboration across organizational units.

Firstly, new virtual forms of organizing present new challenges for the management and people working in these increasingly dispersed setups. These changes in the workplace are fueled by trends toward inter-firm partnering and organizational flexibility. As a consequence workplaces are increasingly fragmented and dispersed with teams being spread over several locations. This development clearly is enabled by capabili-

ties of modern information systems and infrastructures like the Internet. Hence, people rely more and more on media and groupware-supported collaboration with participants who are geographically dispersed.

Secondly, over the last two decades, the number of electronic communication devices and channels at our disposal has increased, creating a heterogeneous accumulation of technologies that are available for the average user. With new communication technologies entering the arena the communication options have mushroomed. Nowadays, people may communicate via several telephones or Internet channels. In addition, many people do not just possess one e-mail address, messenger account, or phone number, but rather they use several similar channels. Consequently, the communicative complexity increases drastically for both the initiator and the recipient of a communication request. For initiators situations are characterized by a high uncertainty as they have to think about the recipient's location and context, the appropriate medium and the relevant contact details. Generally, all required information is not at the disposal of the initiator, resulting in failed communication attempts that are time consuming and costly. The recipient on the other hand is confronted with a myriad of communication devices as well as several addresses and numbers, creating a fragmented communication landscape whose coordination is time consuming and tedious.

These two trends bring about significant structural changes to today's working environment and the workplace situation of mobile professionals (cf. Kakihara, 2003). People are potentially confronted with a level of interaction that might exceed their personal preferences (Sørensen, Mathiassen, & Kakihara, 2002). Furthermore, today's work conditions are marked by increased fluidity of interactions with others. While fluidity offers benefits, such as interacting remotely and flexibly with others, it also creates interruptions and disturbances as asymmetries of interaction become more likely (Kakihara, Sørensen, & Wiberg, 2002).

Asymmetries of interaction occur if “the time and topic are convenient for the initiator, but not necessarily the recipient. This asymmetry arises because while initiators benefit from rapid feedback about their pressing issue, recipients are forced to respond to the initiator’s agenda, suffering interruption” (Nardi, Whittaker, & Bradner, 2000, p.83). Current technologies such as the mobile phone offer only limited support for people in managing their increased communicative volume. Specifically, the effect of decreasing communication delays on the part of the initiator of a communication request often translates into a work interruption on the part of the recipient (Rennecker & Godwin, 2005). Information and communication requests reach each person unfiltered and people do not have gatekeepers that might help to manage and control the communicative volume. People have to fall back on tactics for minimizing interruptions, such as not answering their telephone, working away from their desk, or by signalling “away” or “busy” deliberately in their instant messaging tool. While this situation is unsatisfying on the individual level it also translates into organizational frictions in that information processes do not run as smoothly as they should or that the lack in availability of key personnel causes coordination problems in projects.

REAL-TIME COMMUNICATION TECHNOLOGY

Real-time communication technology can be seen as a technological attempt to mitigate the problems portrayed above. RTC presents itself as the result of the convergence of the telecommunications market and the market for groupware systems. Hence, of particular interest is the integration of communication channels with computer systems. RTC is based on the idea of unified communication (UC), which describes the combination and management of communication channels according to user preferences. Besides the integration of communication technology with computer systems, the merit of RTC lies in the provision of status information in regards to user availability and communication devices. Hence, two main components of RTC can be distinguished (see Table 1).

The idea behind UC is to relieve the user of the burden of juggling with a large number of devices and channels in different contexts. Thus, UC systems aim at integrating different information and communication

channels, such as e-mail, telephone, instant messaging, or SMS in order to reduce the fragmentation and complexity of today’s information and communication landscape. UC is an extension of unified messaging (UM). The aim of UM systems is to manage and coordinate a user’s asynchronous communication through a single portal in which all incoming messages of various channels such as e-mail, audio messages, fax, or SMS are collected and which allows for a conversion of messages between these media types: fax and short messages can be forwarded via e-mail, all text messages (SMS, e-mail, fax) or calendar entries can be read to the user by a machine voice, and the user can decide which device to use to access her/his messages of various types. Users are notified about missed calls and their subjects via e-mails.

UC extends the UM idea to synchronous communication. Users are aided by a communication middleware in the management of channels and devices through a rule-based coordination and filtering system. The user can define preferred channels (text, audio, video) and devices (landline, mobile, or IP phones). Incoming calls can thus be diverted and transferred between channels and devices according to a set of filters and rules that can be related to contexts/situations (“in the office,” “at home”), time, caller, or caller group (“colleagues,” “customers”). An incoming phone call can thus be transferred dynamically to the preferred audio device in a particular situation, as in when the user is not logged in to the office computer, all incoming calls from colleagues are transferred to the mobile phone, while after hours any caller will be diverted to the voice box. For doing so, it is required that each device is registered with the UC system. UC systems enable users (i.e., recipients) to manage the communication volume corresponding to their preferences and contextual demands. The locus of control is shifted from the initiator to the recipient who can decide what is important for organizing his/her work or which requests need instantaneous consideration. UC products from different suppliers are currently entering the market and it is predicted that, by 2007, 80% of enterprise communication purchase decisions will require support for this type of communication solution (Elliot, Blood, & Kraus, 2005).

The second defining feature of RTC is the presence-awareness information, which in RTC is not just limited to people in a buddy list, as is the case in instant messaging systems, but can also refer to

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