InTouch Usability Evaluation

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EXECUTIVE SUMMARY

The main purpose of this test was to asses the performance of an actual customer with little or no previous InTouch experience. The usability test measured the total time needed to accomplish information entry and output, and record user critical incidents. Tasks included routine operations, print operations, and import/export of data.

Each test session consisted of a performance test where the user performed a series of tasks, and a post-test interview where the user filled out a brief user preference questionnaire about the functionality and usability of InTouch and was given the opportunity to make comments or ask questions about InTouch.

Evaluation measures included: observations and comments for each critical incident; classification of errors associated with critical incidents including severity, scope, and source of error; the time necessary to complete each task; the percentage of participants who successfully complete each task; and user rankings of the functionality and usability of InTouch.

All participants did fulfill InTouch developer goals of having users succeed in entering information into InTouch within the first 5-10 minutes of use and outputting information from InTouch within the first half hour of use. Although, many participants did have major problems.

User likes included the InTouch documentation, the exclusion option in sort, the option of creating a new group from the group search dialog box, the choice of sounds for reminders, and the repeat option for reminders.

User dislikes included having to search the giant InTouch menu, the difficulty figuring out the function of the different panes in the main window, the lack of on-line help, and the lack of access to group functions from the main window. Users also disliked InTouch not behaving like other Macintosh applications: its files could not be opened by double-clicking, and no one liked having to select InTouch from the   menu to start-up the program. Most users also had problems with the print and layout dialog boxes.

Problems were rated in terms of severity and scope, and whenever possible, the source of the problems and potential solutions were indicated. The solutions presented in this report are just recommendations. Re-design efforts should consider alternative solutions with both the problems and potential solutions evaluated in light of the total system.

TEST DESCRIPTION

The main purpose of this test is to asses the performance of an actual customer with little or no previous InTouch experience. The usability test measured the total time needed to accomplish information entry and output, and record observed critical incidents. Tasks included routine operations, print operations, and import/export of data.[1] Particular attention was paid to those features that have been the target of significant negative customer feedback.

Specifically, the test attempted to determine if an actual user with little or no previous InTouch experience can

> Successfully enter information into InTouch within the first 5-10 minutes of use.[2]
>
> Successfully output information from InTouch within the first half hour of use.[3]
>
> Successfully perform routine tasks associated with sorting, grouping, and retrieving of information.
>
> Successfully use print and import / output dialogs.

The Prairie Group has received complaints about the printing and import / export dialogs. The test will attempt to determine the precise nature (and possibly the source) of customer difficulties.

Procedure

Test sessions had three stages:

1. <u>General Introduction</u> where the participant was given a short introduction to the testing and introduced to the testing environment. The subject was also given a short demo of thinking aloud.

2. <u>Performance Test</u> which consisted of a series of tasks that the participants were be asked to perform. Participants were videotaped while performing tasks.

3. <u>Post-test debriefing</u> in which the participant filled out a brief user preference questionnaire about the functionality and usability of InTouch, and was given the opportunity to ask questions or make comments about InTouch and the testing process.

Evaluation Measures

The following evaluation measures were collected and calculated.

1. Observations and comments for each critical incident.

2. Classification of errors associated with critical incidents: severity, scope, and source of error were indicated whenever possible.

3. The time necessary to complete each benchmark task.

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[1] Originally, installation was included in the task list. However, as the installation process is straightforward but time-consuming, it was not included in the final task list.
[2] 5-10 minutes is Prairie Group development goal.
[3] First half hour is Prairie Group development goal.

4. The percentage of participants who successfully completed each task.[4]
5. Participant rankings of the functionality and usability of InTouch.

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[4] A task is classified as successful or unsuccessful. No partial measures of completion will be used.

RESULTS

This section contains a summary of the usability test results in tabular form. It includes summaries of both the performance test and questionnaire results. The performance test results include for each task: mean positive/ negative critical incident counts[5], percentage of users who successfully completed the task, and mean time to complete task. The post-test questionnaire results are the mean user satisfaction scores from the post-test questionnaire.

Performance Test Summary

Task	Mean Number Positive Critical Incidents	Mean Number Negative Critical Incidents	% Subjects That Successfully Completed Task	Mean Time (sec)
Insert a Record	0	1.6	100	160.8
Save a File Under a Different Name	0	2.8	100	123.8
Find a Specific Record	0.2	3	60	220.6
Delete Records Belonging to a Group	0	2.4	80	134.2
Sort a File	0	1.2	100	234.2
Add a Reminder	0	5	100	421.8
Make a New Group	0.2	3.4	60	346.4
Print a Fax Cover	0	3.8	80	362.4
Export Records Belonging to a Group	0	1.4	60	203.6
Find Records Using a Simple Group Search	0	1.8	60	186
Find Records Using a Complex Group Search	0	1.4	80	75.8
Import Data From a File	0.6	2.8	60	338.6
Close then ReOpen InTouch	0	1.2	60	54.8

In any re-design efforts, particular attention should be paid to improving those tasks with a less than 80% completion rate.

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[5] Critical incidents are something that happens while participant is working that has significant effect, either positive or negative, on task performance or user satisfaction. (Hartson, 1993)

Post-Test Questionnaire Summary

	Mean Rating[6]
Overall Reactions to InTouch	**4.4**
terrible ... wonderful	4.4
difficult ... easy	3.8
dull ... stimulating	3.4
inadequate power ... adequate power	5.8
rigid ... flexible	4.6
Screen	**4.4**
Organization of information on screen	3
Sequence of screens	4.2
Characters on computer screen	6.2
Highlighting on screen simplifies task	4.2
Terminology and System Information	**3.76**
Use of terms throughout system	4.4
Computer terminology is related to the task	4.2
Messages on screen which prompt user for input	3.2
Computer keeps you informed about what it is doing	4.2
Error messages	2.8
Learning	**3.6**
Learning to operate the system	2.8
Exploring new features by trial and error	4.8
Tasks can be performed in a straight-forward manner	3.2
Remembering names and use of commands	3.4
Help messages on the screen	2.6
Supplemental reference materials	4.6
System Capabilities	**3.75**
Correcting your mistakes	5.4
Experienced and inexperienced users' needs are taken into consideration	2.8
As a free-form information manager, InTouch is	4.4
When compared to other information managers you have used, InTouch is	2.4

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[6] The post-test questionnaire rating scale went from 0 to 9.

FINDINGS, EXPLANATIONS, AND RECOMMENDATIONS

This section contains the findings and recommendations, along with a brief discussion and explanation of them. It has been divided into *General Findings and Recommendations* followed by *Specific Findings and Recommendations.*

The *General Findings and Recommendations* section contains a high-level discussion of the major, global issues.

The *Specific Findings and Recommendations* contains tabular lists of user likes, user wish lists, and user problems.

Finally, the solutions presented in this report are just recommendations. Any re-design should consider alternative solutions. Both the problems and potential solutions should be evaluated in light of the total system.

General Findings and Recommendations

Happily, all participants did fulfill InTouch developer goals of having users succeed in entering information into InTouch within the first 5-10 minutes of use and outputting information from InTouch within the first half hour of use. Unhappily, many encountered major problems: they had great difficulty figuring out the function of the different panes in the main window and they floundered about in the giant InTouch menu. Many grumbled about the lack of access to group functions from the main window and were frustrated by the lack of on-line help.

Probably what frustrated people the most was the giant InTouch menu. It was too big to search quickly or accurately. Further, it contained items generally found in the File or Edit menus, e.g. SaveAs, so it was usually the last place users looked. This menu should be broken up into a series of smaller menus. The File menu should contain file commands, the Edit menu should contain editing commands. The remaining commands may be parceled out to one, or more, menus. Users can be recruited to sort the commands into groups to help develop a menu grouping that is more intuitive to users.

Participants also had a great deal of trouble determining the functions of the different panes and buttons in the main window. Labeling of the windows and better button labels should alleviate many of the problems as would on-line help. In tests, users infrequently referred to the documentation, but frequently went to look for on-line help.

Participants were also disliked InTouch not behaving like other Macintosh applications. Its files could not be opened by double-clicking. Its files do not appear under "Recent Documents" in the menu, nor did InTouch appear under "Recent Applications" in the menu. No one liked having to select InTouch from the menu to start-up the program.

The print and layout dialog boxes were another problem area with users. Most found the boxes too cluttered and the icons indecipherable. Both would benefit from a visual re-design and extensive usability testing focusing just on them.

Specific Findings and Recommendations

Good Points

Documentation

Users gave InTouch documentation high marks. Unfortunately users seldom referred to it, even when having problems.

Sort

Users also liked the sort exclusion option.

Find

Users liked that find isn't necessarily case sensitive.

Group Search

Users found the option of creating a new group when in the group search dialog box very handy.

Reminders

Users especially liked the sound and repeat options.

Problems

This section contains a tabular listing of the specific problems uncovered along with potential solutions. It is organized in terms of existing interface elements.

Problems are classified in terms of Keenan's usability taxonomy (Keenan, 1996).   They are also assigned an importance rating. Importance is a subjective measure of the problems effect on usability and is independent of cost. It is determined as follows:

Importance Rating	Description
Low	If problem did not impact task performance or dissatisfaction very much (e.g., irritant or cosmetic problem), but is still worth listing.
Medium	If user can complete task, but ability to perform it properly was seriously hampered (e.g., caused confusion and required extra effort), or problem was source of dissatisfaction.
High	If interface feature involved is mission critical or is a major source of explicitly expressed dissatisfaction, or if usability problem is a "show stopper" (e.g., user cannot complete key task).

Close / Quit InTouch

Problem	Error Classification / Discussion	Importance	Potential Solution
When prompted to save changes, user cannot cancel operation.	Missing physical affordance (32.11). Missing button (20.2)	Low	Activate cancel button in save dialog box.

Documentation

Problem	Error Classification / Discussion	Importance	Potential Solution
No on-line help.	Functionality: missing functionality that the users want (35.1). Users seldom referred to written documentation, but often requested on-line documentation.	Medium	Add on-line help to system.
User would like to know which index entry is the primary reference for a topic.	Important information not emphasized (21.5)	Low	Bold primary page in index.
Balloon help is not available.	Missing user-requested information (52.1). System did not help user start or complete task. (39.6)	Low	Add balloon help to application.

File Operations

New

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding new file command ("New") in the menubar.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). By convention, new file command is usually found in the File menu. Metaphor doesn't make sense to user (32.4). User does not understand why all InTouch items are in the InTouch menu.	High	Move "New" to a location more intuitive to Mac users, i.e. the File menu.

User has trouble understanding the function of the "New..." command in the InTouch Menu	Names / labels: wording not meaningful enough (24.7)	High	Place option in File menu which will provide a context for user understanding (preferred); or rename option to "New File...".
User confused by "Save" button in "New" dialog box.	Names/Labels: system centered terms instead of user, task domain terms (24.4). User is creating file; system is saving an empty InTouch file.	Low	Change label to "Create".

Open

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding open file command ("Open") in the menubar.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). Metaphor doesn't make sense to user (32.4). User does not understand why all InTouch items are in the InTouch menu.	High	Move "Open..." to a location more intuitive to Mac users, i.e. the File menu.
Buttons in "Open" dialog box are ordered differently than buttons in other file-related dialog boxes, e.g. "Save As" dialog box.	Inconsistent screen layout (19.1). In "Open" dialog box, buttons are ordered "Open" to "Cancel", while in other file-related dialog boxes buttons are ordered from "Cancel" to box action, e.g. "Save". Similar tasks are structured inconsistently (32.1).	Low	Order the buttons in the "Open" dialog box in the same manner as the other dialog boxes.

Recent Files

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding files that were recently opened by InTouch.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). Metaphor doesn't make sense to user (32.4). User does not understand why all InTouch items are in the InTouch menu.	Medium	Move "Recent Files" to a location more intuitive to Mac users, i.e. the File menu. Preferably include list of recent files at the end of the menu before quit; separate with a bar from standard items and quit option.
No directory information for files is given. If two files with same name were recently used, user has no way to distinguish.	Name not meaningful enough (24.7).	Medium	Add directory information.
InTouch data files do not appear under "Recent Documents" in the menu.	Missing shortcut (34.4).	Low	Ensure InTouch data files appear as recent documents.

Save

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding save file command ("Save") in the menubar.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). Metaphor doesn't make sense to user (32.4). User does not understand why all InTouch items are in the InTouch menu.	High	Move "Save" to a location more intuitive to Mac users, i.e. the File menu.
User confused when asked if wishes to save changes in a file that has not been changed. Cause: if "Confirm Save" preference is not selected and user changes data files without saving changes, the user will be prompted to save changes when performing a sort on a newly opened file.	Misleading feedback message (26.13). Temporal problem ... how to handle.	Medium	Message should only consider current file. Internal flags should be reset when the next file is opened.

Save As

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding save as file command in the menubar.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). Metaphor doesn't make sense to user (32.4).	High	Move "Save As..." to a location more intuitive to Mac users, i.e. the File menu.

Group Operations

Problem	Error Classification / Discussion	Importance	Potential Solution
User cannot access group functions from main window.	Missing physical affordance to access functionality from main window. (32.11)	High	Add group button on main window. Re-evaluate button usage on main window; eliminate the infrequently used to cut down on clutter in main window.
User tries to view group by double-clicking on group's name in group window. Extremely common novice error.	Missing direct manipulation (29.2) Mental model not easy to understand (32.5)	Medium	Label the window, e.g. record's group membership.
User doesn't notice checks result from double-clicking on group name. Fairly common mistake.	Check mark signaling group membership is not noticeable (20.6). Interface modes not well distinguished (39.9)	Medium	Use a different symbol. Consider highlighting groups to which the current record belongs.

Group Edit

Problem	Error Classification / Discussion	Importance	Potential Solution
User doesn't connect "Edit Groups ..." with creating a new group. Thinks that it will allow her to specify which records belong in a group.	Label not meaningful enough (24.7)	Medium	Try to find a better label, e.g. add/delete groups.
User is confused by "Delete..." and "Insert..." buttons not working on groups.	Inconsistent ways to manipulate similar objects (29.1) Similar tasks structured inconsistently. (32.1)	Medium	1. Allow user to delete group shown in "Groups List" by highlighting group names and hitting "Delete..." button; or. 2. Change label on button to "Delete Record".

User wants to be able to edit group names in "Groups List"	Inconsistent ways to manipulate similar objects (29.1) Similar tasks structured inconsistently. (32.1)	Medium	Allow user to directly edit group names in "Groups List".
User can move or delete individual groups, but can not move or delete the groups in a single step.	User task not mapped to the system even though functionality to support task is present (32.9). Cognitively indirect manner to manipulate groups (29.8)	Medium	Allow user to highlight several groups and manipulate those groups, e.g. delete.
User has to alphabetize list by moving groups -- cannot alphabetize list in one step.	Interaction: user task not mapped to the system even though functionality to support task is present (32.9). Cognitively indirect manner to alphabetize groups (29.8)	Medium	Option on Group Edit dialog box to alphabetize (or sort) list; explore possibility of keeping the "Temporary" and "Marked" groups in same position, and alphabetizing rest of list.
User would like a pre-defined shortcut for "Edit Group".	Missing shortcut (34.4).	Low	Add a default shortcut for "Edit Group".

Group Search

Problem	Error Classification / Discussion	Importance	Potential Solution
User believes group search returns all records and group names matching the input specification.	Misleading label (24.9); label indicates searches for groups.	Medium	It's just a special type of find. Change label to reflect that. Consider combining find and group search into single function with group search functions handled as options of the basic find, much in the same manner as find file does on the Mac.
User destroys records belonging to a group with group search.	The way results are formatted is not noticeable (20.7) No confirmation for actions with consequences (39.2)	Medium	If attempt to overwrite any group other than temporary and marked, ask for confirmation first.
User not sure requested group search operation was done.	Presentation is not noticeable. System does not guide user's attention to the relevant part of the screen to notice results (39.7)	Medium	Make search results more noticeable; try presenting in a separate window.
User dislikes having to always go through "Find" or to the menubar to get to "Group Search".	Extra steps in task on system (32.7)	Medium	Consider eliminating group search as a separate operation, and make extra capabilities find options. Something along the lines of find file on the Macintosh.
"Group Search" dialog box does not contain a cancel button.	Direct Manipulation: missing direct manipulation (29.2). User close dialog box or hit "Done" (and thereby canceling request) but cannot directly cancel request.	Low	Add "Cancel" button to "Group Search" dialog box.
User wants to be search more than one group at a single time.	User task not mapped to system even though functionality to support is present (32.9)	Low	Modify dialog so that user can select more than one group to search.

Import / Export

Problem	Error Classification / Discussion	Importance	Potential Solution
User wants to highlight a range of records and export them.	Functionality: missing functionality (35.1).	Medium	Add capability.
Not clear what group imported records are placed in.	Placed in current group by default. Specification not an explicit part of the dialog. User must remember to create / change group before beginning import. Interaction too complex (32.3) Missing object (20.2)	Medium	Specify the group as part of the import process. Make current group default.
User wants to be export more than one group at a single time.	User task not mapped to system even though functionality to support is present (32.9)	Low	Modify dialog so that user can select items belonging to both groups to export.

Installation

Problem	Error Classification / Discussion	Importance	Potential Solution
2 icons with install in their name on the installation disk; user does not know which to use and in what order.	Language problem; multiple dissimilar objects named too similarly. Clear in documentation but most people don't read documentation. Task-Facilitation problem: system did not guide or direct user's attention to help the user start the task.	Low	Rename icon(s), or combine functionality.

Main Window

Problem	Error Classification / Discussion	Importance	Potential Solution
Novice InTouch user has great difficulty discerning function of the different panes.	Missing label (24.2), and user did not understand interaction (32.3). During usability testing, some users never fully understand the functions of the different panes, even after using the product for an hour or more. Concept very difficult to uncover by trial and error, and most users did not refer to the paper manual -- although most did look for on-line documentation.	High	Panes should be labeled to facilitate learning process. On-line help and bubble help should be available to increase the likelihood of users accessing documentation.
User has no idea why "Tag" would be used. Clicks it several times, guesses that character might be footnote, and finally deletes characters.	Tag not meaningful enough, users frequently do not understand what action is associated with the button (24.7). Also, interaction: user did not understand interaction (32.3).	High	- More descriptive label, but may be difficult due to combined functionality, may want to break up. - Real question about whether this belongs on main window. Consider placing in a menu so can list symbol, what it does, and shortcut.
User must click on "Stamp" to figure out what button does.	Stamp not meaningful enough, users frequently do not understand what action is associated with the button (24.7).	Medium	Does this belong on the main window? - If it does, use a better label, e.g. date/time stamp. -If it doesn't, place it in a menu and provide a shortcut.

User not sure how Group pop-up controls record display.	User did not understand the interaction (32.3) Label does not indicate full effect of action (24.8)	Medium	Add a more descriptive label to pop-up, e.g. Display Group.
User not sure what the arrows apply to.	Arrows apply to records but are over by address field. That work together (records list and arrows) are not close enough to each other (19.11)	Medium	Can they be incorporated into scrolling device.
When group list and record list was compressed, user thought record, group placeholders were labels for the address/notes field.	Dissimilar objects look too similar, i.e. horizontally compressed panes look like labels. (20.12)	Low	Add (Pull Out) to placeholder label for a horizontally compressed field.

Menubar

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding options in menubar menus.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). Having all InTouch operations accessible from one giant InTouch menu confused users. Also, it increased search time and increased the probability that a user would miss the option being searched for.	High	InTouch menu should be broken into a smaller menus consisting of related choices, e.g. place all file operations in the File menu.
Novice InTouch user doesn't realize the menubar contains InTouch options when the main window and menubar do not abut.	Screen layout: objects that work together are not close enough to each other (19.11). When the menubar and main window did not abut, novices assumed InTouch consisted only of the main window.	High	At startup, the InTouch main window should abut the menubar.

	Problem	Error Classification / Discussion	Importance	Potential Solution
	"Quit" appears in both the Files and InTouch menus.	User did not understand the presence of duplicate quits (32.10).	Low	Remove Quit from InTouch menu.

Open InTouch

Problem	Error Classification / Discussion	Importance	Potential Solution
User confused by lack of InTouch under "Recent Applications" in the menu.	Missing shortcut (34.4). By Mac convention, InTouch should be there.	High	Ensure InTouch appears under recent applications.
User cannot open InTouch file by double-clicking on an InTouch data file.	Missing direct manipulation (29.2). Also, missing shortcut (34.4). By Mac conventions, users expect to be able to double-click on any file. Even experienced InTouch users invariably try to open a file by double-clicking. Not one user went to the menu.	High	Allow user to open InTouch files by double-clicking.

Preferences

Problem	Error Classification / Discussion	Importance	Potential Solution
User unable to specify which data file to be opened at start up.	Task not well mapped (32.6). User never discovered that start-up file could be specified in the "Open..." dialog box. User thought of it as a preference, not an open operation.	High	Allow the user to specify the startup file as a preference and when opening a file (a few experienced users found this handy).
User does not understand that "Confirm Saves" in the General Preferences dialog box will result in the user being prompted to save changes when closing InTouch or switching data files.	Names / Labels: label is misleading (24.9); "Confirms Saves" implies that system asks for confirmation after a save has been initiated.	Medium	Re-word dialog, e.g. prompt to save changes.
User cannot specify that InTouch open the last data file used at startup.	System does not allow user to specify his/her preferences in this area (34.1), i.e. user can specify which file to open at startup, but user cannot specify InTouch use the last file opened.	Low	Add a preferences option that tells InTouch to open the last file opened at startup.

Printing

Layout Dialog

Problem	Error Classification / Discussion	Importance	Potential Solution
Users have great difficulty using layout dialog box; some users refuse to even try.	Numerous visual layout problems: inconsistent screen layout (19.1), screen clutter (19.2), too many objects on screen (19.2), unaesthetic layout of objects (19.3), not clearly delineating groups of objects with borders, boxes, or spacing (19.13), object grouping not intuitive to user so user could not use grouping to help locate an item. Also, interaction is simply too complex (32.3)	High	Redesign from scratch. Look and feel should be more like Print dialog box. Instead of making everything visible, put the less frequently used groups down a level or in a pull down menu. Also, try halving the size of the graphic representation of the layout to allow more space for the functionality. Design should be iterative and involve substantial user testing.
User doesn't recognize item icons in "Layout" dialog box.	Object Appearance: icon is not meaningful enough (20.9). Icons are too small and busy to be easily recognized.	High	Simplify icons to facilitate understanding and add labels.
User can't determine what units are used for the layout width/height.	Object layout: objects that work together, i.e. width/height and units, are not close enough together (19.11).	High	Move the units and dimensions closer together. May want to use borders or boxes to emphasize connection.
User complains of objects jumping around as he explores the different layouts.	Inconsistent object layout (19.1) Also, system did not guide or direct user's attention to the relevant part of the screen (39.6).	High	Common functionality exists across different layouts, however implementation details vary. Group and label by common functionality.
When creating fax cover, user doesn't want to have to specify record. Would like the default to be current record.	Missing default value (36.3).	Medium	Make current record default.

Problem	Error Classification / Discussion	Importance	Potential Solution
"Layout" dialog box does not contain a cancel button.	Missing direct manipulation (29.2). User closes dialog box or hits "Done" button (and thereby canceling request) but cannot directly cancel request.	Low	Add "Cancel" button to "Layout" dialog box.

Print Dialog

Problem	Error Classification / Discussion	Importance	Potential Solution
User doesn't recognize item icons in "Print" dialog box.	Icons are too small and busy to be easily recognized. (20.4)	High	Simplify icons to facilitate understanding and add labels.
User attempts to use the "Layout" pulldown in the "Print" dialog box to select the item to be printed.	Screen Layout: object is not placed for best effect (19.16) Also, task-mapping/interaction: task not mapped well, mapping does not reflect the structure of the user's task (32.6). User wants to specify the item to print before specifying the layout.	Medium	Place "Layout" pulldown beneath mechanism to select item to be printed. May want to re-label. Users frequently referred to layout as format.
Too many options on print/print dialog box. User spending a lot of time worrying about things she doesn't need to.	Too many objects on screen (19.2) Interaction is too complex (32.2)	Low	Differentiate between the necessary and secondary options. Consider placing secondary options at a lower level.

Record Operations

Delete

Problem	Error Classification / Discussion	Importance	Potential Solution
User cannot undo record delete.	User Action Reversal: user unable to undo an action (37.1).	High	"Undo" action should apply to InTouch record operations. Recommend that all "Edit" actions be made functional for records.
User inadvertently deletes a record. Had highlighted a portion of the record and hit the delete button; assumed delete would only apply to portion highlighted.	Names/Labels Problem: 24.7; wording not meaningful enough.	High	Change label to "Delete Record".
In the delete confirmation message, user assumes item refers to the portion of record highlighted, not the entire record.	Feedback Message Problem: 26.5; feedback message vague -- not clear what item refers to.	High	Change item to entire record.
User must delete individual records to delete a group of records.	Interaction: user task not mapped to the system even though functionality to support task is present (32.9), i.e. user can delete individual records but cannot delete multiple records in a single step.	Medium	Allow user to highlight several records in "Records List" and delete them.
"Delete..." on record delete button indicates a dialog box should pop up, but dialog box only pops up when "Confirms Delete" option is active.	Names/Labels: misleading name/label (24.9).	Low	Remove ... from label.

Edit

Problem	Error Classification / Discussion	Importance	Potential Solution
User can easily find all instances of a given string, but cannot easily replace instances of the string.	Functionality missing (35.1).	High	Modify find dialog to include replace and replace all operations.
User would like to spell check information.	Functionality: missing functionality (35.1). Useful if you are using InTouch as something other than an address book.	Low	Either provide or allow the user to plug in a spell-checker.
User wants to use a different font, e.g. bold, for portions of the record text.	Functionality: missing functionality (35.1). Capability would allow delineating things with fonts; it is very desirable when you're using InTouch for something other than an address book.	Low	Add support for different fonts to InTouch.

Find

Problem	Error Classification / Discussion	Importance	Potential Solution
User has trouble finding "Find" in the menubar.	Menu organization: inappropriately grouping unrelated choices in a menu (19.9). By convention, find is usually found in the Edit menu.	High	Move find to a location more intuitive to Mac users, i.e. the Edit menu.
User can't find a record that is in the file because he doesn't realize that find only searches the current group.	Error message does not help user solve problem (27.4). User did not understand the interaction (32.3)	High	1. Make group an explicit part of the find dialog, default current group. 2. In error message, explicitly state the parameters find used.

User doesn't understand field option on find.	User does not differentiate the fields in the main window; did not under stand interaction (32.3)	Medium	Label the fields on the main window.
User doesn't realize that the record wasn't found because he had the whole word only option on.	Error message does not help user solve problem (27.4).	Medium	Need to be more specific in find error messages, in particular what options guided the search.
"Find" dialog box does not contain a cancel button.	Direct Manipulation: missing direct manipulation (29.2). User can close dialog box (and thereby canceling request) but cannot directly cancel request	Low	Add "Cancel" button to "Find" dialog box.

Insert

Problem	Error Classification / Discussion	Importance	Potential Solution
After typing a new record, the subject hits insert which brings up another new record. (Occurred frequently with novice users.)	26.2 Missing feedback. Unaware operation is complete.	High	Add feedback...not message, just have the text appear in the records list as user is typing so they can see that the record has already been inserted.

Snapshot

Problem	Error Classification / Discussion	Importance	Potential Solution
User repeatedly clicks the snapshot button in the main window trying to figure out what it does. When multiple clicks appear to do nothing, user is mystified.	Name/label: label not meaningful to user (24.7); non-message/message feedback is needed (23.2/26.2). Also, user did not understand the interaction (32.3).	High	1. Change label/icon to a more meaningful term, e.g. clipboard, or 2. Clipboard is just a form of cut and paste. Consider treating it as such: place additional commands under edit, i.e. show clipboard and eliminate snapshot button. At the same time, improve overall cut and paste operations on records, groups, etc.
When user hit snapshot, the word snapshot appears in the clipboard, not the address field. (Word 6.0 running at time.)	Functionality not implemented correctly (35.2).	High	Fix so functionality matches documentation.
User wants to use cut and paste on entire records without resorting to "Snapshot" dialog.	Direct Manipulation: missing direct manipulation (29.2).	Medium	Allow users to highlight multiple records in record list, and then cut and paste. If a user highlights items in the record list, the operation applies to the entire record; if highlight items in other fields, operation only applies to object being manipulated in that field.

Sort

Problem	Error Classification / Discussion	Importance	Potential Solution
User assumes when he sorted the ALL group, all records in all groups are sorted.	Did not understand the interaction (32.3) Feedback message general rather than specific (26.5)	Medium	Feedback message should make it clear that only one group, All, was sorted.
User confused that sort dialog box changed since last use.	Each group has it's own sort order. Not apparent to user. (32.3)	Low	Document, preferably on-line.
User wants to cancel sort, but unsure if done will cancel without doing sort.	Missing button (20.2)	Low	Add Cancel button.
User would like to be able to sort several groups simultaneously.	User can sort multiple groups by selecting sort repeatedly, but cannot sort multiple groups in one step. (32.9)	Low	Modify selection method to allow multiple groups to be selected.

Reminders

Problem	Error Classification / Discussion	Importance	Potential Solution
User locates calendar by trial and error.	Label not meaningful (24.7); user's don't understand what the remind corresponds to. Also, icon is not meaningful (20.9) to user.	High	Change reminder label to a term more meaningful to users. During testing, users generally referred to the item as a calendar or alarm. Change icon accordingly.
User sidetracked by Dateview button and highly annoyed when it points to a product that is not installed. Views button as an advertisement and annoyance.	Misleading visual cue (30.7). Dateview Button is largest, most salient on screen but functionality not supported. Also, system did not make erroneous choices unavailable (39.4).	High	In preferences, allow user to specify whether the Remind button takes the user to the standard calendar or DATEVIEW.

Novice user has great difficulty determining where to enter new appointment. Focuses on the calendar and doesn't see the new button.	Related features not well grouped (19.6)	Medium	Try putting buttons to manipulate calendar closer to the calendar. De-clutter screen as much as possible.
"View" in "Remind" dialog box has no meaning for many users.	Label not meaningful enough. User did not understand interaction (32.4)	Medium	Try more descriptive label, e.g. view reminders.
User confused by disabling of modify / delete buttons on a day she defined a reminder.	Need to have an event highlighted for the buttons to be enabled. User did not understand interaction (32.4)	Medium	Possibly use the first event of the day as the default.

New

Problem	**Error Classification / Discussion**	**Importance**	**Potential Solution**
Subject misses the for part of the calendar repeat. Does multiple instances of the reminder by hand.	Related features not well grouped (19.6)	Medium	Screen is very busy. Needs a better organization.
User does not understand the repeat for still; does it with special. Proximity of the two not clear; or wording problem.	Interaction too complex: 32.2. Related features not well grouped (19.6)	Medium	Special is not particularly meaningful to users. May want new label or simplify underlying interaction.
User not sure that reminder was created. Goes to calendar to check.	Missing feedback.	Low	Add feedback.

Modify

Problem	Error Classification / Discussion	Importance	Potential Solution
Changing a single reminder that was generated by repeating another reminder crashes InTouch and sometimes the user's computer.	Functionality implemented incorrectly (35.2).	High	Fix bug.

Special

Problem	Error Classification / Discussion	Importance	Potential Solution
User has no clue as to what L stands for in special dialog box.	Label not meaningful enough. User did not understand interaction (32.4)	High	Use a descriptive label.
When in event dialog box, the special by day yields boxes numbered from 1 to 31, user doesn't know which day of the week goes with which day.	Missing label (24.2)	Medium	Label days of the week.

APPENDICES

Appendix A: Test Plan

The following is the test plan for conducting usability tests of version 2.5.2 of the free-form information manager InTouch.[7] The plan contains the following sections:

Purpose

Test Objectives

User Profile

Method

Task List

Test Environment / Equipment

Evaluation Measures

Test Report Contents and Presentation.

Purpose

The main purpose of this test is to asses the performance of an actual customer with little or no previous InTouch experience. The usability test will measure the total time needed to accomplish information entry and output, and record observed critical incidents. Tasks will include routine operations, print operations, and import/export of data.[8] Particular attention will be paid to those features that have been the target of significant negative customer feedback.[9]

Test Objectives

Specifically, the test will determine if an actual customer with little or no previous InTouch experience can

Successfully enter information into InTouch within the first 5-10 minutes of use.[10]

Successfully output information from InTouch within the first half hour of use. [11]

Successfully perform routine tasks associated with sorting, grouping, and retrieving of information.

Successfully use print and import / output dialogs.

The Prairie Group has received numerous complaints about the printing and import / export dialogs. The test will attempt to determine the precise nature (and possibly the

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[7] InTouch is a product of the Prairie Group, P.O. Box 65820, West Des Moines, Iowa 50265.

[8] Originally, installation was included in the task list. However, as the installation process is straightforward but time-consuming, it was not included in the final task list.

[9] Prairie Group developers summarized and relayed customer complaints to usability testers.

[10] 5-10 minutes is Prairie Group development goal.

[11] First half hour is Prairie Group development goal.

source) of customer difficulties -- potentially leading to recommendations for redesign of the problem area.

User Profile

A total of 5 participants will be tested. A total of 6 people will be selected (5 participants and 1 alternates) that satisfy the following requirements:

Characteristic	Range	Frequency Distribution
Macintosh Experience	Some	n / a.
InTouch Experience	None.	100%[12]
Computer Experience	Novice, Intermediate	n / a.

Method

The test will consist of

1. A performance test of benchmark tasks plus some representative tasks designed to gather InTouch usability information through remote evaluation.

2. A user preference questionnaire designed to determine how successful InTouch was at satisfying user expectations of a free-form information manager.

It will consist of the following three stages:

1. <u>General Introduction</u>:

> Participant will be given a short, scripted introduction to the test which explains the purpose and objectives of the test.

> Participant will be introduced to the testing environment.

> Participant will be verbally informed that the test session will be observed and videotaped. At this time, the participant will be asked to read and sign the consent form.

> Participant will be given the pre-test instructions.

> Participant will be given detailed information on how tasks will be presented and what is expected of the participant; participant will be given a short demo of thinking aloud.

> Participant will be given final verbal reminders. In particular, he / she will be reminded that

> a. The test evaluates the quality of InTouch, *not* the performance of the participant.

> b. He / she should refer to the manual only if he / she gets stuck and is unable to complete the task.

2.

---

[12] Originally, participants with some InTouch experience were to be tested. However, no one with InTouch experience could be recruited.

Performance Test:
The performance test will consist of a series of benchmark and representative tasks that the participants will be asked to perform. The test will be videotaped. The basic procedure for the test will be

> After the introduction is completed, the participant will escorted to the evaluation room and will sit down at the desk (see description of test environment).

> The participant will be guided through a series of tasks by the tester. The participant will be encouraged to

> a. Work without input from the tester.

> b. Think aloud while working through the task.

> c. To refer to the manual only when stuck.

3. Post-test debriefing:
After all tasks are completed, the participant will be given a short break. After which, the participant will fill out a brief user preference questionnaire about the functionality and usability of InTouch. Finally, the participant will be given the opportunity to ask questions or make comments about InTouch and the testing process.

Following completion of the test, the participant will be thanked and dismissed.

Task List

Starting up InTouch.

Inserting records into an InTouch file.

Finding records meeting certain criteria.

Deleting records meeting certain criteria.

Adding and deleting reminders, including repeated reminders.

Printing a fax cover sheet.[13]

Exporting information from InTouch.

Importing information from InTouch.

Saving an InTouch file under a different name.

Test Environment / Equipment

The test will be conducted in the Virginia Tech Computer Science Usability Laboratory. During the performance test, the participant will sit at a desk in the evaluation room with the door closed. If a member of the test team is available, he / she will remain in the evaluation room with the participant. On the desk will reside a Macintosh computer. Close to the desk on a side table will be the following items.

1. A printer.

> Should *not* be an HP printer.[14]

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[13] Originally, participants were to use InTouch to print out envelopes. However, during this operation during pre-test, subjects had great difficulty manipulating the printer. Print out of fax covers was substituted as it required no manipulation of the printer.

Should already be stocked with paper.

Should be correctly connected to the Mac.

2. An InTouch User's Manual.

3. InTouch will be running on the Mac with the

The test InTouch file open.

The InTouch reminder list clear.

Evaluation Measures

The following evaluation measures will be collected and calculated.

1. Observations and comments for each critical incident.

2. Classification of errors associated with critical incidents: severity, scope, and source of error will be indicated whenever possible.

3. The time necessary to complete each benchmark task.

4. The percentage of participants who successfully complete each task.[15]

5. Participant rankings of the functionality and usability of InTouch.

Test Report Contents and Presentation

The report will include the following sections:

1. Executive Summary.

2. Description of the Test.

3. Results which contains a summary of all results in tabular form.

4. Findings, Explanations, and Recommendations.

5. Appendices containing.

Task scenarios.

The test plan.

The post-test questionnaire.

Raw data from the test.

The target audience for this report will be the Prairie Group developers.

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[14] The InTouch HP print drivers are known to be buggy. Prairie Group is working on the problem so there is no reason to subject a participant to the problems.

[15] A task is classified as successful or unsuccessful. No partial measures of completion will be used.

Appendix B: Task Scenarios

1. The file that you see is your family rolodex. Put your name and work phone number in the rolodex so other family members can contact you in an emergency. (Benchmark task: Insert a Record.)

2. Save a copy of your family rolodex for personal use. Call the copy "MY ROLODEX". You will work with "MY ROLODEX" for the remainder of this session. (Benchmark task: Save a File Under a Different Name.)

3. Play around with the system, exploring anything you like in the InTouch System, for as long as you like.

4. Ken Landry is already entered in your rolodex.   He just called you with his new home phone number, add it to his entry. Ken's home phone number is 500-1234. (Benchmark task: Find a Specific Record.)

5. You decide you don't want all of Mary's friends in your rolodex. Make a list of Mary's friends. Delete Sallie's and Brian's information. (Benchmark task: Delete Records Belonging to a Group.)

6. Order the entries in your rolodex alphabetically so that people with the same last name appear together, with family members listed alphabetically by first name. (Benchmark task: Sort a File.)

7. Congratulations, you just found a new ballroom dance class. It meets every Wednesday 8:00-10:00 PM for the next 3 months. Add the class to your calendar. (Benchmark task: Add a Reminder.)

8. You notice that all your relatives have "RELATIVE" in the notes field. You decide to make "family" a new group, and make all your relatives members of the group. (Benchmark task: Make a New Group.)

9. You decide to print out a fax cover sheet for David A. Groom. Be sure to include your return address on the cover sheet. (Benchmark task: Print a Fax Cover.)

10. Uncle Harry (a new InTouch user) would like you to send him an file containing the names and addresses of all the relatives your family sends Christmas cards to. Create an InTouch file by the name of "Relatives" to send to Uncle Harry. (Benchmark task: Export Records Belonging to a Specific Group.)

11. You have to go to Washington, D.C. for the weekend. You don't want to stay in a hotel. You want to stay with someone you know. How many people do you know in Washington? (Benchmark task: Find Records Using a Simple Group Search.)

12. After thinking more about the weekend, you decide you want to stay with family. Find a relative in Washington.
(Benchmark task: Find Records Using a Complex Group Search.)

13. You're in charge of organizing soccer this year. Last year's organizer gave you a tab-delimited text file ("Soccer People") containing the names and addresses of the relevant people. Add this people to your rolodex -- put them in the Soccer group for easy reference. (Benchmark task: Import Data From a File.)

14. That's enough work for today. Shutdown InTouch.

15. Wait you forgot something, re-open "My Rolodex".
(Benchmark task: Close then ReOpen InTouch.)

Appendix C: Post-test Questionnaire[16]

Directions:

Please rate each of the items according to the scales provided and circle the appropriate number.

A. Overall Reactions to InTouch

1)
     0   1   2   3   4   5   6   7   8   9
  terrible   wonderful

2)
     0   1   2   3   4   5   6   7   8   9
  difficult   easy

3)
     0   1   2   3   4   5   6   7   8   9
   dull   stimulating

4)
   0   1   2   3   4   5   6   7   8   9
inadequate power   adequate power

5)
     0   1   2   3   4   5   6   7   8   9
   rigid   flexible

B. Screen

1) Organization of information on screen

     0   1   2   3   4   5   6   7   8   9
  confusing   very clear

---

[16] Adaptation of the QUIS (Questionnaire for User Interface Satisfaction) rating scale developed by the University of Maryland.

2) Sequence of screens

    0   1   2   3   4   5   6   7   8   9
  confusing   very clear

3) Characters on the computer screen

    0   1   2   3   4   5   6   7   8   9
hard to read   easy to read

4) Highlighting on the screen simplifies task

    0   1   2   3   4   5   6   7   8   9
  not at all   very much

C. Terminology and System Information

 1) Use of terms throughout system

    0   1   2   3   4   5   6   7   8   9
  inconsistent   consistent

2) Computer terminology is related to the task you are doing

    0   1   2   3   4   5   6   7   8   9
  never   always

3) Messages on screen which prompt user for input

    0   1   2   3   4   5   6   7   8   9
  confusing   clear

4) Computer keeps you informed about what it is doing

    0   1   2   3   4   5   6   7   8   9
  never   always

5) Error messages

    0   1   2   3   4   5   6   7   8   9
  unhelpful   helpful

D. Learning

1) Learning to operate the system

    0   1   2   3   4   5   6   7   8   9
difficult   easy

2) Exploring new features by trial and error

    0   1   2   3   4   5   6   7   8   9
difficult   easy

3) Tasks can be performed in a straight-forward manner

    0   1   2   3   4   5   6   7   8   9
never   always

4) Remembering names and use of commands

    0   1   2   3   4   5   6   7   8   9
difficult   easy

5) Help messages on the screen

    0   1   2   3   4   5   6   7   8   9
unhelpful   helpful

6) Supplemental reference materials

    0   1   2   3   4   5   6   7   8   9
confusing   clear

E. System Capabilities

1) Correcting your mistakes

    0   1   2   3   4   5   6   7   8   9
difficult   easy

2) Experienced and inexperienced users' needs are taken into consideration

    0   1   2   3   4   5   6   7   8   9
never   always

3) As a free-form information manager, InTouch is

     0   1   2   3   4   5   6   7   8   9
   useless   useful

4) When compared to other information managers you have used, InTouch is

     0   1   2   3   4   5   6   7   8   9
   difficult   easy

Appendix D: Raw Test Data

Performance Data

Positive Critical Incident Data

Task	Subject					Mean
	1	2	3	4	5	
Insert a Record	0	0	0	0	0	0
Save a File Under a Different Name	0	0	0	0	0	0
Find a Specific Record	0	0	1	0	0	0.2
Delete Records Belonging to a Group	0	0	0	0	0	0
Sort a File	0	0	0	0	0	0
Add a Reminder	0	0	0	0	0	0
Make a New Group	0	0	0	0	1	0.2
Print a Fax Cover	0	0	0	0	0	0
Export Records Belonging to a Group	0	0	0	0	0	0
Find Records Using a Simple Group Search	0	0	0	0	0	0
Find Records Using a Complex Group Search	0	0	0	0	0	0
Import Data From a File	1	0	2	0	0	0.6
Close then ReOpen InTouch	0	0	0	0	0	0

Negative Critical Incident Data

Task	Subject					Mean
	1	2	3	4	5	
Insert a Record	1	0	3	4	0	1.6
Save a File Under a Different Name	2	2	7	2	1	2.8
Find a Specific Record	4	5	0	6	0	3
Delete Records Belonging to a Group	3	4	1	3	1	2.4
Sort a File	3	0	1	2	0	1.2
Add a Reminder	3	9	3	10	0	5
Make a New Group	2	6	6	3	0	3.4
Print a Fax Cover	5	5	4	4	1	3.8
Export Records Belonging to a Group	1	2	1	1	2	1.4
Find Records Using a Simple Group Search	0	2	2	3	2	1.8
Find Records Using a Complex Group Search	0	5	2	0	0	1.4
Import Data From a File	4	1	1	3	5	2.8
Close then ReOpen InTouch	1	2	1	1	1	1.2

Task Completion Data

	Subject	%

Task	1	2	3	4	5	Completed
Insert a Record	✔	✔	✔	✔	✔	100
Save a File Under a Different Name	✔	✔	✔	✔	✔	100
Find a Specific Record	✔		✔		✔	60
Delete Records Belonging to a Group	✔	✔	✔		✔	80
Sort a File	✔	✔	✔	✔	✔	100
Add a Reminder	✔	✔	✔	✔	✔	100
Make a New Group		✔	✔		✔	60
Print a Fax Cover	✔	✔	✔		✔	80
Export Records Belonging to a Group	✔	✔			✔	60
Find Records Using a Simple Group Search	✔			✔	✔	60
Find Records Using a Complex Group Search	✔		✔	✔	✔	80
Import Data From a File			✔	✔	✔	60
Close then ReOpen InTouch		✔	✔		✔	60
Percentage of Tasks Successfully Completed by Subject	76.9	69.2	84.6	53.8	100	

Task Timing Data

| | Subject | | | | | Mean |
Task	1	2	3	4	5	Time (sec)
Insert a Record	43	202	286	192	81	160.8
Save a File Under a Different Name	133	101	259	82	44	123.8
Find a Specific Record	198	312	26	519	48	220.6
Delete Records Belonging to a Group	261	99	115	58	138	134.2
Sort a File	293	102	247	435	94	234.2
Add a Reminder	506	703	139	666	95	421.8
Make a New Group	297	345	508	472	110	346.4
Print a Fax Cover	269	472	335	630	106	362.4
Export Records Belonging to a Group	187	273	167	57	334	203.6
Find Records Using a Simple Group Search	145	178	132	253	222	186
Find Records Using a Complex Group Search	66	101	124	38	50	75.8
Import Data From a File	330	378	167	481	337	338.6
Close then ReOpen InTouch	10	45	112	17	90	54.8

Post-Test Questionnaire

| | Subject | | | | | |
	1	2	3	4	5	Mean
Overall Reactions to InTouch (Average Rating)	**3.6**	**4.2**	**3.8**	**3.2**	**7.2**	**4.4**
terrible ... wonderful	3	6	2	4	7	4.4
difficult ... easy	3	3	1	4	8	3.8

dull ... stimulating	3	4	4	0	6	3.4
inadequate power ... adequate power	6	3	8	4	8	5.8
rigid ... flexible	3	5	4	4	7	4.6
Screen (Average Rating)	**4.5**	**2.75**	**3.25**	**3.5**	**8**	**4.4**
Organization of information on screen	3	1	2	2	7	3
Sequence of screens	6	1	3	2	9	4.2
Characters on computer screen	6	1	6	9	9	6.2
Highlighting on screen simplifies task	3	8	2	1	7	4.2
Terminology and System Information (Average Rating)	**2.6**	**3.6**	**2.6**	**2.4**	**7.6**	**3.76**
Use of terms throughout system	3	8	1	4	6	4.4
Computer terminology is related to the task	4	3	5	2	7	4.2
Messages on screen which prompt user for input	1	3	1	2	9	3.2
Computer keeps you informed about what it is doing	2	2	5	4	8	4.2
Error messages	3	2	1	0	8	2.8
Learning (Average Rating)	**4**	**3.2**	**2.7**	**0.7**	**7.3**	**3.6**
Learning to operate the system	3	2	1	0	8	2.8
Exploring new features by trial and error	5	7	2	1	9	4.8
Tasks can be performed in a straight-forward manner	3	3	2	1	7	3.2
Remembering names and use of commands	3	3	2	1	8	3.4
Help messages on the screen	4	0	2	0	7	2.6
Supplemental reference materials	6	4	7	1	5	4.6
System Capabilities (Average Rating)	**3**	**4.5**	**1.5**	**1.5**	**8.25**	**3.75**
Correcting your mistakes	6	9	2	1	9	5.4
Experienced and inexperienced users' needs are taken into consideration	2	1	1	1	9	2.8
As a free-form information manager, InTouch is	3	7	2	2	8	4.4
When compared to other information managers you have used, InTouch is	1	1	1	2	7	2.4