

Reducing business travel by 90%

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Preamble

I will not be attending the workshop (or ICSE) in person as I have made a personal commitment to reduce my own business travel significantly (alas, the 90% target is not yet realisable). While I understand the rationale for organising this workshop, I think that, as a community, we will not be listened to unless we set an example and that flying many thousands of kilometres to discuss methods of reducing carbon emissions is something that really has to stop.

Introduction

Tackling the pressing societal problem of climate change is clearly an area where there a whole set of 'grand challenges', all of which require active participation from the software research community. In this paper, I discuss one such 'grand challenge' and identify a related set of research projects that we might engage in to address this problem.

Business travel is an inescapable fact of modern life and trends to globalisation over the past 20 years have meant that such travel has increased significantly. In 2008, it was estimated that \$929 billion was spent on business travel¹ and, after a drop in 2009 due to the economic recession, growth will resume from 2010. Translating this figure to carbon emissions is not easy but, for sure, it is a lot. Clearly, a major fraction of the total carbon emissions from travel results from such travel.

Why do we do this – the reasons are partly cultural and partly technical. In many industries, there is a culture of 'presence' – if you are not present, you are not 'at work' and changing this culture is something that will take time. However, other reasons are technical – our software-mediated communications systems provide a degraded interaction experience and people feel that this is simply not good enough to replace face-to-face interaction in business transactions.

To address this problem, I believe that we should establish a community grand challenge so that, within ten years, we have effective interaction technology available so that business travel can be reduced by 90%. Clearly, the 90% figure is a challenging goal and, for cultural reasons, may not be attainable – however, we need ambitious goals to drive the innovation and adventurous thinking that is required.

To tackle this problem, we need smart people to think laterally and the notion of setting out a 'research roadmap' is one that I believe stifles rather than encourages innovation. However, in the remainder of this paper I give some examples of research that we might consider to help achieve this goal.

Serendipitous interaction

By and large, few people attend conferences to listen to presentations (although many attend to make such presentations). Paper presentations are, by and large, dull affairs and journal publication is a far better way of disseminating research results. People attend conference to meet people and to interact – sometimes these are planned interactions but, more often, they are serendipitous – we meet colleagues we haven't seen for some time and new people with whom we share technical interests.

¹ <http://www.thetransnational.travel/news.php?cid=NBTA-IHS-Global-Insight.Aug-09.06>

Current electronically-mediated communication systems are best suited to planned interactions and provide little support for 'bumping into people' and chatting over a coffee or a beer. A possible exception to this are virtual worlds such as Second Life although the bizarre avatars that many people choose in this environment do not suggest serious business use.

We need research to investigate how to provide always-on interaction that can be used in formal and informal settings and that provides for the informal interaction that is typical of conferences. This will undoubtedly involve a range of modalities – sometimes perhaps virtual worlds but also interaction through a smart phone in a café. It may involve integrating information from social networks (Facebook, LinkedIn) and social media (blogs, wikis, etc.). We may use the capabilities of modern mobile phones for geotagging and personal identification.

Organizational memories

The notion of organizational memory was one that was current in the 1990s, where organizations tried to capture information that was in people's heads so that it could be reused by the organization as a whole. By and large, these and other attempts at 'knowledge management' were unsuccessful.

However, when we think about why people meet, one important reason is to share information, with the important proviso that we don't know in advance what information must be shared. People are asked to attend meetings because of what they know and hence they can make an effective contribution to the meeting.

I argue that better organizational information systems mean that remote interaction will become much easier because (a) access to information is simply easier and (b) the role of individuals will be to identify the required information rather than provide it.

To address this problem, we need to tackle issues such as the collection and automatic organization of large volumes of information and the provision of ubiquitous retrieval systems that allow the required information to be quickly retrieved and summarized. Google has obviously pointed the way here (and they may indeed solve the problems) but I believe that there is scope for research both into the fundamental problems of information collection and retrieval and into providing appropriate security mechanisms, which will convince businesses that their confidential information can be entrusted to such systems.

Tacit communications

A key benefit of face to face interaction is that we can make use of tacit communications to mediate and change the ways that we communicate. We have probably all faced the situation of presenting to an audience and seeing, through their reactions, that we are simply not getting through to them. We can then dynamically change our presentation content and style in the hope of improving our communication with the audience.

This lack of tacit communication means that technologies such as webinars are poor substitutes for personal presentations and, if we are to make electronic presentations acceptable, we have to provide effective mechanisms whereby audiences can provide feedback, without violating cultural norms and presenters can be made aware of the audience reactions.

How this might be accomplished is not clear to me –perhaps it requires phone apps that can detect a listener's concentration level and transmit this to a presenter or perhaps it can be accomplished remotely by analysis of video pictures of the audience. This might involve looking for yawns, dozing participants, fidgeting, etc.

We also need to provide a way of allowing the audience to signal interaction with the presenter – perhaps by identifying aural signals such as people clearing their throat or by picking out people who raise their hands to ask a question. All in all, we need to support multi-channel communications rather than the impoverished interaction, which is now available.