

Usability Evaluation of the IBM WebSphere “WebVoice” Demo

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Wallace J. Sadowski
James R. Lewis

IBM Voice Systems

West Palm Beach, Florida

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Abstract

This study was the second usability evaluation of the IBM WebSphere and Lotus Domino Speech demo. The previous study used the Wizard of Oz (WOZ) simulation technique to evaluate the system prototype. For the current study, the four participants used a functional demo. Each participant completed three primary tasks for each application (Library, Banking and Calendar) and then exited the system using a voice command. Participants rated each application immediately after completing the tasks for that application and rated the WebSphere demo as a whole. Additionally, participants rated the synthetic speech using the Mean Opinion Scale. The primary purpose of the current study was to ensure that the component applications were consistent with IBM's speech user interface usability guidelines, and to ensure that following the guidelines produced a usable interface. Additionally, we wanted to determine if the recommended changes (based upon the earlier WOZ evaluation) alleviated the targeted usability problems and identify any remaining usability concerns with the functional WebVoice demo.

ITIRC Keywords

WebVoice

Automated Speech Recognition (ASR)

Speech User Interfaces

Telephony

Usability Evaluation

Wizard of Oz (WOZ)

Unclassified

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Introduction

The primary goal of the IBM WebSphere and Lotus Domino WebVoice demo is to provide sample code to illustrate some key VoiceXML coding techniques. Its three component applications perform basic library, banking, and calendar functions. The purpose of the initial WOZ usability evaluation (Sadowski and Lewis, 2000) was to ensure that the applications were consistent with speech user interface usability guidelines planned for publication in an associated programmer's guide (IBM, in preparation) and to ensure that following those guidelines produced a usable interface. The current study was the second usability evaluation of the IBM WebSphere and Lotus Domino Speech demo, this time using a functional system.

The previous study used the Wizard of Oz¹ (WOZ) technique to evaluate the system prototype because a functional system was not available. Doing a WOZ study requires a functional specification of the application, but does not require a working prototype. The purpose of a WOZ prototype is to discover, by simulating an application, any usability concerns before completing the development of the functional system. In a WOZ study, people who are representative of the target product-audience attempt to use speech to control a simulation of the application. This procedure requires a setup in which the users can, in the case of developing telephony interfaces, hear and speak to the application. What the users cannot see is the "wizard behind the curtain" – the person who mimics the application appropriately when a user calls.

After completing the WOZ evaluation, we provided usability recommendations allowing developers to address those issues before completing the functional prototype. The purpose of the current evaluation was to determine the effectiveness of the previous recommendations and to identify remaining usability issues. Although the WOZ methodology is useful for early evaluations, the technique has some shortcomings because it *does not require* the use of the hardware and/or software proposed for the functional system. Therefore, there may be some usability issues that are not identifiable using this technique. Sadowski (in press) discusses some benefits and limitations of the WOZ usability evaluation paradigm for applications using speech-based interfaces.

¹ Scientists at IBM's T.J. Watson Research Institute, such as John Gould and Jeff Kelley, pioneered this technique in the early 1980s. For example, see Gould, J. D., Conti, J., and Hovanyecz, T. (1981) or Kelley, (1985). For more recent work using WOZ to develop speech systems, see Bernsen, N. O., Dybkjaer, H., and Dybkjaer, L. (1996).

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Method

Participants

Four people, two males and two females, used the demo to complete three tasks in each of the three applications - Library, Banking and Calendar². Two of the four participants had no experience using telephony products with speech user interfaces. Two participants were age 40-49, and the other two participants were 50-59. Three of the four participants had at least some college education (two had a bachelor's degree). The two male participants reported having previous speech-based telephony experience, however, the two female participants reported no experience using such systems (see Appendix A).

Apparatus

For this study, the four participants used a standard touch-tone telephone to connect to the WebVoice demo over an analog line.

Procedure

Each participant completed a non-disclosure statement and provided demographic information. The participants received a briefing on the basic procedure and explanations of the scenarios. The scenarios (see Appendix B) were identical for each participant across applications. Participants had to navigate from the main menu to the appropriate application and complete the task scenarios.³ Each participant completed three primary tasks for each application (Library, Banking and Calendar) and then exited the system using a voice command.

Each participant placed a total of three calls to the system.⁴ Participants completed all the task scenarios for a given application using a single telephone call. Immediately after completing the tasks for an application, participants rated the application using the after-task questionnaire (ATQ) and the accuracy questionnaire (AQ). After completing all tasks, participants rated the overall system using the ATQ, AQ, and the Computer System Usability Questionnaire (CSUQ), and used the Mean Opinion Scale (MOS) to rate the quality of the system's synthetic speech.

² The set of tasks were the same as those used in the previous WOZ study (Sadowski and Lewis, 2000).

³ The order of application task scenarios were balanced across applications.

⁴ Due to "processing errors" two participants were booted out of the system requiring them to place another call to the demo to complete the remaining tasks.

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Results

After-Task Questionnaire (ATQ) Results

Users completed the after-task questionnaire (ATQ) immediately after using an application and rated the overall WebVoice system using the ATQ (see Appendix C). The rating scales ranged from 1 to 7, with lower scores indicating better ratings. Tables 1 - 4 report those ratings (See Appendix D for the ATQ raw data). A repeated measures ANOVA on the independent variables of application and ATQ item found no significant main effects or interactions.

Table 1. After-Task Questionnaire (ATQ) ratings of the Library application.

Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	4	5	3	4.0
2	3	3	3	3.0
3	1	2	2	1.7
4	2	2	2	2.0
Mean				
	2.5	3.0	2.5	2.7
Std. Dev.				
	1.3	1.4	0.6	1.1

Table 2. After-Task Questionnaire (ATQ) ratings of the Banking application.

Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	3	2.3
3	1	1	1	1.0
4	1	1	1	1.0
Mean				
	1.5	1.5	1.8	1.6
Std. Dev.				
	0.6	0.6	1.0	0.7

Table 3. After-Task Questionnaire (ATQ) ratings of the Calendar application.

Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	2	2.0
3	2	2	3	2.3
4	2	4	3	3.0
Mean				
	2.0	2.5	2.5	2.3
Std. Dev.				
	0.0	1.0	0.6	0.5

Table 4. After-Task Questionnaire (ATQ) ratings of the WebVoice demo (overall).

Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	2	2.0
3	2	2	1	1.7
4	1	1	1	1.0
Mean				
	1.8	1.8	1.5	1.7
Std. Dev.				
	0.5	0.5	0.6	0.5

Accuracy Questionnaire (AQ) VXML/Phone Version Results

Users completed the accuracy questionnaire (AQ) immediately after using an application and rated the overall WebVoice system using the AQ (see Appendix E). Accuracy and response time ratings ranged from 1 to 7, with lower scores indicating better ratings. Tables 5 - 8 report those ratings. A repeated measures ANOVA on the independent variables of application and AQ item found no significant main effects or interactions.

Table 5. Accuracy Questionnaire (AQ) ratings of the Library application.

Participant	Accuracy Rating	Response Time Rating	Est. Accuracy in Percentage (%)
1	4	2	90
2	3	3	90
3	1	2	100
4	3	4	90
Mean			
	2.75	2.75	93
Std. Dev.			
	1.26	0.96	5.00

Table 6. Accuracy Questionnaire (AQ) ratings of the Banking application.

Participant	Accuracy Rating	Response Time Rating	Est. Accuracy in Percentage (%)
1	2	2	95
2	2	2	100
3	2	3	85
4	1	1	100
Mean			
	1.75	2.00	95
Std. Dev.			
	0.50	0.82	7.07

Table 7. Accuracy Questionnaire (AQ) ratings of the Calendar application.

Participant	Accuracy Rating	Response Time Rating	Est. Accuracy in Percentage (%)
1	2	2	95
2	2	3	90
3	4	2	80
4	2	2	90
Mean			
	2.50	2.25	89
Std. Dev.			
	1.00	0.50	6

Table 8. Accuracy Questionnaire (AQ) ratings of the WebVoice demo (overall).

Participant	Accuracy Rating	Response Time Rating	Est. Accuracy in Percentage (%)
1	2	2	95
2	2	2	90
3	2	2	93
4	1	2	90
Mean			
	1.75	2.00	92
Std. Dev.			
	0.50	0.00	2

Computer System Usability Questionnaire (CSUQ) Results

Table 9. Users rated the overall WebVoice demo using the CSUQ questionnaire (see Appendix F). The rating scales ranged from 1 to 7, with lower scores indicating better ratings.

Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
1	2	2	3	3	3	2	2	2	2	7	2	3	4
2	2	2	3	3	3	2	2	2	3	2	2	2	3
3	3	1	1	1	2	1	2	1	1	2	3	2	1
4	2	2	2	2	2	2	2	1	6	3	3	2	2
Mean	2.3	1.8	2.3	2.3	2.5	1.8	2.0	1.5	3.0	3.5	2.5	2.3	2.5
Std Dev	0.50	0.50	0.96	0.96	0.58	0.50	0.00	0.58	2.16	2.38	0.58	0.50	1.29
Count	4	4	4	4	4	4	4	4	4	4	4	4	4
sem	0.25	0.25	0.48	0.48	0.29	0.25	0.00	0.29	1.08	1.19	0.29	0.25	0.65
df	3	3	3	3	3	3	3	3	3	3	3	3	3
Crit-t	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943
90% CI delta	0.5	0.5	0.9	0.9	0.6	0.5	0.0	0.6	2.1	2.3	0.6	0.5	1.3
Upper	2.7	2.2	3.2	3.2	3.1	2.2	2.0	2.1	5.1	5.8	3.1	2.7	3.8
Mean	2.3	1.8	2.3	2.3	2.5	1.8	2.0	1.5	3.0	3.5	2.5	2.3	2.5
Lower	1.8	1.3	1.3	1.3	1.9	1.3	2.0	0.9	0.9	1.2	1.9	1.8	1.2

Participant	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	SYS USE	INFO QUAL	INTER QUAL	OVER ALL
1	2	2	3	2	2	2	2	2	2.4	3.1	2.3	2.6
2	2	3	3	3	3	3	3	3	2.4	2.4	3.0	2.6
3	1	1	5	1	3	1	1	1	1.5	1.6	3.0	1.7
4	2	2	3	1	1	2	1	1	1.9	2.9	1.7	2.1
Mean	1.8	2.0	3.5	1.8	2.3	2.0	1.8	1.8	2.0	2.5	2.5	2.2
Std Dev	0.50	0.82	1.00	0.96	0.96	0.82	0.96	0.96	0.43	0.69	0.64	0.44
Count	4	4	4	4	4	4	4	4	4	4	4	4
sem	0.25	0.41	0.50	0.48	0.48	0.41	0.48	0.48	0.21	0.34	0.32	0.22
df	3	3	3	3	3	3	3	3	3	3	3	3
Crit-t	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943
90% CI delta	0.5	0.8	1.0	0.9	0.9	0.8	0.9	0.9	0.4	0.7	0.6	0.4
Upper	2.2	2.8	4.5	2.7	3.2	2.8	2.7	2.7	2.4	3.2	3.1	2.6
Mean	1.8	2.0	3.5	1.8	2.3	2.0	1.8	1.8	2.0	2.5	2.5	2.2
Lower	1.3	1.2	2.5	0.8	1.3	1.2	0.8	0.8	1.6	1.8	1.9	1.8

Mean Opinion Scale (MOS) Questionnaire Results

Table 10. Users rated the synthetic speech of the WebVoice demo using the MOS Questionnaire (see Appendix G). The rating scales ranged from 1 to 5, with lower scores indicating better ratings.

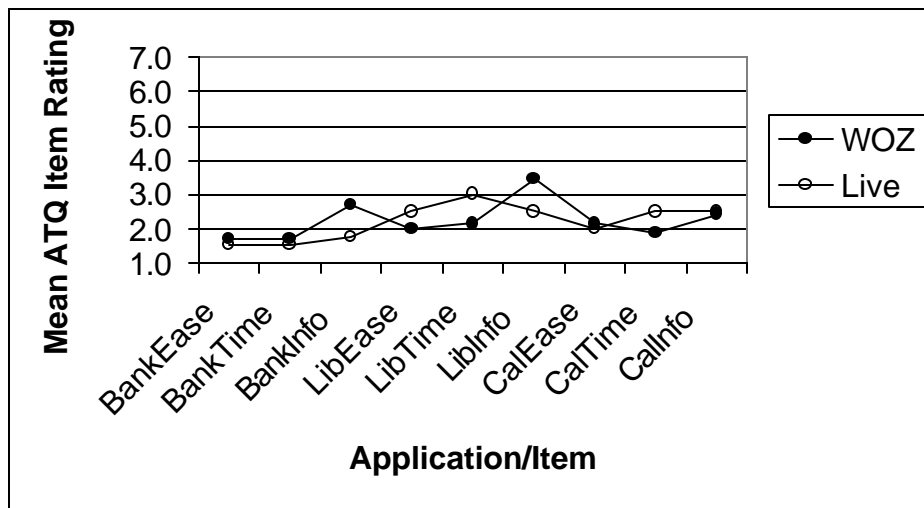
Participant	Global	Listen	Comp	Artic	Pron	Rate	Pleas	Average
1	3	2	2	2	2	1	3	2.1
2	3	2	1	2	2	2	3	2.1
3	2	2	1	2	3	2	4	2.3
4	3	2	3	3	1	5	3	2.9
Mean								
	2.8	2.0	1.8	2.3	2.0	2.5	3.3	2.4
Std. Dev.								
	0.5	0.0	1.0	0.5	0.8	1.7	0.5	0.3

Key: Global: Global Impression
 Listen: Listening Effort
 Comp: Comprehension Problems
 Artic: Speech Sound Articulation
 Pron: Pronunciation
 Rate: Speaking Rate
 Pleas: Voice Pleasantness

Comparison of WOZ ATQ Ratings and Live ATQ Ratings

A 3 x 3 repeated measures ANOVA on the independent variables of test (i.e., WOZ vs. Live), application, and ATQ item found a marginally significant main effect for application, $F(2,18) = 2.78, p=.09$, and ATQ item, $F(2,18) = 3.05, p=.07$. There was also a marginally significant three-way interaction, $F(46) = 4.00, p=.065$, between the independent variables. Subsequent t -tests, justified by the significant interaction, did not indicate any significant differences between the independent variables of ATQ item and test. However, two of the three largest differences between ATQ ratings across tests (see Table 11) corresponded to question three of the ATQ, which relates to the support information provided by the system.

Table 11. Graph illustrating the interaction between the independent variables of test, application, and ATQ item.



Subsequent exploratory t -tests, between the independent variables of overall ATQ item ratings and test, found a marginally significant effect, $t(9) = 1.91, p=.09$, for ATQ question three.⁵ There appears to be a shift in the ATQ ratings, as one might expect, due to changes to the call flow based upon the findings of the WOZ study. The statistical results do not support any firm conclusions regarding this shift, but it is reasonable to assume that the WOZ recommendations regarding the commands “Exit” and “Repeat” (i.e., the only recommendations made that address support information) may have resulted in the difference in the ATQ ratings of support information. For detailed information on those recommendations (i.e., recommendations 1, 3, and 6), see Sadowski and Lewis (2000).

⁵ Note, there were no corrections made to avoid an inflated alpha level due to multiple t -tests.

Unclassified

Discussion

The initial evaluation of the WebVoice demo used the Wizard of Oz (WOZ) evaluation technique. The WOZ simulation uncovered seven usability issues. Those usability issues included, a) ambiguity regarding how to exit the system, b) ambiguity regarding how to have information repeated, c) prompts that disrupt a natural call flow and d) inconsistency among prompts within applications. Another reported issue arose from post-test investigation concerning what word users preferred as the voice command to exit the system.

The current usability evaluation used a live (i.e., functional) demo that incorporated the recommendations from the WOZ study (See Appendix H). WOZ tests, although very useful for early evaluations, have limits regarding what usability problems they can identify in speech enabled systems (Sadowski, in press). Of the seven usability issues identified in this study, five of seven were undiscoverable using the WOZ technique. These five usability problems include Recommendations 1, 2, 3, 4, and 5 within this report, which correspond to issues regarding the presentation of information to users or the recognition of user input. The WOZ technique can not test these types of issues without using synthetic speech and a recognition engine (Sadowski, in press). Thus, the Live test discovered only two additional, low priority, usability issues that the WOZ technique could have potentially identified (See Recommendations 6 and 7).

The benefits of the WOZ testing methodology is confirmed by identification of 43% of the high priority issues, 67% of the medium priority issues, and 50% of the low priority issues during the previous study. The WOZ test identified 50% of the usability problems without using a functional prototype. Table 12 shows the number and priority ratings of the usability problems discovered by both tests.

Table 12. Usability problems discovered for WOZ and Live tests.

TEST	High Priority	Med. Priority	Low Priority	Total
WOZ	3 (43%)	2 (67%)	2 (50%)	7 (50%)
Live	4 (57%)	1 (33%)	2 (50%)	7 (50%)
Total	7 (100%)	3 (100%)	4 (100%)	14(100%)

Unclassified

Recommendations

High Priority

Issue 1. For two of the three library tasks, users were to obtain the catalog number of a book and write it down. Of the seven⁶ catalog numbers presented to users only one catalog number was transcribed correctly (86% error rate). One usability concern regarding the transcription errors is the presentation *method* (i.e., the pronunciation of the catalog numbers). The catalog numbers were pronounced as, “P one hundred fourteen point oh two” and “S five hundred three.” Three of four participants transcribed the numbers as, “P10014.02” and “S5003” respectively⁷.

Recommendation A: Insert an “and” between the hundred’s number and the ten’s number. For example, “S, five hundred *and* three.”

Recommendation B: Alternatively, the system might present the digits and/or letters one at a time. For example, “S, Five, Zero, Three.”

Issue 2. For two of the three library tasks, users were to obtain the catalog number of a book and write it down. A second usability concern regarding the transcription errors (i.e., the 86% error rate reported in Recommendation 1) of catalog numbers is the presentation *rate* of the catalog numbers. Two of the four users could not transcribe an “entire” catalog number due to the speed of presentation. Additionally, all four of the test users reported difficulty writing down the catalog numbers correctly due to the rapid presentation rate.

Recommendation: Slow down the presentation rate of information requiring transcription for later use or referral.

Issue 3. When users seek to establish Calendar entries (e.g., creating an appointment or reminder) the system asks the user for a “start date.” Two of four participants stated the “start date” using all numeric characters. For example, two users stated “twelve, twenty-five, two-thousand” to represent a start date of December 25, 2000. The system accepted the input both times, however, upon confirmation the system interpreted the entered start date as “Tuesday, July first, twelve-twenty-five.” The system subsequently prompted users that a “processing error” had occurred and booted users out of the system.

⁶ The system failed to provide one catalog number requested by the first participant. The system gave an error message stating “No data returned.” Therefore, this reduces the total number of catalog numbers presented to a total of seven (7).

⁷ The correct catalog numbers were P114.02 and S503.

Recommendation A: Enhance the date grammar so it can correctly recognize this type of input.

Recommendation B: Alternatively, ensure that the system registers numerically spoken entries as “out of grammar” and replace the *first* self-revealing help prompt with the more instructive *second* self-revealing help prompt. Consequently, initial OOG utterances (i.e., using numeric entry of dates) result in a help prompt that provides users with the appropriate method of date entry.

Issue 4. The system proceeds to the next prompt “immediately” after presenting catalog numbers, savings account balances and checking account balances. Therefore, the user cannot use the “Repeat” command to replay that information.

Recommendation A: Developers should analyze each turn taking opportunity to be aware of what to repeat should the user issue the “repeat” command. When users will hear extensive messages (e.g., book jacket summaries) or information they may wish to write down (e.g., catalog numbers or account balances) developers should code the software such that “repeat” commands result in the prompt and the information heard before the prompt being repeated.

Recommendation B: If Recommendation A proves to be unfeasible developers may alternatively add a turn taking dialogue which asks the user whether they wish to replay the information just heard. For example, “Repeat or Continue?”

Recommendation C: Slow down the presentation rate of information to minimize the need to repeat it (See Recommendation 2).

Medium Priority

Issue 5. When users are within the Library application, they can state “Library” at anytime to return to the top level of that application. However, when a user said “Library” while they were at lower levels of the Library application the system did not return users to the top level of the application. This is important since users may wish to return to the top level of an application in order to start a task over.

Recommendation: Check to see that “Library” is in grammar within the Library application. Saying “Library” should return users to the top level of that application (i.e., present users with the first prompt of that application).

For example;

C: Please choose one of the following searches: Subject, Author, Title, or Exit.

H: Library

C: Welcome back to the Library catalog system.

Low Priority

Issue 6. The Calendar application portion of the demo allows users to “create” and “review” reminders, invitations, and appointments. Although the task sheet specifically asked participants “...to establish a reminder...”, two of the four participants attempted to create an “appointment” instead. This suggests that some users may have difficulty differentiating between an appointment and a reminder.

Recommendation: If users of this application may not have experience using the Lotus Notes Calendar application incorporate a brief explanation of the functional and operational differences between the two types of entries in the first level help prompt.

Issue 7. When creating an appointment in the calendar application the user must state the appointment “location.” If the user is not sure how to respond to the initial prompt the first level help prompt states the options, “My office, your office, my managers office, at headquarters, to be determined.” Note: The option “your office” does not appear to be an appropriate option since there is no reference to who the *your* in “your office” is referring to. Since this version of the WebVoice is a demo, these “location” options may only serve to illustrate the systems capabilities; however, it exposes a weakness in the Calendar application. The inability to dictate directly into the application limits the flexibility of the system. It is impossible to list every possible location and adding all possible locations to the grammar set is unreasonable.

Recommendation A: Allow users to specify the “subject” and “location” by dictating directly into those fields. Because this is a demo, this recommendation is rated as a low priority. However, for this to be a feasible product in the future dictating into some fields will be necessary.

Recommendation B: Developers should add more potential responses to the request for “subject” and “location” to the appropriate grammar set.

Recommendation C: Replace “Your Office” with “His office” and “Her Office.”

Unclassified

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Unclassified

Appendix A. Participant Demographics

Participant	Gender	Age Group	Education	Telephony Experience⁸
1	Male	50 – 59	B.A.	Yes
2	Male	40 – 49	High School	Yes
3	Female	50 – 59	Some College	No
4	Female	40 – 49	B.A.	No

⁸ Refers to telephony systems using speech-based interfaces.

Unclassified

Appendix B. Task Scenarios for WebVoice Applications

The following four pages display the task scenarios that participants completed using the appropriate application within the WebVoice demo. The participants completed the Library, Banking, and the Calendar tasks. The order of application use was counter-balanced to control the influence of presentation order. We manipulated the order of the tasks within the Calendar application to determine the affects on the usability of a prompt-change within that application interface.⁹ Therefore, this appendix contains both Calendar scenarios used (A and B).

⁹ Participants 2 and 4 worked from the B version of the Calendar task scenarios.

Library Scenarios

WebVoice – Library Scenarios

Please use the WebVoice system to complete these 4 transactions in a single telephone call (i.e., do not hang-up to start a new transaction).

1. Please search for a book written by Nora Roberts and obtain the catalog number.

Catalog Number _____

2. Please search for a book called “Rivers End.” Listen to the system’s description of the book then briefly describe below what the book is about.

“Rivers End” is about...

3. Please search for a book about Science and obtain the catalog number.

Catalog Number _____

4. Please leave the system before hanging up.

_____ Completed successfully

_____ Unsuccessful

Banking Scenarios

WebVoice – Banking Scenarios

Please use the WebVoice system to complete these 4 transactions in a single telephone call (i.e., do not hang-up to start a new transaction).

1. Please find out what your savings account balance is.

Balance _____

2. Please transfer \$500 from savings into checking.

_____ Completed successfully

_____ Unsuccessful

3. Please find out what your checking account balance is.

Balance _____

4. Please leave the system before hanging up.

_____ Completed successfully

_____ Unsuccessful

Calendar Scenarios (Version A)

WebVoice – Calendar Scenarios (A)

Please use the WebVoice system to complete these 4 transactions in a single telephone call (i.e., do not hang-up to start a new transaction).

1. Please use the system to establish a reminder that you have a meeting this Christmas Day from 11:00am until 1:30pm.

_____ Completed successfully

_____ Unsuccessful

2. Please determine if the reminder is in the system.

_____ Completed successfully

_____ Unsuccessful

3. Please use the system to set up a lunch appointment from 12:00pm until 2:00pm for New Years Day.

_____ Completed successfully

_____ Unsuccessful

4. Please leave the system before hanging up.

_____ Completed successfully

_____ Unsuccessful

Calendar Scenarios (Version B)

WebVoice – Calendar Scenarios (B)

Please use the WebVoice system to complete these 4 transactions in a single telephone call (i.e., do not hang-up to start a new transaction).

1. Please use the system to set up a lunch appointment from 12:00pm until 2:00pm for New Years Day.

_____ Completed successfully

_____ Unsuccessful

2. Please use the system to establish a reminder that you have a meeting this Christmas Day from 11:00am until 1:30pm.

_____ Completed successfully

_____ Unsuccessful

3. Please determine if the reminder is in the system.

_____ Completed successfully

_____ Unsuccessful

4. Please leave the system before hanging up.

_____ Completed successfully

_____ Unsuccessful

Unclassified

Appendix C. After-Task Questionnaire (ATQ)

For each of the statements below, circle the rating of your choice.

1. Overall, I am satisfied with the ease of completing this task.

STRONGLY **STRONGLY**
AGREE **1** **2** **3** **4** **5** **6** **7** **DISAGREE**

2. Overall, I am satisfied with the amount of time it took to complete this task.

STRONGLY **STRONGLY**
AGREE **1** **2** **3** **4** **5** **6** **7** **DISAGREE**

3. Overall, I am satisfied with the support information provided when completing this task.

STRONGLY **STRONGLY**
AGREE **1** **2** **3** **4** **5** **6** **7** **DISAGREE**

Unclassified

Appendix D. After-Task Questionnaire (ATQ) Raw Data

After Task Questionnaire - Library				
Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	4	5	3	4.0
2	3	3	3	3.0
3	1	2	2	1.7
4	2	2	2	2.0
Mean				
	2.5	3.0	2.5	2.7
Std Dev				
	1.3	1.4	0.6	1.1
Count				
	4	4	4	4
sem				
	0.65	0.71	0.29	0.53
df				
	3	3	3	3
Crit-t				
	1.943	1.943	1.943	1.943
90% CI delta				
	1.3	1.4	0.6	1.0
Upper				
	3.8	4.4	3.1	3.7
Mean				
	2.5	3.0	2.5	2.7
Lower				
	1.2	1.6	1.9	1.6

After Task Questionnaire - Banking				
Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	3	2.3
3	1	1	1	1.0
4	1	1	1	1.0
Mean				
	1.5	1.5	1.8	1.6
Std Dev				
	0.6	0.6	1.0	0.7
Count				
	4	4	4	4
sem				
	0.29	0.29	0.48	0.34
df				
	3	3	3	3
Crit-t				
	1.943	1.943	1.943	1.943
90% CI delta				
	0.6	0.6	0.9	0.7
Upper				
	2.1	2.1	2.7	2.3
Mean				
	1.5	1.5	1.8	1.6
Lower				
	0.9	0.9	0.8	0.9

After Task Questionnaire - Calendar				
Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	2	2.0
3	2	2	3	2.3
4	2	4	3	3.0
Mean				
	2.0	2.5	2.5	2.3
Std Dev				
	0.0	1.0	0.6	0.5
Count				
	4	4	4	4
sem				
	0.00	0.50	0.29	0.24
df				
	3	3	3	3
Crit-t				
	1.943	1.943	1.943	1.943
90% CI delta				
	0.0	1.0	0.6	0.5
Upper				
	2.0	3.5	3.1	2.8
Mean				
	2.0	2.5	2.5	2.3
Lower				
	2.0	1.5	1.9	1.9

After Task Questionnaire - WebVoice Overall				
Participant	Quest. 1	Quest. 2	Quest. 3	Overall
1	2	2	2	2.0
2	2	2	2	2.0
3	2	2	1	1.7
4	1	1	1	1.0
Mean				
	1.8	1.8	1.5	1.7
Std. Dev.				
	0.5	0.5	0.6	0.5
Count				
	4	4	4	4
sem				
	0.25	0.25	0.29	0.24
df				
	3	3	3	3
Crit-t				
	1.943	1.943	1.943	1.943
90% CI delta				
	0.5	0.5	0.6	0.5
Upper				
	2.2	2.2	2.1	2.1
Mean				
	1.8	1.8	1.5	1.7
Lower				
	1.3	1.3	0.9	1.2

Appendix E. The Accuracy Questionnaire (AQ) – VXML/Phone Version

For each of the statements below, circle the rating of your choice. If an item is not applicable, circle N/A.

1. This system's accuracy is acceptable.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE N/A

COMMENTS:

2. The time it takes for the system to recognize what I say is acceptable.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE N/A

COMMENTS:

3. In your estimation, what percentage of the time did the system correctly recognize your speech?

_____ %

COMMENTS:

4. If you needed the type of information this system provides, would you be willing to use it?

Yes **No**

COMMENTS:

Unclassified

Appendix F. Computer System Usability Questionnaire (CSUQ)

The following pages contain a copy of the Computer System Usability Questionnaire (CSUQ) administered to all participants.

1. Overall, I am satisfied with how easy it is to use this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

2. It was simple to use this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

3. I could effectively complete the tasks and scenarios using this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

4. I was able to complete the tasks and scenarios quickly using this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

5. I was able to efficiently complete the tasks and scenarios using this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

6. I felt comfortable using this system.

STRONGLY
AGREE 1 2 3 4 5 6 7 **STRONGLY**
DISAGREE

COMMENTS:

7. It was easy to learn to use this system.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

8. I believe I could use this system very effectively in the future.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

9. The system gave error messages that clearly told me how to fix problems.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

10. Whenever I made a mistake using the system, I could recover easily and quickly.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

11. The introduction to the system was clear.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

12. It was easy to obtain the information I needed.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

13. The information provided by the system was easy to understand.

STRONGLY
AGREE **1** **2** **3** **4** **5** **6** **7** **STRONGLY**
DISAGREE

COMMENTS:

14. The directive help messages/instructions were effective in helping me complete the tasks and scenarios.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

15. The organization of information was clear and logical.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

16. Overall, the speech-based interface of this system was pleasant.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

17. I liked using speech to control this system.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

18. This system has all the functions and capabilities I would expect it to have.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

19. Overall, I am satisfied with this system.

STRONGLY									STRONGLY
AGREE	1	2	3	4	5	6	7		DISAGREE

COMMENTS:

20. I would use this system.

STRONGLY									STRONGLY
-----------------	--	--	--	--	--	--	--	--	-----------------

Appendix G. Mean Opinion Scale (MOS) Questionnaire

For each question, choose one answer from the five possible choices.

1. *Global Impression:* Please rate the sound quality of the voice you heard.

- Excellent
- Good
- Fair
- Poor
- Bad

2. *Listening Effort:* Please indicate the degree of effort you had to make to understand the voice.

- No effort required
- Slight effort required
- Effort required
- Major effort required
- Message not understood with any feasible effort

3. *Comprehension Problems:* Please indicate if you found single words hard to understand.

- None
- Few
- Some
- Many
- Every word

4. *Speech Sound Articulation:* Please indicate if the speech sounds were clearly distinguishable.

- Yes, very clearly
- Yes, clearly enough
- Fairly clear
- No, not very clear
- No, not at all

5. *Pronunciation:* Please indicate if you noticed any anomalies in the naturalness of sentence pronunciation.

- No
- Yes, but not annoying
- Yes, slightly annoying
- No, annoying
- Yes, very annoying

6. *Speaking Rate*: Please indicate if you found the speed of delivery of the messages appropriate.

- Yes
- Yes, but slower than preferred
- Yes, but faster than preferred
- No, too slow
- No, too fast

7. *Voice Pleasantness*: Please indicate if you found the voice pleasant.

- Very pleasant
- Pleasant
- Fair
- Unpleasant
- Very unpleasant

Appendix H. WebVoice Scripts

The following pages contain the WebVoice scripts illustrating the call flow paths and self-revealing help prompts for each application

Key

C = Computer speech

H = Human input

Main Menu

C: Welcome to the IBM WebSphere and LOTUS Domino Speech Demo.

C: At any time, you can say Main Menu to return here, or say Repeat to replay system messages.

C: Main Menu: Library, Banking, Calendar, or Exit?

Help prompt 1: Please say Library, Banking, Calendar or Exit.

Help prompt 2: This demo includes three applications, Library, Banking, and Calendar. To start an application, say the application's name. You can return to the Main Menu at any time by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Library, Banking, Calendar or Exit.

H: Library (*Users can say this option at any point during the interaction.*)

Library

C: Welcome to The Library Catalog System (*or Welcome BACK to The Library Catalog System, if the user was previously here in the same session*).

C: You can return here at any time by saying Library.

C: Please choose one of the following searches: Subject, Author, Title.

Help prompt 1: Please say Subject, Author, or Title.

Help prompt 2: This application lets you find books in a small library with five books. To use this application, you need to tell the system what to search by: Subject, Author, or Title. You can restart the Library at any time by saying Library, or return to the Main Menu by saying Main Menu.

You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Subject, Author, Title.

Search By Author

H: Author

C: Please state the author's first and last name.

Help prompt 1: Please choose one of the following authors: Nora Roberts, Brian Green, William Lace, Dr. Seuss, Galen Grimes.

Help prompt 2: This is a small library, with books by five different authors. From here, you can pick one of the authors, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following authors: Nora Roberts, Brian Green, William Lace, Dr. Seuss, Galen Grimes.

H: <Selected author's first and last name>

C: Found <Book Title> by <Book Author>.

C: Say one of these options: Read Jacket, Catalog Number, New Search.

Help prompt 1: To hear a brief summary of the book, say Read Jacket. To get the number you need to find the book in the library, say Catalog Number. Or you can start over by saying New Search. Please say one of these options: Read Jacket, Catalog Number, New Search.

Help prompt 2: From here, you can get some information about the selected book, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Read Jacket, Catalog Number, New Search.

Read Book Jacket

H: Read Jacket

C: Please wait for jacket information. (*Computer retrieves and reads a short synopsis of the book.*)

C: Choose one: Read Jacket, Catalog Number, New Search, or Exit.

Help prompt 1: To hear a brief summary of the book again, say Read Jacket. To get the number you need to find the book in the library, say Catalog Number. Or you can start over by saying New Search. Please say one of these options: Read Jacket, Catalog Number, New Search, or Exit.

Help prompt 2: From here, you can get some information about the selected book, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Read Jacket, Catalog Number, New Search, or Exit.

Search By Title

H: Title

C: Please state the title.

Help prompt 1: Please select one of the following titles. You only need to say a few words from the title to select it, and you can make your selection at any time: Sports Great Nolan Ryan, River's End, The Cat in the Hat, 10 Minute PC Upgrades, The Elegant Universe.

Help prompt 2: This is a small library, with only five books. From here, you can pick one of the titles, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following titles: Sports Great Nolan Ryan, River's End, The Cat in the Hat, 10 Minute PC Upgrades, The Elegant Universe.

H: <Selected book title>

C: *(Computer retrieves and reads book information.)* <Book title> by <Author>.

C: Say one of these options: Read Jacket, Catalog Number, New Search

Help prompt 1: To hear a brief summary of the book, say Read Jacket. To get the number you need to find the book in the library, say Catalog Number. Or you can start over by saying New Search. Please say one of these options: Read Jacket, Catalog Number, New Search.

Help prompt 2: From here, you can get some information about the selected book, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Read Jacket, Catalog Number, New Search.

Get Library Catalog Number

H: Catalog number

C: The Library Catalog Number for <Book Title> is <Catalog Number>.

C: Please choose one of the following searches: Subject, Author, Title or say Exit.

Help prompt 1: Please say Subject, Author, Title or Exit.

Help prompt 2: This application lets you find books in a small library with five books. To use this application, you need to tell the system what to search by: Subject, Author, or Title. You can restart the Library at any time by saying Library, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Subject, Author, Title or Exit.

Search By Subject

H: Subject

C: Please state the subject.

Help prompt 1: Please say one of the following subjects: Sports, Kids' Books, Novels, Computers, Science.

Help prompt 2: This is a small library, with only five books. From here, you can pick one of the subjects, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following subjects: Sports, Kids' Books, Novels, Computers, Science.

H: <Selected book subject>

C: (*Computer retrieves and reads book information.*) For <subject>: Found <Book title> by <Author>.

C: Say one of these options: Read Jacket, Catalog Number, New Search

Help prompt 1: To hear a brief summary of the book, say Read Jacket. To get the number you need to find the book in the library, say Catalog Number. Or you can start over by saying New Search. Please say one of these options: Read Jacket, Catalog Number, New Search.

Help prompt 2: From here, you can get some information about the selected book, say Main Menu to return to the Main Menu, or say Library to restart the Library application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Read Jacket, Catalog Number, New Search.

Banking

H: Banking (*Users can say this option at any point during the interaction.*)

C: Welcome to the Banking system.

C: You can return here at any time by saying Banking.

C: Please say one of the following options: Inquiries, Transfers.

Help prompt 1: Please say either Inquiries or Transfers.

Help prompt 2: This application simulates some simple banking functions. To use this application, you need to tell the system whether you are inquiring about your account balances or transferring funds. You can restart the Banking application at any time by saying Banking, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Inquiries, Transfers.

Inquiries

H: Inquiries

C: Inquiries. Savings or checking?

Help prompt 1: Please say either Savings or Checking.

Help prompt 2: From here, you can get the balance for your savings or checking account, say Main Menu to return to the Main Menu, or say Banking to restart the Banking application. You can leave the demo by hanging

Unclassified

up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Savings, Checking.

H: Savings

C: Your Savings account balance is \$1,250.53.

C: Choose one: Inquiries, Transfers or Exit. *(This is a shorter prompt, demonstrating the technique of tapering.)*

Help prompt 1: Please say either Inquiries or Transfers.

Help prompt 2: This application simulates some simple banking functions. To use this application, you need to tell the system whether you are inquiring about your account balances or transferring funds. You can restart the Banking application at any time by saying Banking, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Inquiries, Transfers or Exit.

H: Inquiries

C: Inquiries. Savings or checking?

Help prompt 1: Please say either Savings or Checking.

Help prompt 2: From here, you can get the balance for your savings or checking account, say Main Menu to return to the Main Menu, or say Banking to restart the Banking application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Savings, Checking.

H: Checking

C: Your checking account balance is \$953.28.

C: Choose one: Inquiries, Transfers or Exit.

Help prompt 1: Please say Inquiries, Transfers or Exit.

Help prompt 2: This application simulates some simple banking functions. To use this application, you need to tell the system whether you are inquiring about your account balances or transferring funds. You can restart the Banking application at any time by saying Banking, or return to the Main Menu by saying Main Menu. You can leave the demo by

Unclassified

hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Inquiries, Transfers or Exit.

H: Inquiries

C: Inquiries. Savings or checking?

Help prompt 1: Please say either Savings or Checking.

Help prompt 2: From here, you can get the balance for your savings or checking account, say Main Menu to return to the Main Menu, or say Banking to restart the Banking application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Savings, Checking.

H: Savings

C: Your savings account balance is \$1,250.53.

Transfers

H: Transfers

C: Transfers. Accounts or bills?

Help prompt 1: Please say either Accounts or Bills.

Help prompt 2: From here, you can transfer funds between your accounts, get the status of an automatic bill payment, say Main Menu to return to the Main Menu, or say Banking to restart the Banking application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Accounts, Bills, Banking.

H: Accounts

C: Bank systems updating. Transfers not currently available. Please call back later.

C: Choose one: Inquiries, Transfers or Exit.

Help prompt 1: Please say Inquiries, Transfers or Exit.

Help prompt 2: This application simulates some simple banking functions. To use this application, you need to tell the system whether you are inquiring about your account balances or transferring funds. You can restart

the Banking application at any time by saying Banking, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Inquiries, Transfers or Exit.

H: Transfers

C: Transfers. Accounts or bills?

Help prompt 1: Please say either Accounts or Bills.

Help prompt 2: From here, you can transfer funds between your accounts, get the status of an automatic bill payment, say Main Menu to return to the Main Menu, or say Banking to restart the Banking application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Accounts, Bills or Banking.

H: Bills

C: Paid this month's utilities two days ago.

Calendar

H: Calendar (*Users can say this prompt at any point during the interaction.*)

C: Welcome to the LOTUS Domino Calendar system.

C: You can return here at any time by saying Calendar.

C: Please say one of the following calendar entry options: Create, Review.

Help prompt 1: Please say either Create or Review.

Help prompt 2: This application simulates some simple calendar functions. To use this application, you need to tell the system whether you want to create or review calendar entries. You can return to this part of the demo at any time by saying Calendar, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Create, Review.

H: Create

C: Create reminder, invitation, or appointment?

Unclassified

Help prompt 1: Please say the type of calendar entry you want to create: reminder, invitation, appointment.

Help prompt 2: From here, you can indicate the type of calendar entry you want to create, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Reminder, Invitation, Appointment.

H: Reminder

C: Please complete the reminder form.

C: Subject is?

Help prompt 1: Please say one of the following subjects: Meeting, Important event, Do today, Birthday, Medical.

Help prompt 2: This system allows you to select from a small list of subjects. From here, you can pick one of the subjects, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following subjects: Meeting, Important event, Do today, Birthday, Medical.

H: Medical

C: Start date is?

Help prompt 1: Please state the start date.

Help prompt 2: State the month and day and, optionally, the year. Start date is?

Help prompt 3: For example, July third. Or you can say 'today' or 'tomorrow'. Start date is?

Help prompt 4: From here, you can provide a start date for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state a start date, providing the month and day, and, optionally, the year. Start date is?

Unclassified

H: June twentieth

C: Start time is?

Help prompt 1: Please state the start time.

Help prompt 2: State the start time in hours and minutes.

Help prompt 3: For example, ten o'clock AM or three-thirty PM. Start time is?

Help prompt 4: From here, you can provide a start time for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state the start time in hours and minutes. Start time is?

H: 9 AM.

C: Add reminder with subject Medical starting June twentieth at nine AM. Yes or no?

Help prompt 1: Please say Yes or No.

Help prompt 2: If you say Yes, the system add the reminder. If you say No, the system will discard the reminder. Add reminder?

H: Yes.

C: Reminder added.

C: Create or Review?

Help prompt 1: Please say either Create or Review.

Help prompt 2: From here, you can indicate the type of calendar entry you want to create, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Create, Review or Exit.

H: Invitation

C: Please complete the invitation form.

C: Subject is?

Unclassified

Help prompt 1: Please say one of the following subjects: Meeting, Conference call, Area function, Lunch, Corporate event.

Help prompt 2: This system allows you to select from a small list of subjects. From here, you can pick one of the subjects, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following subjects: Meeting, Conference call, Area function, Lunch, Corporate event.

H: Meeting

C: Start date is?

Help prompt 1: Please state the start date.

Help prompt 2: State the month and day and, optionally, the year. Start date is?

Help prompt 3: For example, July third. Or you can say 'today' or 'tomorrow'. Start date is?

Help prompt 4: From here, you can provide a start date for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state a start date, providing the month and day, and, optionally, the year. Start date is?

H: May twenty-third

C: Start time is?

Help prompt 1: Please state the start time.

Help prompt 2: State the start time in hours and minutes.

Help prompt 3: For example, ten o'clock AM or three-thirty PM. Start time is?

Help prompt 4: From here, you can provide a start time for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state the start time in hours and minutes. Start time is?

H: 10 AM

Unclassified

C: End time is?

Help prompt 1: Please state the end time.

Help prompt 2: State the end time in hours and minutes.

Help prompt 3: For example, ten o'clock AM or three-thirty PM. End time is?

Help prompt 4: From here, you can provide an end time for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state the end time in hours and minutes. End time is?

H: 11 AM

C: Location is?

Help prompt 1: Please say one of the following locations: My office, Your office, My manager's office, At headquarters, To be determined.

Help prompt 2: This system allows you to select from a small list of locations. From here, you can pick one of the locations, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following locations: My office, Your office, My manager's office, At headquarters, To be determined.

H: My office

C: Attendees are?

Help prompt 1: Please say one or more of the following members of your attendees list: Steve, Ron, Peggy, Mary, Marshall.

Help prompt 2: For example, you could say "Mary, Steve, and Ron". Please say one or more of these attendee names: Steve, Ron, Peggy, Mary, Marshall.

Help prompt 3: This system allows you to select from a small list of attendees. From here, you can pick one or more of the attendees, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one or more of these attendee names: Steve, Ron, Peggy, Mary, Marshall.

Unclassified

H: Marshall and Peggy

C: Add invitation with subject Meeting starting May twenty-third from ten AM to eleven AM in my office with Marshall and Peggy. Yes or no?

Help prompt 1: Please say Yes or No.

Help prompt 2: If you say Yes, the system add the reminder. If you say No, the system will discard the reminder. Add reminder?

H: Yes.

C: Invitation added.

C: Create or Review?

Help prompt 1: Please say either Create or Review.

Help prompt 2: From here, you can create another calendar entry by saying Create, review entries by saying Review, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Create, Review or Exit.

H: Appointment

C: Please complete the appointment form.

C: Subject is?

Help prompt 1: Please say one of the following subjects: Meeting, Important event, Legal, Medical, Lunch.

Help prompt 2: This system allows you to select from a small list of subjects. From here, you can pick one of the subjects, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following subjects: Meeting, Important event, Legal, Medical, Lunch.

H: Lunch

C: Start date is?

Help prompt 1: Please state the start date.

Unclassified

Help prompt 2: State the month and day and, optionally, the year. Start date is?

Help prompt 3: For example, July third. Or you can say 'today' or 'tomorrow'. Start date is?

Help prompt 4: From here, you can provide a start date for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state a start date, providing the month and day, and, optionally, the year. Start date is?

H: April fifth

C: Start time is?

Help prompt 1: Please state the start time.

Help prompt 2: State the start time in hours and minutes.

Help prompt 3: For example, ten o'clock AM or three-thirty PM. Start time is?

Help prompt 4: From here, you can provide a start time for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state the start time in hours and minutes. Start time is?

H: Noon

C: End time is?

Help prompt 1: Please state the end time.

Help prompt 2: State the end time in hours and minutes.

Help prompt 3: For example, ten o'clock AM or three-thirty PM. End time is?

Help prompt 4: From here, you can provide an end time for the reminder, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state the end time in hours and minutes. End time is?

H: One o'clock PM

Unclassified

C: Location is?

Help prompt 1: Please say one of the following locations: My office, Your office, His office, Her office, Restaurant.

Help prompt 2: This system allows you to select from a small list of locations. From here, you can pick a location, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following locations: My office, Your office, His office, Her office, Restaurant.

H: Restaurant

C: Add appointment with subject Lunch starting April fifth from noon to one o'clock PM in Restaurant. Yes or no?

Help prompt 1: Please say Yes or No.

Help prompt 2: If you say Yes, the system add the appointment. If you say No, the system will discard the appointment. Add appointment?

H: Yes.

C: Appointment added.

C: Create or Review?

Help prompt 1: Please say either Create or Review.

Help prompt 2: This application simulates some simple calendar functions. To use this application, you need to tell the system whether you want to create or review calendar entries. You can return to this part of the demo at any time by saying Calendar, or return to the Main Menu by saying Main Menu. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following options: Create, Review or Exit.

H: Review

C: Review reminders, invitations, or appointments?

Help prompt 1: Please say the type of calendar entry you want to review: reminder, invitation, appointment.

Help prompt 2: From here, you can indicate the type of calendar entry you want to review, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Reminders, Invitations, Appointments.

H: Invitations

C: Invitations on what date?

Help prompt 1: Please state the review date.

Help prompt 2: State the month and day and, optionally, the year. Review date is?

Help prompt 3: For example, July third. Or you can say 'today' or 'tomorrow'.
Review date is?

Help prompt 4: From here, you can provide a review date, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state a review date, providing the month and day, and, optionally, the year. Review date is?

H: Today

C: You have ___#___invitations for today. The___ invitation is _____, etc.

C: Create or Review?

Help prompt 1: Please say either Create or Review.

Help prompt 2: From here, you can indicate the type of calendar entry you want to review, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Create or Review.

H: Appointments

C: Appointments for what date?

Help prompt 1: Please state the review date.

Help prompt 2: State the month and day and, optionally, the year. Review date is?

Unclassified

Help prompt 3: For example, July third. Or you can say 'today' or 'tomorrow'.
Review date is?

Help prompt 4: From here, you can provide a review date, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please state a review date, providing the month and day, and, optionally, the year. Review date is?

H: Tomorrow

C: You have _#_ appointments for tomorrow. The ___ appointment is _____, etc...

C: Create or Review?

Help prompt 1: Please say either Create or Review.

Help prompt 2: From here, you can indicate the type of calendar entry you want to review, say Main Menu to return to the Main Menu, or say Calendar to restart the Calendar application. You can leave the demo by hanging up or saying Exit. To hear a prompt again, say Repeat. To continue, please say one of the following choices: Create or Review.

H: Reminders

C: You have one reminder for today. Remember your medical appointment at three o'clock PM.