



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

The Florida Department of Health, Health Management System Version 2019.03.00

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1. Executive Summary

A usability test of The Florida Department of Health, Health Management System EHR was conducted on 3/28/2019 at the Florida Department of Health in Walton and Okaloosa counties by the Florida Department of Health. 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). During the usability test, sixteen healthcare professionals matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 22 tasks typically conducted on an EHR. The tasks were concentrated in the following areas:

- 170.315(a)(1) Computerized Provider Order Entry – Meds
- 170.315(a)(2) Computerized Provider Order Entry – Laboratory
- 170.315(a)(3) Computerized Provider Order Entry – Diagnostic Imaging
- 170.315(a)(4) Drug-Drug, Drug-Allergy Interactions Checks
- 170.315(a)(5) Demographics
- 170.315(a)(6) Problem List
- 170.315(a)(7) Medication List
- 170.315(a)(8) Medication Allergy List
- 170.315(a)(9) Clinical Decision Support
- 170.315(a)(14) Implantable Device List
- 170.315(b)(2) Clinical Information Reconciliation
- 170.315(b)(3) Electronic Prescribing

The tasks listed above have been forced-ranked and tested in the order of degree of associated risk and the potential to cause patient harm if performed incorrectly by the user.

The elements used to evaluate the risk included:

- Number of individuals that would see/ be able to check the request prior to the patient's involvement
- The number of steps required to complete the effort
- The base medical knowledge required by the user for each criteria
- Frequency of the need to perform each function

The resultant forced-ranking was as follows:

- 170.315(a)(1) Computerized Provider Order Entry – Meds
- 170.315(b)(3) Electronic Prescribing
- 170.315(a)(4) Drug-Drug, Drug-Allergy Interactions Checks
- 170.315(a)(2) Computerized Provider Order Entry – Laboratory
- 170.315(a)(3) Computerized Provider Order Entry – Diagnostic Imaging

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- 170.315(a)(9) Clinical Decision Support
- 170.315(a)(6) Problem List
- 170.315(a)(8) Medication Allergy List
- 170.315(a)(7) Medication List
- 170.315(a)(5) Demographics
- 170.315(a)(14) Implantable Device List
- 170.315(b)(2) Clinical Information Reconciliation

Previous iterations of this study included maintaining a patient's allergies. For comparative purposes, although not aligned with the designated Safety Enhanced Design modules as specified in 170.315(g)(3) Safety Enhanced Design, these tests were included with this study.

During the hour long one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included as Appendix 3). Participants were instructed that they could withdraw at any time. All participants had some prior experience with the EHR; however, no participants had experience performing all tasks included in the study. One week prior to the study, each participant was provided instructional design materials that explained the functionality within each of the modules involved with the test. These materials are similar in form and content to the materials provided to the user community with each EHR upgrade or release. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test while the data logger recorded user performance data on paper. The administrator did not give the participant assistance on how to complete the task but rather directed the participant to the instructional design materials. Note: The administrator made available additional copies of the materials if the training materials previously provided were not readily available.

The following types of data were collected for each participant:

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

Following the conclusion of the test, participants were asked to complete a post-test questionnaire. 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, represented in TABLE 1: EHRUT Performance and Rating data summarized by application

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module. All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected.

Task	Measure	Path Deviation		Task Time (Seconds)			Errors	Task Ratings 5=Easy	
	Task Success	Mean	Deviations		Mean	Deviations		Mean	Mean
			(Observed/ Optimal)	Percent		(Observed/ Optimal)	Percent		
Allergy	97%	19/12	+58%	81	51/58	+70%	.375	4.9	
Medication	94%	45/34	+32%	220	120/109	+109%	1.625	4.6	
DUR	88%	28/19	+47%	140	52/174	+30%	.6875	4.2	
CPOE-Lab	67%	38/23	+65%	130	133/160	+83%	3.0625	3.9	
CPOE-Rad	78%	27/18	+50%	108	68/93	+73%	1.6875	3.9	
CDS	92%	78/43	+81%	320	176/63	+279%	2.5625	4.4	
Implantable Devices	81%	8/4	+100%	31	21/119	+18%	.5	4	
Reconciliation	31%	16/8	+100%	44	110/170	+64%	1.875	1.3	

TABLE 1: EHRUT Performance and Rating data summarized by application module.

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance. The SUS score for the tasks in this test was 79 (as seen in Table 5 below). Broadly interpreted, scores under 68 represent systems with below average usability; scores over 68 would be considered above average.

In addition to the performance data, the following qualitative observations were made:

1.1. Major findings

The following are the major findings of the study based on interpretation of the qualitative findings, verbal reports of the participants and observations from the administrator and data logger.

- The Computerized Provider Order Entry process is expressed over multiple pages, creating difficulty in tracking new orders, orders yet to be completed, orders in-process and resulted orders.
- Efficiency is diminished when users are required to navigate to a separate page to complete workflow tasks. This is most apparent in the ‘additional information’ required in e-prescribing and in navigating to the clinical decision support module.
- The Clinical Decision Support (CDS) module needs to be made more accessible by increasing the points of entry during relevant activities in the workflow.
- The Implantable Devices module was not easily found for any users.

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- The Clinical Information Reconciliation module is not intuitive enough for users to be successful without guidance.

1.2.Areas for improvement

Based upon participant feedback, the major areas of improvement for the EHRUT have been identified as: consolidation of the CPOE ordering process, CDS workflow integration, Program Component data gathering, and enhancements to new functionality, including Implantable Devices and Clinical Information Reconciliation.

Consolidation of Ordering Information for CPOE

The Clinician Portal contains a menu selection for orders that includes a page for lab, medication and radiology orders as well as in- house services. The links from this section direct the user to the order entry page. A separate workflow must be followed to see outstanding orders and results. The study showed that this additional workflow was not always recognized by the study participants. The disjointed nature of the CPOE order entry in HMS may result in duplicate orders entered and/or missed results.

CDS Workflow Integration

The Clinical Decision Support (CDS) module contains all clinical decision alerts for a patient. The user is alerted that CDS alerts exist for the patient by an alert counter that is located on the Clinic Visit banner. Certain workflows within the application do not require that the user access the specific pages where the presence of an alert is noted.

Recent enhancements have included additional notification icons within the client banner directing the user's attention to the presence of alerts. Users commented that the icons should also provide linkages to the CDS module.

Program Component Data Gathering

During the electronic ordering process, the Florida Department of Health requires collection of additional data elements before an order can be completed. The method used to collect this data is not well-integrated with the application's workflow. As a result, this selection was commonly missed by users, prompting an alert and additional step.

Implantable Devices

The module developed to allow the maintenance of Implantable Devices is a relatively new addition to the EHR. Additional time needs to be dedicated to the design of this module.

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Specifically, its integration into the clinical workflow. The current, single entry point into the module was very difficult to find if users had not previously been exposed to its location. It is important to note that due to the scope of practice for the EHRUT, this module is not expected to be highly utilized.

Clinical Information Reconciliation

The module developed to allow Clinical Information Reconciliation and Incorporation is a relatively new addition to the EHR. Additional time may need to be dedicated to the design of this module. Although the module is not considered overly cumbersome, the user is not provided enough 'guidance' during the workflow. The result is that users are left with the impression that reconciliation has occurred when it may not have.

2. Introduction

The EHRUT tested for this study was The Florida Department of Health, Health Management System Version 2019.03.00 EHR. The EHRUT is designed to present medical information to healthcare professionals in Florida's 67 county health departments. The EHRUT consists of standard clinical functionality, programmatic templates representing the programs within the Florida Department of Health and a complete practice management module. 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 EHR Under Test (EHRUT). To this end, measures of effectiveness, efficiency and user satisfaction, such as the time spent on tasks, frequency that a successful task execution occurred and the total number of path deviations, were captured during the usability testing.

3. Method

3.1. Participants

A total of sixteen participants were tested on the EHRUT. Participants in the test were doctors and nurses. Participants were recruited by the Florida Department of Health and were compensated for their time through their existing salaries. In addition, participants had no direct connection to the development of the EHRUT(s). Participants were not from the testing or

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supplier organization. Participants were given the opportunity to have the same orientation and level of training as the actual end users would have received.

For test purposes, end-user characteristics were identified and translated into a recruitment screening tool used to solicit potential participants (included as Appendix 1).

Recruited participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. TABLE 2: Study participant demographics and experience, lists 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 could not be tied back to individual participants.

Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
57	Female	50-59	Master's Degree	Nurse Practitioner	180	240	24	Computer Glasses
18	Female	30-39	Associate degree	Registered Nurse	40	240	24	No
96	Female	30-39	Bachelor's degree	Registered Nurse	24	180	13	No
76	Female	60-69	Associate degree	Nurse Practitioner	341	336	84	No
92	Female	40-49	Bachelor's degree	Registered Nurse	120	360	24	No
1	Female	60-69	Associate degree	Registered Nurse	312	252	252	No
91	Female	40-49	Associate degree	RN/Clinic Supervisor	84	300	120	No
77	Female	40-49	Master's Degree	APRN	312	252	252	No
29	Female	40-49	Bachelor's degree	RN/Clinic Nursing Supervisor	264	264	19	No
40	Female	60-69	Master's Degree	APRN	264	492	264	No
22	Female	30-39	Some College credit, no degree	LPN	82	228	82	No
30	Male	50-59	Master's Degree	APRN	39	240	240	No
26	Female	60-69	Doctorate Degree	physician	430	387	175	No
81	Female	40-49	Bachelor's degree	RN/ Nursing Supervisor	251	420	160	No
8	Female	50-59	Some College credit, no degree	LPN	85	288	72	No
72	Female	50-59	Some College credit, no degree	LPN	317	240	21	No

TABLE 2: Study participant demographics and experience.

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17 participants (matching the demographics in the Participants section) were recruited and sixteen participated in the usability test. One participant was unwilling to perform the required tasks to be included within the study.

Participants were scheduled for one hour sessions with sufficient time allocated between each session for debrief by the administrator(s) and data logger(s), and 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 recruiters.

3.2. Study Design

Overall, the objective of this test was to uncover areas where the application performed well (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 only The Florida Department of Health, Health Management System. The participants used the system in different locations and worked from their usual work location using the technical resources (computer and peripherals) that were familiar to them. Participants were provided with the same instructions and a common training curriculum. 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 can be found in Section 3.9 on Usability Metrics.

3.3. Tasks

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

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- 170.315(a)(1) Computerized Provider Order Entry – Meds
 - **4. Record (Medication List)** : Add a medication [Metformin/reported] to the patients list of home medications
 - **6. Access (Medication List/ERx/CPOE)**: View a list of all medications including active, inactive, on hold and voided medications
 - **7. Change (Medication List/ERx/CPOE)**: Stop the Tylenol prescription today due to an adverse reaction. Then make sure Tylenol is inactive in the medication list. [Tylenol]
- 170.315(b)(3) Electronic Prescribing
 - **5. Record (ERx/CPOE)**: ePrescribe a medication [Tylenol 325-600mg PO q4-6 hours]
- 170.315(a)(4) Drug-Drug, Drug-Allergy Interactions Checks
 - **8. DUR- Drug- Drug**: Indicate a Drug-Drug Interaction [Tylenol + add Warfarin] (Moderate Alert)
 - **9. DUR- Drug-Allergy**: Indicate a severe Drug-Allergy Alert [Cipro + add Cipro] (Severe Alert) – Cancel prescription prior to issue
- 170.315(a)(2) Computerized Provider Order Entry – Laboratory
 - **10. CPOE- Laboratory Order-Record**: Order a lab [CBC]
 - **11. CPOE- Laboratory Order-Change**: Delete the previous lab [CBC] order
 - **12. CPOE- Laboratory Order-View**: View all lab orders (resulted and non-resulted) for the active client
- 170.315(a)(3) Computerized Provider Order Entry – Diagnostic Imaging
 - **13. CPOE- Radiology Order-Record**: Add a radiological order [Chest X-Ray, Single View, Frontal] status: planned
 - **14. CPOE- Radiology Order- Access**: View all outstanding radiology orders
- 170.315(a)(9) Clinical Decision Support
 - **15. CDS: Lab Tests/Incorporate CCD**: Incorporate a CCD in to the client’s record [includes lab result for HgA1c/Alert will appear as a result of import] Navigate to the CDS module to view alert
 - **18. CDS- Vital Signs**: Add a pulse rate [220] to the vitals and measures record, navigate to the CDS module to view this alert
- 170.315(a)(6) Problem List
 - **16. CDS: Problem List/Linked Referential Materials**: Within Medical History, record that the patient has had 2 sex partners in the last 12 months with no condom use. Navigate to the CDS alert to view details and bibliographic information.
- 170.315(a)(8) Medication Allergy List

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- **17. CDS-Medication Allergy List:** Add an allergy [eggs] to the allergy list, navigate to the CDS module to view this alert
- 170.315(a)(7) Medication List
 - **19. CDS-Combo:** Add a height [5'5"] and weight [285lbs] to the vitals and measures record. Add a medication [Metformin] to the medication list. Navigate to the CDS module to view this alert.
- 170.315(a)(5) Demographics
 - **20. CDS-Demographics:** [Female client, age 50, no prior service/med hx] Navigate to the CDS module to view this alert.
- 170.315(a)(14) Implantable Device List
 - **21. ID Maintain:** Create a clinical visit, navigate to the implantable device list. Inactivate the listed device.
- 170.315(b)(2) Clinical Information Reconciliation
 - **22. CIR-Electronically and simultaneously display data from at least 2 sources (Medications, Allergies, Problems):** Incorporate a CCD [Browse for File/Reconcile]
 - **CIR-Problem List:** Select sleep apnea from the imported list and add to the list of current problems.
 - **CIR-Allergies:** Select an allergy [eggs] from the imported file and add to the list of current allergies
 - **CIR-Medications-** Select a medication [Warfarin] which is missing from your active medication list, add this medication to the list of current medications.

Tasks were selected based on their frequency of use, criticality of function, and those that may be most troublesome for users. In addition, tasks were constructed in light of the study objectives. The twelve areas of the system where Safety Enhanced Design was specifically applied were the primary focus of the study.

Previous iterations of this study included maintaining a patient's allergies. For comparative purposes, although not aligned with the designated Safety Enhanced Design modules, these tests were included with this study.

1. **Allergy- Record:** Enter an allergy [Morphine]
2. **Allergy- Change:** Change the status of an allergy [Morphine] from active to inactive
3. **Allergy- Access:** View the history of an allergy [Morphine]

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3.4.Procedure

At the beginning of each observational session, participants were greeted. Participants were then assigned a participant ID. Each participant reviewed and signed an informed consent and release form (included as Appendix 3) prior to the start of the observation session. 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 extensively experienced with the following qualifications:

Data Logger: Ruben Medalla

Ruben is a Registered Nursing Consultant with 10 years of nursing experience that includes acute hospital settings and clinical informatics for the Florida Health Department. He earned his bachelor's degree in Nursing in 2008 and is pursuing a Master of Science in Nursing Informatics at Duke University in North Carolina. In his role as an RN consultant for the department, Ruben provided clinical expertise by facilitating multiple EHR user groups and clinician-based focus groups that provide input into the development of a relevant, and well-designed In-house built EHR.

Administrator: Michael Cragg

Michael is a Certified Project Management Professional with 20 years of experience managing information technology development projects. He earned his bachelor's degree in Computer Science Information Systems from the State University of New York in 2000 and was certified as a Project Management Professional in 2008. As the project manager for the department's EHR and Health Information Exchange projects, Michael has worked extensively with the user community as well as functioning in a facilitative role overseeing a development team of 40.

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.

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- 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 Section 3.10.

Following the session, the administrator gave the participant the post-test questionnaire (included as Appendix 5), 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.

3.5. Test Location

The test facility included a quiet testing room with a table, computer for the participant, and ample working space for the administrator and data logger. Only the participant, data logger and administrator were in the observation room. 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.

3.6. Test Environment

The EHRUT would typically be used in a healthcare office or facility. In this instance, the testing was conducted in actual healthcare settings within The Florida Department of Health's county health departments. For testing, the computer was a Dell model running Windows 7 with Internet Explorer 8 or higher. The participants used a mouse and keyboard when interacting with the EHRUT. The application was set up by the Florida Department of Health clinical team according to the documentation describing the system set-up and preparation. The application itself was running on a Cache platform using a training / test database on a LAN connection. 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).

3.7. Test Forms and Tools

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

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1. Informed Consent
2. Moderator's Guide
3. Post-test Questionnaire

Examples of these documents can be found in Appendices 2-3 respectively.

The Moderator's Guide was devised to be able to capture required data. The participant's interaction with the EHRUT was observed and notes were taken about verbal comments.

3.8. Participant Instructions

The administrator read the following instructions aloud to each participant (included as Appendix 4).

Introduction

I want to thank you so much for agreeing to participate in this study on the Department of Health's Electronic Health Record, HMS. As you may know already, the purpose of the study is to help us understand what the user experience is like. The results will be used to help make improvements to the design of the site.

Training Q/A

Before we get started, are there any questions regarding the training materials that you were provided?

- If yes, spend no more than 10 minutes answering questions
- If no, proceed to test

Agenda for session

What I'd like to do is ask you a few questions about your background up front. Then we're going to step through a series of tasks in which you will use the HMS to complete the action. I'm going to ask you to work through the tasks the best that you can, like you would typically do without someone watching you. At the end of each section, we will discuss any comments about the action. At the end of the series we will talk about your overall experience with the HMS EHR and I'll have you fill out a short questionnaire. The whole process should take about an hour.

We're testing our ideas, not you

I want you to know that we are testing HMS today. We are in no way testing you. There is no right or wrong answers to the questions I'll ask you today. We're interested in your honest impressions, so please feel free to share what you think of your experience. You're not going to hurt anyone's

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feelings – we just want to find out what is and is not working so we can make it better. Some of the functionality that you will see in the version of HMS that you work with today will not be available to you at the county health department, until further development to ensure ease of use is completed.

Discussion

Participants should not use a think-aloud protocol during the testing. Excessive verbalization or attempts to converse with the moderator during task performance should be strongly discouraged. Participants will naturally provide commentary, but they should do so, ideally, after the testing. Some verbal commentary may be acceptable between tasks, but again should be minimized by the moderator.

If at any time you need me to repeat a question, or if you want to stop or take a break, just say so and we'll do that. If there are any required values that are not stated in the instructions, use your best judgment. Do you have any questions? All right, let's get started.

Participants were then given 22 tasks to complete. Tasks are listed in the moderator's guide in Appendix 4.

3.9. 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 the Florida Department of Health, Health Management System by measuring participant success rates and errors
2. Efficiency of the Florida Department of Health, Health Management System by measuring the average task time and path deviations

3.10. Data Scoring

The following table (Table 3) details how tasks were scored, errors evaluated and time data analyzed.

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Measures	Rationale and Scoring
<p>Effectiveness: Task Success</p>	<p>A task was counted as a “Success” if the participant was able to achieve the correct outcome, without assistance, within the time allotted on a per task basis.</p> <p>The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage.</p> <p>Task times were recorded for successes. Observed task times were divided by the optimal time for each task as a measure of optimal efficiency.</p> <p>Optimal task performance time, as benchmarked by expert performance under realistic conditions, was recorded when constructing tasks. Target task times used for task times in the Moderator’s Guide were operationally defined by taking multiple measures of optimal performance and multiplying by a factor of 125% that allows some time buffer because the participants were not trained to expert performance. Thus, if expert, optimal performance on a task was 100 seconds then allotted task time performance was 125 seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.</p>
<p>Effectiveness: Task Failures</p>	<p>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 a “Failure.” No task times were taken for errors.</p> <p>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 were counted as errors. This is expressed as the mean number of failed tasks per participant.</p> <p>On a qualitative level, an enumeration of errors and error types was collected.</p>

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Measures	Rationale and Scoring
<p>Efficiency: Task Deviations</p>	<p>The participant’s path (i.e., steps) through the application was recorded. Deviations occurred 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.</p> <p>All task deviations were recorded within the detailed notes of the study. Optimal paths (i.e., procedural steps) were recorded when constructing tasks.</p>
<p>Efficiency: Task Time</p>	<p>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.</p>
<p>Satisfaction: Task Rating</p>	<p>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 Easy) to 5 (Very Difficult). This data was averaged across participants.</p> <p>Common convention is that average ratings for systems judged easy to use should be 1.8 or below.</p> <p>To measure participants’ confidence in and likeability of the Florida Department of Health, Health Management System 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 5.</p>

TABLE 3: Rationale and scoring.

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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. Participants who failed to follow session and task instructions had their data excluded from the analyses.

To facilitate the usability tests of the Clinical Decision Support modules, data was preloaded to simulate typical clinical scenarios. The participants were asked to add additional data or change existing data in order to initiate each alert. Following the firing of the alerts, the participants were asked to use the application to acknowledge each of the alerts. It was determined during the test that data required for the firing of the Medication List-based alert was not configured correctly. Therefore, the tasks related to this alert were not included within the overall mean scores tabulated. The task is not represented in the documentation. The evaluation team felt that there were a sufficient number of tasks related to the Clinical Decision Support module to enable a critical evaluation of the usability without inclusion of the Medication List-based alert.

The usability testing results for the EHRUT are detailed below (see Table 4). The results should be seen in light of the objectives and goals outlined in Section 3.2 Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

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Task	Measure	N	Task Success	Path Deviation		Task Time (Seconds)			Errors	Task Ratings 5=Easy
	#	Mean	Deviations		Mean	Deviations		Mean	Mean	
			(Observed/Optimal)	Percent		(Observed/Optimal)	Percent			
Allergy-Record		1	100%	11/6	179%	51	18/27	68%	19%	4.8125
Allergy-Change		2	100%	5/4	131%	21	15/13	117%	0%	5
Allergy-Access		3	94%	3/2	130%	10	7/18	41%	19%	4.8125
Medication-Record		4	94%	18/16	110%	98	69/78	88%	88%	4.4375
Medication-Prescribe		5	100%	16/10	158%	88	27/78	34%	50%	4.5
Medication-Access		6	100%	3/3	115%	9	6/4	151%	0%	5
Medication-Change		7	81%	8/5	165%	25	18/11	166%	25%	4.625
DUR-Drug-Drug		8	94%	13/10	133%	66	27/48	55%	13%	4.625
DUR-Drug-Allergy		9	81%	15/9	162%	74	26/60	43%	56%	3.75
CPOE-Lab Record		10	75%	19/15	125%	74	57/62	92%	106%	3.6875
CPOE-Lab Change		11	88%	9/3	290%	33	20/50	40%	38%	4.4375
CPOE-Lab Access		12	38%	11/5	220%	23	56/34	165%	163%	3.5
CPOE-Rad Record		13	81%	19/15	124%	86	52/109	48%	56%	4.0625
CPOE-Rad Access		14	75%	9/3	286%	22	16/19	86%	113%	3.8125
CDS-Lab		15	63%	7/4	178%	21	38/9	424%	69%	3.625
CDS-Problem		16	88%	22/13	170%	115	65/60	109%	125%	3.75
CDS-Med Allergy		17	100%	14/7	205%	59	19/44	43%	19%	4.625
CDS-Vitals		18	100%	9/5	186%	36	13/34	39%	13%	4.8125
CDS-Combo		19	100%	13/6	211%	42	11/27	41%	6%	4.9375
CDS-Demographics		20	100%	13/8	156%	48	30/29	102%	25%	4.875
Implantable Devices		21	81%	8/4	198%	31	21/16	134%	50%	4
CIRI		22	31%	16/8	205%	44	110/36	305%	188%	1.3125

TABLE 4: EHRUT Performance and Rating data detail

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 79 (as seen in Table 5 below). Broadly interpreted, scores under 68 represent systems with below average usability; scores over 68 would be considered above average.

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- 10. CPOE- Laboratory Order-Record (75%)**
- 12. CPOE- Laboratory Order-View (38%)**
- 13. CPOE- Radiology Order-Record (81%)**
- 14. CPOE- Radiology Order- Access (75%)**
- 15. CDS: Lab Tests/Incorporate CCD (63%)**
- 21. Implantable Device Maintain (81%)**
- 22. CIRI - (Medications, Allergies, Problems) (31%)**

As acknowledged below in the 'Areas for Improvements', and as witnessed by the study administrator and data logger, several factors reduced success percentage on these tasks. Some of these tasks also had a heightened degree of path deviation which is indicative of the participant's need to 'look' for what they were trying to find. Some participants abandoned these tasks which can explain why only some and not all of the path deviation scores were elevated.

4.2.2. EFFICIENCY

The data collected regarding the task time and path deviations, and represented in TABLE 4: EHRUT Performance and Rating data detail, is a good indicator of the efficiency of the functionality present in the application. For the purposes of this study, we will consider a task path deviation percentage of +200% or more a cause for concern. The task required greater than two times the number of steps to complete than when performed by the 'expert' user. The following tasks demonstrate 'inefficient' functionality in the application:

- 11. CPOE- Laboratory Order-Change (290%)**
- 12. CPOE- Laboratory Order-View (220%)**
- 14. CPOE- Radiology Order- Access (286%)**
- 17. CDS-Medication Allergy List (205%)**
- 19. CDS-Combo (211%)**
- 22. CIRI - (Medications, Allergies, Problems) (205%)**

When analyzing the data, some consideration must be given to task number 22 and as these tasks are related to an entirely new module. Besides the pre-study training materials, study participants had little exposure to these.

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Within the medication module, the functions that permit the accessing of medication history and updating of a medication order are not initiated from the same location where the original medication orders are generated. Although seasoned users may be familiar with the design, it is not intuitive and caused delays in the study participant's ability to complete the task.

The lab ordering process (change/view) was also one of the areas that demonstrated an extraordinarily high task step variance. The administrator and data logger noted that the cause for the variance was likely in the design of the task to be executed. The study participants were instructed to select a lab order that was difficult to find. Several study participants had trouble finding the particular test to order and as a result, the task took longer than expected. The rest of the activities involved in the task were not problematic to the study participants.

The module developed to allow Clinical Information Reconciliation and Incorporation is a relatively new addition to the EHR. Additional time may need to be dedicated to the design of this module. Although the module is not considered overly cumbersome, the user is not provided enough 'guidance' during the workflow. The result is that users are left with the impression that reconciliation has occurred when it may not have. Certification requirements indicate that the EHR design should provide users a view of reconciled lists prior to committing them to the patient's chart. In its present design, a combined list appears at the bottom of the page as users are reconciling and only once they hit save will the patient's chart be updated. Frequently, users assumed that the reconciled list displayed at the bottom of the screen WAS the patient's chart. As a result, several users left the page without saving. In some cases, users realized this when confirming the list in the patient's chart and returned to the reconciliation screens to try again. The design should be altered to make it clearer to the user that the combined list is pre-incorporation. In addition, the system could alert the user when attempting to navigate away from the page that changes are present that have not been saved.

4.2.3. SATISFACTION

The data collected regarding the system usability, and represented in TABLE 5: System Usability Scale Results, is a good indicator of the satisfaction that users get from using the application. Broadly interpreted, scores under 68 represent systems with below average usability; scores over 68 would be considered above average. This system's score was 16%

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higher than the average score of 68 which indicates that there is a more than acceptable degree of satisfaction with the system.

Based on the SUS results, Study Participants indicated that there were two areas where dissatisfaction existed:

- They found the system unnecessarily complex.
- They found the system very cumbersome to use.

The SUS was performed in an identical manner to the test performed in 2014. All SUS scores improved dramatically except for the complexity/cumbersome areas mentioned earlier. For those two ratings, users indicated almost an identical level of satisfaction/dissatisfaction from the previous study.

4.2.4. MAJOR FINDINGS

The following are the major findings of the study based on interpretation of the qualitative findings, verbal reports of the participants and observations from the administrator and data logger.

- The Computerized Provider Order Entry process is expressed over multiple pages, creating difficulty in tracking new orders, orders yet to be completed, orders in-process and resulted orders. Users have an expectation that if information is available within the application it will be easily accessible from the same general location. Some users may venture out and look for additional information if they know it is there but the majority of users tend to assume that the information is not available.
- Efficiency is diminished when users are required to navigate to a separate page to complete workflow tasks. This is most apparent in the additional information required in e-prescribing and in navigating to the Clinical Decision Support module. In addition, the additional navigation may result in some users disregarding the alerts, greatly diminishing their value. However, it is recognized that the application did employ a good strategy in that the Clinical Decision Support module does not rely on pop-up messages to alert users. Many of the participants commented that they like the way the alerts were presented but wished it was more closely integrated into the clinical workflow.
- The Clinical Decision Support (CDS) module needs to be made more accessible by increasing the points of entry during relevant activities in the workflow. Efficiency can be gained in this module by adding a severity to each alert and allowing the user to take

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action on the CDS list page. Indicators of clinical decision support functions should be enhanced to ensure that they are present in the applicable workflow. Some users indicated that in the case of a very severe alert, the application should require some action before proceeding.

- Additional time needs to be dedicated to the design of the Implantable Device module. Specifically, its integration into the clinical workflow. The current, single entry point into the module was very difficult to find if users had not previously been exposed to its location. It is important to note that due to the scope of practice for the EHRUT, this module is not expected to be highly utilized.
- The module developed to allow Clinical Information Reconciliation and Incorporation is a relatively new addition to the EHR. Additional time may need to be dedicated to the design of this module. Although the module is not considered overly cumbersome, the user is not provided enough 'guidance' during the workflow. The result is that users are left with the impression that reconciliation has occurred when it may not have.

4.2.5. AREAS FOR IMPROVEMENT

Based upon participant feedback, the major areas of improvement for the EHRUT have been identified as: consolidation of the CPOE ordering process, CDS workflow integration, Program Component data gathering, and enhancements to new functionality, including Implantable Devices and Clinical Information Reconciliation.

Consolidation of Ordering Information for CPOE

The Clinician Portal contains a menu selection for orders, containing a page for lab, medication and radiology orders as well as in-house services. The links from this section direct the user to the order entry page. A separate workflow must be followed to see outstanding orders and results. The disjointed nature of the CPOE order entry in HMS may result in duplicate orders to be entered and/or results to be missed. The ordering functions were integrated into the application over several years and that is obvious. No effort was made to create a single ordering interface and users often express the desire to have one. Although it may result in a significant effort, it is recommended that a consolidated ordering interface is developed that provides users the ability to generate new orders and check the status of existing orders.

CDS Workflow Integration

The Clinical Decision Support (CDS) module contains all clinical decision alerts for a patient. The user is alerted that CDS alerts exist for the patient by an alert counter that is located on

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the clinic visit banner. One user identified that they would not have seen the alert regarding an allergy for the flu vaccine in her normal workflow for that type of visit. It is recommended that the presence of alerts be indicated within multiple places in the application to ensure that users executing a variety of workflows have the opportunity to benefit from the information.

In the e-prescribing module, Florida Department of Health users are required to capture organizational specific information, including program component, sub program component and shipping indicators. This information is not part of the industry standard and is therefore not present on the main prescription page. The user is forced to navigate to a separate screen, known as “Additional Information” to enter this information. This selection was commonly missed by users, requiring additional steps to be taken. A different method to capture similar information is used in the electronic lab ordering module. Study participants indicated that they would like to see changes in the way this data is collected so that it does not result in several additional steps. One participant indicated that it would be an improvement if the collection method used in the two areas was at least consistent.

Clinical Decision Support

The clinical decision support module is designed to alert clinicians to take action based upon values entered into the EHR including demographics, allergies, medications, vital signs, problems or a combination of this information. Study participants requested that the severity of alerts be added to the clinical decision support module to decrease alert fatigue. The majority of users completed clinical decision support tasks, without difficulty, however inconsistencies in the triggering criteria (some CDS alerts require that a clinical visit be added after the information was entered) added non-valued steps to some alerts. One user suggested that CDS alerts are able to be handled from the list page to prevent the user from having to access the detail of each alert. Efficiency can be gained in this module by adding a severity to each alert and allowing the user to take action on the CDS list page. Indicators of clinical decision support functions should be enhanced to ensure that they are present in the applicable workflow.

Implantable Devices

Additional time needs to be dedicated to the design of the Implantable Device module. Specifically, its integration into the clinical workflow. The current, single entry point into the module was very difficult to find if users had not previously been exposed to its location.

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Once users were able to locate the link to this module, the tasks required were not of any concern. Users were able to find the information they needed and act on it appropriately.

It is important to note that due to the scope of practice for the EHRUT, this module is not expected to be highly utilized. However, recommendations will be made to the Clinical Development Workgroup to determine other appropriate paths into the module.

Clinical Information Reconciliation and Incorporation

The module developed to allow Clinical Information Reconciliation and Incorporation is a relatively new addition to the EHR. Additional time may need to be dedicated to the design of this module. Although the module is not considered overly cumbersome, the user is not provided enough 'guidance' during the workflow. The result is that users are left with the impression that reconciliation has occurred when it may not have.

The application allows the user to select specific Allergies/Medications/Problems to be incorporated into the patient's record. The application displays a new 'combined' list at the bottom of the screen to provide the user a view of the modified list once the reconciliation is committed. Many users misinterpreted this combined view as indicative that reconciliation had occurred. As a result, users often left the page without committing the changes and updating the list in question. The application does not provide a warning to the users when this occurs. A design consideration might be to add an alert for the user indicating that the changes had not yet been saved prior to allowing them to navigate away from the page. It appeared as if users would benefit from a single action that would allow them to commit all Allergies/Medications/Problems that had been reconciled rather than individual saves for each impacted list.

5. Appendices

The following appendices include supplemental data for this usability test report. Following is a list of the appendices provided:

- Sample Recruiting screener
- Participant demographics
- Non-Disclosure Agreement (NDA) and Informed Consent Form
- Example Moderator's Guide
- System Usability Scale Questionnaire

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A. Appendix 1: Recruiting screener

Recruiting Script for Florida Department of Health Electronic Health Record Usability Study

Hello, I am from the Bureau of Clinical Management and Informatics in the Office of Information Technology within the Florida Department of Health. We are recruiting individuals to participate in a usability study for the Health Management System electronic health record. We would like to ask you a few questions to see if you qualify and if you would like to participate. This should only take a few minutes of your time. This is strictly for research purposes. If you are interested and qualify for the study, we would welcome your participation in the study and you will be able to meet the requirements of the study within the normal course of your work day. Can I ask you a few questions?

1. Are you male or female? [We are attempting to recruit a mix of participants]

2. Have you participated in a focus group or usability test in the past 12 months? [If yes, Terminate]

3. Do you, or does anyone in your home, work in marketing research, usability research, web design [...etc.]? [If yes, Terminate]

4. Do you, or does anyone in your home, have a commercial or research interest in an electronic health record software or consulting company? [If yes, Terminate]

5. Which of the following best describes your age? [23 to 39; 40 to 59; 60 - to 74; 75 and older] [We are attempting to recruit a mixed demographic]

6. Which of the following best describes your race or ethnic group? [e.g., Caucasian, Asian, Black/African-American, Latino/a or Hispanic, etc.]

7. Do you require any assistive technologies to use a computer? [if so, please describe]

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Professional Demographics

8. What is your current position and title? (Must be healthcare provider or system administrator)

RN: Specialty _____

Physician: Specialty _____

Resident: Specialty _____

Administrative Staff _____

Other [Terminate]

9. How long have you held this position?

10. Describe your work location (or affiliation) and environment?

11. Which of the following describes your highest level of education? [e.g., high school graduate/GED, some college, college graduate (RN, BSN), postgraduate (MD/PhD), other (explain)]

Computer Expertise

12. Besides reading email, what professional activities do you do on the computer? [e.g., access EHR, research; reading news; shopping/banking; digital pictures; programming/word processing, etc.] [If no computer use at all, Terminate]

13. About how many hours per week do you spend on the computer? [Recruit according to the demographics of the intended users, e.g., 0 to 10, 11 to 25, 26+ hours per week]

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14. What computer platform do you usually use? [e.g., Mac, Windows, etc.]

15. What Internet browser(s) do you usually use? [e.g., Firefox, IE, AOL, etc.]

16. In the last month, how often have you used an electronic health record?

17. How many years have you used an electronic health record?

18. How many EHRs do you use or are you familiar with?

Contact Information *If the person matches our qualifications, ask*

Those are all the questions I have for you. Your background matches the people we're looking for. Would you be able to participate on [date, time]? [If so collect contact information]

May I get your contact information?

Name of participant: _____

Address: _____

City, State, Zip: _____

Daytime phone number: _____

Evening phone number: _____

Alternate [cell] phone number: _____

Email address: _____

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B. Appendix 2: Participant demographics

Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
57	Female	50-59	Master's Degree	Nurse Practitioner	180	240	24	Computer Glasses
18	Female	30-39	Associate degree	Registered Nurse	40	240	24	No
96	Female	30-39	Bachelor's degree	Registered Nurse	24	180	13	No
76	Female	60-69	Associate degree	Nurse Practitioner	341	336	84	No
92	Female	40-49	Bachelor's degree	Registered Nurse	120	360	24	No
1	Female	60-69	Associate degree	Registered Nurse	312	252	252	No
91	Female	40-49	Associate degree	RN/Clinic Supervisor	84	300	120	No
77	Female	40-49	Master's Degree	APRN	312	252	252	No
29	Female	40-49	Bachelor's degree	RN/Clinic Nursing Supervisor	264	264	19	No
40	Female	60-69	Master's Degree	APRN	264	492	264	No
22	Female	30-39	Some College credit, no degree	LPN	82	228	82	No
30	Male	50-59	Master's Degree	APRN	39	240	240	No
26	Female	60-69	Doctorate Degree	physician	430	387	175	No
81	Female	40-49	Bachelor's degree	RN/ Nursing Supervisor	251	420	160	No
8	Female	50-59	Some College credit, no degree	LPN	85	288	72	No
72	Female	50-59	Some College credit, no degree	LPN	317	240	21	No

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C. Appendix 3: Informed Consent Form

The Florida Department of Health would like to thank you for participating in this study. The purpose of this study is to evaluate the Health Management System electronic health record 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.

Agreement

I understand and agree that as a voluntary participant in the present study conducted by the Florida Department of Health, I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and agree to be observed by the Florida Department of Health.

I understand and consent to the use and release of any and all information collected by the Florida Department of Health. I understand that the information 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 information and understand the information may be used by the Florida Department of Health 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 the Florida Department of Health. 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: _____

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D. Appendix 4: Moderator's Guide

See 'EHR Usability Test Moderator's Guide' included as an external attachment.

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E. Appendix 5: System Usability Scale Questionnaire

#	Statement	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



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

The Florida Department of Health, Health Management System Version 2015

Date of Usability Test:	11/21/2024 and 12/5/2024
Date of Report:	12/5/2024
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1. Executive Summary

A usability test of The Florida Department of Health, Health Management System EHR was conducted on 11/21/2024 and 12/5/2024 at the Florida Department of Health State Health Office by the Florida Department of Health. The purpose of this test was to test and validate the usability of the enhancements made for the ONC criterion 170.315(b)(11) Decision Support Intervention functionality. This EHR Under Test (EHRUT) was previously certified and usability tested for the functionality of ONC criterion 170.315(a)(9). The tasks and test results described in this supplemental report focus on the delta updates for 170.315(b)(11) compared to its predecessor 170.315(a)(9). Please refer to original usability test report covering 170.315(a)(9) tasks for additional information.

During the usability test, eleven (11) users matching the target demographic criteria served as participants and used the EHR in simulated, but representative tasks. This study collected performance data on three (3) tasks which cover the changes from 170.315(a)(9) to 170.315(b)(11):

- Task 1: User Triggers User-supplied Predictive DSI and Access/Record/Change Source Attributes (170.315 (b)(11))
- Task 2: User Selects Evidenced-based DSI, Access/Record/Changes Source Attributes and Provides User Feedback (170.315 (b)(11))
- Task 3: Admin User Exports User Feedback (170.315 (b)(11))

During the 15-minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included as Appendix 3). Participants were instructed that they could withdraw at any time. All participants had some prior experience with the EHR; however, no participants had experience performing all tasks included in the study. One week prior to the study, each participant was provided instructional design materials that explained the functionality within each of the modules involved with the test. These materials are similar in form and content to the materials provided to the user community with each EHR upgrade or release. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test while the data logger recorded user performance data on paper. The administrator did not give the participant assistance on how to complete the task but rather directed the participant to the instructional design materials. Note: The administrator made available additional copies of the materials if the training materials previously provided were not readily available.

The following types of data were collected for each participant:

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

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- Participant’s satisfaction ratings of the system

Following the conclusion of the test, participants were asked to complete a post-test questionnaire and were compensated 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, represented in TABLE 1: EHRUT Performance and Rating data summarized by task. All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected.

Task	Measure	N	Task Success	Path Deviation		Task Time (Seconds)		Errors	Task Ratings 5=Easy	
	#	Mean (SD)	Mean (SD)	Deviations		Mean (SD)	Deviations		Mean (SD)	Mean (SD)
				(Observed/Optimal)	Percent		(Observed/Optimal)	Percent		
User Triggers User-supplied Predictive DSI and Access/Record/Change Source Attributes	1	100% (0.0)	9.27/6	+54%	141 (69)	75/66	+214%	0% (0.0)	4.7 (0.62)	
User Selects Evidenced-based DSI, Access/Record/Changes Source Attributes and Provides User Feedback	2	100% (0.0)	8.63/7	+22%	131 (93)	68/63	+208%	0% (0.0)	4.8 (0.39)	
Admin User Exports User Feedback	3	81% (0.4)	7/5	+40%	67 (32)	23/44	+152%	0% (0.0)	4.4 (0.54)	

TABLE 1: EHRUT Performance and Rating data summarized by task.

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance. The SUS score for the tasks in this test was 90 (as seen in Table 5 below). Broadly interpreted, scores under 60 represent systems with below average usability; scores over 80 would be considered above average.

In addition to the performance data, the following qualitative observations were made:

1.1. Major findings

The following are the major findings of the study based on interpretation of the qualitative findings, verbal reports of the participants and observations from the administrator and data logger.

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- Users experienced consistency in the look, feel and functionality of pages within the decision support module.
- The criteria that cause DSI rules to fire are consistent and clinically relevant.

1.2.Areas for improvement

Based upon participant feedback, the application performed as intended and there were no suggestions for improvement.

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2. Introduction

The EHRUT tested for this study was The Florida Department of Health, Health Management System Version 2015 EHR. The EHRUT is designed to present medical information to healthcare professionals in Florida's 67 county health departments. The EHRUT consists of standard clinical functionality, programmatic templates representing the programs within the Florida Department of Health and a complete practice management module. The usability testing attempted to represent realistic exercises and conditions.

This EHRUT was previously certified and usability tested for the functionality of ONC criterion 170.315(a)(9). The tasks and test results described in this supplemental report focus on the delta updates for 170.315(b)(11) compared to its predecessor 170.315(a)(9). Please refer to original usability test report covering 170.315(a)(9) tasks for additional information. The usability testing attempted to represent realistic exercises and conditions associated with the 170.315(b)(11) functionality within the EHRUT. 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 for the associated tasks in this report. To this end, measures of effectiveness, efficiency and user satisfaction, such as time to complete the tasks and deviations from optimal pathways, were captured during the usability testing.

3. Method

3.1. Design Standard

The Florida Department of Health employed the NISTIR 7741 usability standard in our product design. NISTIR 7741 is a guide to the processes approach for improving the usability of electronic health records. ([\(NISTIR 7741\) NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records | NIST](#))

3.2. Participants

A total of eleven (11) participants were tested on the EHRUT. Participants in the test were recruited by the Florida Department of Health and were compensated for their time through their existing salaries. Participants were given the opportunity to have the same orientation and level of training as the actual end users would have received.

For test purposes, end-user characteristics were identified and translated into a recruitment screening tool used to solicit potential participants.

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Recruited participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. TABLE 2: Study participant demographics and experience, lists 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 could not be tied back to individual participants.

Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
101	Female	30-39	Master's degree	Quality Assurance Analyst	144	144	96	No
102	Male	40-49	Bachelor's degree	Applications Architect	300	300	180	No
103	Male	30-39	Master's degree	Systems Analyst	78	180	30	No
104	Male	40-49	Bachelor's degree	Systems Analyst	204	264	144	No
105	Female	50-59	Associate's degree	Registered Nurse	211	240	454	Multifocal computer glasses
106	Male	30-39	Master's degree	Web Applications Programmer	120	120	120	No
107	Male	40-49	Master's degree	Decision Support Specialist	240	240	120	No
108	Female	40-49	Bachelor's degree	Registered Nurse	228	228	90	No
109	Female	30-39	Bachelor's degree	Web Applications Programmer	144	144	36	No
110	Female	30-39	Master's degree	Information Technology Analyst	120	120	36	No
111	Female	60-69	Bachelor's degree	Systems Project Consultant	228	300	96	No

TABLE 2: Study participant demographics and experience.

All participants recruited participated in the usability test.

Participants were scheduled for 15-minute sessions with sufficient time allocated between each session for debrief by the administrator(s) and data logger(s) and 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 recruiters.

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3.3. Study Design

Overall, the objective of this test was to uncover areas where the application performed well (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 only The Florida Department of Health, Health Management System. The participants used the same location and worked from their usual work location using the technical resources (computer and peripherals) that were familiar to them. Participants were provided with the same instructions and a common training curriculum. 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 can be found in Section 3.9 on Usability Metrics.

3.4. Tasks

A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might complete with this EHR according to its respective ONC certified criteria. Tasks used in the study are listed below and with their relative risk associated with user errors noted.

- Task 1: User Triggers User-supplied Predictive DSI and Access/Record/Change Source Attributes (170.315 (b)(11)) (medium risk)
- Task 2: User Selects Evidenced-based DSI, Access/Record/Changes Source Attributes and Provides User Feedback (170.315 (b)(11)) (medium risk)
- Task 3: Admin User Exports User Feedback (170.315 (b)(11)) (low risk)

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Although the system is not currently configured with a predictive DSI, it is capable of supporting one, and we used a stand-in test intervention for the purpose of the usability testing. In the event that a user supplied predictive DSI is enabled, it would function much like the functionality tested in this report.

3.5.Procedure

At the beginning of each observational session, participants were greeted. Participants were then assigned a participant ID. Each participant reviewed and signed an informed consent and release form (included as Appendix 3) prior to the start of the observation session. 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 extensively experienced with the following qualifications:

Data Administrator: Jill Parker

Jill is an Advanced Registered Nurse Practitioner (Family Practice) with more than 25 years of professional experience combined in acute care, primary care, and public health settings. She earned her bachelor's degree in nursing from the Florida State University and her master's degree in nursing from the University of West Florida. In her role as Executive Community Health Nursing Director for the department, Jill provided clinical expertise by facilitating multiple EHR user groups and clinician-based focus groups that provide input into the development of a relevant, and well-designed In-house built EHR.

Data Logger: Michael Cragg

Michael is a Certified Project Management Professional with 25 years of experience managing information technology development projects. He earned his bachelor's degree in Computer Science Information Systems from the State University of New York in 2000 and was certified as a Project Management Professional in 2008. As the project manager for the department's EHR and Health Information Exchange projects, Michael has worked extensively with the user community as well as functioning in a facilitative role overseeing a development team of 50.

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

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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 Section 3.10.

Following the session, the administrator gave the participant the post-test questionnaire (included as Appendix 5) 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.

3.6. Test Location

The test facility included a quiet testing room with a table, computer for the participant, and ample working space for the administrator and data logger. Only the participant, data logger and administrator were in the observation room. 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.

3.7. Test Environment

The EHRUT would typically be used in a healthcare office or facility. In this instance, the testing was conducted in a testing environment to mimic that setup. For testing, the computer was a Dell model running Windows 11 with the Edge browser. The participants used a mouse and keyboard when interacting with the EHRUT. The application was set up by the Florida Department of Health clinical team according to the documentation describing the system set-up and preparation. The application itself was running on a Cache platform using a training / test database on a LAN connection. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation. Additionally,

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participants were instructed not to change any of the default system settings (such as control of font size).

3.8. Test Forms and Tools

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

1. Informed Consent
2. Moderator's Guide
3. Post-test Questionnaire

Examples of these documents can be found in Appendices 2-3 respectively.

The Moderator's Guide was devised to be able to capture required data. The participant's interaction with the EHRUT was observed and notes were taken about verbal comments.

3.9. Participant Instructions

The administrator instructions aloud to each participant (included as Appendix 4). Participants were then given 3 tasks to complete.

3.10. 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 the Florida Department of Health, Health Management System by measuring participant success rates and errors
2. Efficiency of the Florida Department of Health, Health Management System by measuring the average task time and path deviations
3. Satisfaction with the Florida Department of Health, Health Management System by measuring ease of use ratings.

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3.11. Data Scoring

The following table (Table 3) details how tasks were scored, errors evaluated, and time data analyzed.

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Measures	Rationale and Scoring
<p>Effectiveness: Task Success</p>	<p>A task was counted as a “Success” if the participant was able to achieve the correct outcome, without assistance, within the time allotted on a per task basis.</p> <p>The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage.</p> <p>Task times were recorded for successes. Observed task times were divided by the optimal time for each task as a measure of optimal efficiency.</p> <p>Optimal task performance time, as benchmarked by expert performance under realistic conditions, was recorded when constructing tasks. Target task times used for task times in the Moderator’s Guide were operationally defined by taking multiple measures of optimal performance and multiplying by a factor of 125% that allows some time buffer because the participants were not trained to expert performance. Thus, if expert, optimal performance on a task was 100 seconds then allotted task time performance was 125 seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.</p>
<p>Effectiveness: Task Failures</p>	<p>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 a “Failure.” No task times were taken for errors.</p> <p>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 were counted as errors. This is expressed as the mean number of failed tasks per participant.</p> <p>On a qualitative level, an enumeration of errors and error types was collected.</p>

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Measures	Rationale and Scoring
<p>Efficiency: Task Deviations</p>	<p>The participant’s path (i.e., steps) through the application was recorded. Deviations occurred 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.</p> <p>All task deviations were recorded within the detailed notes of the study. Optimal paths (i.e., procedural steps) were recorded when constructing tasks.</p>
<p>Efficiency: Task Time</p>	<p>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.</p>
<p>Satisfaction: Task Rating</p>	<p>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 Easy) to 5 (Very Difficult). This data was averaged across participants.</p> <p>Common convention is that average ratings for systems judged easy to use should be 1.8 or below.</p> <p>To measure participants’ confidence in and likeability of the Florida Department of Health, Health Management System 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 5.</p>

TABLE 3: Rationale and scoring.

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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. Participants who failed to follow session and task instructions had their data excluded from the analyses.

The usability testing results for the EHRUT are detailed below (see Table 4). The results should be seen in light of the objectives and goals outlined in Section 3.2 Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Task	Measure	N	Task Success	Path Deviation		Task Time (Seconds)		Errors	Task Ratings 5=Easy	
		#	Mean (SD)	Deviations		Mean (SD)	Deviations		Mean (SD)	
				(Observed/Optimal)	Percent		(Observed/Optimal)	Percent	Mean (SD)	
User Triggers User-supplied Predictive DSI and Access/Record/Change Source Attributes		1	100% (0.0)	9.27/6	+54%	141 (69)	75/66	+214%	0% (0.0)	4.7 (0.62)
User Selects Evidenced-based DSI, Access/Record/Changes Source Attributes and Provides User Feedback		2	100% (0.0)	8.63/7	+22%	131 (93)	68/63	+208%	0% (0.0)	4.8 (0.39)
Admin User Exports User Feedback		3	81% (0.4)	7/5	+40%	67 (32)	23/44	+152%	0% (0.0)	4.4 (0.54)

TABLE 4: EHRUT Performance and Rating data detail

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 79 (as seen in Table 5 below). Broadly interpreted, scores under 68 represent systems with below average usability; scores over 68 would be considered above average.

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EHR Usability Test Report of The Health Management System (HMS) Version 2015 System Usability Questionnaire Results																
System Usability Score Results																
f	Statement	P107 Score Contribution	P103 Score Contribution	P111 Score Contribution	P102 Score Contribution	P101 Score Contribution	P108 Score Contribution	P110 Score Contribution	P105 Score Contribution	P104 Score Contribution	P109 Score Contribution	P106 Score Contribution	Score Contribution Sum			
1	I think that I would like to use this system frequently	5	4	5	4	5	4	4	3	5	4	4	3	39.0		
2	I found the system unnecessarily complex	1	4	1	4	4	1	1	4	1	4	2	3	37.0		
3	I thought the system was easy to use	5	4	5	4	5	4	5	4	5	4	5	4	43.0		
4	I think that I would need the support of a technical person to be able to use this system	1	4	1	4	2	3	1	4	1	4	1	4	39.0		
5	I found the various functions in this system were well integrated	5	4	5	4	4	3	5	4	5	4	5	4	40.0		
6	I thought there was too much inconsistency in this system	1	4	1	4	1	4	1	4	1	4	1	4	41.0		
7	I would imagine that most people would learn to use this system very quickly	5	4	5	4	5	4	5	4	5	4	5	4	40.0		
8	I found the system very cumbersome to use	1	4	2	3	1	4	1	4	1	4	3	2	36.0		
9	I felt very confident using the system	5	4	5	4	5	4	5	4	5	4	5	4	43.0		
10	I needed to learn a lot of things before I could get going with this system	1	4	4	1	3	2	1	4	1	4	1	4	36.0		
													Total Score Contributions:	394		
													System Usability Score:	90		

TABLE 5: System Usability Scale Results

4.2. Discussion of the Findings

4.2.1. EFFECTIVENESS

The data collected regarding the task success and path deviations and represented in TABLE 4: EHRUT Performance and Rating data detail, is a good indicator of the effectiveness of the functionality present in the application. For the purposes of this study, we will consider a task success percentage of 83 or better acceptable. The following tasks demonstrate ‘ineffective’ functionality in the application:

- Task 3: Admin User Exports User Feedback (170.315 (b)(11)) (low risk)

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This task required permissions to be set in the reporting environment. These permissions take overnight to populate. Two participants were unable to complete this task due to the improper setting of permissions. This was not a failure of the application that users would regularly see in day-to-day use.

4.2.2. EFFICIENCY

The data collected regarding the task time and path deviations and represented in TABLE 4: EHRUT Performance and Rating data detail, is a good indicator of the efficiency of the functionality present in the application. For the purposes of this study, we will consider a task path deviation percentage of +200% or more a cause for concern. The task required greater than two times the number of steps to complete than when performed by the 'expert' user. All tasks scored as efficient according to that scale.

4.2.3. SATISFACTION

The data collected regarding the system usability and represented in TABLE 5: System Usability Scale Results, is a good indicator of the satisfaction that users get from using the application. Broadly interpreted, scores under 68 represent systems with below average usability; scores over 68 would be considered above average. This system's score of 90 was well above the average score of 68 which indicates that there is a more than acceptable degree of satisfaction with the system.

Based on the SUS results, Study Participants indicated that there were two areas where slight dissatisfaction existed:

- They found the system unnecessarily complex.
- They found the system very cumbersome to use.

The SUS was performed in an identical manner to the test performed in 2014 and 2019. SUS scores improved for the complexity/cumbersome areas mentioned above. For those two ratings, users indicated an improved level of satisfaction/dissatisfaction from the previous studies.

4.2.4. Major findings

The following are the major findings of the study based on interpretation of the qualitative findings, verbal reports of the participants and observations from the administrator and data logger.

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- Users experienced consistency in the look, feel and functionality of pages within the decision support module.
- The criteria that cause DSI rules to fire are consistent and clinically relevant.

4.2.5. Areas for improvement

Based upon participant feedback, the application performed as intended and there were no suggestions for improvement.

5. Appendices

The following appendices include supplemental data for this usability test report. Following is a list of the appendices provided:

- Sample Recruiting screener
- Participant demographics
- Non-Disclosure Agreement (NDA) and Informed Consent Form
- Example Moderator's Guide
- System Usability Scale Questionnaire

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A. Appendix 1: Recruiting screener

Recruiting Script for Florida Department of Health Electronic Health Record Usability Study

Hello, I am from the Bureau of Clinical Management and Informatics in the Office of Information Technology within the Florida Department of Health. We are recruiting individuals to participate in a usability study for the Health Management System electronic health record. We would like to ask you a few questions to see if you qualify and if you would like to participate. This should only take a few minutes of your time. This is strictly for research purposes. If you are interested and qualify for the study, we would welcome your participation in the study and you will be able to meet the requirements of the study within the normal course of your work day. Can I ask you a few questions?

1. Are you male or female? [We are attempting to recruit a mix of participants]

2. Have you participated in a focus group or usability test in the past 12 months? [If yes, Terminate]

3. Do you, or does anyone in your home, work in marketing research, usability research, web design [...etc.]? [If yes, Terminate]

4. Do you, or does anyone in your home, have a commercial or research interest in an electronic health record software or consulting company? [If yes, Terminate]

5. Which of the following best describes your age? [23 to 39; 40 to 59; 60 - to 74; 75 and older] [We are attempting to recruit a mixed demographic]

6. Which of the following best describes your race or ethnic group? [e.g., Caucasian, Asian, Black/African-American, Latino/a or Hispanic, etc.]

7. Do you require any assistive technologies to use a computer? [if so, please describe]

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Professional Demographics

8. What is your current position and title? (Must be healthcare provider or system administrator)

RN: Specialty _____
Physician: Specialty _____
Resident: Specialty _____
Administrative Staff _____
Other [Terminate] _____

9. How long have you held this position?

10. Describe your work location (or affiliation) and environment?

11. Which of the following describes your highest level of education? [e.g., high school graduate/GED, some college, college graduate (RN, BSN), postgraduate (MD/PhD), other (explain)]

Computer Expertise

12. Besides reading email, what professional activities do you do on the computer? [e.g., access EHR, research; reading news; shopping/banking; digital pictures; programming/word processing, etc.] [If no computer use at all, Terminate]

13. About how many hours per week do you spend on the computer? [Recruit according to the demographics of the intended users, e.g., 0 to 10, 11 to 25, 26+ hours per week]

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14. What computer platform do you usually use? [e.g., Mac, Windows, etc.]

15. What Internet browser(s) do you usually use? [e.g., Firefox, IE, AOL, etc.]

16. In the last month, how often have you used an electronic health record?

17. How many years have you used an electronic health record?

18. How many EHRs do you use or are you familiar with?

Contact Information *If the person matches our qualifications, ask*

Those are all the questions I have for you. Your background matches the people we're looking for. Would you be able to participate on [date, time]? [If so collect contact information]

May I get your contact information?

Name of participant: _____

Address: _____

City, State, Zip: _____

Daytime phone number: _____

Evening phone number: _____

Alternate [cell] phone number: _____

Email address: _____

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B. Appendix 2: Participant demographics

Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
101	Female	30-39	Master's degree	Quality Assurance Analyst	144	144	96	No
102	Male	40-49	Bachelor's degree	Applications Architect	300	300	180	No
103	Male	30-39	Master's degree	Systems Analyst	78	180	30	No
104	Male	40-49	Bachelor's degree	Systems Analyst	204	264	144	No
105	Female	50-59	Associate's degree	Registered Nurse	211	240	454	Multifocal computer glasses
106	Male	30-39	Master's degree	Web Applications Programmer	120	120	120	No
107	Male	40-49	Master's degree	Decision Support Specialist	240	240	120	No
108	Female	40-49	Bachelor's degree	Registered Nurse	228	228	90	No
109	Female	30-39	Bachelor's degree	Web Applications Programmer	144	144	36	No
110	Female	30-39	Master's degree	Information Technology Analyst	120	120	36	No
111	Female	60-69	Bachelor's degree	Systems Project Consultant	228	300	96	No

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C. Appendix 3: Informed Consent Form

The Florida Department of Health would like to thank you for participating in this study. The purpose of this study is to evaluate the Health Management System electronic health record 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.

Agreement

I understand and agree that as a voluntary participant in the present study conducted by the Florida Department of Health, I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and agree to be observed by the Florida Department of Health.

I understand and consent to the use and release of any and all information collected by the Florida Department of Health. I understand that the information 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 information and understand the information may be used by the Florida Department of Health 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 the Florida Department of Health. 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: _____

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D. Appendix 4: Moderator's Guide

See 'EHR Usability Test Moderator's Guide' included as an external attachment.

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E. Appendix 5: System Usability Scale Questionnaire

#	Statement	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

Participant Information

Participant Initials:	Participant Number:	CHD:	Site:
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Testing Team Information

Proctor:	Recorder:	GoToMeeting ID:
Test Date:	Test Start Time:	Test End Time:

Participant Introduction

The administrator will read the following instructions aloud to each participant.

Thank you for participating in this study. Your input is very important. Our session today will last about 15 minutes. During that time, you will use an instance of an electronic health record. I will ask you to a few tasks using this system and answer some questions.

Please note that we are not testing you; we are testing the system. Therefore, if you have any difficulty this may mean 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. Please be honest with your opinions. All 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.

Participants will then be given tasks to complete.

- User Triggers User-supplied Predictive DSI and Access/Record/Change Source Attributes (170.315 (b)(11))
 - Task Overview



1. Log into DEVUAT.
<https://hmsdevuat.doh.ad.state.fl.us/csp/hms52/HMSPortal/HMSFrames.csp?countyid=52&firstEntry=1>
 2. Find client record (name to be provided)
 3. Open client record (name to be provided)
 4. Navigate to and click on the DSI icon in the banner.
 5. Select and open the PrEP DSI.
 6. Contract an administrator (via MS Teams) and request they update the reference attribute to this link: [Recommendation: Prevention of Acquisition of HIV: Preexposure Prophylaxis | United States Preventive Services Taskforce.](#)
 7. Exit the PrEP DSI while the change is being made by the administrator.
 8. Await confirmation from the administrator that the change was made.
 9. Navigate back to the PrEP DSI to confirm the change was made.
 10. Rate the difficulty of this task on a scale of 1 to 5, with 1 being Very difficult and 5 being Very Easy.
- User Selects Evidenced-based DSI and Access/Record/Change Source Attributes (170.315 (b)(11))
 - User Triggers Evidenced-based DSI and Provides User Feedback (170.315 (b)(11))
 - Task Overview
 1. Exit the PrEP DSI.
 2. Navigate to and click on the DSI icon in the banner.
 3. Select and open the Colorectal Cancer Screening DSI.
 4. Contract an administrator (via MS Teams) and request they update the reference to this link: [Official journal of the American College of Gastroenterology | ACG](#)



5. Exit the Colorectal Cancer Screening DSI while the change is being made by the administrator.
6. Navigate back to the Colorectal Cancer DSI to confirm the change was made.
7. Type and enter a sentence into the user feedback field and save.
8. Rate the difficulty of this task on a scale of 1 to 5, with 1 being Very Difficult and 5 being Very Easy.

- Admin User Exports User Feedback (170.315 (b)(11))

- Task Overview

1. Navigate to [Test Report Portal](#).
2. Type in the search bar HMS DSI Feedback.
3. Click the magnifying glass.
4. Select the HMS DSI Feedback report.
5. Select county filter *HMSDEVUAT*.
6. Select alert filter 8: *Colorectal Cancer Screening*.
7. Enter start date *12/05/2024* and end date *12/06/2024*.
8. Click Submit.
9. Verify your feedback entered for the Colorectal Cancer Screening DSI is recorded.
10. Please rate the difficulty of this task on a scale of 1 to 5, with 1 being Very Difficult and 5 being Very Easy.

Participants will then be given this survey to complete.

#	Statement	Strongly Disagree				Strongly Agree
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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