

OKbridge Online Bridge Game Redesign Case Study

OKbridge, the world's largest online bridge club, has over 15,000 members in 100 countries. Members are online bridge players, typically over 50-years of age. Theo Mandel, Ph.D. was hired as the usability consultant to the OKbridge design and development team. Mandel worked closely with the Founder and CEO of the company, Matt Clegg, and his team to design, prototype and conduct usability evaluations during the design and development process.

This case study was originally published on the UCD Works website (www.UCDWorks.org). UCD Works was initiated and managed by the [IOP MMI](#), an Innovation-oriented Research Program Human-Machine Interaction funded by the Dutch Ministry of Economic Affairs, beginning in 2002. This website promoted user centered design by providing case studies of successful projects as the best way to demonstrate the effectiveness of a user-centered design approach.

Current Situation

The current application (OKwin) was introduced in 1995. The program followed a typical 1990's Windows application style, displaying a menu bar and toolbar, with a very simplistic graphic design. While functional, the program user interface was awkward and not extremely enjoyable to use.

Figure 1 shows OKwin's basic user interface. A chat area is displayed prominently below the menu bar and toolbar, allowing members to chat online and discuss strategy while watching and playing games. Online chat is an important component of OKbridge. When opening the program, the main "Lobby" area displays available tables and players the user can watch or ask to join to play. The right-hand area displays player and observer information for the selected table. Actions buttons (Options, Join, Serve, Refresh, etc.) are displayed along the bottom of the window and also in the toolbar at the top.

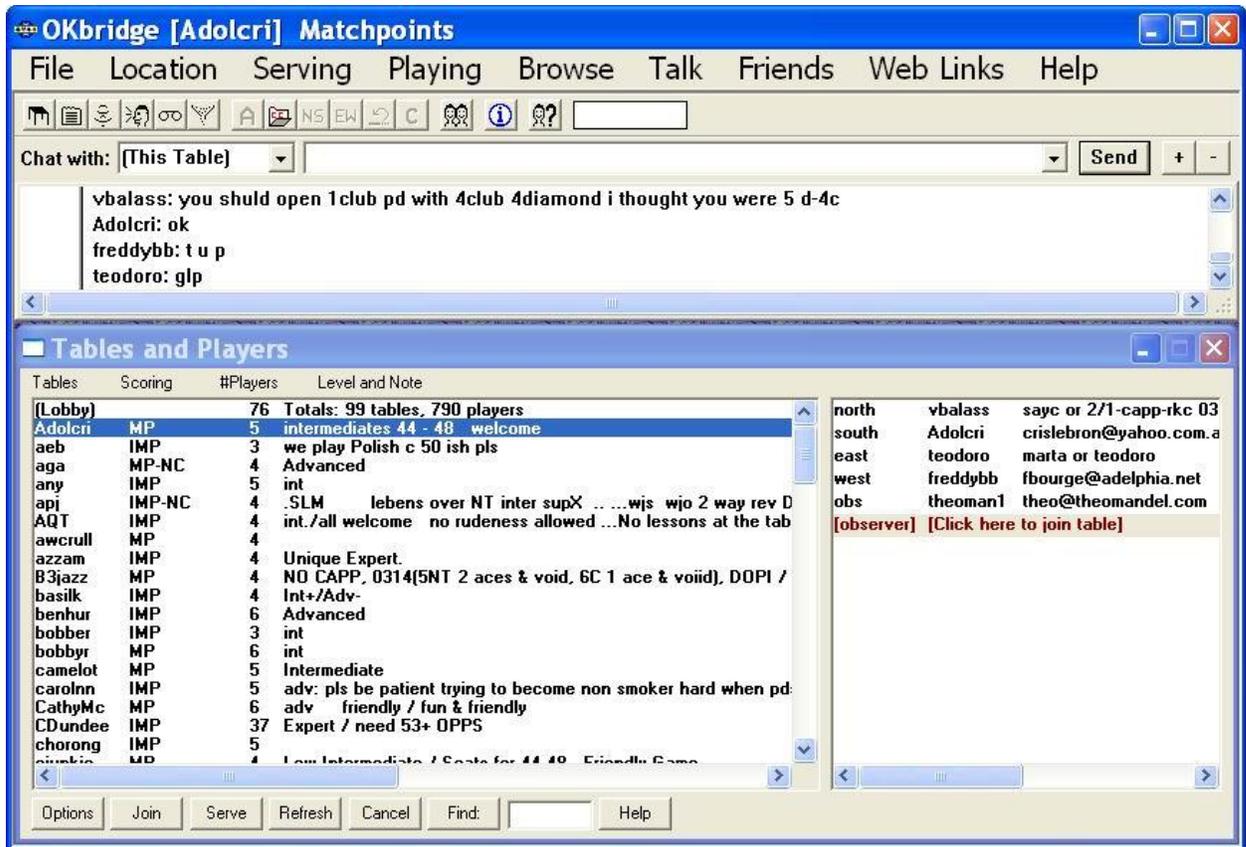


Figure 1. Tables View in OKwin

Figure 2 shows the program interface when watching or playing a game online. The main area now shows a game table with the four players and their hands. Each player is represented by an icon or a graphic selected by the user. Players will only see the appropriate hands (their own and the dummy's hand). Observers may view some or all hands. Cards played during the current hand are displayed in the middle of the game area. The game score is displayed in a gray box at the upper left corner of the game area. Game results are displayed in a pop-up window.

Examples of the application menu bar drop-down lists are shown in **Figure 3**. You can see that the standard application menu bar is not especially well-suited to playing cards. Users must be familiar with the Windows menu bar concept to play online bridge.



Figure 2. Playing or Watching an OKwin Game



Figure 3. OKwin Menu Bar Choices

The toolbar icons and descriptions are outlined below. As with many software applications, the icons are not easy to recognize or remember. Also, fifteen icons were found to be overwhelming for the novice user.

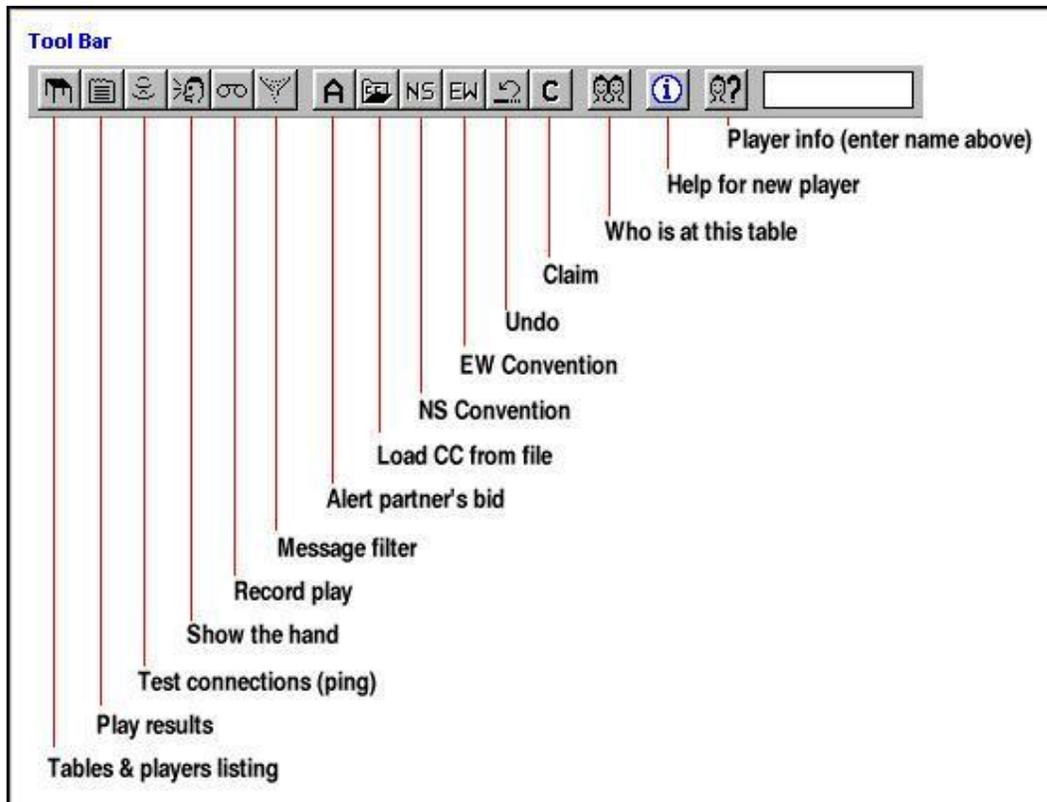


Figure 4. OKwin Program Toolbar Icons

Objectives

OKwin allows members to remotely play bridge any time of day or night, observe players and games of all levels, and participate in international tournaments. OKbridge's members are mostly older adults and are typically not computer-savvy or motivated to use computers. While OKbridge members aren't computer enthusiasts, they are all passionate about playing bridge. One member said,

"OKbridge is an exciting club in which to have a membership. I get to meet people from all over the world, play with my long-time friends even though thousands of miles separate us. Being a working person I love being able to play whenever I HAVE the time. No time constraints prevent me from enjoying a hobby I love. I can also practice for a tournament with a distant friend and be better prepared for the event when we participate because we have practiced beforehand. It is a great club and a wonderful concept. I am happy to be a member."

While functional, the program's interface was viewed by members as old-fashioned and awkward. OKbridge provides live help-desk support. This service is very much appreciated by members. One member commented, "I have wanted to tell you that,

as a 'computer know-nothing' I have to turn to many sites for help and nowhere do I get such prompt, courteous and effective help as at your help-desk. I have been a member for over 3 years now and I must have turned to you at least 30 times in the past. I do not remember an occasion when I did not get what I wanted." While appreciated by members, help-desk support is quite costly in an environment when users have minimal computer skills and rely heavily on program support.

With increased competition in the online bridge industry, OKbridge wished to improve program functionality, reduce use of help-desk support, and enhance the user interface and overall usability of the program. OKbridge management determined the key to expanding their membership base lay in creating an extremely easy-to-use and appealing program interface. They wished to enhance the experience for new members and first-time users while also designing an interface that current members will find pleasing. Finally, they wished to provide additional features that are important to expert players. The new program would also establish a stable platform for future software development. Since usability was seen as a critical component of the new program, a usability consultant was sought out to join the product design and development team.

Target Audience

OKbridge members are interested in playing bridge online for a number of reasons. OKbridge allows users to play remotely and individually, without having to travel or arrange games with other players. A powerful feature of the program is the ability to designate members as "Friends" to easily identify online players they enjoy chatting with and playing with regularly. Also, international usage allows users to play games and tournaments 24 hours a day across all time zones.

The bridge-playing population is made up of typically older adults. The average age of OKbridge members is over 50 years old, with many members in their sixties and seventies. This age group typically has a low level of computer and Internet skill and interest. Many users only use their computer to play bridge. Members are familiar and comfortable with the current OKbridge program, and will be resistant to changing software programs, in spite of the deficiencies of the current program and the intended functional and usability benefits of the new program.

There are two meaningful demographic dimensions in the OKbridge audience – bridge ability and length of membership. In terms of bridge ability, there are two important subgroups of members – **novice-intermediate** players and **advanced** players. A novice-intermediate player typically has played bridge for less than ten years and has fewer than 50 master points, and generally plays only the Standard American system. If they are not American, they play the predominant bidding system of their country. An advanced player meets at least two of the following criteria: (1) they have played bridge for over twenty years, (2) they are an ACBL Life master or have an equivalent ranking in their native country, and (3) they regularly play 2/1, precision or some other advanced bidding system.

A **new member** is someone who was not an OKbridge member prior to the introduction of OKplus. A **long-time member** is someone who was an OKbridge member for at least a year prior to OKplus. This creates a third category of members, namely those who are neither new members nor long-time members. The new design did not focus on usability requirements for this member category.

UCD approach

Theo Mandel, Ph.D., a usability and interface design consultant was hired to join OKbridge developers, working remotely in locations across the United States. Mandel conducted a complete user-centered evaluation, design and validation process. Heuristic usability reviews of the application and competitor's programs were performed. Users were interviewed to gather product requirements and an HTML prototype created. User evaluations were conducted on prototypes and the final product. Typical scenarios were performed and satisfaction ratings collected.

Usability Factors:

Four factors that make up usability (*Handbook of Usability Testing*, Rubin 1994) were utilized. These factors determine the appropriate areas to define and measure usability objectives. The four factors are:

1. Usefulness
2. Effectiveness
3. Learnability
4. Attitude

Usability objectives were defined for new and long-term members. Each objective was assigned a measurement technique for assessing whether the objective was met. Measurement techniques were:

1. **OKbridge server log data analysis** – assessing and analyzing online registration and program usage dates, usage times, time periods, and tasks performed using OKwin and OKplus programs.
2. **Web survey** – asking members satisfaction and usage questions based on audience types and dates/times of program usage. The web survey was conducted one month after completing the first playing session on OKplus. Data was collected during a 3-month period starting one month after the release of OKplus. A positive experience was defined as an average score of 3.5 or better on a 5-point scale.
3. **Usability evaluation** – in a representative environment, asking participants (based on audience types) to perform common registration and program tasks. Performance, errors and satisfaction data were collected. Usability evaluations addressed the usability factors in these ways:

Effectiveness
New Members
<p>Objective:</p> <p>At least 90% of new members shall succeed in playing a hand of bridge within fifteen minutes of being requested to do so.</p>

Learnability														
New Members														
<p>Objective:</p> <p>At least 90% of new members shall succeed in performing key OKplus features/tasks during a usability evaluation. Tasks and completion time objectives are:</p> <table border="0"> <thead> <tr> <th>Task</th> <th>Time Objective</th> </tr> </thead> <tbody> <tr> <td>1. Serve a table</td> <td>5 minutes</td> </tr> <tr> <td>2. Use convention cards</td> <td>10 minutes</td> </tr> <tr> <td>3. Browse results</td> <td>5 minutes</td> </tr> <tr> <td>4. Create a friends list</td> <td>3 minutes</td> </tr> <tr> <td>5. Compose and send a private message</td> <td>3 minutes</td> </tr> <tr> <td>6. View a player's profile</td> <td>2 minutes</td> </tr> </tbody> </table>	Task	Time Objective	1. Serve a table	5 minutes	2. Use convention cards	10 minutes	3. Browse results	5 minutes	4. Create a friends list	3 minutes	5. Compose and send a private message	3 minutes	6. View a player's profile	2 minutes
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6. View a player's profile	2 minutes													
Long-Time Members														
<p>Objective:</p> <p>At least 90% of long-time members shall succeed in performing key OKplus features/tasks during a usability evaluation. Tasks and completion time objectives are:</p> <table border="0"> <thead> <tr> <th>Task</th> <th>Time Objective</th> </tr> </thead> <tbody> <tr> <td>1. Serve a table</td> <td>5 minutes</td> </tr> <tr> <td>2. Use convention cards</td> <td>10 minutes</td> </tr> <tr> <td>3. Browse results</td> <td>5 minutes</td> </tr> <tr> <td>4. Create a friends list</td> <td>3 minutes</td> </tr> <tr> <td>5. Compose and send a private message</td> <td>3 minutes</td> </tr> <tr> <td>6. View a player's profile</td> <td>2 minutes</td> </tr> </tbody> </table>	Task	Time Objective	1. Serve a table	5 minutes	2. Use convention cards	10 minutes	3. Browse results	5 minutes	4. Create a friends list	3 minutes	5. Compose and send a private message	3 minutes	6. View a player's profile	2 minutes
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HTML Prototype:

A web-based HTML and JavaScript prototype was created to define the user interface and interaction aspects of the new program. A user interface specification accompanied the prototype to further define interface, interaction, navigation and graphic aspects of the program to be developed. The prototype was used to guide product development and for conducting user evaluations.

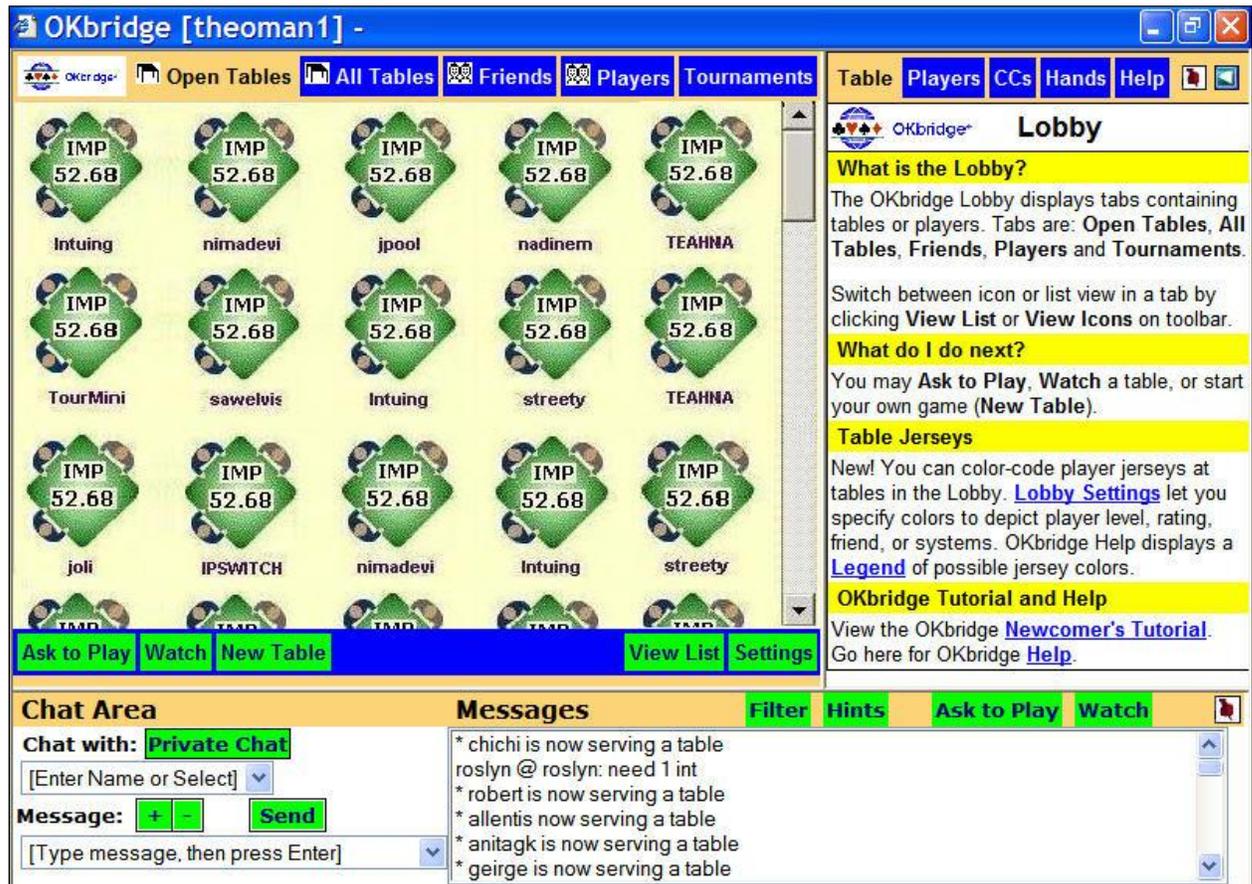


Figure 5. Tables Icon View in the OKplus Prototype

Figure 5 shows the initial lobby view of the application. Compare this interface with Figure 1 showing the same interface for OKwin. Notice that the new design does not display a menu bar or toolbar. Rather, each screen area displays action buttons for user interaction and tabs to navigate within an area. The information area on the right displays instructions and details for players and members. Each view of the lobby and tables offers both a list view and icon view of its contents (Figure 6).

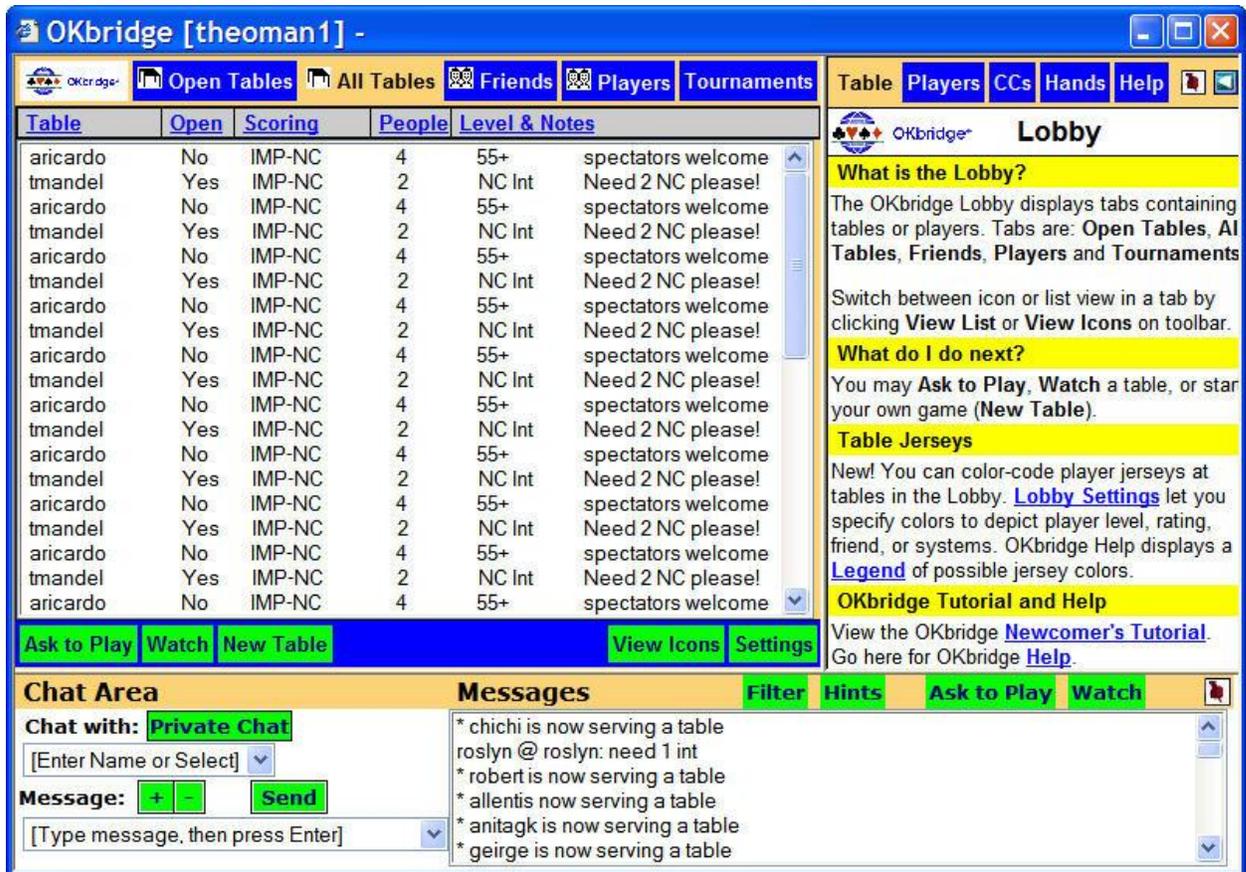


Figure 6. Tables List View in the OKplus Prototype

Figure 7 shows the prototype view for playing a game in OKplus. This view compares to the current program view shown in Figure 2. The new design utilizes screen space better to display the game area and cards. All appropriate user actions are displayed as buttons across the bottom of the playing area. The information area on the right displays details of the current hand and game.

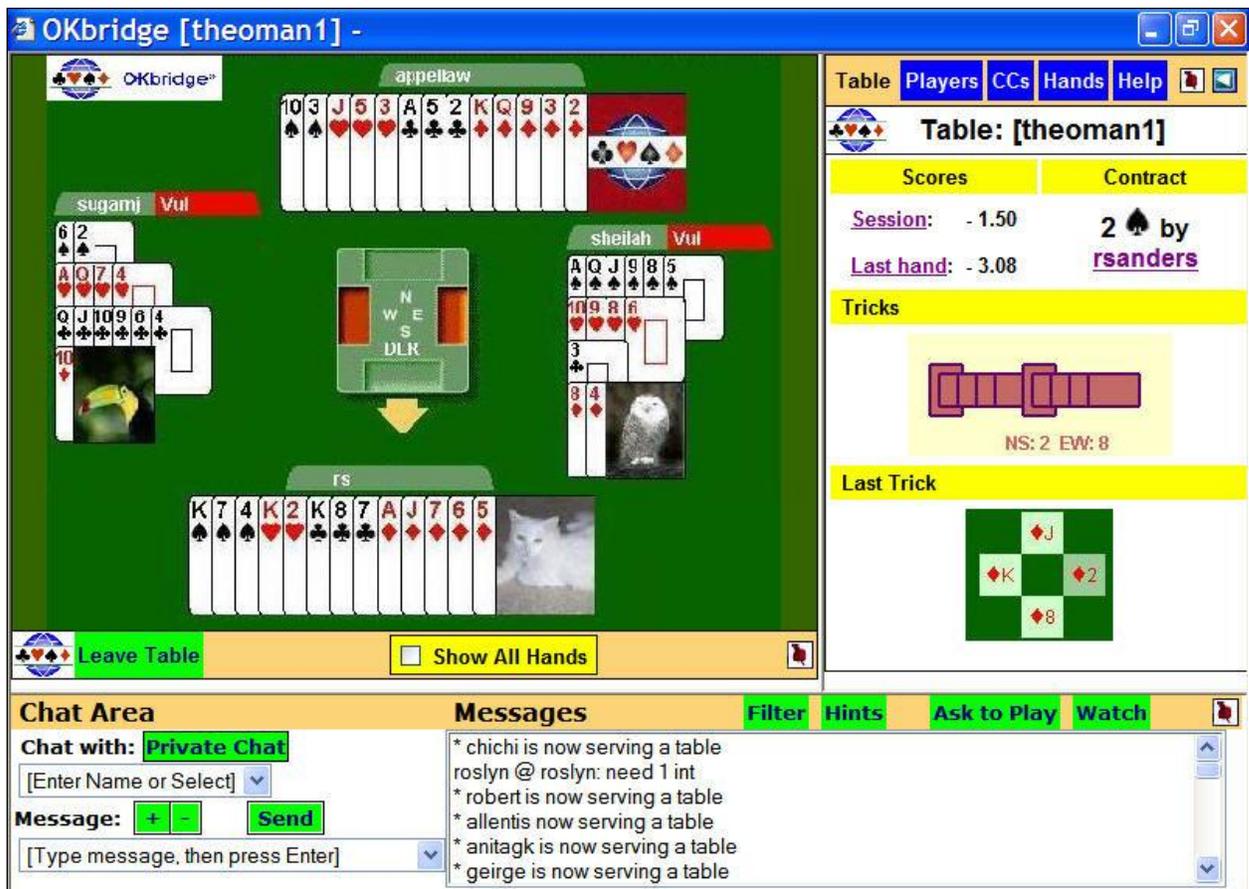


Figure 7. Playing or Watching a Game in the OKplus Prototype

User preferences are displayed in a pop-up dialog (**Figure 8**) where users can change settings for all aspects of the program. In the original program, OKwin, user settings were displayed in a dialog launched from the File menu bar list.

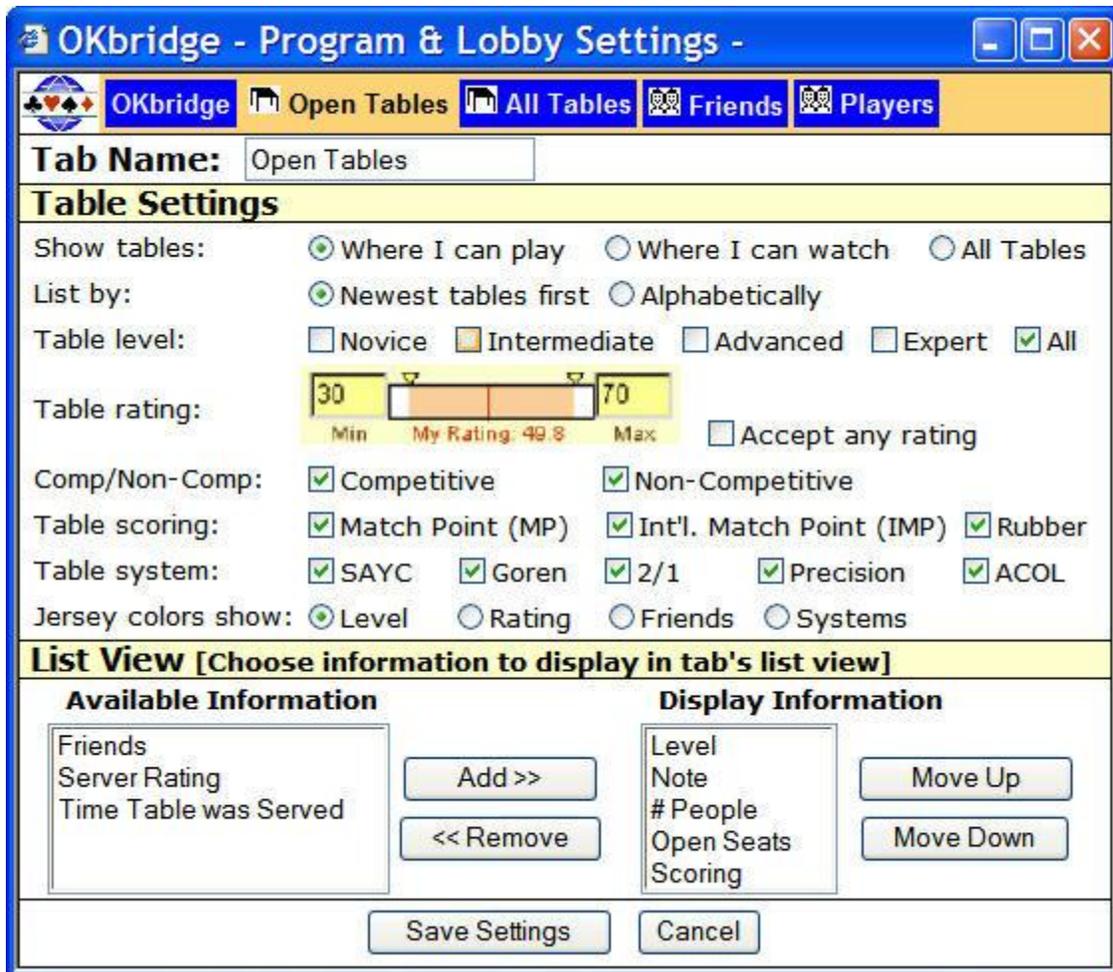


Figure 8. User Preferences Dialog in the OKplus Prototype

Test procedure

Heuristic usability reviews were conducted on OKbridge's and competitor's online bridge programs. A heuristic review assesses product design from the perspective of common industry guidelines and usability-based design, always with a user-centered focus. The heuristic review's deliverable includes a comprehensive report identifying product interface design and usability issues, problems, and recommended solutions. Usability issues are prioritized to help clients assess potential impact to the product's design and development efforts.

Iterative usability evaluations were conducted during the OKplus design and development process. Two user evaluations were conducted using the prototype, and two using versions of the program under development.

During prototype design, members were first asked to review (on paper) proposed screens and features from the new product as screenshots and provide feedback in the form of ratings and written comments. Later, users were asked to perform common tasks using the prototype.

Two rounds of user evaluations were conducted during development. Both evaluations asked users to perform seven common tasks and to provide feedback in the form of ratings and written comments. Task completion time, errors and satisfaction ratings were collected in user evaluations.

Final product

OKplus, a web-based version of OKbridge's online bridge game that works with any browser and platform with improved ease-of-use and advanced functionality, was unveiled mid-2004.

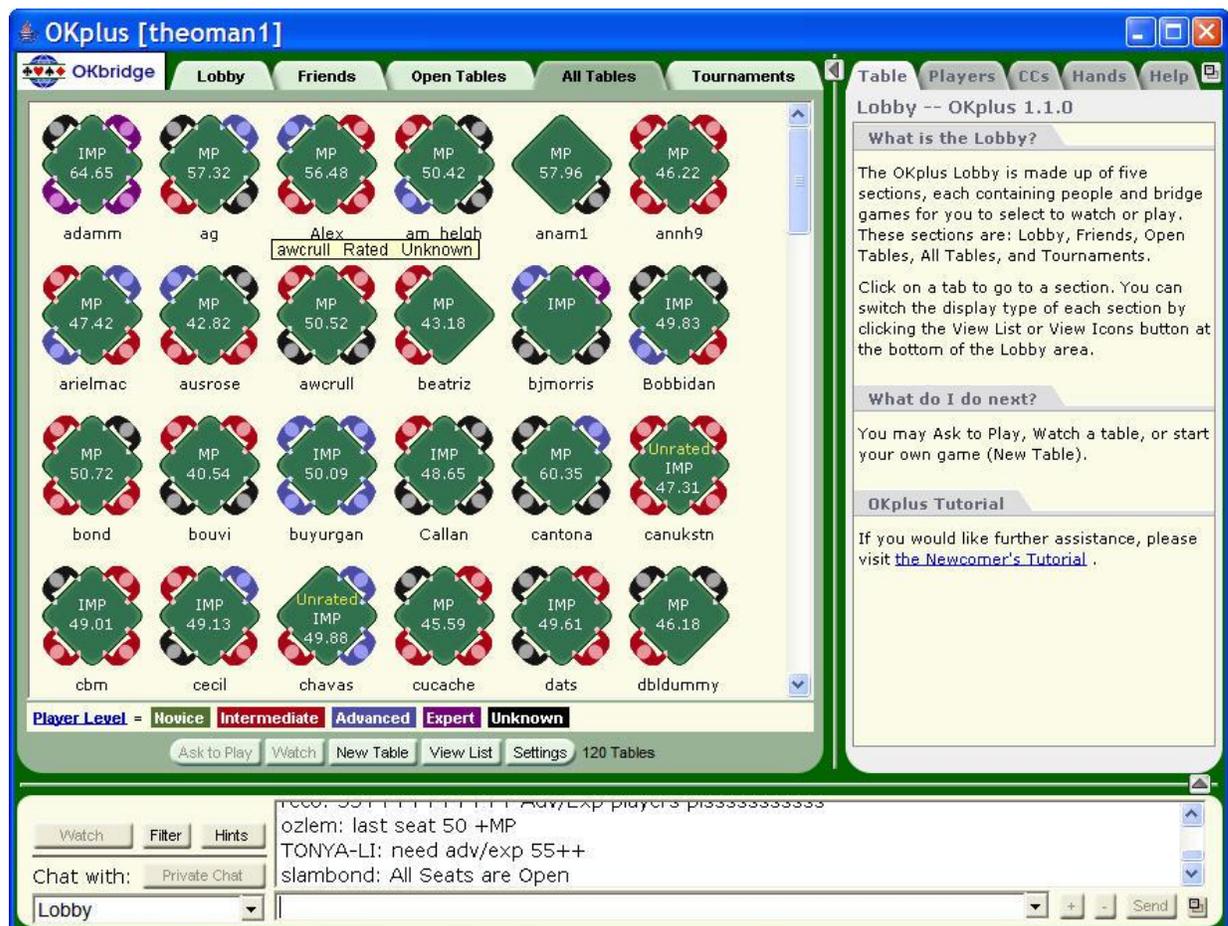


Figure 9. OKplus Tables Icon View

Screenshots and short videos of the final product are shown here for comparison with the original program and the prototype. Please note that the final product interface is quite close to the prototype user interface.

OKplus [theoman1]

OKbridge Lobby Friends Open Tables All Tables Tournaments

Table ▲	Open	People	Scoring	Rating	Level	Note
abacus	No	4	IMP	50.26	Intermediate	
ag	Yes	7	MP	57.32	Advanced	
alanos	No	4	IMP	54.00	Unknown	50 + please
alertb	No	4	IMP	48.67	Unknown	
alessia	No	4	MP	47.35	Intermediate	47-49 int
am_helgh	Yes	4	MP	50.42	Unknown	need 2 50ish
ana2	Yes	4	IMP		Unknown	
anam1	Yes	2	MP	57.96	Unknown	good
arielmac	No	5	MP	47.42	Intermediate	friendly 47-51
ausrose	No	5	MP	42.82	Intermediate	
babs	No	4	IMP	45.43	Intermediate	lehman 47 or less
barryl	No	5	IMP	51.38	Advanced	
beatriz	Yes	1	MP	43.18	Intermediate	Interm 42-48
big-al	No	4	IMP	49.47	Intermediate	45-50 lehman with
biomed	No	4	IMP	47.01	Intermediate	
bjmorris	No	4	IMP		Unknown	
bond	No	4	MP	50.72	Intermediate	need inter sayc ple
bouvi	No	5	MP	40.54	Unknown	need players int m
Callan	No	5	IMP	48.65	Unknown	
cantona	No	4	MP	60.35	Unknown	
carolvr	No	5	IMP	51.78	Intermediate	
cbm	No	4	IMP	49.01	Intermediate	
cucache	No	4	MP	45.59	Intermediate	

Ask to Play Watch New Table View Icons Settings 107 Tables

Watch Filter Hints

Chat with: Private Chat

Lobby

Table Players CCs Hands Help

Lobby -- OKplus 1.1.0



ag
Alan
Advanced
57.32

andrea
andrea giom...
Intermediate
59.30

touchet
Christian Ch...
Unknown
53.23

ag

Table Information

Scoring

MP. Play at this table is rated.

Spectators (click to display info)

frangau - Francois Gauthier
huseyin - huseyin sahin
rju - Richard Unger
dada-1 - jamil ahmed

anam1: 10
ag: 52+ mps
suha: need 1 good Nc IMPS
tiger8: 2more pl 44-49

Figure 10. OKplus Tables List View

OKplus [theoman1]

OKbridge

molva Vul

jbook Vul

waldbbd Vul 3NT

suha Vul

Show Hands 60 Leave Table Settings

Table Players CCs Hands Help

suha

Game Information

International Matchpoints Unrated

Undbs allowed

Scores

IMP-22.74

Session: 10.35 -10.35

LastHand: -- --

Contract: 3NT

By: waldbbd

Tricks

Bidding

NS:3 EW:4

Last Trick

Lead

♠6 ♥6

♦J

♠K

Chat

Watch Filter Hints

Chat with: Private Chat

Spectators

suha has joined the table as South.

* Declarer is claiming 9 tricks in total...

* theoman1 is now a spectator.

Declarer's claim of 9 total tricks has been accepted.

Figure 11. Playing or Watching a Game in OKplus

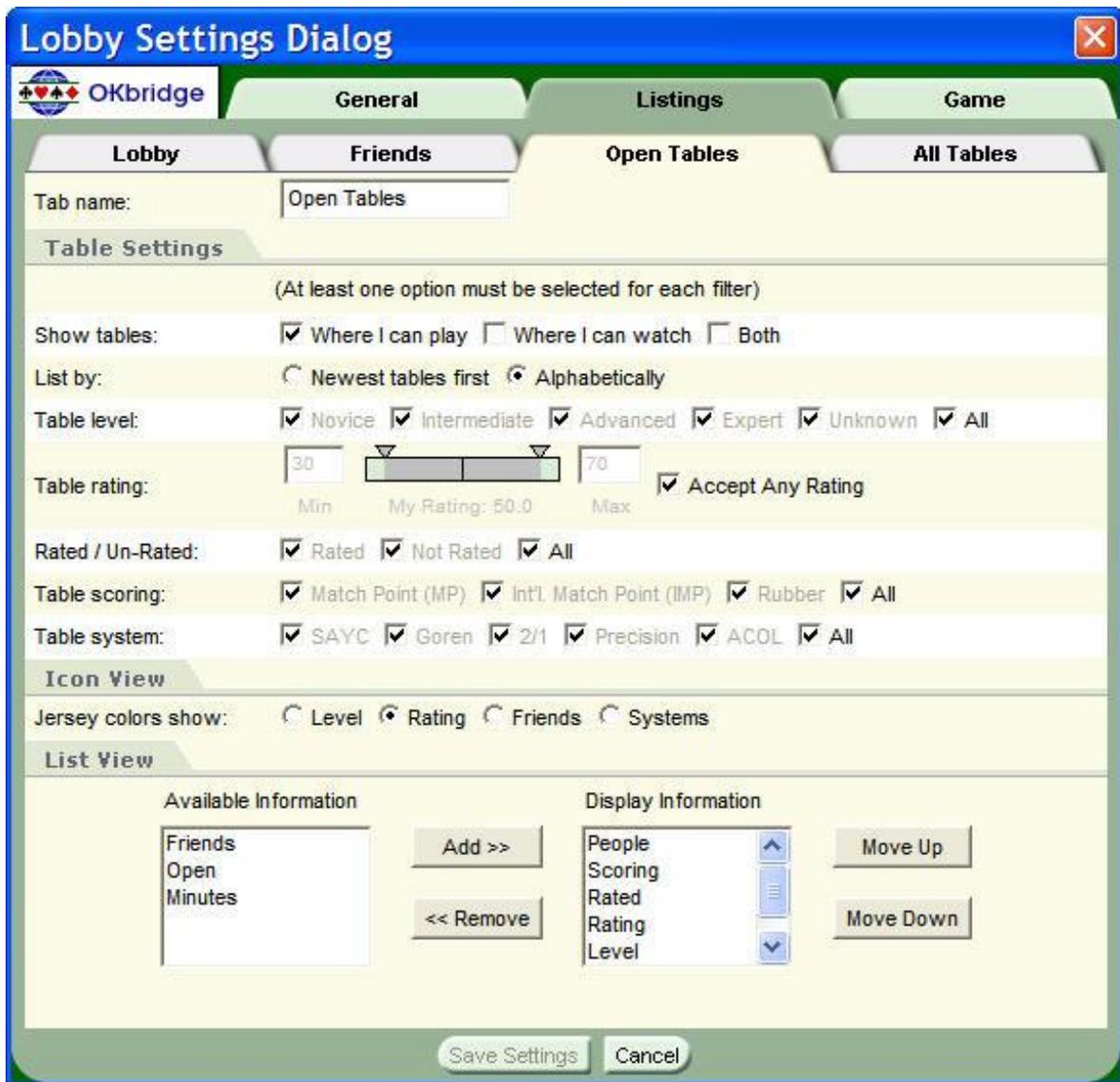


Figure 12. User Preferences Dialog

To show how users interact with the new program, the following videos were captured (AVI files - may require TSCC codec). You must be connected to the Internet to view the video demos.

- [Watch a Game](#)
- [Find a Player](#)
- [Set Up a Game](#)

Conclusions

The user-centered usability process was shown to benefit the design and development of the OKbridge online bridge game. User acceptance of the new software was somewhat mixed. User evaluations of the prototype and product under development met stated usability objectives and provided valuable feedback regarding user interface and usability issues.

Web survey ratings after use showed positive satisfaction ratings, though not as high as expected or desired. As discussed in this case study, the OKbridge community is very set in their ways regarding using computer software and they stubbornly use the older Windows-based program, OKwin, which they are familiar with. Getting members to switch to the new program will be an on-going education and marketing effort.

Program usage logs showed about 15% of the OKbridge members consistently use the new program. While this is a lower percentage of use than desired or expected, increased use is expected in the future. New releases of OKplus will solve most of the software bugs found in earlier releases. In future releases, the new software will also offer features not found in the older software, thus offering additional incentive for members to switch programs.

No significant impact on the customer service (Help Desk) workload was found. However, there were a few specific problems in OKwin that OKplus solved, thus the help team is now able to recommend a solution when previously they couldn't. For example, OKwin is designed with a peer-to-peer architecture. With the growing popularity of firewalls, DSL and cable modems, many users are blocked from accepting incoming network connections, and so the peer-to-peer architecture of OKwin prevents these users from serving tables. OKplus does not have a peer-to-peer architecture, so it does not suffer from this problem.

About the Author

Theo Mandel, Ph.D. was a member of the historic CUA User Interface Architecture team for 11 years at IBM, conducting ground-breaking user research on graphical user interfaces (GUIs) and establishing user interface guidelines and standards for the PC platform. Mandel launched a successful 20-year consulting career as a well-respected expert in user experience design and usability. Theo is the author of two critically-acclaimed books on interface design and usability. **The Elements of User Interface Design** was one of the first interface design textbooks translated into Russian. Dr. Mandel was the invited keynote speaker at the international 2009 User eXperience Russia conference in Moscow.

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