BEYOND BEING THERE

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ABSTRACT

A belief in the efficacy of imitating face-to-face communication is an unquestioned presupposition of most current work on supporting communications in electronic media. In this paper we highlight problems with this presupposition and present an alternative proposal for grounding and motivating research and development that frames the issue in terms of needs, media, and mechanisms. To help elaborate the proposal we sketch a series of example projects and respond to potential criticisms.

Keywords: Telecommunications, CSCW.

INTRODUCTION

Face-to-face conversation provides a richness of interaction seemingly unmatched by any other means of communication. It is also apparent that living and working near others, whether that be in the same house, adjacent offices, or the same city, affords certain opportunities for interaction that are unavailable to those not co-located.

Research has clarified and substantiated both of these commonsense intuitions. It has been shown, for example, that there is a predictable fall-off in likelihood of collaboration between two researchers as a function of separation distance, even after correcting for factors such as organizational distance and similarity of research interest [5, see also 8]. This is understood to occur because of the large number of informal interactions necessary to create and maintain working relationships. There are also well-developed theories of interaction that predict why some interactions seem to only work when face-to-face, while others can work over the phone, and still others through written correspondence [12,3,14].

This research supports the idea that we as humans have developed a broad range of mechanisms for social interaction, which seem to meet well our needs for initiating and maintaining friendships and working relationships, for discussing, negotiating, planning, and all other types of social interactions. These are known to be complex processes, and ones which physical proximity facilitates.

Many of us in the telecommunications field would like to create systems that allows the same richness and variety of interaction, but with distance no longer an issue. Ideally, these systems should work so well that those at a distance should be at no disadvantage to those who are physical present. This in large measure is the telecommunication problem. But how best to accomplish it?

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> *If, as it is said to be not unlikely in the near future, the principle of sight is applied to the telephone as well as that of sound, earth will be in truth a paradise, and distance will lose its enchantment by being abolished altogether.* Arthur Strand, 1898 [7].

Roughly speaking, the response of telecommunication researchers has been to follow the path that Strand implicitly outlined nearly 100 years ago: solve the telecommunication problem by creating a sense of *being there*, by establishing some form of audio and video connections between two distant locations (A notable exception to this is email, about which we will have more to say later). Hence the introduction of the telephone itself, and its enhancement through the addition of video, for teleconferencing, shared informal spaces [1,5], and one-on-one conversation. It is not too far from the mark to characterize the goal of the research by quoting from one of the stated goals of a recent informal telecommunication experiment: *"the total effect is*

to produce an environment at each end... which is as close as possible to being there [10]."

How successful have the many efforts directed at this goal been? To measure progress towards the direct face-to-face part of this goal, social psychologists have evolved measures of *social presence* [12] and *information richness* [3] to estimate how closely telecommunication tools capture the essence of face-to-face communication. To simplify matters slightly, it is generally agreed that various communication options can be ranked on an axis, in order of decreasing social presence, as face-to-face, audio/video communication, audio only, and written correspondence/email. While it is encouraging that the addition of the video channel seems to increase the social presence, it is often (though not always) the conclusion of studies that the audio/video medium is much closer to the audio only medium than it is to the face-to-face condition.

It is tempting to think that with perhaps a little more screen resolution, a little more fidelity in the audio channel, a little more tweaking to bring the machinery in conformance with subtle and long-established social mechanisms such as eye contact, telecommunications systems will achieve a level of information richness so close to face-to-face that for most needs it will be indistinguishable.

But will they ever be close enough? It is clear they can, for example provide a cost-effective and efficient alternative to business travel to a distant location, and may be superior to audio only telephone for some communicative needs. We have no argument with that. But is this general approach going to be adequate for the long term? Is it powerful enough to see us through to achieving the goal that those at a distance will be at no real disadvantage to those co-located?

A recent study of the Cruiser video system suggests that in one important respect, systems designed using this approach may *never* be "close enough." In a recent trial aimed at seeing whether a video/audio system provided enough information richness, it was found that subjects used the mechanism to set up face-to-face conversation with friends down the hall, but not in lieu of them[6]. The result is not surprising. Perhaps we are demanding too much. After all, its purpose is to enable communication between two distant locations, where going into the next office to talk to the person is not an option. When you have the choice between face-to-face and an imitation, no matter how good, it is natural to choose the real thing. This is a problem inherent with imitation, but we think it is particularly telling for communication. When we make a choice between two channels to use for informal interaction, discrepancies between the two channels are decisive. Thus, if one channel is half as good as another, we don't use it half as often, we probably don't use it at all, so long as the other is readily available. And that fundamental edge of real face-to-face and physical proximity over its imitation, accumulated over the hundreds of interactions it takes to form friendships or successful collaborations means, we believe, that organizations will continue to decouple into geographical groups (See, for example, the discussion of group cohesion in chapter 8 of [12]).

It seems to us that there is no real solution to this situation so long as people use one medium to communicate with those at a distance and another for those for whom distance is not an issue. Those distant will always remain at a disadvantage to those present. It is not really even a question of the quality of the device. It is what it is trying to achieve. It could be 3-D holographic with surround-sound, but if people use an imitation to talk to some people but the "real thing" to those physically proximate, a fundamental difference will always remain.

A logical extension to this line of thinking is that the people at a distance will never stop being at a disadvantage until we use the same mechanisms to interact with each other when we are physically close as when we are physically distant. And that means that to make real progress on the telecommunication problem, we must develop tools that people prefer to use even when they have the option of interacting as they have heretofore in physical proximity. We must develop tools that go beyond being there. But what would it mean for something to be better than being there? And how could we design such a device?

Perhaps a brief analogy could get us moving in the right direction. It is customary for a person with a broken leg to use crutches, but how odd it would be if they continued to use the crutches after their leg was restored to its natural condition. In contrast, one wears shoes because they provide certain advantages over our natural barefoot condition. Special purpose shoes, such as running shoes, are designed to enhance our best performance. Now crutches and shoes are both tools of a sort, but there is a difference. The crutch is designed specifically to make the best of a bad situation -- to let someone hobble around until they are back in shape. On the other hand, shoes are to correct some of the problems of our natural condition, and, in the case of athletic shoes, to enhance our performance.

In telecommunications research perhaps we have been building crutches rather shoes. What we are getting at is this: telecommunications research seems to work under the implicit assumption that there is a natural and perfect state -- *being there* -- and that our state is in some sense *broken* when we are not physically proximate. The goal then is to attempt to restore us, as best as possible, to the state of *being there*. In our view there are a number of problems with this approach. Not only does it orient us towards the construction of crutch-like telecommunication tools but it also implicitly commits us to a general research direction of attempting to imitate one medium of communication with another. A research direction which, as we indicated above and will discuss more fully below, has serious limitations.

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No man putteth a piece of new cloth unto an old garment, for that which is put in to fill it up taketh from the garment, and the rent is made worse. Neither do men put new wine into old bottles: else the bottles break, and the wine run-

neth out, and the bottles perish: but they put new wine into new bottles, and both are preserved. Matthew 9:16-17.

To start to elaborate an alternative approach to the telecommunication problem, let's take a step back. For the purpose of discussion, let's frame human communication in terms of needs, media, and mechanisms.

We'll say that communication needs are those human requirements which, when met, encourage and facilitate interaction. They span the whole range of human needs and are the underlying human requirements that get served by communication. They are independent of the medium with which we communicate. For example, we would characterize Daft and Lengel's [4] suggestions of characteristics of information rich channels, *cue variety, feedback, and message personalization*, as candidate needs. Other researchers [6] suggest *simultaneously being reminded of a need to talk to someone* and *having a communication channel* as key aspects of informal communication. Schegloff [15] and others have discussed *turn taking*, *repair*, and *stylized openings* as seemingly essential to conversation. It is such underlying needs that we are referring to in the framework we are proposing.

Media are simply what mediates communication. For face-to-face interactions the medium is physically proximate reality. Viewing physical proximity as a medium might at first seem odd but it is of central importance to our argument since the way it has come to mediate face-to-face interactions serves as *the model* for communication. This in turn we will argue has led to a focus on and imitation of the basic characteristics of face-to-face interactions such as their 3-dimensional high-resolution visual and auditory character.

Finally, mechanisms are ways to meet informal communication needs that are enabled by a medium. While needs are media independent, mechanisms are closely, perhaps inextricably, connected to specific media. Examples of mechanisms that seem to work well for physically-proximate interactions might include eye contact, body posture, stereotypical openings and closings in spoken language, or even the strategy of going down to the lounge to see who's taking a break from work.

In an important sense, computationally-mediated communication is a new medium, potentially as good or better than the physically proximate medium we are used to. Here we mean to include not just email, as if sometimes intended by the term, but all communication that is mediated by any type of electronic or computational device, whether it be an audio amplifier, television camera, or email system. As the quote beginning this section suggests, new mechanisms are required for new media. It is thus crucial to consider what mechanisms of communication the new computational medium enables and to realize that mechanisms that may be effective in face-to-face interactions might be awkward or ineffective if we try to replicate them in an electronic medium. This is one of the inherent limitations in imitating one medium with another. As we discussed above, the imitation will never be as good as the real thing. This is true by definition if one is strict in using the old medium as the standard of measurement. However, even with a more relaxed standard, the new medium will seldom measure up because of discrepancies in the strengths and weaknesses of the two media. Requiring one medium to imitate the other inevitably pits strengths of the old medium against weaknesses of the new. At the same time, to the extent that the goal is imitation, one will not be led to exploit the distinctive strengths of the new medium.

The assumption that the *media* and *mechanisms* of face-to-face interaction are actually the *requirements* for ideal communication is so pervasive that it is implied in the very name of the industry currently most concerned with supporting informal communication in the new medium -- *tele*communication. The implication is that we are trying to find ways to communicate at a distance as if we weren't at a distance. But it is our contention that such an approach will always limit our thinking to replicating or imitating the mechanisms of one medium with another.*

In contrast, we argue that a better way to solve the telecommunication is to not focus on the *tele-* part, but the *communication* part. That is, to make the new medium satisfy the needs of communication so well that people, whether physically proximate or not, prefer to use it.

The framework of needs, media, and mechanisms also suggests a way to achieve a level of performance for communication tools that goes beyond being there. First, it frees us to ask "what's right with the new medium?" For example, three significant features of the new medium are its ability to support asynchronous communication, anonymous communication, and to automatically archive communication. Yet all of these potentially important features are ignored when the medium is used just to recreate synchronous face-to-face interactions between distant sites.

It also creates a framework in which it becomes meaningful to ask the question: what's wrong with (physically proximate) reality? That is, when we view physically proximate reality as simply *a* medium, we can ask what requirements it meets well, and also what ones it meets poorly, inefficiently, or not at all. We can then explore new mechanisms to meet those needs, mechanisms which leverage the strengths of the new medium.

EXAMPLES

To further illustrate the approach we are proposing, we offer a sampling of projects which are in various stages of devel-

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* We are reminded of a colleague's description of his reaction to a demonstration of the clarity of a fiber communications link. He responded that often when one was calling a friend or relative far away what one wanted to communicate was the message that "I am far away and thinking of you." He suggested that the new fiber medium made that harder to say. With the old medium one could *hear the distance* and thus the medium itself helped to convey the message.}

opment in our group. We conclude each example with a set of hypotheses that we expect the project will help us evaluate.

Email communication is surely the paramount success of computationally-mediated informal communication. It's design fits well with the framework we propose since it satisfies a number of communicative requirements primarily by exploiting the asynchronous nature of the electronic medium rather than by attempting to imitate synchronous physical interactions. It meets our critical litmus test of being used by groups even when in close physical proximity. In fact, in our own experience, it is not uncommon to send email to someone in the next adjacent office, or even someone sharing an office. In this light, it is not surprising that email was viewed as one of the most (if not the most) successful communication tools in an extensive study that explored the ability of a research group to function when located at two sites, separated by several hundred miles [1].

Yet the sense that we must imitate face-to-face is strong. In a recent popular article on email communication it was noted almost apologetically: "Electronic mail that includes graphics, pictures, sound and video will eventually become widely available. These advances will make it possible to reintroduce some of the social context cues absent in current electronic communications. Even so, electronic interactions will never duplicate those conducted face-to-face [9]."

One direction that our approach leads one to consider is other elaborations of email that are not at all imitative, but move in complementary or even opposite directions. Four of our examples can roughly be considered as such. The fifth example looks directly at those tasks for which the very rich, synchronous interaction and immediate feedback that face-to-face communication provides seems essential.

Ephemeral Interest Groups

Successful informal discussions often take place when there is both an opportunity to communicate and a natural topic of discussion. For example, suppose you have a colleague you would like to know better. It is easier to start up a conversation when both are sitting in a lounge reading a newspaper, or both are waiting for a meeting to start, than interrupting his work by knocking on his office door. In both of these desirable situations, ones' presence in the lounge or in the meeting room indicates that one is available for conversation, and the approaching meeting or newspaper provides an natural topic of conversation.

A problem with these mechanisms, however, is that both parties need to be free at the same time. Thus, without being too precise, the likelihood of these opportunities goes roughly as the *product* of the fraction of the time that each person is available in these circumstances.

The potentially asynchronous nature of computationally-mediated interactions increases the potentially available time for informal interaction to approximate something proportional to the fraction of time available to each person considered separately. This is a much larger value, and implies the makings of a more effective way of having informal interactions, either to get to know a colleague better, or to maintain contact with a close associate. But how to create natural topics of conversation?

The idea of an ephemeral interest group is to create a mechanism that allows a (typically) short-lived discussion to be attached to any object in a community's electronic "space." Thus, items on an electronic calendar listing research talks, apnews stories in electronic form, and even postings to a company-wide bulletin board can provide a seed for an ephemeral interest group.

The word ephemeral helps to emphasize that these discussions differ from those handled by specialized bulletin boards, netnews groups, or special interest mailing lists. In those cases, interests of a more long-standing nature are well served. The intent is to provide a mechanism that allows a group to be created at virtually zero cost to a potential user, and that these groups can be thought of as disposable, intended only to last a few hours or at most a few days.

We have been operating a first version of such a service for over four months at Bellcore. It has been reasonably successful. Users report that it creates a greater sense of informality than postings to the general bulletin board, while allowing them to potentially reach all the readers of the bulletin board, without bothering those that are not interested in that discussion. And, true to its email heritage, allows those not located at the site to keep up on what's going on with a system that puts them at no apparent to disadvantage to those co-located.

As a result of formal interviews and more general user feedback, we have recently begun limited use of a redesigned system, emphasizing increased visibility, and lower user cost of access and interaction. With these changes, there are preliminary indications of increased participation, and the ability to handle topics that are more ephemeral. We plan to report on this work in more detail elsewhere [2]. These ephemeral interest groups provide a means of initiating friendships electronically which we discuss in the next section.

Hypotheses: People using this system that aren't present rate themselves as more a part of the community than those who don't use it and are present.

Meeting Others

While there is currently much discussion of electronic access to information resources and new kinds of information services that may soon be offered, one might conjecture that many people are more concerned with meeting interesting people and having richer fuller relationships than with access to most forms of electronic information. Let's briefly consider what kinds of systems we might be led to propose based on our framework.

First, we are exploring providing users in our lab with a sort of electronic persona that provides people with access to information about others. This includes their publications, picture, state information that is automatically recorded about activity on their workstation, as well as the opportunity to include the kinds of information that many people

now attach to the doors of their offices (cartoons, quotes, etc.). The goal is not to replicate in the electronic media what is available in other media but to provide low-cost access to the information so that when reading about a topic, such as an ephemeral interest group posting, one has ready access to other information about them and an opportunity to initiate a conversation. More importantly we think that these pieces of information can provide opportunities for initiation of informal communication.

A second project is a more ambitious variant of the first. It's goal is to provide a form of what one might call *computing personals* in which people would have the opportunity to compose structured profiles describing themselves and allow those profiles to enter into negotiation with other profiles on the net to attempt to locate other people that they might be interested in meeting. The issues of how to construct initial profiles and tailor them as well as the design of the process of negotiation is challenging. Yet one can project that such a form of interaction might provide an interesting alternative way of meeting others.

Hypotheses: Allowing low cost electronic access to information about others will provide an effective way of learning about people for the first time, decrease the cost of initiating contact, and support the maintenance of interactions over time.

Anonymity

One characteristic of an electronic medium that is not shared with face-to-face interactions is an ability to be anonymous. Sproull and Kiesler [9] note that people are in some cases more truthful in email than in face to face, in part because the interaction is more anonymous. Could one not exploit this property to create a new type of email in which exchanges could happen anonymously? This has the potential of satisfying a set of requirements that are not readily satisfied in face-to-face communications. Anonymity could permit exchanges without some of the costs associated with nonanonymous encounters.

Our point is not primarily that such anonymous exchanges will necessarily be valuable (there are certainly many problems that they might generate) but rather that looking at mechanisms enabled by characteristics of a medium and how they might satisfy needs of individuals and groups leads one to posit systems and services that differ from those that follow from an imitative approach.

Hypotheses: Anonymous exchanges will encourage people to discuss issues that they are reluctant to discuss in face to face encounters and lead to discussion of those issues much earlier in a relationship. There is some evidence already available on this issue. One sees anonymous posting services arising on the internet to allow people to interact about very personal topics that it is clear they would be reluctant to discuss in initial fact-to-face encounters.

Semisynchronous Discussions

The perspective we are proposing also encourages one to explore needs, media, and mechanisms independently as well as the linkages between them. As mentioned earlier the asynchronous nature of email is quite effective in supporting certain communicative requirements but focusing on the medium also leads one to ask how the mechanism might be varied. It is clear that the plasticity of the electronic medium allows us quite a bit of flexibility. One does not need to view things as either synchronous or asynchronous. One can imagine semisynchronous mechanisms that might be useful in meeting certain requirements.

Consider for example the following problem of communicating via an electronic bulletin board system. The problem is that the tone and direction of a discussion can be set from the first few responses to a message and people who might well have responded to the original message are reluctant now to enter the discussion. A variant of this problem is not uncommon in meetings or in the classroom in which the first response to a topic can lead the discussion away from what many people might have thought would have been a more productive direction.

The synchronous nature of face-to-face communication does not afford one many options here but in the electronic medium we can explore a variety of semisynchronous mechanisms. Suppose for example that people sending messages intended for discussion could avail themselves of such a mechanism. One variant would permit people to respond to a message at any time but all responses would get batched up and come out at fixed times.

Hypotheses: Use of semisynchronous mechanisms will encourage a greater range of responses than the normal asynchronous or synchronous mechanisms.

Beyond Face-To-Face

The previous examples have emphasized the idea that many things which currently occur in face-to-face, synchronous interactions might actually benefit from being handled in a way that is not, at least superficially, very imitative of face-to-face encounters. However, we certainly feel that some interactions require very rapid, synchronous feedback, and as much information richness or social presence as can be brought to bear.

There is a great deal of enthusiasm, both among telecommunications researchers and the general public, for the possibilities that widespread use of cellular/PCS phone systems, and pen-based wireless computers will allow. How will they change our world? Certainly we can imagine simple extrapolations of current phone and computer use, making computers easier to work with, and phones more readily available. Does the beyond being there approach suggest more imaginative possibilities for these new technologies?

We'll start by asking a question that's easy to ask in our framework. Much telecommunication research has aimed at achieving the level of information richness that we currently have in face-to-face interactions. But no one seems to be asking the question, "what would happen if we were to develop communication tools with a higher information richness than face-to-face?" In the framework proposed in this paper, such tools are actually not all that hard to imagine. We begin by thinking of needs that are not well met in

unassisted face-to-face interaction. While we are just beginning to investigate this area, the following examples illustrate the style of approach we are advocating.

Clarity: Could things be clearer in spoken natural language than they are today? American Sign Language provides an intriguing possibility. In ASL, pronoun reference is handled by indicating spatial locations for objects of discussion, and then referring to the various objects by pointing. Thus, while there may be a reference ambiguity in an English sentence using the word "he," there need be no such confusion in ASL.

Feedback: Facial expressions, head nodding, and verbal cues all are used to indicate back to the speaker that one understands and is following the conversation. We would argue that all these mechanisms are rather imprecise. The speaker may wonder: what aspects of what I am saying does the listener understanding? What does the listener think my key point is? But with the spatial location of key pieces of the discussion in a shared visual space, the listener may be able to use tablet gestures to provide a rich range of feedback that simultaneously indicates what aspect of the speaker's comments he is responding to.

Archive: One problem with spoken words in unenhanced physical proximity is that they leave no easily-searchable archive or trace. Recording and making transcriptions, or annotating records after the fact seems a cumbersome process at best. We are pursuing a way to make a system tightly integrated into the spoken interaction, in such a way that the combination of audio and visual record is created without additional effort beyond that needed to converse, and is easily searchable.

What we are suggesting here is a kind of auditory paper, a real-time visual extension to natural language itself.

Hypotheses: Face-to-face conversations using auditory paper will be rated as having higher social presence than unassisted face-to-face interactions. We conjecture that auditory paper will some day, even without the face-to-face component, be viewed as having greater social presence than unassisted face-to-face conversations.

RESPONSES TO POTENTIAL CRITIQUES

We admittedly are trying to present an extreme position as our use of the phrase *beyond being there* might suggest. Our purpose in taking such a position is to highlight our argument and make crisp an alternative approach to support of informal communication in the electronic medium that we feel isn't currently being adequately pursued. Here we respond to a collection of potential critiques.

Advantages of Imitation

There surely are advantages that arise from the imitation of physically proximate reality. An obvious one is that people are used to it and so they will know how to act in the new situation. We would like to suggest though that there can be subtle problems, even when the imitation is successful, because of slight differences in what the media can support. An example is the eye contact problem associated with video conferencing systems. More importantly though our concern is that in trying to build things that are easy to get use to because they are familiar we will never get beyond the level that the familiar solutions have taken us. In addition, all of the novel representational and communicative uses of the electronic medium almost by definition fall outside of what people are used to now.

Culture

A more difficult criticism is that in advocating our beyond being there position we do not adequately address the issues of culture that surround the use of any media. This criticism would take us to task for failing to give adequate due to culture. That culture provides an important backdrop for our informal communication with others can not be minimized. Our position is that as we explore the new characteristics of media and how they might better meet our requirements we may well see culture change to incorporate and support mechanisms enabled by the new medium because they provide better ways of meeting underlying requirements.

Intersubjectivity

One of the factors that makes face-to-face communication so compelling is how it supports intersubjectivity. Intersubjectivity is a topic that a number of modern philosophers of communication have discussed. Simply put it refers to the creation of a context in which I know that you know that I know what we are talking about. In face-to-face interactions it is constructed via mechanisms of facial expressions, tone of voice, and body language. Much of the richness of face-to-face conversation has to do with exploiting mechanisms of intersubjectivity. Careful examination of almost any encounter will demonstrate their pervasiveness. One will see how a glance can be used to convey a question or to elaborate or even change the underlying context of a discussion.

No matter how powerful and important such mechanisms are there is no reason in principle that the underlying requirements might not be better serviced via mechanisms of other media or via a combination of mechanisms of multiple media. While current techniques, such as embedding little pictures of smiles in email text, to afford the electronic media some of the mechanisms of face-to-face pale in comparison to the richness of direct interactions, one must remember that the electronic medium is still very young. More importantly, looking at nonimitative approaches that focus on underlying requirements and the distinctive characteristics of the electronic media rather than on imitation of the mechanisms of face-to-face might lead to even better solutions.

For example, the ability to remove or selectively enable intersubjectivity might itself have distinct advantages. This is something that is certainly easier to accomplish in electronic forms of communication. A number of people have commented that they can operate more efficiently when viewing a lecture via video or using multiple authoring software precisely because others are not provided with information about them that would be communicated in face-to-face interactions. They can, for example, timeshare their

attention with other activities without making the kinds of statements that doing that would do if they were attending the lecture. Thus, they are able to meet other requirements that might have higher value to them precisely because they don't have the kinds of intersubjectivity afforded so readily in face-to-face interactions.

Thus, it is instructive to realize that since there are certainly costs associated with the maintenance of intersubjectivity there may well be occasions when being able to decide not to bear those costs is advantageous.

SUMMARY AND CONCLUSION

Let us summarize our argument:

1. The general telecommunication problem seems to be to create a system that affords us the same richness and variety of interaction that we have when we are physically proximate, even when we are physically distant.

2. Many current efforts to accomplish this attempt to create a sense of "being there," chiefly by establishing audio and video channels between distant locations.

3. Any system which attempts to bring those that are physically distant into a physically proximate community by imitating physical proximity will always keep the former at a disadvantage. This is not because of the quality of the systems, but because of what they attempt to achieve.

4. If we ever hope to solve the telecommunication problem, we must develop tools that people prefer to use even when they have the option of interacting in physical proximity as they have heretofore. To do that requires tools that go *beyond being there.*

5. To create such tools, we suggest framing the problem in terms of needs, media, and mechanisms. The goal then becomes identifying needs which are not ideally met in the medium of physical proximity, and evolving mechanisms which leverage the strengths of the new medium to meet those needs.

In conclusion, we return to the quote at the beginning of this paper. At least since 1898, people have had a vision of a future where new technologies would allow us to interact with others that are far away just as we do with those that are near. We share that vision, but differ from Strand's quote in how best to accomplish it. In our view of the future, it is not so much distance that will be abolished, but rather our current concept of *being there.*

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