Bridging the Gap with a Remote User

PAPER SUMMARY

Topic Category:	Usability method implementation or adaptation
Presentation Type	Overview of a concept, philosophy or methodology
Intended Audience:	Topics for People Who Are Experienced in Usability but New to the Topic Topics for People Who Are Experienced in Usability and the Topic Friends and Allies
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YOUR BACKGROUND IN THIS MATERIAL

The remote testing methodology presented here has been successfully implemented in several enterprise application user interface design projects by user experience engineers from the author's organization. The business case study presented is one such example of a successful implementation. This methodology has resulted in a significant reduction both in project costs and schedules. The ability to test with a wider user population and the collaboration of usability professionals, product teams and users in different geographical locations are the other benefits of this methodology. It has evolved over the past year and is continually being improved.

PREVIOUS PUBLICATION OR USE OF THIS MATERIAL

This material has not been published before.

ABSTRACT:

A remote usability testing method that has successfully been used in the design process of enterprise software applications is presented. This paper explains how choosing the right tool facilitates testing multiple users in different geographical locations which results in significant saving for an organization in terms of time and money.

INTRODUCTION

Remote usability testing is becoming more pervasive in our industry. This is driven primarily by efforts to find more cost effective User-Centered Design (UCD) techniques, by an improvement in broadband technology and infrastructure, and by an increasing number of global customers and development organizations. Traditional usability evaluation methods of visiting customer sites or flying customers onsite are still immensely valuable. Companies however, are trying to keep their budgets down with an eye toward increasing their Return of Investment (ROI) and staying competitive in the marketplace.

Although pervasive, remote usability testing is still a nascent field. Organizations do not rely solely on this method as a means of data collection primarily due to the non-availability of a single all-encompassing remote testing technology. The paradox is that several remote usability technologies exist in the market, but a single comprehensive solution is lacking. Every available technology has potential shortcomings which makes remote usability studies a challenge. Therefore choosing the right remote usability tools and infrastructure becomes vitally important.

What is the methodology involved to select the right remote usability tool? That question is answered in this paper where various commercial remote usability technologies were evaluated against several criteria. The criteria chosen were generalized with the intention that these findings can be used by other organizations in determining their specific need. One of the key criteria was selecting a tool that that did not compromise the quality of data collection.

Experimentation with the selected remote usability tool showed that this was not a one-stop solution. The tool had to be integrated with other technologies to arrive at a complete remote usability infrastructure solution. This solution helped in replicating a traditional usability evaluation.

The remote usability infrastructure solution is discussed in this paper. This solution has been used in several enterprise application design projects. A case study is presented in which the chosen remote usability solution is utilized in a user interface evaluation of an enterprise portal application where team members and customers were in different geographical locations. A complete cost and benefit analysis and lessons learned from this study are also presented.

METHODS

An evaluation study was performed to determine on the right remote usability tool suitable for the organization. This involved evaluating various commercial remote usability technologies against several criteria.

Two usability professionals put together a list of criteria that centered around two important facets:

- Replication of data collection quality from a traditional usability evaluation
- Technical and financial feasibility for the organization

Each criterion is presented below with a series of supporting questions. These questions were used to gather data when evaluating the tools against specific criteria. The key criteria included the following:

Cost

- Does the cost of the tool fit the budget of an organization?
- Is the tool already available in the organization and can it be reused?
- Will the cost cover customer support?
- Is the cost calculated on a per license basis or on a time basis?

Client Install Required

- Does the user have to install the remote usability product on their machines?
- Does the user have to download a plug-in?
- Will the download interfere with a user's computing environment?

Ability for a user to access application remotely

- Can a user access the tool remotely using a Uniform Resource Locator (URL)?

Color

- Does the tool have the ability to offer a minimum of 256K color with a True Color maximum?

Two-way Control

- Does the tool allow a test administrator to control a user's screen?

Operating System (OS) Support

- Does the tool have a multi-platform offering?

Records Sessions

- Can the tool record audio and video data?
- Is the quality of the data recorded acceptable for distribution within an organization?

Accessible through a firewall

- Can a user gain access to a tool across company firewalls?
- Does the tool require ports to be opened to be accessed?

This methodology was implemented to find a tool suitable for conducting remote usability studies in the organization. Experimentation was carried out with the selected tool to find out if it would suffice in providing a complete one-stop infrastructure solution. If it was deemed not to be a comprehensive solution other add on technologies would have to be evaluated. That formed the second part of the study.

REMOTE USABILITY ACTIVITIES

Traditional usability activities such as usability tests, usability evaluations, design reviews and heuristic evaluations usually take place in a lab or at a customer site. A remote usability activity simply means performing the same traditional usability activities with members of the project team and the user in different geographical locations.

Krauss [2] has summarized remote usability activities into four distinct types:

(1) Real-time design walkthroughs and usability tests

(2) Surveys

(3) Automated usage tracking

(4) Handling of user-reported critical incidents

This paper focuses on the first remote usability activity which will be referred to as a usability evaluation. A usability evaluation is a real-time task based design walkthrough.

EVALUATING REMOTE USABILITY TECHNOLOGIES

The evaluation consisted of gathering five commercially available remote usability technology products. The products chosen include Unicenter Remote Control 6.0, Microsoft NetMeeting 3.01, Microsoft LiveMeeting 1.09, WebEx 7.0.10 and GoToAssist 6.0. There are several remote usability technologies available in the market. Budget limitations restricted this study to five available technologies. The five remote usability technologies were either already available in the organization or could be downloaded for free on the web.

A test machine was set up in a lab for the purpose of the evaluation. Each tool was installed separately on the test machine. The tools were then put through a mock remote usability evaluation and rated against the aforementioned criteria. While the criteria to choose a tool can be generalized for any organization, the results of the evaluation may be organization specific.

Table 1 summarizes the various commercial tools evaluated against the selected criteria.

Table 1: Criteria vs. Remote Usability Technologies

Criteria	Unicenter Remote Control 6.0 *	Microsoft NetMeeting 3.01 *	Microsoft Live Meeting 1.09 / Placeware*	WebEx 7.0.10 *	GotoAssist 6.0 *
Cost	Available in the organization **	Default with Windows XP Operating System	Available in organization **	Either $200 per month unlimited usage per seat per concurrent user OR 30 cents/ minute	$500 per seat
Client Install Required	Yes	Yes	Yes	Yes	Yes
Access remotely via a URL	No	No	Yes	Yes	Yes
Color: Min 256	Yes	Yes	Yes	Yes	Yes
Two-Way Control	Yes	Yes	No – turned off by organization ***	Yes	Yes
Operating System Supported	Windows only	Windows only	Windows only	Windows only	Windows only
Records sessions	Yes	No	Yes	Yes	Yes
Accessible through firewall	No	No	Yes	Yes	Yes

* Tool has already been purchased by the support group in the author's organization and is already available

** Trademark or registered trademark of Computer Associates, Inc., Microsoft Corporation., Keynote Systems Corp, WebEx, Corp, Citrix Corp.

*** Requires bi-directional ports to be opened. This was turned off at the author's organization.

Based on the results of the evaluation, it was decided that the GoToAssist tool was best suited for the organization's need. Several mock remote usability studies were then conducted with the selected GoToAssist tool. These studies were conducted with internal users both within and outside the organizations firewall. This was done to determine if the GoToAssist tool would suffice as a complete remote usability infrastructure solution. The results of the studies showed that there were several other technologies that needed to be used in conjunction with the GoToAssist tool. A case study is presented where the complete infrastructure solution is explained and then used in the remote usability evaluation of an enterprise portal design solution.

CASE STUDY: AN ENTERPRISE PORTAL WEB APPLICATION REMOTE USABILITY EVALUATION

Enterprise Portal Design

The next release of an enterprise portal web application underwent a typical User-Centered Design (UCD) process. This involved performing customer interviews to gather user interface requirements and decide user roles and features. After the process flow and architectural diagrams were complete, storyboards were created. Interactive Hypertext Markup Language (HTML) role-based prototypes of the user interface were then created. A remote usability evaluation using the GoToAssist tool was conducted to gather feedback on those role-based prototypes. This was the first in a series of evaluations for this enterprise portal application design.

Composition of Team and Locations

A single evaluation administrator based in Islandia, New York conducted the evaluation. Two other usability professionals based in Princeton, New Jersey; and Hyderabad, India and one product team member in Framingham, Massachusetts participated in the evaluation as observers.

Geographical Distribution of Team Members and User

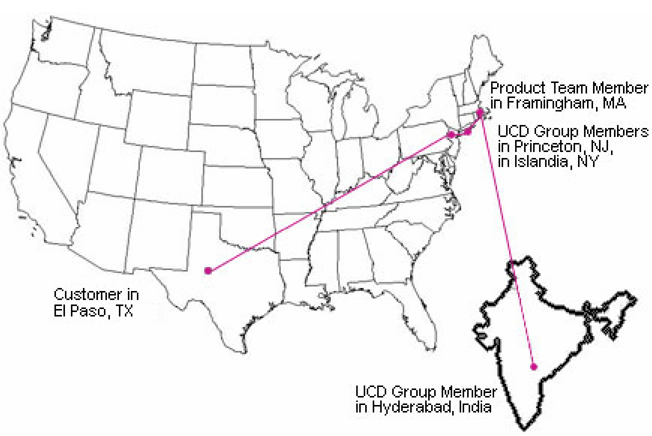

Figure1. Geographical distribution of product team and customer

Sixteen users from three customer organizations took part in the remote usability evaluation. These customers were located in seven different geographical locations including Waltham, Massachusetts; El Paso, Texas; London, England; Rochester, New York; Atlanta, Georgia; Stamford, Connecticut; and San Diego, California. These users had different roles in their organization. The appropriate prototype was to a user based on their specific role.

SupportConnect Portal

The author's organization has an existing SupportConnect portal (Figure 2). Every customer that requires support with an organization specific product is registered on this SupportConnect portal. Customers taking part in the remote usability evaluation of the enterprise portal were asked to register with the SupportConnect portal if they did not already have a valid username and password.

SupportConnect Portal Interface

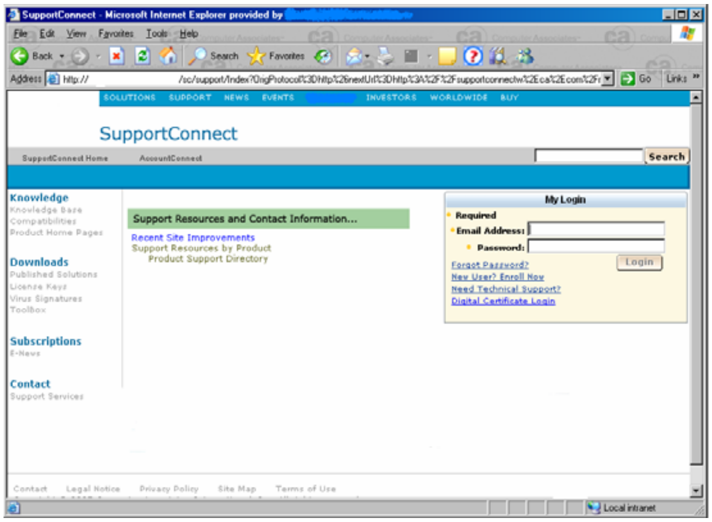

Figure2. Customer registration

Hosting the Prototype

To perform the remote usability evaluation, a customer had to have access to the role-based interactive prototypes. These prototypes were hosted on a server which ran outside the firewall of the author's organization. Security had to be provided which meant that only authorized users should be allowed access to the prototypes. This security was enabled by associating the prototypes on the remote server with specific customer usernames on the SupportConnect portal.

Before the Evaluation

Instruction Email

An instruction email was sent a few days before the remote usability evaluation to participating customers. This email had teleconference information, GoToAssist tool information, SupportConnect URL and the remote usability server URL. A Non-Disclosure Agreement (NDA) and an Informed Consent form were attached to the email. The NDA is a legal document that asks customers not to disclose product designs to competitor companies. The Informed Consent form explains to customers that audio and video information will be captured during the evaluation. This involves recording customers' screens and capturing their audio conversation. By signing the NDA customers gave their prior consent to being recorded during the evaluation. Customers were asked to sign both forms and fax them back to the usability evaluation administrator prior to the start of the evaluation.

User Tasks

Tasks that customers had to perform were emailed only a few minutes before the start of the remote usability evaluation. Customers were asked to print a copy of the tasks and keep them handy for the evaluation. To prevent them from familiarizing themselves with the tasks beforehand, they were requested not to read them.

Audio Conversation

The audio portion of the evaluation was facilitated using a teleconference number. The teleconference number for domestic US customers is a toll free number. International users have to use an international teleconference number. The teleconference system had an interactive menu to record audio conversations. These files were made available by the teleconference company for a small fee.

During the Evaluation

Opening minutes of conference call

The UCD group and the product manager dialed into the teleconference number a few minutes prior to the start of the remote usability evaluation. The evaluation administrator asked all other team members to mute their phone for the duration of the evaluation. The evaluation administrator started a NetMeeting session on his own computer. The other UCD group members and the Product Manager used the NetMeeting session to view the evaluation administrator's computer screen. The evaluation administrator used the GoToAssist tool to view customers' screens. Users were greeted by the evaluation administrator as soon as they dialed into the teleconference number. Users were specifically told that there were other project members on the call. The evaluation administrator thanked users for faxing the NDA and the Informed Consent Forms. The evaluation administrator then walked users through the GoToAssist set up. A remote usability evaluation was conducted with individual users just like a traditional usability evaluation.

Establishing a GoToAssist Session

Users were asked to open the instruction email and click on the SupportConnect URL. They were then asked to choose a "Usability" portal. They then clicked the Next button and were taken to another screen where they were asked to enter their initials. The evaluation administrator then gave them a code (Figure 3) over the phone which they were asked to type in. Once they entered the code they had to download a small plug-in. Their screen sharing session then began. Customers were asked to provide full access to their keyboard and mouse to the test administrator for the duration of the evaluation. The evaluation administrator was now able to see the customer's screen. The other project members could view customers' screens via the evaluation administrator's screen.

Code Management Dialog

Figure 3. Code given to users

GoToAssist Full Access Dialog

Figure 4. Granting full access

Product Prototype Access

The evaluation administrator asked users to click the remote usability server URL. Users had to use their SupportConnect username and password to enter this site. They were then presented a number of prototype URLs called Prototype 1, Prototype 2, and Prototype 3 etc. Access to a specific product prototype URL was granted based on user roles (Figure 5). The enterprise portal ran on a Tomcat server.

Enterprise Portal Application

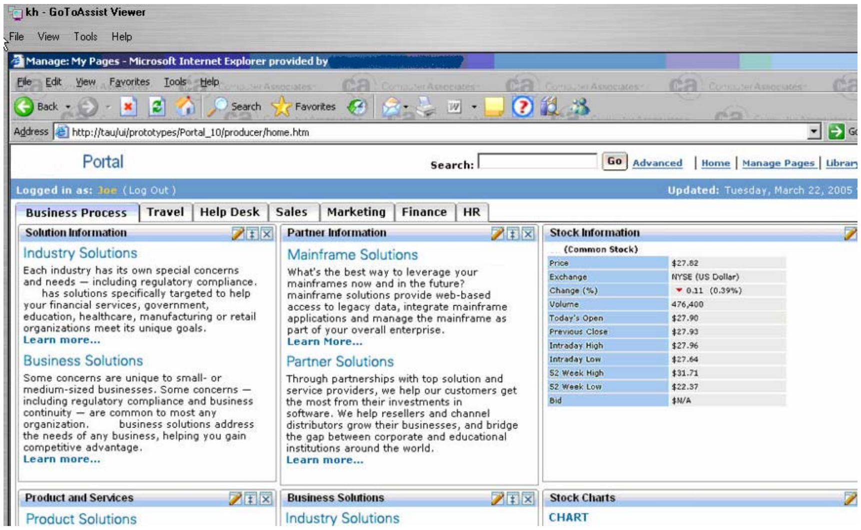

Figure 5. A user's screen as seen through the GoToAssist tool

Recording the Evaluation

Once customers accessed the product prototypes, the evaluation administrator started the recording. This involved recording their screens and the audio conversation. Customers were verbally told that the recording was about to start and were requested to turn off applications that had confidential information. The evaluation then proceeded like a traditional usability evaluation.

Cost Analysis of this Remote Usability Method

A previously completed traditional usability evaluation of another enterprise application was analyzed in terms of cost. One UCD group member visited two domestic customer locations. Only eight users could participate in that evaluation. The entire exercise took about ten business days and travel costs alone were about $5000. Because of prohibitive travel costs only a single UCD group member could travel to the customer sites and the product team could not participate in the process.

Sixteen users in seven customer locations spread across two continents participated in the remote usability evaluation of the enterprise portal. This exercise was completed in one business week. Three UCD group members and a product team member also participated in this process. If this test had to be conducted traditionally it would have taken about five business weeks. Travel costs for the entire team would have been in the region of $75000 which is a conservative estimate. This remote usability evaluation resulted in shortening the development cycle by four weeks and significant monetary saving. The additional time was better utilized to perform more design iterations and test with additional users. In addition, the remote usability evaluation enabled testing the interface with a diverse user population for different role-based prototypes. The initial expenditure for the remote usability infrastructure was negligible when compared to maintaining a traditional usability lab.

Advantages of this Remote Usability Method

As shown by the case study remote usability studies have a number of advantages. Krauss [2] has summarized the potential benefits of remote usability activities:

- There is significant saving in the budget of an organization. Expenses that are incurred in a traditional usability study such as cost of travel, infrastructure set up, lab maintenance, boarding and lodging for users are now non-existent.
- The time to complete a usability study is also greatly reduced. Usability studies can be set up at very short notice. More testing can be done in less time.
- There is no geographical limitation on the number of users who can participate. As a result a diverse group of users provide that extra dimension of feedback offering more validity to the process.
- Usability groups and product teams spread across the globe can now participate in a usability study in real time.

This remote usability evaluation conducted revealed some added benefits:

- Most users felt comfortable taking part in a usability study from their own desks. This removes the unnatural setting of a lab environment. A remote usability evaluation tests users in their actual work environment.
- In traditional usability studies users have to be physically brought into a lab. Due to this requirement they are often from the same geographical area. Applications are being used all across the world and need to appeal to a wider more international audience. Through a remote usability study users from different countries can participate thereby removing the cultural bias in product design.
- It is much easier to test role-based enterprise solutions due to quick and easy access to users.

Disadvantages of this Remote Usability Method

There are numerous challenges associated with conducting remote usability studies:

- A remote usability study involves observing users desktops as they interact with a product or a prototype. A few customers considered viewing their desktops as compromising the security of their organizations. This happened in the case of government and defense contractors. These users refused to take part in such a study.
- Users have different computing environments. Sometimes software installed on a users operating system or their choice of operating system itself prevented them from accessing the remote usability tools.
- As users perform the evaluation in their own work environment it is difficult to control external noise or distractions. Sometimes users talk to their coworkers, answer emails or instant messages during a usability study. The test administrator has little control over a user in such situations.
- As the test administrator cannot see users' facial expressions it is difficult to gauge their reactions at times. Relying solely on a telephone conversation as a means of communication may not be the best indicator and could skew results.
- Tasks are emailed to users a few minutes before an evaluation. Users are asked to not read the tasks before the start of the evaluation. This is only a good-faith request and there is likelihood of users reading the tasks when printing them out. This is another factor that could possibly distort results.
- International users are sometimes reluctant to use the teleconference number as it involves making an international call. In this case, as the test administrator has to call the user outside of the conference system a remote usability study cannot be recorded.
- This remote usability method has only been tested for web-based applications. More research needs to be carried out to perform usability studies with non web-based products.
- As the usability study is being conducted over high bandwidth networks there is loss of quality when recording such a study. Although several commercial usability tools

are available there will always be loss of recording quality when streaming data is being recorded in real-time.
- The recording tool provided only 16-bit color support. More research revealed that 24-bit color support would be required to maximize color quality.

Recording Challenges using the GoToAssist Tool

Collection of video data and archiving these results are an important aspect of a usability study. Results have showed that the GoToAssist recording uses their own native file format. The file format of the recorded files was overlooked in the criteria for tool selection. Combining audio data from the teleconference line and video data from the GoToAssist product in real-time proved extremely difficult. Project members in the organization had to have a GoToAssist player installed on their system to view these recordings. Distributing videos to various teams was even more challenging.

More research was carried out and Microsoft Live Meeting was used to record the GoToAssist recording to arrive at a single integrated video using Windows Media file format. Recording over an existing recording has resulted in a significant compromise in video quality. Recording usability studies and distributing those videos have significant technical limitations and needs more research. This facet alone can influence the choice of a remote usability tool.

Future Direction

This remote usability method has a number of advantages which have already been discussed. In a global IT world, with shrinking IT budgets this usability method has a significant role to play. Remote usability studies are a promising field in the Human Computer Interaction (HCI) world and will play a significant role in shaping the future. While there are plenty of remote usability tools in the market there is no single tool available that offers a complete solution. There is still plenty of work to be done in this field. However it is evident that remote usability is clearly the way of the future.

ACKNOWLEDGEMENTS

The author is indebted to his manager and the UCD group for their support.

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