

Creating New User Experiences to Enhance Collaboration

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Abstract: When technologies are introduced into collaborative settings, people are often required to work together in new, unfamiliar ways. This can lead to problems of resistance, and even non-adoption. Conscious of this issue, we have developed a system which is designed to support collaboration, not through any major change to the work process, but rather by improving people's experience of working together. Here we report on a system designed to support the collaborative use of information accessed by salesperson and customer during the early stages of a sales transaction. The system, embedded in a shared worktable, promotes a number of new user experiences, changing the way people are able to meet, sit together, communicate, and represent what they are discussing. We found that the new user experiences enhance collaboration, supporting the work process while avoiding problems of resistance.

Keywords: User experience, user resistance, work process, collaboration, adoption, sales transaction

1 Introduction

New technologies for collaboration rarely meet with immediate acceptance. User resistance can arise for a number of reasons. For example, workflows that are slowed down by changes to systems can affect performance measures and bonuses, leading to staff resentment. On top of this, new systems can sometimes force people to be accountable and inspectable in ways they previously were not (Benamati *et al*, 1997). Changes to work processes represented by new systems may also incur new divisions of labour which are perceived as unfair if those that get the benefit of a system are different to those who need to do the work (Grudin, 1988). In some areas, proposed solutions can be unfeasible, since they may overlook aspects of the work that are essential (Bentley *et al*, 1992). There can be learning overheads and usability problems without apparent workarounds (Bødker, 1999). Or a previous system may simply have been well-liked (Rogers, 1994).

Potential solutions to the problem of user resistance include workplace studies to find out what people actually do in detail, and to identify areas

where resistance is likely to happen (*ibid.*); participant design, which includes all stakeholders in system development from an early stage (see *e.g.* Preece *et al*, 2002), and mediation (Okamura *et al*, 1994), whereby third parties are on hand to guide implementation, train, or lead attitudes and adoption. Another solution is to recommend limited, incremental change (*e.g.* Bentley *et al*, *op. cit.*).

All these approaches share a tacit assumption: when we think about supporting collaborative work with new systems, this involves altering people's jobs. While it seems likely that new systems will always involve some degree of change to work processes, what we are interested in is the extent to which this could be minimised: how far collaborative work might be supported by new systems that concentrate, first, on changing the user experience.

What do we mean by 'user experience'? This can refer to usability, where users are engaged, and their needs met, by well-designed interfaces (*e.g.* Donoghue, 2002). Equally, novel multimedia can make using a system fun and entertaining (Douglas & Hargadon, 2000). New kinds of user experience of socialising and interacting are increasingly preva-

and hire cars. This means the initial quote is not produced with all availability checked: it is only as the agency receives deposits that they will confirm products. Second, the customer may want to make changes, sending in a revised plan so that the itinerary needs redeveloping. When the full balance is paid the holiday is sold and the transaction is closed (4).

An important aspect of the simplified transactional model is that it allows us analyse how user experiences affect the work process. In the following sections we show how user experiences, from both customer and agent perspectives, impact the creation of inputs and outputs, and hence the success of the work process as a whole.

2.2 User experiences

The agency we worked with, in common with many others, prides itself on being able to provide expert personal service to its customers. Agents are highly trained not only in how to put holidays together but also how to advise customers in engaging and persuasive ways, often using their personal experiences abroad to describe and recommend products.

The work process is designed for this experience to be available to customers. In terms of the transaction, it is crucial that agents are able, as far as possible, to deliver it at first contact - *i.e.* during the approach stage – because the plan developed here is the foundation on which the transaction is built. It is important that the plan is actionable (*e.g.* there are no problems with the products no longer existing, or timings wrong, *etc.*) and that the customer is happy with it, in order for the agent, who works for commission, to be confident there is likely to be a sale. However, the systems and interfaces used to put plans together, and the kind of customer and agent experience they are associated with, mean this stage can be problematic.

2.3 The customer experience

Working around the system

When a customer visits an agency they may have some ideas about what they want to do, but these are often vague. However, queries from the agent are specific, focussing initially on where they want to go when. In fact, agents use a ‘query structure’ which reflects the order in which they plan the product. This mirrors booking order, starting with flights, moving to hotels, and finally land sales. Agents use this order because it is a feasible planning model given the IT systems used, form-based applications front-ending databases that are queried using codes which need to be specific for information to be re-

trieved. These systems do not support general querying or browsing. Entering codes is time-consuming especially where options need to be compared. Further work is incurred by the need to cut and paste results into a separate system, a customer booking form.

What this means is that the customer is immediately asked for specific decisions. However, these can be hard to make without access to the information held by the IT systems. This information is not designed for customer use and the physical arrangement of people and technology reflects this: when a customer sits down with an agent, the two parties sit on either side of a desk. The agent’s PC is turned away from the customer facing him/herself (see Figure 2, below). The experience for the customer, then, is interview-like and it can be difficult to negotiate the questions. In practice what the agent needs to do is present options that the customer has to memorize.

Talk as the representational medium

An important issue at the approach stage is that while the agent can see, as well as talk about, information, the customer does not usually have visual cues: for him/her, the tour is represented verbally. However, this can lead to difficulties. Talk is ephemeral: to keep track of a topic, participants need to remember what has been said, and in complex trip-planning this can quickly become challenging.

For example, the customer may say s/he wants to visit the US, South Africa and Australia in that order, and the agent, entering the information into his/her PC, retrieves results enabling them to verbally quote various alternative flight packages with different stop-off options. Trying to weigh up the alternatives in the head can make it difficult for the customer to confirm on the spot, or to be able to deal with further questions asked when a decision is made, since this involves remembering the details of the package. The approach stage frequently comes to a halt at this point, with the customer requesting a written summary. Because talk represents the product, it is difficult to build, and this can lead to a concentrated but confusing customer experience.

Social awkwardness

Problems with creating a tour plan during the approach stage can arise from the design and positioning of the interface, and pressure on the representational modality (talk). On top of this, there are social interactional issues to do with sharing and evoking information interpersonally.

The two parties face each other as strangers. This kind of mutual orientation is intimate, but the parties have no particular method of ice-breaking at a time

when they may need to negotiate emotive questions which may be difficult to ask and/or answer, including, for example, ‘How serious are you?’, ‘How much do you have to spend?’, ‘How old are you?’, or ‘Have I exceeded my budget yet?’.

At the same time, during the approach stage, direct gaze alternates with aversion of gaze, because the agent needs to ask questions, and then to attend to his/her PC to input and retrieve information. This can be socially confusing, since two contradictory meanings are alternating: ‘I am paying attention to you’; and ‘I am doing something else’ (Goffman, 1959). In some activities the mix of attention and disattention has become conventional and is accepted by clients, for example medical consultations (Greatbatch *et al*, 1993). However, this does not seem to be the case for sales transactions where customers can become impatient and even interrupt what the agent is doing.

Another means of communicating face-to-face is gesture. Gesture can signal emphasis, hesitation, anxiety, satisfaction, and so on (Myers, 2000). It can also be used to point things out, or to ‘draw’ something ‘in the air’. Again, in the interactions we saw, this can become ambiguous. Agents may point and ‘draw’ on the basis of information they have, but the meaning of this may not be clear to the customer, as s/he does not have access to the same information. Equally, customers may produce meaningful gestures which are not being attended to because the agent is looking at the PC screen, *e.g.*, as in Figure 2 (a) and (b), the customer’s head-move to regain attention, as well as the (slightly perplexed) resting of the head in the hand.



Figure 2: Aspects of the customer experience.

Misunderstandings like these can create social awkwardness at a time when it is already difficult to collaborate. Thus, the social situation can limit what or how much information the customer volunteers, its quality, and its usefulness as input for the transaction.

2.4 The agent experience

We have concentrated on the customer experience, since many issues to do with creating input to the work process are to do with problems the customer has at the approach stage. But what is the experience like for the agent?

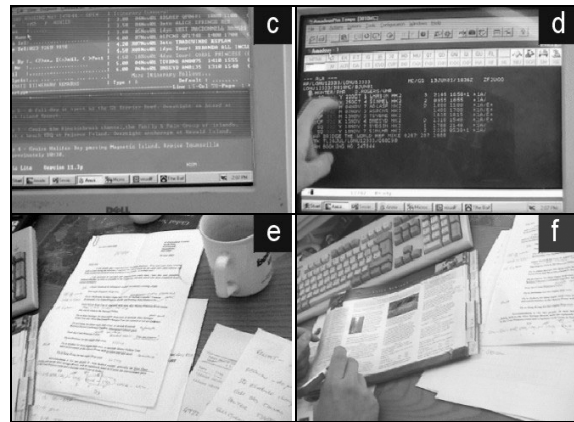


Figure 3: Aspects of the agent experience.

During the approach stage, the agent is involved in a complex of activities: asking questions, entering codes, retrieving results, explaining and suggesting. S/he must appear pleasant, expert and professional. However, such ‘demeanour work’ can be difficult to sustain (King & Randall, 1994). The multi-tasking involved in attending to the customer whilst using the system can undermine it.

Figure 3 shows some further aspects of the agent experience. S/he works with two systems, a booking system (c) and a fares database (d). The two systems have to be manually coordinated through cut and paste. Thus, (c) shows an itinerary being built from queries to (d). Meanwhile, this is being coordinated with a customer plan, sent in after pre-planning (e). The plan is covered with agent annotation as s/he tries to make sense of it. The example demonstrates some of the issues of attempting to move directly from a pre-planning to a development stage: the agent does not know which brochure(s) the customer has used, and is unfamiliar with some of the products. The image (f) shows the agent searching. At the same time the plan is chronological, where agents need to work with product orders, necessitating a ‘translation’. During development stages like these, agents may need to call customers and attempt to establish more easily actionable possibilities, such as those with which they are familiar and which may be easier to implement through face-to-face consultations at the approach stage. The agent experience, then, is one of trying to create actionable plans in a

context that requires complex juggling of information in different media in response to different kinds of demands – from the customer and from the system. Because development represents many hours of work with these types of issues as the norm, agents make decisions during the approach stage about costs and benefits and do not progress unless a sale is looking fairly definite. Rather, they refer work back to the customer. This means, again, that approach stages can be unsatisfactory for customers.

2.5 The impact of user experiences

Earlier on we defined ‘user experience’, in addition to interface usability and related feelings, as the quality of social interaction that goes on around a system. This can be highly important where the result of the collaboration is needed for the next stage of the work process.

As we have seen, the user experience at the approach stage of a sales transaction is disparate. It can mean the succeeding work process (*i.e.* the remainder of the transaction) is compromised. It may never start at all, and there can be a need for verbal repair work. The customer experience is limited in that s/he is only vicariously involved in using the system. However, equally important are the kinds of social experience the system is associated with. As we have seen, its design, placement and accessibility can give rise to lack of information to work on, and difficulty in representing what is being discussed. Social awkwardness can occur, relating to confusion of social meanings associated with attention, gaze and gesture. These aspects of the user experience have a crucial effect on the work process because they can spoil the quality of the input to that process, and also the ability to use it effectively later on.

3 Designing a New User Experience

Struck by how unsatisfactory the existing user experience can be, and its effects on the success or failure of completing the transaction, we decided to design a new user experience aimed at more effectively supporting collaboration.

3.1 Design rationale

We considered not only how we might design a better interface, but also how the physical set-up of information and collaborating parties could change the way customers and agents interact when they first meet. Our design was intended to enhance the user experience for both parties both at the interface and in terms of their social interaction, by means of:

Putting users in control

- by allowing both agent and customer to interact with the interface;
- by providing an intuitive interface, removing the need for queries in the form of codes;
- through facilities for saving, reloading and editing that reduce the need for activities like translation and searching;
- by empowering customers to contribute, and agents to do what they are good at: describe and recommend products.

Providing rich representations

- through shared information visualizations of the holiday both agent and customer working together can use to plan a trip;
- that allow rapid creation of meaningful content;
- that take the pressure off the verbal medium.

Reducing social awkwardness

- through setting up a new physical arrangement of technologies, changing the way the customer and agent sit together and collaborate;
- by creating better means of ice-breaking and negotiating emotive questions;
- by enabling agent and customer to interact in more natural, socially familiar ways.

3.2 How it works

Our prototype system is shown in Figure 4. It consists of three interlinked components: an interactive planner ((a) front left, and (b)); budget and timeline visualizations ((a) front right, and (d)); and electronic versions of brochure pages ((a) back, and (c)). These are embedded in a custom-built table. The visualizations and interactivity are designed to be as intuitive as possible. The multi-display architecture was developed to be able to deal with the variety of representations and screen estate needed for this type of planning.

For prototyping purposes we limited the planner to one continent, Australia. To use the system, users drag and drop different product types onto and between destinations. When connected to destinations, products fly out dynamically constructed menus which list the options available there (*e.g.* all the hotels). Selecting an option brings up appropriate brochure information, and menus can be used to enter requirements, for example date and number of people. The costed result, produced through automated queries to the agency’s databases, is inserted into the budget and timeline visualizations. Tours can be edited through adding, deleting or inserting, in any order, and at fine levels of detail by zooming into destinations. The itinerary can be represented

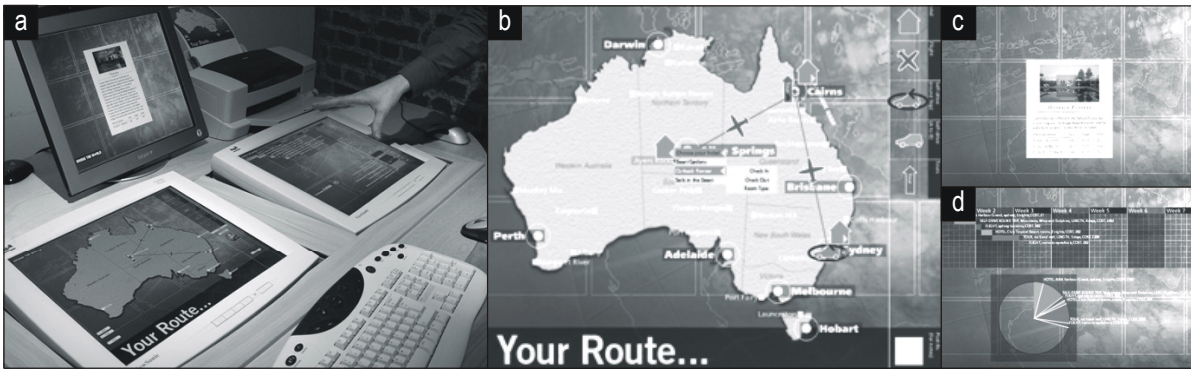


Figure 4: Planner (a); main screen (b); brochure display (c); budget and timeline (d).

textually as well as visually and printed as a customised brochure that customers can take away.

4 Observing the New User Experience

In order to evaluate the new user experience and assess how acceptable it was to agents and customers, we decided to try it out at a real life event – an international London trade show where there would be a diversity of customers and agents available. Many thousands of people passed through this event over its four-day duration and we had ample opportunity to see how new user experiences could support work processes, and what issues of resistance might arise.

4.1 Findings

Putting users in control

One major finding from our study is how far the existing systems are associated with restrictive ways of doing things: product orders, verbal query structures, the need to translate customer input into database queries and re-translate the results back to the customer. All of this is time-consuming and effortful, creating social situations which are not much fun and can be confusing; as well as limiting the value of plans for the remainder of the work process. One of our main design aims was to create a less restrictive system which could involve customers more, and release agents from the need to do complicated computational work at a time when they need to advise and persuade.

One finding was that both customers and agents took to the system readily. Interactivity was mastered quickly, to such an extent that it was hardly commented on. The configuration of products, as well as the need look at different screens to see costs and times, or brochure information, appeared to present no special problems. Agents were impressed by

the way the system did computational work for them by removing the need for queries, and presenting information dynamically according to product and location. What this suggests is that agents need not be resistant to new systems if they enable them to do their jobs in ways which are intuitive and save work. The system reduces the need for search, and there is no need to manually construct itineraries through cut and paste across different systems. The system also supported agents' demeanour work. Because agents did not need to switch attention and verbally translate information to customers, there was less work involved in presenting themselves in a helpful and professional manner.

Providing rich representations

Another design aim was to create rich content allowing more effective planning. Neither party had difficulties in understanding how the system worked. Trips could be visually constructed quickly and easily. The shared creation of content had several effects: to reduce cross-purposes and repair work; to get the two parties onto the same topic; and to reduce divergent planning strategies.

The visual creation of the product had effects on conversation, which was freer-flowing and better coordinated. Conversation was less prone to lapses due to memory problems, and the disattention involved where the agent switches attention to his/her screen. The mix of two modalities, verbal and visual, seems to have enabled easier, more natural social interaction.

Another effect of the planner was that customers could get a vicarious experience of their holiday, which had the effect of drawing them in. Customers were engaged in ways which are not possible with the current arrangement of technology.

Reducing social awkwardness

A further design aim was to reduce social awkwardness. We felt that changing the physical set-up could help with this.

When agent and customer sat together side-by-side, rather than face-to-face, with shared representations to look at, they did not need to look directly at each other. This had a range of effects. What we found was that by improving content, the two parties immediately had a topic of discussion, and this acted as an ice-breaker. Gaze behaviour was less confused as well as more meaningful. We saw synchronization of gaze (Figure 5 (a)) as well as shared gaze shifts which were seamless – both parties appeared to know where to look.



Figure 5: Part of the new user experience.

We also observed less ambiguous use of gesture. The customer in Figure 5 (a) is using gesture to point out what he is discussing and drawing the agent's attention toward it. In addition, the two parties would often 'draw' different alternatives by gesturing in the air.

Social awkwardness was also reduced in that, because the customer could control the planner and edit the trip, there was less need for emotive questions. Budgets, for example, are self-revealing through the planning process.

The physical set-up, then, together with the information displays, creates a different kind of interaction where social awkwardness is reduced by creating meaningful content to concentrate on, and reducing the need for strangers to fill each other's visual field. This enabled the two parties to relax and even joke (Figure 5 (b)).

Taking it to the next stage

At the trade show the agency had a networked system allowing their normal work processes to proceed. We were interested to see whether output from the planner could be used as input to this process. We saw a number of customers taking print-outs from the planner to agents working with the standard system. This had two effects. First, it showed that customers were serious, a key decision agents need to make at first contact. Second, the fact that the plans were actionable, having been produced on the back of agency databases, meant that agents were able to confirm that they would send out full quotes. Because work had already been done for them, agents' demeanour often became relaxed and

chatty, making for a congenial customer experience. This suggested (a) that the use of the planner can make the approach and development stages of the transaction easier to negotiate; and (b) that it can effectively support the transition from the approach stage to the development stage.

5 Discussion and Conclusion

In our research on two-party collaborations in sales settings, we have found a range of problems to do with the early user experience. These can compromise the ability of customers and agents working together to create the plan which is used as input to the work process. This, in turn, can affect the success of that process. We saw an opportunity for a new form of support for collaborative work: creating new user experiences which support the work process, without needing to make any significant change to the process itself. In so doing we aimed to alleviate problems of resistance, which often occur where people have to do things in new ways that interrupt what they are used to, creating learning overheads, new responsibilities, and so on.

Our research has involved redefining and expanding the concept of user experience. Starting out as a usability term, 'user experience' now encompasses feelings at the interface, including whether it is helpful, entertaining or aesthetically pleasing (Preece *et al*, *op. cit.*). Recently, Norman (2002) has introduced the idea of emotion in design, suggesting that affective factors are at least as important as usability considerations. There is a further dimension to user experience: the interpersonal. User experiences in co-located collaborative settings involve not only the usability of interfaces and feelings about them, but also the social interaction that occurs around, and is mediated by them. Here, other factors become important. Mutual understanding, empowerment, trust, confidence, congeniality and naturalness are just a few.

By concentrating on the user experience in these sorts of areas we have gone some way to showing how a work process can be improved without needing to look, first, at changing that process - and risking problems of resistance. Our research shows how the use of legacy IT (not initially designed for collaboration) can lead, in social settings, to interruption of social meanings and practices that people are familiar with. In the current set-up, conversation is limited by basic issues to do with memory and lack of access to content. There is turn-taking confusion; and resources like attention, gesture and gaze are rendered ambiguous. By restoring these cues, as

well as concentrating on what is conventional and intuitive at the interface, we have gone some way toward creating a system that appears readily adoptable because, although both agent and customer are doing things in different ways, the changes are to do with improving the interpersonal user experience on which the work process depends. The interaction is more natural, the two parties understand each other better and are empowered to meet their own as well as the other's needs; and trust, confidence and congeniality are enhanced.

Often, computer support has been implemented in an incremental and evolutionary way, to avoid people being upset by change. Workplace studies may recommend limiting change because the process is already functioning reasonably well. This can make it difficult to envisage or design for new ways of doing things, a problem (a) where the process may not be optimal and (b) at a time when there is great interest in technological innovations and their possible advantages, including pervasive computing, and new kinds of display arrangements which can engender new kinds of interactions. Our research suggests that improvements in the work process can be brought about by looking at how to design new user experiences. These can be accepted with little resistance where people are empowered to do what they need to do while remaining able to depend on working and social practices that they already know and trust.

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