Vision Works, Inc
Vision Works version 10.0

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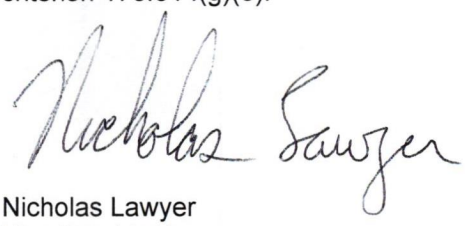
For public release:
Vision Works, Inc. attests that the usability standard/process and usability report submitted for the certification of Vision Works Version 10.0 is accurate and complete per the requirements of the ONC criterion 170.314(g)(3).



Nicholas Lawyer
Vice President
Vision Works, Inc.

04/12/2018

Vision Works Safety-Enhanced Design Usability Report

Report based on ISO/IEC 25062: 2006 Common Industry Format by Usability Test Reports

Product:	Vision Works version 10.0
Dates of Usability Tests:	November 7th & April 12th
Date of Report:	April 12th
Report Prepared By:	Vision Works, Inc.
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Executive Summary

Vision Works conducted a system usability test of Vision Works Software Version 10.0 on November 7th and April 12th, Cedar Rapids IA, administered by Vision Works, Inc. The purpose of this test was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR Under Test (EHRUT). We looked for issues that might cause confusion for the users and could lead to errors in the patient's data in the system.

The study collected performance data on tasks typically conducted in the EHRUT which are related to 10 different areas being certified:

170.315(a)(1) Computerized Provider order entry – Medication Orders

- Record a Medication Order
- Change a Medication Order
- Access a Medication List and Orders

170.315(a)(2) Computerized provider order entry – Laboratory Orders

- Record a Laboratory Order
- Change a Laboratory Order
- Access Laboratory Orders

170.315(a)(4) Drug-drug, Drug-allergy Interaction Checks

- Create drug-drug and drug-allergy interventions prior to CPOE completion
- Adjustment of severity level of drug-drug interventions

170.315(a)(5) Demographics

- Record Demographics
- Change Demographics
- Access Demographics

170.315(a)(6) Problem List

- Record a Problem
- Change a Problem
- Access Problems

170.315(a)(7) Medication List

- Record a Medication Order
- Change a Medication Order

- Access a Medication List and Orders

170.315(a)(8) Medication Allergy List

- Access Allergy List
- Record an Allergy record
- Change an Allergy record

170.315(a)(9) Clinical Decision Support

- Add Clinical Decision Support Alerts
- Trigger and View Clinical Decision Support Alerts
- CDS import Transition of Care

170.315(a)(14) Implantable Device List

- Access Implantable Device List
- Record an Implantable Device record
- Change an Implantable Device record

170.315(b)(2) Clinical Information Reconciliation

- Reconcile Patient's active medication list with another source
- Reconcile patient's active problem list with another source
- Reconcile patient's medication allergy list with another source
- Export new CDA with incorporated information

170.315(b)(3) Electronic Prescribing

- Change Prescription
- Cancel Prescription
- Refill Prescription
- Send a Medication History Request to Pharmacy

The test administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using Vision Works Version 10.0. During the testing, the administrator timed the tests and recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task other than to setup each task exercise with a brief definition of the task objectives. Participants had all previously received some basic end-user system instruction. User tasks were prioritized in accordance with the risk associated with user errors and common workflow.

The following types of data were collected for each participant:

- Number of tasks successfully completed within the allotted time without assistance
- Time to complete the tasks
- Number and types of errors
- Path deviations
- Participant's verbalizations
- Participant's satisfaction ratings of the system

All participant data was de-identified and no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire and were compensated with $25 gift card for their time. Various recommended metrics, in accordance with the examples set forth in the *NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records*, were used to evaluate the usability of the EHRUT. Following is a summary of the performance and rating data collected on the EHRUT.

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be:

Major Findings
Overall participants commented that the system was easy to use and very intuitive with minimal guidance or instruction. It was commented that the navigate tree made finding information quick and easy to access. The test results showed that most participants completed the tasks quickly and close to optimal time. Based on feedback from each of the tasks and (SUS) score, the system appears to be obtaining a high degree of satisfaction.

Areas of Improvement
Due to path deviations in Clinical Decision Support Alerts maintenance this task should be reviewed and potentially redesigned to help improve work flow. Overall participants had little to say that was critical or otherwise regarding the EHRUT in the study.

Introduction

The EHRUT tested for this study was Vision Works Version 10.0 which was designed to present medical information to healthcare providers in a Mental Health/Child Welfare setting. The usability testing attempted to represent realistic exercises and conditions.

The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the EHRUT. To this end, measures of effectiveness, efficiency, and user satisfaction, were captured during the usability testing.

Method

Participants

A total of 10 participates were tested on the EHRUT. Our participants are staff and therapists whom work in an outpatient mental health \ child welfare environment. Participants were recruited by Vision Works, Inc. and were compensated with a $25 gift card for their time. We have used candidates from agencies that currently use our software, but have not been associated with the design, development or implementation of the EHRUT being tested. The participants were users of our previous products and were familiar with our software but not this version of the software. Training was provided to the participants for areas that were new or different in our software.

Recruited participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. The following is a table of participants by characteristics, including demographics, professional experience, computing experience and user needs for assistive technology. Participant names were replaced with Participant IDs so that an individual's data cannot be tied back to individual identities.

Participant	Occupation / Role	Gender M/F	Age	Education	Years of Professional Experience	Years of Computer Experience	Years of Product Experience	Assistive Technology Needs
1	Intake Staff	F	30-39	Associates Degree	19	19	13	None
2	Director of Mental Health Services	F	40-49	Bachelor's Degree	20	18	18	None
3	Program Manager	F	20-29	Bachelor's Degree	7	18	6	None
4	Program Manager	M	30-39	Associates Degree	18	18	1	None
5	Billing Manager	F	40-49	Associates Degree	13	13	5	None
6	RN	F	20-29	Associates Degree	8	15	2	None
7	Therapist	F	30-	Master's	14	20	11	None

			39	Degree				
8	Quality Assurance Staff	M	30-39	Associates Degree	2	7	2	None
9	Therapist	F	30-39	Associates Degree	15	20	2	None
10	Director of Services	F	40-49	Master's Degree	26	30	18	None
11	Program Manager	F	40-49	Bachelor's Degree	19	19	16	None
12	Director Access	F	40-49	Master's Degree	20	20	18	None
13	Therapist	F	30-39	Master's Degree	13	19	6	None
14	Program Coordinator	F	20-29	Bachelor's Degree	6	12	5	None

A total of 14 participants (matching the demographics in the section on Participants) were recruited and all 14 participated in the usability test. None of the participants failed to show for the study. Participants were scheduled for 60 minute sessions with 30 minutes in between each session for debrief by the administrator(s) and data logger(s), and to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics as provided by the recruiting firm.

Study Design

Overall, the objective of this test was to uncover areas where the application performed well – that is, effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the participants. The data from this test may serve as a baseline for future tests with an updated version of the same EHR and/or comparison with other EHRs provided the same tasks are used. In short, this testing serves as both a means to record or benchmark current usability, but also to identify areas where improvements must be made. During the usability test, participants interacted with one EHR. Each participant used the system in the same location and was provided with the same instructions. The system was evaluated for effectiveness, efficiency, and satisfaction as defined by measures collected and analyzed for each participant:

- Number of tasks successfully completed within the allotted time without assistance
- Time to complete the tasks
- Number and types of errors
- Path deviations
- Participant's verbalizations (comments)
- Participant's satisfaction ratings of the system

Additional information about the various measures are found in the Usability Metrics section.

Tasks

A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might do with this EHRUT, including:

- Record a Medication Order
- Change a Medication Order
- Access a Medication List and Orders
- Record a Laboratory Order
- Change a Laboratory Order
- Access Laboratory Orders
- Record Demographics
- Change Demographics
- Access Demographics
- Record a Problem
- Change a Problem
- Access Problems
- Access Allergy List
- Record an Allergy record
- Change an Allergy record
- Add Clinical Decision Support Alerts
- Trigger and View Clinical Decision Support Alerts
- CDS import Transition of Care
- Reconcile Patient's active medication list with another source
- Reconcile patient's active problem list with another source
- Reconcile patient's medication allergy list with another source
- Export new CDA with incorporated information
- Create drug-drug and drug-allergy interventions prior to CPOE completion
- Adjustment of severity level of drug-drug interventions
- Access Implantable Device List
- Record an Implantable Device record
- Change an Implantable Device record
- Change Prescription
- Cancel Prescription
- Refill Prescription
- Send a Medication History Request to Pharmacy

Procedure

Upon arrival, participants were greeted; their identity was verified and matched with a name on the participant schedule. Participants were then assigned a participant ID. Each participant reviewed and signed an informed consent and release form (See Appendix 2). A representative from the test team witnessed the participant's signature.

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The usability testing staff conducting the test was experienced usability practitioners with over 22 years of working in the Mental Health and computer technology fields.

The administrator moderated the session including administering instructions and tasks. The administrator also monitored task times, obtained post-task rating data, and took notes on participant comments. A second person served as the data logger and took notes on task success, path deviations, number and type of errors, and comments.

Participants were instructed to perform the tasks (see specific instructions below):

- As quickly as possible making as few errors and deviations as possible.
- Without assistance; administrators were allowed to give immaterial guidance and clarification on tasks, but not instructions on use.
- Without using a think aloud technique.

For each task, the participants were given a written copy of the task. Task timing began once the administrator finished reading the question. The task time was stopped once the participant indicated they had successfully completed the task. Scoring is discussed below in Data Scoring Section.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 3), compensated them for their time, and thanked each individual for their participation.

Participants' demographic information, task success rate, time on task, errors, deviations, verbal responses, and post-test questionnaire were recorded into a spreadsheet.

Participants were thanked for their time and compensated. Participants signed a receipt and acknowledgement form (See Appendix 4) indicating that they had received the compensation.

Test Location

The test facility included a waiting area and a quiet testing room with a table, computer for the participant, and recording computer for the administrator. Only the participant and administrator were in the test room. All observers and the data logger worked from a separate room where they could see the participant's screen and face shot, and listen to the audio of the session. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient

temperature within a normal range. All of the safety instruction and evacuation procedures were valid, in place, and visible to the participants.

Test Environment

The EHRUT would typically be used in a healthcare office or facility. In this instance, the testing was conducted in an office setting. For testing, the computer used a Dell desktop running Windows 10 operating system. The participants used a mouse and keyboard when interacting with the EHRUT.

Vision Works system uses a standard display set to a minimum resolution of 1024x768. The application was set up by the Vision Works and running in our training environment or a LAN. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation. Additionally, participants were instructed not to change any of the default system settings (such as control of font size).

Test Forms and Tools

During the usability test, various documents and instruments were used, including:

1. Non-Disclosure Agreement (NDA)
2. Informed Consent Form
3. System Usability Scale Questionnaire
4. Incentive Receipt and Acknowledgement Form
5. Moderator's Guide

Examples of these documents can be found in Appendices 1-5 respectively. The Moderator's Guide was designed to capture required data. The participant's interaction with the EHRUT was captured and recorded digitally with screen capture software (GoToMeeting) so that the administrator and data logger could observe and record test data.

Participant Instructions

The administrator reads the following instructions aloud to the each participant (also see the full moderator's guide in Appendix 3):

Thank you for participating in this study. Your input is very important. Our session today will last about 60 minutes. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application.

Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. I did not have any involvement in its creation, so please be honest with your opinions. All of the information that you provide will be kept confidential and your name will

not be associated with your comments at any time. Should you feel it necessary you are able to withdraw at any time during the testing.

Following the procedural instructions, participants were shown the EHR and as their first task, were given time to explore the system and make comments. Once this task was complete, the administrator gave the following instructions:

For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have successfully completed the task. I would like to request that you not talk aloud or verbalize while you are doing the tasks. I will ask you your impressions about the task once you are done.

Participants were then given 18 tasks to complete. Tasks are listed in the moderator's guide (see Appendix 5).

Usability Metrics

According to the NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, EHRs should support a process that provides a high level of usability for all users. The goal is for users to interact with the system effectively, efficiently, and with an acceptable level of satisfaction. To this end, metrics for effectiveness, efficiency and user satisfaction were captured during the usability testing. The goals of the test were to assess:

1. Effectiveness of Vision Works 10.0 EHR by measuring participant success rates and errors

2. Efficiency of Vision Works 10.0 EHR by measuring the average task time and path deviations

3. Satisfaction with Vision Works 10.0 EHR by measuring ease of use ratings

Data Scoring

The following table details how tasks were scored, errors evaluated, and the time data analyzed.

Measure	Scoring
Effectiveness: Task Success	A task was successful if the participant achieved the correct result without help. The total number of successes were then divided by the number of times the task was attempted. The results are provided as a percentage. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task time, as benchmarked by expert performance under realistic conditions, was recorded when constructing tasks. Target task times shown in the Moderator's Guide were defined by taking multiple measures of optimal performance and multiplying by some factor [e.g., 1.25]. This gave participants buffer time since they were not trained to expert performance.

Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors.[11] On a qualitative level, an enumeration of errors and error types should be collected.
Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.
Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. [12] Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the [EHRUT] overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire. Questions included, "I think I would like to use this system frequently," "I thought the system was easy to use," and "I would imagine that most people would learn to use this system very quickly." See full System Usability Score questionnaire in Appendix 3

Results

Data Analysis and Reporting

Test results were calculated according to the methods specified in the Data Scoring Section. Data was excluded from analyses if participants failed to follow session and task instructions. The results below should be seen in light of objectives and goals outlined in the study design section. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Task	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings
	#	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD)	Mean (SD)
1. Record a Medication Order	10	100% 0%	12/12	29 (14)	29/25	0 (0)	98 (3)
2. Change a Medication Order	10	90% 29.8%	9/9	21 (8)	21/20	0 (0)	100 (0)
3. Access Medication List and orders	10	100% 0%	3/3	5 (1)	5/4	0 (0)	100 (0)
4. Record Lab Order	10	100 0%	12/12	22 (7)	22/20	0 (0)	99 (2)
5. Change Lab Order	10	100% 0%	4/4	14 (5)	14/12	0 (0)	99 (3)
6. Access Lab Orders	10	100% 0%	3/3	4 (2)	4/3	0 (0)	100 (0)
7. Record an Allergy	10	100% 0%	8/8	18 (5)	18/15	0 (0)	100 (0)
8. Change an Allergy	10	100% 0%	5/4	16 (4)	16/15	0 (0)	100 (0)
9. Access an Allergy	10	100% 0%	3/3	4 (2)	4/4	0 (0)	100 (0)
10. Record Demographics	10	100% 0%	10/10	68 (13)	68/60	0 (0)	96 (5)
11. Change Demographics	10	100% 0%	9/9	41 (9)	41/45	0 (0)	98 (4)
12. Access Demographics	10	100% 0%	4/4	10 (6)	10/8	0 (0)	100 (0)
13. Record a Problem	10	100% 0%	9/9	17 (3)	17/20	0 (0)	99 (1)
14. Change a Problem	10	100% 0%	5/5	7 (2)	7/8	.1 (.3)	99 (3)
15. Access Problems	10	100% 0%	3/3	4 (1)	4/5	0 (0)	100 (0)
16. Activate Clinical Decision Support Alerts	10	100% 0%	27/26	43 (9)	43/40	0 (0)	97 (8)
17. Trigger and View Clinical Decision Supports Alerts	10	100% 0%	25/25	34 (5)	34/30	0 (0)	99 (3)
18. CDS Import Transition of Care	10	100% 0%	19/19	45 (3)	45/40	0 (0)	97 (8)
19. Reconcile Patient's Active medication list with another source	10	100% 0%	12/12	37 (12)	37/35	0 (0)	96 (3.74)
20. Reconcile Patient's Active medication Allergy list with another source	10	100% 0%	8/8	16 (7)	16/15	0 (0)	37.5 (4.03)
21. Reconcile Patients Active problem list with another source	10	100% 0%	8/8	13 (4)	13/15	0 (0)	98.5 (3.2)
22. Export New CDA with incorporated information	10	100% 0%	8/8	31 (4)	31/30	0 (0)	100 (0)
23. Create Drug-Drug and Drug-Allergy interventions prior to CPOE Completion	10	100% 0%	8/8	25 (4)	29/25	0 (0)	98 (3)
24. Adjustment of severity level of drug-drug interventions	10	100% 0%	14/14	25 (2)	20/21	0 (0)	100 (0)
25. Record an Implantable Devices	10	100% 0%	7/7	29 (14)	29/25	0 (0)	98 (3)
26. Change an implantable	10	90%	5/5	21	21/20	0	100

	Device Record		29.8%		(8)		(0)	(0)
27.	Access Implantable Device List	10	100 (0)	3/3	5 (1)	5/4	0 (0)	100 (0)
28.	Change Prescription	10	100 (0)	6/6	22 (2)	22/20	0 (0)	100 (0)
29.	Cancel Prescription	10	100 (0)	7/7	25 (6)	25/25	0 (0)	100 (0)
30.	Refill Prescription	10	100 (0)	5/5	22 (4)	22/20	0 (0)	100 (0)
31.	Send a Medication History Request To Pharmacy	10	100 (0)	4/4	12 (8)	12/15	0 (0)	100 (0)

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 95. Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average.

Effectiveness

Participants were able to easily complete all of the assigned tasks except one participant failed to complete one task. In the case of the task that wasn't completed the user remember the path after they had said done. It is believed with more training that user would have been able to remember the task and completed it successfully. All of the tasks were always completed successfully by the test participants. Participants described the EHRUT as very user friendly and easy to understand. Participant feedback on EHRUT effectiveness was overwhelmingly positive.

Efficiency

In all but one case path deviations were in line with what was expected, especially since most of the functionality was new to the participants and limited training was provided to them for the new items. Generally speaking all but one participant was able to complete tasks close to the optimal time with minimal path deviations.

Satisfaction

Overall the participants expressed a high level of satisfaction with the tested and scored all of the task as Rating from 90 to 100. Even the error that did occurred wasn't associated with the system or performance but rather the training of the participant on what to do.

Major Findings

Overall participants commented that the system was easy to use and very intuitive with minimal guidance or instruction. It was commented that the navigate tree made finding information quick and easy to access. The test results showed that most participants completed the tasks quickly and close to optimal time. Based on feedback from each of the tasks and (SUS) score, the system appears to be obtaining a high degree of satisfaction.

Areas of Improvement

Due to path deviations in Clinical Decision Support Alerts maintenance this task should be reviewed and potentially redesigned to help improve work flow.. Overall participants had little to say that was critical or otherwise regarding the EHRUT in the study.

Appendices

APPENDIX 1: Non-Disclosure Agreement

THIS AGREEMENT is entered into as of __/__/ 20__, between _____ ("the participant") and Vision Works, Inc., located at 3801 River Ridge Dr NE, Cedar Rapids, IA, 52402.

The Participant acknowledges his or her voluntary participation in today's usability study may bring the Participant into possession of Confidential Information. The term "Confidential Information" means all technical and commercial information of a proprietary or confidential nature which is disclosed by Vision Works Inc., or otherwise acquired by the Participant, in the course of today's study.

By way of illustration, but not limitation, Confidential Information includes trade secrets, processes, formulae, data, know-how, products, designs, drawings, computer aided design files and other computer files, computer software, ideas, improvements, inventions, training methods and materials, marketing techniques, plans, strategies, budgets, financial information, or forecasts.

Any information the Participant acquires relating to this product during this study is confidential and proprietary to Vision Works, Inc. and is being disclosed solely for the purposes of the Participant's participation in today's usability study. By signing this form, the Participant acknowledges that s/he will receive compensation for feedback and will not disclose this confidential information obtained today to anyone else or any other organizations.

Participant Name: _____

Signature: _____ Date: _____

APPENDIX 2: Informed Consent

Vision Works, Inc. would like to thank you for participating in this study. The purpose of this study is to evaluate an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototype and give your feedback. The study will last about 60 minutes. At the conclusion of the test, you will be compensated for your time.

Agreement

I understand and agree that as a voluntary participant in the present study conducted by Vision Works, Inc. I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and videotaped by the Vision Works, Inc.

I understand and consent to the use and release of the videotape by Vision Works, Inc. I understand that the information and videotape is for research purposes only and that my name and image will not be used for any purpose other than research. I relinquish any rights to the videotape and understand the videotape may be copied and used by Vision Works, Inc. without further permission.

I understand and agree that the purpose of this study is to make software applications more useful and usable in the future.

I understand and agree that the data collected from this study may be shared with outside of Vision Works and Vision Works client. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

I agree to immediately raise any concerns or areas of discomfort with the study administrator. I understand that I can leave at any time.

Please check one of the following:

☐ YES, I have read the above statement and agree to be a participant.

☐ NO, I choose not to participate in this study.

Signature: _____ **Date:** _____

APPENDIX 3: System Usability Scale

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	4	5
2. I found the system unnecessarily complex	1	2	3	4	5
3. I thought the system was easy to use	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	1	2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	4	5
6. I thought there was too much inconsistency in this system	1	2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	4	5
8. I found the system very cumbersome to use	1	2	3	4	5
9. I felt very confident using the system	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system	1	2	3	4	5

APPENDIX 4: Acknowledgement of Receipt

I hereby acknowledge receipt of a $25 gift card for my participation in a research study run by Vision Works, Inc.

Printed Name: _____

Address: _____

_____

Signature: _____ Date: _____

Usability Researcher: _____

Signature of Usability Researcher: _____

Date: _____

Witness: _____

Witness Signature:_____

Date:_____

APPENDIX 5: Moderators Manual

Task 1: Record a Medication Order

Initial position
Take the participant to client id 1 in system.

Instructions
Please enter a prescription for Lipitor 20mg for this client. The route is Oral and starting today.

Optimal Time and Path
Time: 25 Seconds

1. Click Medical Node.
2. Click on the Medication History Node.
3. Press the new button located in the Detail section.
4. Click into the Medication field.
5. In the keyword field enter Lipitor.
6. Press Search button.
7. Click on the 20 mg oral tablet option.
8. Press Select button.
9. Drop down Route list.
10. Select “Oral”
11. Press Save.

User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to 100	Comments
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Task 2: Change a Medication Order

Initial position
Take the participant to client id 1 in system.

Instructions
Please modify the prescription for Lipitor 20mg and change it to 10mg.

Optimal Time and Path
Time: 20 Seconds

1. Click Medical Node and expand it.
2. Click on the Medication History Node.
3. In the History grid highlight the Lipitor line item.
4. In the Medication field click on the button.
5. In the keyword field enter Lipitor.
6. Press Search button.
7. Click on the 10 mg oral tablet option.
8. Press Select button.
9. Press Ok.

User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to 100	Comments
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Task 3: Access Medication List and orders

Initial position
Take the participant to client id 1 in system.

Instructions
Go to the Medication History and review list of Medication Orders.

Optimal Time and Path
Time: 4 Seconds

1. Click Medical Node and expand it.
2. Click on the Medication History Node.
3. In the History grid review orders and changes.

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Task 4: Record a Laboratory Order

Initial position
Take the participant to client id 1 in system.

Instructions
Please enter a lab order for provider Mickey Mouse to have a test done for the amount of Hemoglobin in blood, LOINC Code 718-7. The order was ordered on the current date and is Pending. No Lab is specified.

Optimal Time and Path
Time: 20 Seconds

1. Click Medical Node and expand it.
2. Click on the Lab Orders Node.
3. Press the new button located in the Detail section.
4. Click into the Order by field.
5. Pick Mickey Mouse from the dropdown list of providers.
6. Click into the Test field.
7. In the LOINC Code field enter the code 718-7.
8. Press Search button.
9. Click on the Hemoglobin [Mass/volume] in Blood option.
10. Press Select button.
11. Enter Status as “Pending”.
12. Press Save.

User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to 100	Comments
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Task 5: Change a Laboratory Order

Initial position
Take the participant to client id 1 in system.

Instructions
Add and Save a note on the last lab order. Enter a note that the lab was not done per client request.

Optimal Time and Path
Time: 12 Seconds

1. Click Medical Node.
2. Click Lab Orders.
3. Enter Note: “Test was not done per client request”.
4. Click Save.

User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to 100	Comments
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Task 6: Access Laboratory Orders

Initial position
Take the participant to client id 1 in system.

Instructions
Locate Laboratory Orders for the client.

Optimal Time and Path
Time: 3 Seconds

1. Click Medical Node.
2. Click Lab Orders.
3. Review Orders.

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Task 7: Record an Allergy Record

Initial position
Take the participant to client id 1 in system.

Instructions
Go to the Medication Allergies and record a new allergy for Aspirin, snomed code 1191. The client gets mild case of hives when Aspirin is taken.

Optimal Time and Path
Time: 15 Seconds

1. Click Medical Node.
2. Click Medication Allergies.
3. Click New button.
4. Click RXNorm ID.
5. Search for Aspirin.
6. Set Reaction.
7. Set Status to Active.
8. Click Save.

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Task 8: Change an Allergy Record

Initial position
Take the participant to client id 1 in system.

Instructions
Add and Save a note to the active allergy for Aspirin saying that baby Aspirin don't cause the reaction.

Optimal Time and Path
Time: 15 Seconds

1. Click Medical Node.
2. Click Medication Allergies.
3. Enter Note.
4. Click Save.

User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to 100	Comments
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Task 9: Access Allergy list

Initial position
Take the participant to client id 1 in system.

Instructions
Go to Medication Allergies and review list of allergies checking for Active and Inactive records.

Optimal Time and Path
Time: 4 Seconds

1. Click Medical Node.
2. Click Medication Allergies.
3. Locate allergy for aspirin and review Statuses.

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Task 10: Record Demographics

Initial position
Take the participant to the blank gateway screen.

Instructions
A new Client called Jimmy Jones has come into the agency and is in the admission process. Enter the new client and their demographics into the system. There demographics are as follows:

1. Birth Sex : Male
2. Sexual Orientation : Straight, Heterosexual
3. Gender Identity : Identifies as Male
4. Date of Birth : 01/07/2005
5. Race : White
6. Ethnicity : Not Hispanic or Latino
7. Preferred Language: English

Optimal Time and Path
Time: 60 Seconds

1. Click on the New button located in the blank gateway screen.
2. Enter the Client's name.
3. Enter Birth Sex.
4. Enter Sexual Orientation.
5. Enter Gender identity.
6. Enter Date of Birth.
7. Enter Race.
8. Enter Ethnicity.
9. Enter Preferred Language.
10. Press the save button.

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Task 11: Change Demographics

Initial position
Take the participant to the new client record for Jimmy Jones, id 6.

Instructions
Modify all the following demographics for Jimmy Jones to the new values below:

1. Preferred Language: Abkhazian
2. Date of Birth : 01/07/2004
3. Race : Asian
4. Ethnicity : Declined to Specify
5. Birth Sex: Female
6. Sexual Orientation : Declined to Specify
7. Gender Identity : Declined to Specify

Optimal Time and Path
Time: 45 Seconds

1. Click on Client.
2. Edit Birth Sex.
3. Edit Sexual Orientation.
4. Edit Gender identity.
5. Edit Date of Birth.
6. Edit Race.
7. Edit Ethnicity.
8. Edit Preferred Language.
9. Press the save button.

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Task 12: Access Demographics

Initial position
Start the participant in a blank gateway screen.

Instructions
Search for client id 6 and review demographics that were entered.

Optimal Time and Path
Time: 4 Seconds

1. Click on Search button.
2. Enter id 6 in Client ID.
3. Press select button.
4. Review the client and view demographics.

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Task 13: Record a Problem

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has come in complaining of a sudden hearing loss. Go to the Problems and create a new record for the problem of "Sudden Hearing Loss", Code = 79471008, starting today and with a status of active.

Optimal Time and Path
Time: 20 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Problems node.
3. Press the new button located in the Detail section.
4. Click into the Problem field.
5. In the keyword field enter Sudden Hearing Loss.
6. Press Search button.
7. Click on the item with code 79471008.
8. Press Select button.
9. Press Save.

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Task 14: Change a Problem

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has returned a day later stating that their hearing has returned. Go to the Problems and edit the record for the problem of "Sudden Hearing Loss", Code = 79471008, starting today and set as resolved

Optimal Time and Path
Time: 15 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Problems node.
3. Press the new button located in the Detail section.
4. Click on the arrow next to the "Resolved" field and select the current date.
5. Press Save.

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Task 15: Access Problems

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has come in complaining of a sudden hearing loss. You need to check and see if this is a current problem listed for the client by checking if the Resolved date is set.

Optimal Time and Path
Time: 5 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Problems node.
3. Review list to see if the item is an active Problem.

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Task 16: Add Clinical Decision Support Alerts

Initial position
Take to empty client gateway.

Instructions
Go to the CDS Maintenance and add Decision support alerts one for each of the following: Problems, Medication List, Medication Allergies List, Demographics, Labs, and Vitals.

Optimal Time and Path
Time: 40 Seconds

1. Select the Menu Items at the top of the gateway called “Maintenance -> Meaningful Use -> Decision Support”.
2. Under the filter criteria uncheck the “Show only active records” and press Filter.
3. Click and highlight the record called “Problems: Hearing Loss Issue”.
4. Press the Edit button.
5. Check the Active Flag.
6. Press the Save button.
7. Click and highlight the record called “Medication List: Lotrel” and repeat steps 4 thru 6.
8. Click and highlight the record called “Medication Allergy: Allergic to Lotrel” and repeat steps 4 thru 6.
9. Click and highlight the record called “Demographic Age and Lotrel” and repeat steps 4 thru 6.
10. Click and highlight the record called “Labs” and repeat steps 4 thru 6.
11. Click and highlight the record called “Vitals: High Blood Pressure” and repeat steps 4 thru 6.

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Task 17: Trigger and View Clinical Decision Support Alerts

Initial position
Start at the empty client gateway.

Instructions
Search for client 4 and handle warnings. Only on the first message where the info button is active press the button and then review the displayed information. Close that window and continue handling the messages until no more are displayed.

Optimal Time and Path
Time: 30 Seconds

1. Click Search button.
2. Enter client id 6 and press search button.
3. Press select button.
4. Read warning and verify displayed correctly.
5. If Info button is active press the button and review the new window when displayed and the close the new window.
6. Press Handled button.
7. Repeat steps 4 and 6 until messages are no longer displayed.

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Task 18: CDA import Transition of Care

Initial position
Take to client 5 in the client gateway.

Instructions
Import a transition of care document via the External Charts and import the Medication History, Medication Allergy, and Problems lists. Handle the warnings as they are displayed.

Optimal Time and Path
Time: 40 Seconds

1. Click on the External Charts node.
2. Press New.
3. Double click on Test.xml file.
4. Set name field to “Test” and press Save Button.
5. Press the Import button.
6. Click on Medication History and then select OK.
7. When screen is displayed press the Next Button.
8. Now press the Save Button.
9. When CDS warning is displayed press handled.
10. Press the Import button.
11. Click on Medication Allergy and then select OK.
12. When screen is displayed press the Next Button.
13. Now press the Save Button.
14. When CDS warning is displayed press handled.
15. Press the Import button.
16. Click on Problems and then select OK.
17. When screen is displayed press the Next Button.
18. Now press the Save Button.
19. When CDS warning is displayed press handled.

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Task 19: Reconcile Patient's active medication list with another source

Initial position
Take the participant to client id 3 in system.

Instructions
A Client is coming to your organization on referral from their Primary Doctor. You have received a CDA and need to import the file and reconcile the Medications in the file to what is in the client's record. Import file 2Referral.xml file from the C drive of your machine.

Optimal Time and Path
Time: 35 Seconds

1. Click External Charts.
2. Press the New button.
3. Locate the File on the C drive and press Open button.
4. Close File view and enter in Description "Received from Primary Doctor".
5. Press Save Button.
6. Press Import Button.
7. Select Medication History option.
8. Press Ok Button.
9. Review File Data and compare to existing data.
10. Press Next button.
11. Unselect items that should not be in the client's file.
12. Press Save button.

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Task 20: Reconcile patient's active problem list with another source

Initial position
Take the participant to client id 3 in system.

Instructions
A Client is coming to your organization on referral from their Primary Doctor. You have received a CDA and have already imported the file and reconcile the Medications in the file. You now need to reconcile the problems with what is in the client's record.

Optimal Time and Path
Time: 15 Seconds

1. Click External Charts.
2. Press Import Button.
3. Select Problems option.
4. Press Ok Button.
5. Review File Data and compare to existing data.
6. Press Next button.
7. Unselect Items that should not be in the client's file.
8. Press Save button.

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Task 21: Reconcile patient's medication allergy list with another source

Initial position
Take the participant to client id 3 in system.

Instructions
A Client is coming to your organization on referral from their Primary Doctor. You have received a CDA and have already imported the file and reconcile the Medications and Problems in the file. You now need to reconcile the Allergies with what is in the client's record.

Optimal Time and Path
Time: 15 Seconds

1. Click External Charts.
2. Press Import Button.
3. Select Medical Allergies option.
4. Press Ok Button.
5. Review File Data and compare to existing data.
6. Press Next button.
7. Unselect Items to that should not be in the client's file.
8. Press Save button.

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Task 22: Export new CDA with incorporated information

Initial position
Take the participant to client id 3 in system.

Instructions
Now that all the information has been incorporated from the external file we need to produce a new CDA to send with the client.

Optimal Time and Path
Time: 30 Seconds

1. Click Tools – Meaningful Use -> CDA menu item.
2. Under Document Type select “Referral Note”
3. Press the search button next to Patient.
4. Enter Client ID 3 and press search.
5. Press select.
6. Select output folder and save to desktop.
7. Press Export Button.
8. Press ok when completion screen appears.

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Task 23: Create drug-drug and drug-allergy interventions prior to CPOE completion

Initial position
Take the participant to client id 3 in system.

Create a prescription for Vicodin 7.5mg capsule where they would take 1 capsule once daily for 7 days then view the resulting warnings.

Optimal Time and Path
Time: 25 Seconds

1. Click ePrescribe button.
2. Once the window appears click on the Prescribe menu item.
3. Enter Lotrel into the Name field and press Find.
4. Select the 5-10mg Capsule option.
5. Enter “Take 1 capsule once daily” as instructions using the drop downs.
6. Enter in a quantity of 30 pills.
7. Press Continue.
8. View the warning.

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Task 24: Adjustment of severity level of drug-drug interventions

Initial position
Take the participant to client id 3 in system.

Instructions
Create a prescription for Coumadin 5mg capsule where they would take 1 capsule once daily for 30 days then view the resulting warnings. Cancel the prescription and go to Practice options and modify the drug-drug interactions to Severe and Contraindicated Only. Then re-add the prescription and view that the warning is no longer displayed

Optimal Time and Path
Time: 25 Seconds

1. Click ePrescribe button.
2. Once the window appears click on the Prescribe menu item.
3. Enter Lotrel into the Name field and press Find.
4. Select the 5-10mg Capsule option.
5. Enter “Take 1 capsule once daily” as instructions using the drop downs.
6. Enter in a quantity of 30 pills.
7. Press Continue.
8. View the warning.
9. Press Cancel.
10. Click Advance Options.
11. Click Preferences practice.
12. Change option in drug-drug interactions to Severe and Contraindicated only.
13. Repeat steps 3 thru 7.
14. Notice warning not shown.

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Task 25: Record an Implantable Device Record

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has come in notifies you that they have a Polyester suture. They have the paper work with them that lists the device's ID. Record the device information into the system for the patient.

Optimal Time and Path
Time: 40 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Implants node.
3. Press the new button located in the Detail section.
4. Click into the UDI field.
5. In the Pop-up window enter the following in the UDI into the field : (01)10884521062856(11)141231(17)150707(10)A213B1(21)1234.
6. Click on OK button.
7. Press Save.

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Task 26: Change an Implantable Device Record

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has returned a year later stating that the previous Polyester suture was removed. Modify the client's Implant record to change the status to not active.

Optimal Time and Path
Time: 15 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Implants node.
3. Locate the device in the list and highlight it.
4. Uncheck the Active flag.
5. Press Save.

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Task 27: Access Implantable Device List

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has come in and as part of the intake process you need to see if this client has any implantable devices.

Optimal Time and Path
Time: 5 Seconds

1. Click Medical and expand the node in the tree.
2. Click on the Implants node.
3. Review list to see if the item is an active Implant.

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Task 28: Change a Prescription

Initial position
Take the participant to client id 1 in system.

Instructions
A Client has come in and due to symptoms that are present during examination you decide to prescribe Procardia XL 30mg tablets to be taken one tablet once a day after meals for 5 days. The prescription was sent to the pharmacy but they have sent back a change request seeking to change the medication to Adalat CC 30 mg tablets instead. Go in and approve the request from the pharmacy using the following SIG password: userrx.

Optimal Time and Path
Time: 20 Seconds

1. Click ePrescribe button.
2. Once the window appears click on the Renewal Requests menu item at the top of the screen.
3. Review the Request listed on the screen under Messages.
4. Drop Down Medication Alternatives and select the item for Adalat.
5. Under the Action drop down select “Approved selected Alternative”.
6. Now enter the Signature Password and press the Perform button.

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Task 29: Cancel a Prescription

Initial position
Take the participant to client id 5 in system.

Instructions
Your just realized that you prescribed and sent electronically to the pharmacy the wrong prescription for this client. You sent Crestor 10mg Tablet and you didn't need this. Find and cancel the prescription.

Optimal Time and Path
Time: 25 Seconds

1. Click ePrescribe button.
2. Once the window appears click go to the "Pending prescriptions" section on the screen and press the "Show All prescriptions" link.
3. Locate the Crestor 10 MG prescription.
4. Too the right of the prescription, click on the Cancel link.
5. When the new screen appears pick the reason for cancellation and select "Prescribed in Error" as the reason.
6. Check the "Also Stop Active Medication" option.
7. Press the Cancel Prescription button.

8. User	Success / Fail	Path	Time (secs)	Errors	Rating 1 to	Comments
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Task 30: Refill a Prescription

Initial position
Take the participant to client id 6 in system.

Instructions
A Client has gone to the pharmacy and asked to have a refill for a prescription. The pharmacy has sent you a request for refill. Go in and grant the refill request for the client. The medication is Lanoxin 125 mcg Tablet. You can use the following SIG password: userrx.

Optimal Time and Path
Time: 20 Seconds

1. Click ePrescribe button.
2. Once the window appears click on the Renewal Requests menu item at the top of the screen.
3. Review the Request listed on the screen under Messages.
4. For the Lanoxin 125 mcg Tablet, drop down the Action list and pick "Renew + 2 Refills" option.
5. Now enter the Signature Password and press the Perform button.

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Task 31: Send a Medication History request to Pharmacy

Initial position
Take the participant to client id 4 in system.

Instructions
A Client has come in and you wish to quickly review to see if they have recently been prescribed any medications.

Optimal Time and Path
Time: 15 Seconds

1. Click ePrescribe button.
2. Once the window appears click on the Medication History Link under Manage Medications.
3. From the new screen pick the option of “1 year” for the time frame to retrieve data.
4. Press the Obtain new Data button.

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