Usability Test Report
BroadStreet v1

Report based on NISTIR 7742 Format for Usability Test Reports

Date of Test: June 19 - Nov 18, 2023

Date of Report: December 04, 2023

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Cohort III: Report based on NISTIR 7742 Format for Usability Test

Reports Date of Test: Nov 21- Nov 29, 2024

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1. EXECUTIVE SUMMARY

BroadStreet Version 1 represents a transformative approach in the realm of Electronic Health Records (EHR). Designed to revolutionize how healthcare is experienced, interacted with, and delivered, it aligns with the specific requirements of an ONC Certified Electronic Health Record. At its core, BroadStreet Version 1 features a unique task architecture that enhances the way users capture, modify, and interact with patient health information. This innovative design is intended to streamline healthcare delivery while ensuring a high level of user engagement and efficiency.

This report presents the findings from the usability testing of BroadStreet Version 1. Conducted in accordance with the NISTIR 7742 Customized Common Industry Format Template for Electronic Health Record Usability Testing (EHRUT), the study employed a user-centered design process as outlined in NISTIR 7741. The goal was to assess and validate the usability of BroadStreet Version 1's user interface for a diverse range of healthcare professionals. The NISTIR 7741, provides guidance for EHR developers to build usable interfaces, following User Center Design (UCD) processes to ensure that designed EHRs are efficient, effective, and satisfying to the user. https://www.nist.gov/publications/nistir-7741-nist-guide-processes-approach-improving-usability-electronic-health-records,

The usability test was split into two cohorts to capture a broad spectrum of user experiences. Cohort I, tested between June 19-20, 2023, comprised eleven participants with limited to no prior experience with the system. Cohort II, conducted between November 17-18, 2023, included ten participants with minimal familiarity with the EHR's functionality. Five participants were involved in both cohorts. A total of sixteen participants, who matched the target demographic criteria as prospective Electronic Health Record (EHR) users, were involved in the testing.

The tests, conducted remotely by BroadStreet Health, LLC, featured tasks that simulated real-world healthcare job functions. Participants' performances were recorded, and their feedback was collected through questionnaires and the System Usability Scale (SUS).

Cohort III, conducted between November 21 - 29, 2024, included ten participants with mixed level of experience with the system. Of the ten, one individual participated in Cohort I and II. The tests, conducted remotely and in person, featured tasks specific for Decision Support Interventions and usability to both access and modify source attributes for Evidence-based and Predictive interventions.

2. INTRODUCTION

The EHRUT tested for this study was BroadStreet version 1. BroadStreet is designed to support and streamline healthcare providers' workflow in Post Acute/Long Term Care and clinical/ambulatory settings. The usability testing focused on realistic tasks performed on a daily basis including collecting, modifying, and reconciling outside records, as well as completing different actions related to demographics, implantable devices, labs, diagnostics, and medications. Clinical Decision Support interventions for problems, medications, medication allergies, demographics, laboratory, and vitals, as well as a combination of two, were available as a reference in the patient's chart and at the time of adding new or the incorporation/reconciliation of a referral summary into the patient's chart. The BroadStreet workflow is designed to prioritize efficiency while providing care with unified views of patient information.

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, and any requirements for future training materials. To

this end, measures of effectiveness, efficiency, and user satisfaction were captured during the testing.

The purpose of Cohort III testing was to validate the usability of § 170.315(b)(11) - Decision Support Interventions (DSI) to provide, enable, and integrate evidence-based and predictive clinical decision support tools to enhance care delivery and improve patient outcomes.

3. METHOD

3.1 PARTICIPANTS

A total of 16 participants were tested on the EHRUT BroadStreet. Participants in the test included Physicians, NPs, RNs, LPNs, and medical office staff. Participants had no direct connection to the development of or the organization of producing BroadStreet, the EHRUT. Participants in Cohort I were not given the opportunity to have the same orientation and level of training as the actual end users would have received. Cohort II participants were familiar with some of the features as they were recently released and were provided with a high-level 7-minute introduction video of new features but were not provided with an end user's orientation and level of training.

Sixteen participants took part in the usability test and all participants showed up for the study. Participants were scheduled for 30-45 minute sessions. Time was allotted to set systems for proper testing conditions as well as to debrief the tester after completion of the test. Standardized forms were used to collect and organize the testers' demographics.

Participants had a mix of backgrounds and demographic characteristics (Table 1).

Table 1. Participant Demographic

Gender	Age Range	Education	Occupation/Role	Professional Experience (mos)	Computer Experience (mos)	Product Experience (mos)	Assistive Technology Needs
Female	50-59	High school diploma	Office Staff Member	240	240	0	No
Female	30-39	MD	Physician	132	240	0	No
Male	30-39	Master's degree	Nurse Practitioner	60	240	0	No
Male	50-59	MD	Physician	240	240	3	No
Female	70-79	PhD	Psychologist	240	240	0	No
Female	50-59	Associate degree	Registered Nurse	240	60	0	No
Female	40-49	Associate degree	Office Manager	132	240	3	No
Female	40-49	Master's degree	Nurse Practitioner	240	60	0	No
Male	20-29	Some college credit, no degree	Office Staff Member	60	240	0	No
Male	20-29	Bachelor's degree	Accounting and Payroll HR	60	132	3	No
Female	40-49	Associate degree	Licensed Practical Nurse	240	240	0	No
Male	20-29	Bachelor's degree	Licensed Practical Nurse	132	240	3	No
Male	40-49	Associate degree	Office Manager	60	240	3	No
Female	30-39	Master's degree	Nurse Practitioner	60	240	3	No
Female	50-59	Master's degree	Nurse Practitioner	240	240	3	No
Female	50-59	Associate degree	Medical Assistant	240	240	3	No

Cohort III participants had a mixed level of familiarity to the EHRUT BroadStreet and included Physicians, NPs, RNs, LPNs, and general administrative personnel. They were appropriately given a high-level introduction to the system but were not provided with an end user's orientation and level of training. Of the ten, one individual participated in previous Cohorts. See Table 1A for backgrounds and demographic characteristics of all those in Cohort III.

Table 1A. Cohort III Participant Demographics

Gender	Age Range	Education	Occupation/Role	Participant Professional (mos)	Computer Experience (mos)	Product Experience (mos)	Assistive Technology Needs
Female	40-49	Associate degree	Office Manager	132	240	3	No
Female	30-39	Bachelor's degree	Customer Service	72	240	0	No
Male	50-59	Master's degree	Educator	156	360	0	No
Male	30-39	Bachelor's degree	Executive Administration	120	240	0	No
Female	30-39	Master's degree	Executive Administration	12	240	0	No
Female	60-69	Associate degree	Executive Administration	16	480	0	No
Female	40-49	Associate degree	Licensed Practical Nurse	216	360	12	No
Female	30-39	Bachelor's degree	Medical Assistant	18	240	0	No
Female	30-39	FNP	Nurse Practitioner	24	240	0	No
Female	20-29	MD	Physician	6	240	0	No

3.2 STUDY DESIGN

Objective

The primary objective of this usability test was to identify the strengths and weaknesses of BroadStreet EHR in terms of effectiveness, efficiency, and user satisfaction. The focus was on pinpointing areas where the system either excelled or fell short in usability as experienced by the test participants. Data gathered from this test will serve as a benchmark for future evaluations, particularly when assessing new versions of the EHR system.

Participant Interaction

During the usability test, participants interacted solely with the BroadStreet EHR system. Each participant conducted the test using their own equipment in a location of their choice. This setup was intended to mimic a real-world environment, ensuring that the findings were grounded in practical usage scenarios.

Cohort-Specific Approaches

Cohort I: Participants in this cohort were not familiar with the system's new features and functionalities, as these had been recently released. They did not receive any end-user training and had no interaction with the moderator during the test. This approach was chosen to assess how intuitive the new features were for users encountering them for the first time.

Cohort II: In contrast, participants in Cohort 2 conducted the test in their actual work environments, which included typical workplace interruptions such as phone calls. This cohort's testing was designed to reflect a real-world setting, with participants already familiar with the platform's basic functionalities.

Cohort III: Using a standard laptop or desktop computer, all participants were unfamiliar with the system's new features and functionalities, as these were recently implemented. To ensure an unbiased

evaluation, 80% of the participants had no prior experience or knowledge of the system. This approach was designed to assess how intuitive the setup and interaction features are for new users.

Evaluation Criteria

The evaluation of the system was based on several criteria, observed and recorded during the participants' test sessions:

- **Task Completion:** The ability of participants to complete tasks successfully within the allotted time.
- **Task Completion Time:** The time taken by participants to complete each task.
- **Error Analysis:** The number and types of errors made by participants.
- **Path Deviations:** The number of deviations from the prescribed task performance path.
- **Participant Feedback:** Comments from participants regarding their experience.
- **Task Difficulty Rating:** Participants' rating of each task in terms of ease or difficulty.

This comprehensive approach to study design ensures that the usability test results are reflective of actual user experiences, providing valuable insights into how the BroadStreet EHR system can be optimized for better performance.

3.3 TASKS

The tasks designated for this usability test were designed to reflect the typical activities and workflows a user would encounter while using BroadStreet EHR. These tasks were carefully selected to encompass both critical functions related to safety and those frequently utilized within the system, ensuring a comprehensive evaluation of the user experience.

Each participant in the usability test was assigned the same set of tasks, as outlined in Table 2. These tasks were divided among the two cohorts, with Cohort I focusing on fundamental functionalities and Cohort II on more advanced features. Participants were encouraged to ask questions both before and after performing these timed tasks. They also had access to written instructions to aid in task completion.

Table 2. Task Testing Scenarios

Task ID	Cohort	Criterium	Task description
1/a1	I	§ 170.315(a)(1) - CPOE: Review Medication Order	Review Patient Record (Medication Orders)
2/a1	I	§ 170.315(a)(1) - CPOE: Enter Medication Order	Create New Medication Order (Lipitor)
3/a1	I	§ 170.315(a)(1) - CPOE: Modify Medication Order	Modify Medication Order (Lipitor)
4/a2	II	§ 170.315(a)(2) - CPOE: Enter New Lab Order	New Lab Order
5/a2	II	§ 170.315(a)(2) - CPOE: Access and Modify Lab Order	Access and Modify Lab Order
6/a3	II	§ 170.315(a)(3) - CPOE: Enter New Diagnostic Order	New Diagnostic Order

7/a3	II	§ 170.315(a)(3) - CPOE: Access and Modify Diagnostic Order	Access and Modify Diagnostic Order
8/a5	I	§ 170.315(a)(5) - Modify Demographics	Change a patient's demographic (modify DOB)
9/a5	I	§ 170.315(a)(5) - Record Demographics	Record patient's demographic (gender, preferred language, race)
10/a5	I	§ 170.315(a)(5) - Record Demographics	Record patient's date of death with reason
11/a9	II	§ 170.315(a)(9) - Edit User CDS Access	Set CDS Access Permission for Users
12/a9	II	§ 170.315(a)(9) - Interact / Acknowledge CDS	Interact with CDS Interventions in Chart
13/a9	II	§ 170.315(a)(9) - Access Info Button for Clinical Information	Add Diagnosis and Interact with CDS Info Button
14/a9	II	§ 170.315(a)(9) - Trigger CDS Intervention for Review and Acknowledgement	Add Diagnosis and Interact with Combined CDS Intervention
15/a14	II	§ 170.315(a)(14) - Add Implantable Device	Add Implantable Device Details to Patient's Chart
16/b2	II	§ 170.315(b)(2) - Retrieve and Associate Outside Record	Retrieve Outside Records & Add to Patient Chart
17/b2	II	§ 170.315(b)(2) - Incorporate Outside Record Problem List with CDS	CCDA Reconcile & Incorporate DX into Chart while utilizing CDS
18/b2	II	§ 170.315(b)(2) - Incorporate Outside Record Allergy and Medications with CDS	CCDA Reconcile & Incorporate Meds & Allergies while utilizing CDS

Each task was carefully chosen to evaluate specific functionalities within the BroadStreet EHR. For Cohort I, tasks typically involved basic operations like changing and recording demographics and reviewing, entering, and modifying medication orders. For Cohort II, the tasks were more advanced, including interactions with Clinical Decision Support (CDS) systems, managing user access, incorporating external records, and entering new orders for labs and diagnostics. These tasks were instrumental in assessing both the basic and complex capabilities of the EHR system, providing a comprehensive view of its usability across different user proficiency levels.

Following are the tasks broken down by ONC criteria:

§ 170.315(a)(1) - Medications

Review Medication Order (task id: 1/a1): Identifying medication name and current dosage. Find the Omeprazole order. Write down/state the dosage of MG

Enter Medication Order (task id: 2/a1): Including its name, dosage, directions, and diagnosis. Enter Lipitor - select “Lipitor 10 mg PO Tablet”. Enter Quantity – 1, Type -- select Tablet(s), Frequency

-- select Daily (QD), Duration -- enter 30, Type Hyperlipidemia - select E78.5 - Hyperlipemia, unspecified.

Modify Medication Order (task id: 3/a1): Identify a current medication, and change the dosage. Find the most recent Lipitor order in the list, Modify to Lipitor 40mg.

§ 170.315(a)(2) - Laboratory

Enter New Lab Order (task id: 4/a2): Including the type of test, urgency, and diagnosis. Select CBC, Urgency - select Routine, Diagnosis - muscle weakness - select "M62.81 – Muscle weakness (generalized)".

Access and Modify Lab Order (task id: 5/a2): Review the Order List select lab, and modify the Lab Test order. Select CBC Order, Edit Order removing CBC, and Select BMP.

§ 170.315(a)(3) - Diagnostic Imaging

Enter New Diagnostic Order (task id: 6/a3): Including Type Diagnostic, Procedure, Diagnosis. Select Radiology, Select Screening chest X-ray, and select "R05.1 Acute Cough".

Access and Modify Diagnostic Order (task id: 7/a3): Review Order List select Diagnostic and Modify Procedure Order - Select Radiology Order, Edit Procedure removing Screening chest x-ray, Select Routine Chest X-ray.

§ 170.315(a)(5) - Demographics

Change Demographics (task id: 8/a5): Correction of DOB. Select Year "1938", Select Month "March", and Select Day "10" as the date.

Record Demographics (task id: 9/a5): Record gender, preferred language, race. Gender - select Male, Preferred Language - select English, Race - select Asian.

Modify Demographics (task id: 10/a5): Add death date and reason. Select year "2020", Select month "January", Select day "1" as the date, and Enter "Pneumonia"'

§ 170.315(a)(9) - Clinical Decision Support (CDS)

Edit User CDS Access (task id: 11/a9): Set up care team permissions for access to Clinical Decision Support (CDS) Interventions by navigating to the Users page, editing a specific user's profile to enable additional CDS access for "Editing" or "Reading" for the problem list, medication list, medication allergy list, patient demographics data, laboratory tests, and vital signs, by choosing the "Read" CDS option. Save to update the user's access.

Interact / Acknowledge CDS (task id: 12/a9): Interact with CDS Indicators - While reviewing a patient's chart, select, review, and acknowledge the CDS evidence-based interventions for "Demographics" and "Vitals".

Access Info Button for Clinical Information (task id: 13/a9): Interact with CDS Infobutton - Hover over the newly added diagnosis "E78.5 Hyperlipidemia, Unspecified", and select Infobutton to automatically open the browser of the corresponding MedlinePlus Connect webpage to review associated diagnostic and therapeutic reference information.

Trigger CDS Intervention for Review and Acknowledgement (task id: 14/a9): Add a new diagnosis "I10 Essential Hypertension", to the patient's chart. Select the CDS Indicator for a Combination of "Problem" and "Demographic". Review and Acknowledge.

§ 170.315(a)(14) - Implantable Devices

Add Implantable Device (task id: 15/a14): Post patient's cataract surgery, add the 50-character UDI # for "Posterior-chamber Intraocular Lens, Pseudophakic (Physical Object)" into the patient's chart. Upon scanning or manual entry, the system automatically populates the relevant data for Serial Number, Lot or Batch, Device Identifier, Manufacturing Date, and Expiration Date. Additionally, the system includes additional warnings such as "labeling does not contain MRI safety information".

§ 170.315(b)(2) - Clinical Information Reconciliation and Incorporation

Retrieve and Associate Outside Record (task id: 16/b2): Retrieve Outside Record and add to Patient Chart - select Document Inbox, locate patient record, search patient list and add patient referral document to patient's chart and begin reconciliation.

Incorporate Outside Record Problem List with CDS (task id: 17/b2): Incorporate Problem List from Outside Record into Patient Chart - Review and compare Problem List from CCDA with Diagnosis List in Patient's chart. Select CDS indicator (a)(9) to review, and acknowledge the CDS intervention for "Repeated Falls" in the CCDA list. Select "Repeated Falls" to incorporate into the Patient Chart.

Incorporate Outside Record Allergy and Medications with CDS (task id: 18/b2): Incorporate Medications and Allergies from Outside Records into the Patient Chart - Review and compare the Medication List from CCDA with the Medication List in the Patient's chart. Select "acetaminophen" to incorporate specific medications and allergies from outside records into the Patient's Chart. Review and compare the Allergy List from CCDA with the Allergy List in the Patient's chart. Select CDS indicator (a)(9) to review, and acknowledge the CDS intervention for "sodium sulfate" in the CCDA list. Select "sodium sulfate" to incorporate into the Patient Chart.

Table 2A. Cohort III Task Testing Scenarios

19/b11	III	§ 170.315(b)(11) – Evidence Decision Support Interventions (DSI) User Feedback	User Feedback for Evidenced-based DSI
20/b11	III	§ 170.315(b)(11) - Evidence-based Decision Support Interventions (DSI)	Evidence-based DSI Access and Modify Source Attributes
21/b11	III	§ 170.315(b)(11) – Predictive Decision Support Interventions (DSI)	Predictive DSI Access and Modify Source Attributes

For Cohort III, the tasks focused on advancing and exploring opportunities to implement new algorithmic tools based on patient demographics and clinical attributes, incorporating active feedback loops for Decision Support Interventions.

§ 170.315(b)(11) - Decision Support Interventions (DSI)

User Feedback (task id: 19/b11): Navigate to Patient list selecting specified patient. Review patient profile selecting the DSI Indicator next to the patient's age to open the DSI Preventive Screening Recommendations for Adults aged 50+. After reviewing the recommendations select the option "Have Feedback" to provide text and star based ratings. Once complete select Send Feedback and Acknowledge for feedback to be submitted and saved.

Evidence Based DSI Access and Modify Source Attributes (task id: 20/b11): Navigate to System Settings and select the subheading CDS Interventions. Review the source attributes for the intervention

"Preventative Screening Recommendations for Adults Aged 50+." Select the "pencil" icon in the upper right corner to modify the source attributes. Add "White" under the Race(s) text window, scroll to the bottom of the page, and save the changes. Confirm the modification is now listed under Source Attributes.

Predictive DSI Access and Modify Source Attributes (task id:21/b11): Navigate to Applications in the navigation menu on the left side of the landing page. Click on the "i" icon next to the title Life Expectancy Calculator. Select the "pencil" icon in the upper right corner to modify the source attributes. Scroll to the bottom of the page, type "Nursing Home Resident" in the text box under Additional Source Attributes, and save the changes.

3.4 PROCEDURE

Upon initiation of the testing session, participants were greeted and their identity was confirmed. They were asked to review and sign the Consent for Research and Development document and return it via Dropbox Sign. Two staff members were assigned, one to moderate and one to log data. The Moderator ran the testing session including administering instructions and tasks. The Data Logger took notes on task success, error, path deviations, and timing of the task, and recorded the session through shared video. Participants were instructed to perform the tasks (sample in Appendix 3) as quickly as possible making as few errors and deviations as possible.

For each task, the participants were given a written copy of the task. Task timing began once the task was started, and timing stopped once the participant indicated that s/he had finished and/or the task was completed.

Scoring, on a 1 to 5 scale with 1 = very hard, 5 = very easy, was performed after each task section.

Following the entire testing session, the participant was asked to complete a post-test questionnaire and the System Usability Scale (SUS). (Appendix 5)

The participants' demographic information, task success rate, time on task, errors, deviations, verbal responses, and post-test questionnaires were recorded. Participants were thanked for their time, the recording was stopped, and the testing session was concluded.

In Cohort III, due to the brevity of the tasks, a single staff member was assigned to both moderate and log data. Participants reviewed the instructions and then completed the tasks with as few deviations or errors as possible. They completed post-test questionnaire in addition to scoring once time was stopped for each task.

3.5 TEST LOCATION & ENVIRONMENT

The tests were performed in the participants' location of choice. Locations were representative of and simulated the environment in which they would normally perform their work activities in the EHR. The test was performed utilizing video technology while monitoring the participant's screen and recording the audio. The equipment used by the participant was their normal work computer or laptop and mouse or keyboard. The screen magnification was set to no more than 100% for optimal EHR viewing. Video invitation was sent to the participant by the Moderator or Data Collector and assistance was given as needed to arrive at the test starting point in Cohort 1 and participants in Cohort 2 received prompts as needed to the starting point of each task. The EHR was accessed through Google Chrome or Microsoft Edge browser. Assistance was given to the participant to gain access and navigate through security measures.

In Cohort III, a combination of video technology and in person testing was completed using a standard laptop or desktop computer. The participants accessed the EHR through Google Chrome and assistance was provided to log in to the testing software.

3.6 TEST FORMS & TOOLS

Various documents and electronic platforms were used to perform and record this test as well as participant demographic data and test data.

Documents:

- Consent for Research and Development (Appendix 1)
- Moderator Introduction (Appendix 2)
- Participant Guide (Appendix 3)
- Participant Demographic Questionnaire (Appendix 4)
- Post-Test Questionnaire (Appendix 5)
- System Usability Scale SUS (Appendix 5)

Platforms:

- Zoom or Skype
- Google Chrome or Microsoft Edge Browser
- Dropbox Sign

3.7 PARTICIPANT INSTRUCTIONS

The participants were emailed a Volunteer User Packet before their testing session. This included the Participant Guide. The orientation script was read to the participants by the Moderator. Audio and video were recorded for each participant's session. Samples of the Participant Guides are available in Appendix 3.

The Cohort III session was not recorded and participants received a guide with session instructions, along with an orientation and brief introduction.

3.8 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 BroadStreet by measuring participant success rates and errors
2. Efficiency of BroadStreet by measuring path deviations and task time
3. Satisfaction with BroadStreet by measuring ease of use ratings and SUS score

3.9 DATA SCORING

Table 3 presents a comprehensive breakdown of the scoring methodology for tasks, along with an evaluation of errors and an analysis of time data associated with each task.

Table 3. Details of Rationale and Scoring

Measures	Rationale and Scoring
Effectiveness: Task Success	A task was counted as a "success" if the user was able to achieve the correct outcome within the allotted task time. The total number of successes is calculated for each task and then divided by the total number of times that 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 performance time was generated by timing experienced users executing the same steps/tasks as participants. Target task times for efficiency are defined by taking the optimal performance time and multiplying it by 1.25 allowing for some buffer time because participants lack experience and are not trained to expert performance. CDS tasks were granted an additional optimal task performance time of 30 seconds for review and acknowledgment.
Effectiveness: Task Failures	If the participant abandoned the task, or could not perform the overall task, or reached the end of the allotted time without successful completion, the task was counted as a "Failure." No task times were taken for failures. Errors were counted if the overall task was successful but the task was not executed properly. The total number of errors was calculated for each task and then divided by the total number of participants. This should also be expressed as how error-prone the task is.
Efficiency: Task Deviations	The participant's path through the application was recorded. Deviations occurred if the participant, for example, visited an incorrect 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 was divided by the number of optimal steps to provide a ratio of path deviation.
Efficiency: Task Time	Each task was timed from when the administrator or participant said "Begin" until the participant said "Done" or when the participant stopped performing the task. Only times for tasks that were successfully completed were included in the average task time analysis. The average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	The 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). This data is averaged across participants. To measure participants' confidence in and likeability of the EHRUT overall, the testing team administered a series of post-test questions included in Appendix 4 as well as the System Usability Scale (SUS) questionnaire

4 RESULTS

4.1 DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. The results should be seen in light of the objectives and goals outlined in the Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Table 4. Results of Each Task / Measure

Task		Effectiveness				Efficiency						Satifaction	
		Task Success		Task Errors		Path Deviation		Task Time (seconds)				Task Ratings 5 = Easy	
Task Description	n	Mean	Standard Deviation	Mean	Standard Deviation	Observed	Optimal	Mean	Standard Deviation	Observed	Optimal	Mean	Standard Deviation
Review Patient Record (Medication Orders)	11	90.91%	95.35%	0%	0%	3.00	3.00	21.42	9.51	21.42	13.18	4.55	0.93
Create New Medication Order (Lipitor)	11	100%	0%	0%	0%	13.36	13.00	78.31	18.09	78.31	53.69	4.73	0.65
Modify Medication Order (Lipitor)	11	100%	0%	0%	0%	9.09	9.00	54.96	25.07	54.96	37.85	4.55	0.82
New Lab Order	10	100%	0%	0%	0%	8.00	7.00	94.40	29.50	94.40	128.80	4.80	0.40
Access and Modify Lab Order	10	100%	0%	0%	0%	12.00	11.00	58.00	26.40	58.00	60.00	4.70	0.50
New Diagnostic Order	10	100%	0%	0%	0%	12.0	11.0	86.5	28.6	86.5	100.0	4.9	0.3
Access and Modify Diagnostic Order	10	100%	0%	0%	0%	6	6	39.7	12.9	39.7	55	5	0
Change a patient's demographic (modify DOB)	11	100%	0%	0%	0%	6.00	6.00	69.10	25.95	69.10	39.18	4.55	0.69
Record patient's demographic (gender, preferred language, race)	11	100%	0%	9.09%	30.15%	8.27	8.00	43.35	24.27	43.35	33.35	4.64	0.92
Record patient's date of death with reason	11	100%	0%	0%	0%	7.00	7.00	47.16	13.71	47.16	39.19	4.91	0.30
Set CDS Access Permission for Users	10	100%	0%	0%	0%	8	7	61.5	21.9	61.5	57.5	4.9	0.3
Interact with CDS Interventions in Chart	10	100%	0%	0%	0%	6	5	45	22.3	45	61.3	5	0
Add Diagnosis and Interact with CDS Info Button	10	100%	0%	0%	0%	12	11	102.2	23.4	102.2	90	4.9	0.3
Add Diagnosis and Interact with Combined CDS Intervention	10	100%	0%	0%	0%	8	7	49.2	21.7	49.2	75	4.9	0.3
Add Implantable Device Details to Patient's Chart	10	100%	0%	0%	0%	10	10	74.3	27.2	74.3	93.8	4.7	0.5
Retrieve Outside Records & Add to Patient Chart	10	100%	0%	10.00%	32.00%	11	10	120.8	49.2	120.8	111.3	4.2	0.8
CCDA Reconcile & Incorporate DX into Chart while utilizing CDA	10	100%	0%	20.00%	42.00%	5	4	33.9	21.8	33.9	62.5	5	0
CCDA Reconcile & Incorporate Meds & Allergies while utilizing CDA	10	100%	0%	0%	0%	12	11	78.4	31.1	78.4	150	4.8	0.4

Table 4A. Cohort III Results of Each Task / Measure

Task		Effectiveness				Efficiency						Satifaction	
		Task Success		Task Errors		Path Deviation		Task Time (seconds)				Task Ratings 5 = Easy	
Task Description	n	Mean	Standard Deviation	Mean	Standard Deviation	Observed	Optimal	Mean	Standard Deviation	Observed	Optimal	Mean	Standard Deviation
User Feedback for Evidenced-based DSI	10	90%	95%	0%	0%	8	8	62.1	14.47	62.1	49.5	4.8	0.4
Evidence-based DSI Access and Modify Source Attributes	10	100%	0%	0%	0%	8	8	47.6	15.8	47.6	46.25	4.8	0.4
Predictive DSI Access and Modify Source Attributes	10	100%	0%	0%	0%	6	6	42.4	5.64	42.4	48.75	4.8	0.4

4.2 DISCUSSION OF THE FINDINGS

A.1 Medications

Effectiveness: Despite varying degrees of previous digital technology experience, users had a 90.91% success rate and felt they were informed and understood exactly how to enter the prescription. The error experienced was a result of a lack of familiarity with reviewing a medication order.

Efficiency: Overall users finished tasks within the allotted time and did not experience any burden of data entry. The deviations experienced were a result of unfamiliarity with the task architecture.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task

A.2 Labs

Effectiveness: With a 100% success rate users executed the complex ordering task with no errors.

Efficiency: The majority of users completed tasks in the target time.

Satisfaction: Out of a scale of 1 = very hard and 5 = very easy, user satisfaction scored 4 or above for each task.

A.3 Diagnostics

Effectiveness: With a 100% success rate, users executed the complex ordering task with no errors, however, during the review, had an issue sorting multiple types of diagnostic ordering options.

Efficiency: All tasks were completed in the allotted time. The deviation is a result of unfamiliarity of task type based on day-to-day role.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task.

A.5 Demographics

Effectiveness: The presentation summary is easy to understand leading to a 100% success rate with one error.

Efficiency: The task architecture was unfamiliar in the first demographics task but became more intuitive as the following tasks were completed with a minor deviation.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task.

A.9 Clinical Decision Support (CDS)

Effectiveness: The presentation felt overwhelming because interaction was included for all 6 data elements throughout the user's experience. Users quickly acclimated to the workflow after the first task, finding it easy and useful leading to a 100% success rate with two deviations for CDS interaction and two deviations for User Access setup.

Efficiency: All were completed in the allotted time but times varied due to the participants' interaction with the CDS intervention. The interactive notification architecture was also unfamiliar in the first task but became more intuitive as the following tasks were completed and alerts appeared after adding certain clinical details to the patient's chart.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task.

A.14 Implantable Device

Effectiveness: The presentation summary was very easy to understand leading to a 100% success rate with no deviations or errors.

Efficiency: The action of adding an implantable device to the patient profile was a completely new user experience as it required registering information from within an internal care collaboration note.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task.

B. 2 Reconcile Outside Records

Effectiveness: The presentation was dense with multiple steps to follow but the outcome task excited users leading to a 100% success rate with multiple deviations based on different tester backgrounds (provider vs office) and previous user interface experience.

Efficiency: The task combined multiple user experiences between task architecture, new outside records inbox, new outside record association, and reconciliation of data elements into the current patient's chart. All tasks were completed in the allotted time. Deviations were the result of unfamiliarity with the task architecture and the new combined workflow.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 3 or above for each task.

B.11 Decision Support Interventions (DSI)

Effectiveness: The presentation was clear and easy to follow, achieving a 100% success rate. Minor deviations and one error were noted, influenced by the testers' backgrounds (e.g., provider vs. office staff) and their level of experience with the software.

Efficiency: The task integrated diverse user experiences, enabling direct feedback during specific clinical interactions and refining which patients would present with specific DSI indicators. All tasks were successfully completed within the allotted time. Deviations primarily stemmed from user unfamiliarity with providing direct feedback in a clinical interaction context.

Satisfaction: Out of a scale of 1 = very hard, 5 = very easy, user satisfaction scored 4 or above for each task.

Major Takeaways

The volunteer user participants were purposefully selected to have minimal, if any experience with the new EHR functionality. The common themes of “easy to learn”, “intuitive”, “user-friendly”, and “now I’ve learned what to do" were made by multiple participants in the Post Test Questionnaire. Other comments included “Reconciling outside records is always a lot of effort, and even though this included multiple steps, I was able to complete it, end to end, despite the interruptions and did not make any entry errors.” This helped to validate the system developers' goal of quick learning and easy system utilization by its users.

Volunteer user participants also expressed liking the organization of the task and system functionality such as “drop and click”, “important patient data was upfront and readily seen”, and “able to navigate multiple places from the main summary page”. Volunteer user participants expressed excitement that they will be able to reconcile records from third-party sources into the patient’s chart with ease for improved transitions of care.

Cohort III participants appreciated the added functionality to “provide direct feedback” within the system directly to the administrators about what was and wasn’t relevant for their patient care planning.

Areas for Improvement

Volunteer user participants expressed concerns regarding the number of CDS indicators and issues about making them more specific to their practice. Testing staff commented on fluctuation in task efficiency for reviewing the CDS interventions. Occasional path deviations were also noted by the testing staff, although some workflows were more intuitive than the optimal path with miniscule time delays. Suggestions were received for possible improvements in future versions including for reconciliation of outside record data elements into the patient’s chart.

5 APPENDICES

5.1 Appendix 1: INFORMED CONSENT

Informed Consent

BroadStreet EHR would like to thank you for participating in this study. The purpose of this study is to evaluate an electronic health records system. You will be asked to perform several tasks using the prototype and give your feedback. The study will last about 30 minutes.

Agreement

I understand and agree that as a voluntary participant in the present study conducted by WashSense, 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 WashSense.

I understand and consent to the use and release of the videotape by WashSense. I understand that the information and videotape are 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 WashSense 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 others outside of WashSense. I understand and agree that data confidentiality is assured because only deidentified 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.

I understand that I am volunteering for this study and no monetary or other compensation is being offered.

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: _____

5.2 Appendix 2: SAMPLE FROM MODERATOR'S GUIDE

Moderator: (Read Orientation) Thank you for participating in this study. Our session today will last approximately 30 minutes. During that time, you will be looking at an electronic health record system. I will ask you to complete a few tasks using this system and answer some questions. We are interested in how easy or difficult this system is to use, what you like in the system, and how we could improve it. You will be asked to complete these tasks independently, trying to do them as quickly as possible and with the fewest possible errors or deviations.

5.3 Appendix 3: PARTICIPANT SAMPLE GUIDE

Cohort 1

First Impression

I will navigate you to the EHR BroadStreet patient's chart but do not click on anything once we have arrived. Please notice the patient clinical summary at the top and below the horizontal tab menu to review the patient's detailed information. You will have 1 minute to record your comments about what you notice. Include likes/dislikes, what you expect to do from this page, its organization, the ease of understanding for how to possibly navigate the EHR, etc.

Criteria (a)(5) - Demographics

I. Modify Demographics
   a. Click the green circle with a pen.
   b. Select Demographics
      i. Modify the birth date
         a) First, select the year "1938"
         b) then select the month "March"
         c) then select day "10" as the date
   c. Save & Sign

State "Done". Score this task: 1 = very hard, 5 = very easy

II. Record Demographics
   a. Click the green circle with a pen.
   b. Select Demographics
      i. Click Gender and select Male
      ii. Click Preferred Language and select English
      iii. Click Race and select Asian
   c. Save & Sign

State "Done". Score this task: 1 = very hard, 5 = very easy

Criteria (a)(1) - Medications

I. Review Medication List
   a. Click the Medications tab on the Patient's Chart
   b. Under "BroadStreet Rx Orders", Find the Omeprazole order
   d. Write down/state the dosage of milligrams (MG) _____

State "done". Score this task: 1 = very hard, 5 = very easy

II. Order Medication
   a. Click the green circle with the pen
   b. Select New Order for Rx
      i. Rx Order
         a) Enter "Lipitor 10mg PO Tablet"
      ii. Dosing details
         a) Quantity – enter 1
         b) Type - select Tablet(s)
         c) Frequency - select Daily (QD)
         d) Duration - enter 30
      iii. Diagnosis
         a) Select E78.5 - Hyperlipemia, unspecified
   e. Click Save & Sign

State "Done". Score this task: 1 = very hard, 5 = very easy

III. Modify Medication
   a. Click the Orders tab on the Patient's Chart
   b. Find the most recent Lipitor order and Select Edit
   c. Modify Order
      i. Remove Lipitor 10mg PO Tablet
      ii. Select Lipitor 40mg order
   d. Click Save & Sign

State "Done". Score this task: 1 = very hard, 5 = very easy

Criteria (a)(5) (cont'd)

I. Add Death Date and Reason
   a. Click the green circle with the pen.
   b. Select Demographics.
   c. Click Date of Death, and select 2020 January 1
   d. Enter "Pneumonia" as Cause of Death
   e. Click Save & Sign

State "Done". Score this task: 1 = very hard, 5 = very easy

Cohort II

Moderator introduces Task: Please Review the directions for the task and when ready, state "begin". When finished, state "Done".

Criteria (a)(9) Clinical Decision Support (CDS)

Set up care team permissions for Clinical Decision Support (CDS) Interventions for Albert NP.

I. Navigate to "Users" and open User List
II. Edit to open User Profile "Albert NP".
III. In the Additional Permissions field, select "Read CDS"
IV. Save

State "Done". Score this task: 1 = very hard, 5 = very easy

First Impression of Patient's Chart

Moderator: I will navigate you to the EHR BroadStreet patient's chart. This chart is complete with patient information entered by the intake coordinator and includes demographics, reported allergies, medications, lab results, weight, height, primary diagnosis, surgical procedure, etc. You have up to a minute to collect your thoughts and feel free to click around as well. When Done, You will then make comments below. Include likes/dislikes, what you expect to do from this page, its organization, the ease of understanding for how to possibly navigate the EHR, etc.

Criteria (a)(9) (cont'd)

I. Demographics – Age
   Continue from the BroadStreet patient's chart
   a. Click on the CDS indicator next to patient's age, review, and Acknowledge
II. Vital Signs – Weight
   a. Click on the CDS indicator next to the patient's BMI, review, and Acknowledge.

State "Done". Score this task: 1 = very hard, 5 = very easy

Criteria (a)(9) (cont'd)

III. Problem List – Info button Updating the Chart: Adding to the Problem list (paper chart review)
   a. Click the green circle with the pen
   b. Select Clinical Status Review
   c. Type Paper Chart Review
   d. Navigate to + Add New Entry
   e. Select "e78.5 Hyperlipidemia, Unspecified" and Add Entry
   f. Click the "I" icon to open a new tab containing relevant clinical content in MedlinePlus Connect
   g. Once reviewed, close the Medline tab in the browser to return to the BroadStreet tab

State "Done". Score this task: 1 = very hard, 5 = very easy

IV. Problem List – Combination of Demographics and Problem Updating the Chart: Adding to the Problem list (paper chart review)
   a. Add Diagnosis

b. Select “i10 Essential (Primary) Hypertension” and Add Entry
c. Click the CDS Indicator of the newly added diagnosis, review, and Acknowledge
d. Click Save and Sign

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (b)(2) Reconcile Outside Records – CCDA

I. Retrieving Outside Records and add to Patient’s Chart
   a. Navigate to the Document Inbox in the navigation menu
   b. Locate the patient's record and assign to the Patient's chart
   c. Select Your Test’s Patient Name to open chart
   d. Select "Reconcile" from the menu of patient’s document
   e. The Diagnoses, Medications, and Allergies from the patient’s current chart and CCDA document are listed.

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (b)(2) (cont’d) with (a)(9)

II. Incorporating the Outside Record Problem List into the Patient’s Chart
   a. Review and Compare the Problem/Diagnosis list from the chart with the list from the CCDA
   b. Notice "Repeated Falls" in the CCDA list. Click the CDS indicator. Review and Acknowledge
   c. Add “Repeated Falls” to the patient’s chart diagnosis list
   d. Save Draft.

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (b)(2) (cont’d) with (a)(9)

III. Incorporating the Outside Record Medication List and Allergies into Patient’s Chart
   a. Select the Medications Tab
      1. Review and Compare the Medications list from the chart with the CCDA list
      2. Notice "acetaminophen" in the CCDA list
      3. Add “acetaminophen” to the patient’s chart
   b. Select the Allergies Tab
      1. Review and Compare the Allergy list from the chart with the CCDA list
   c. Notice "sodium sulfate" in the CCDA list. Click the CDS indicator. Review and click Acknowledge
   d. Add “sodium sulfate” to the patient’s chart
   e. Save and Sign

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (a)(2) Lab Orders

I. New Lab Order
   a. Click the green circle with the pen
   b. Select New Orders and add New Lab Order
   c. Complete the following fields:
      i. Lab Type: “Complete Blood Count/Auto Diff”
      ii. Urgency: “Routine”
      iii. Diagnosis: “M62.81 – Muscle weakness (generalized)”
   d. Save and Sign

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (a)(2) (cont’d)

II. Access and Change Lab Order
   a. Click the Orders Tab of the Patient's Chart
   b. Locate the CBC Lab Order and Select "Edit Note"
   c. Update Lab Type: Remove CBC and select “Basic Metabolic Panel, AMA”
   d. Save Changes

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (a)(3) Diagnostic Orders

I. New Diagnostic Order
   a. Click the green circle with the pen
   b. Select New Orders and Add New Diagnostic Order
   c. Click into each of the Order fields and complete the following
      i. Order Type: “Radiology”
      ii. Procedure: “Screening chest x-ray (procedure)”
      iii. Diagnosis: R05.1 Acute Cough”
   d. Save and Sign

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (a)(3) (cont’d)

II. Access and Change Diagnostic Order
   Continue from the Orders Tab in the BroadStreet patient’s chart
   a. Locate the Radiology Order Select "Edit Note"
   b. Update Procedure: Remove “Screening chest X-ray” and select “Routine Chest X-ray”
   c. Save Changes

State “Done”. Score this task: 1 = very hard, 5 = very easy

Criteria (a)(14) Implantable Device List

I. Adding Information for Implantable Device
   Continue from the BroadStreet patient’s chart
   a. Click the Notes Tab of the Patient's Chart
   b. In “Referral Coordination & Review” Note copy the 50 Characters UID Number

c. Navigate to the Patient's Profile and "+ Add Devices"
d. Paste the 50 Character UID Number and select "Posterior-chamber Intraocular Lens, Pseudophakic (Physical Object)"
e. Save

State "Done". Score this task: 1 = very hard, 5 = very easy

Cohort III

Moderator introduces purpose of testing is due to recent revisions by the ONC Health IT Certification Program in response to emerging "artificial intelligence and machine learning-based predictive algorithms used to aid decision making in healthcare".

Task: Review the directions for the task and when ready, state "begin". When finished, state "Done".

Criteria (b)(11) Evidence-based DSI User Feedback

I. In the navigation menu
   a. Click "Patients"
   b. Select patient "James Adams"
   c. From Patient Profile, note DSI indicator next to patient's age and click to open.
   d. Review and click into "Have Feedback" to give 3 star rating and add text comment "Not Appropriate for this patient".
   e. Click to "Send Feedback" and "Acknowledge" to close window.

State "Done". Score this task: 1 = very hard, 5 = very easy

Criteria (b)(11) Evidence-based DSI: Access and Modify Source Attributes

II. In the navigation menu
   a. Click "CDS Interventions" under "System Settings"
   b. Click on intervention title "Preventative Screening Recommendations" to review Source Attributes
   c. Click pencil to Edit
   d. Modify Source Attribute to include Race.
   e. Click "Save" at bottom of page.

State "Done". Score this task: 1 = very hard, 5 = very easy

Criteria (b)(11) Predictive DSI: Access and Modify Source Attributes

III. In the navigation menu
   a. Click "Applications" from Navigation menu
   b. Click on "i" icon of application title "Life Expectancy Calculator"
   c. Click pencil to Edit
   d. Modify Source Attribute to type "Nursing Home Resident" under Additional Source Attributes.
   e. Click "Save" at bottom of page.

State "Done". Score this task: 1 = very hard, 5 = very easy

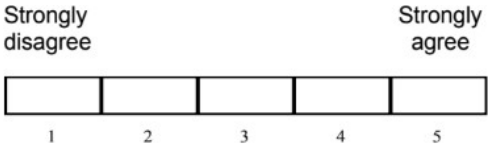
5.4 Appendix 4: PRE-TEST QUESTIONNAIRE

1. Name: _____
2. Credentials: _____
3. Organization: _____
4. Contact method (please provide one of the following):
    a. Work phone: _____
    b. Cell phone: _____
    c. Email: _____
5. Due to logistical restraints and the parameters of this study, we cannot provide assistive technologies during the testing session. Do you require any assistive technologies to use a computer? [if Yes, disqualify]
    a. Yes
    b. No
6. Do you, or does anyone in your household, have a commercial interest in an electronic health record software or consulting company? [if Yes, disqualify]
    a. Yes
    b. No
7. Highest Level of Education:
    a. Less than High School
    b. High school graduate/GED
    c. Some college
    d. Trad/Technical/Vocational Training
    e. Associate Degree
    f. College graduate – Bachelor's Degree
    g. Masters Degree
    h. Doctorate Degree (e.g., MD, DO, PhD)
    i. Other (please specify): _____
8. Which best describes your current age?
    a. 10-19
    b. 20-29
    c. 30-39
    d. 40-49
    e. 50-59
    f. 60-60
    g. 70-79
    h. 80-
9. How many years of experience do you have using computers for personal and professional activities (such as email, shopping, record keeping, etc.)? Estimate to closest exact year.
    a. <1 year
    b. 1-5yrs
    c. 6-10 yrs
    d. 11-20 yrs
    e. >20 years
10. What is your gender?
    a. Male
    b. Female
    c. Other (please specify): _____
    d.

11. What is your current role? Circle all that apply
    a. Certified Nursing Assistant (CNA)
    b. Office Staff Member
    c. Bedside Care Provider
    d. Group/Facility Director
    e. Information Technology
    f. Licensed Practical Nurse (LPN)
    g. Marketing/Communications
    h. Medical Assistant (MA)
    i. Registered Nurse
    j. Nurse Practitioner (NP)
    k. Office Manager
    l. Pharmacist
    m. Physician
    n. Physician Assistant (PA)
    o. Other (please specify): _____
12. In which setting do you primarily work?
    a. Inpatient
    b. Emergency Department/Urgent Care
    c. Ambulatory/Clinic
    d. Long Term Care Facility/Assisted Living Facility
    e. Hospice
13. How many years have you been working in your field? Estimate the closest year.
    a. <5
    b. 5-10
    c. 11-20
    d. >20
14. How do you capture patient data in your organization?
    a. Primarily on paper
    b. Primarily electronically
    c. Blend of paper and electronically
15. How much experience do you have with WashSense/Arsana programs? Estimate the closest year.
    a. less than 1 year
    b. 1-5 years
    c. 6-10 years
    d. 11-20 years
    e. >20 years

5.5 Appendix 5: SYSTEM USABILITY SCALE & POST-TEST QUESTIONNAIRE

System Usability Scale (SUS)



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

Post-Testing Questions

1. What was your overall impression of this system?
2. What aspects of the system did you like most?
3. What aspects of the system did you like least?
4. Were there any features that you were surprised to see?
5. What features did you expect to encounter but did not see? That is, is there anything that is missing in this application?
6. Compare this system to other systems you have used. Would you recommend this system to your colleagues?