Safety Enhanced Design Documentation for Dox EMR Version 5.2.0

A modified and home grown UCD is used for the development of DoxEMR. Our UCD is based on the standards defined by NISTIR 7741. We continually accept and encourage suggestions in an open user forum and have used suggestions from our users in improving our current design. User feedback is solicited regarding both usability and patient health information safety.

The participants in the review group include a cross-section of user types to represent the spectrum of users that will interact with the application on a regular basis. The participant types include EPs, technicians, and IT super-users. Responses from the participants will be evaluated by our business analyst team which will include representatives from our Customer Support, Product Design, and Quality Assurance teams as well as Executive team leaders. All users in the review groups will receive on-line training regarding recommended workflow for each item that is being evaluated as well as written training material to be used for reference.

Participants will be divided into two groups. The first evaluation group will receive a series of screenshots depicting processes and recommended clinical workflows for each item. Each user in this group will evaluate each item with a survey regarding effectiveness, efficiency, ease of use, and will be allowed to comment regarding any concerns for patient safety with utilization of proposed processes. The second evaluation group will use each item in a live testing environment in their own clinic setting. Each user's experience will be recorded for live review as well as post-evaluation assessment. One clinic site's utilization of the application will be recorded and simultaneously observed in real-time by our evaluation team. Following live utilization of the application as directed, participants will complete a survey regarding effectiveness, efficiency, ease of use, and will be allowed to comment regarding any concerns for patient health information safety with utilization of proposed processes. In addition to survey results, metrics for this group will include the following: time to complete each task, path deviations from those recommended during training instruction, number of times needed to refer to written training material, and areas of confusion regarding workflow or processes.

EHR Usability Test Report of DOX EMR Version 5.2.0

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

DOX EMR Version 5.2.0
Date of Usability Test: 10/16/2017
Date of Report: 10/27/2017
Report Prepared By: Bart Ripperger, President

Contents

1. EXECUTIVE SUMMARY

A usability test of DOX EMR version 5.2.0 was conducted on 10/16/2017 in Phoenix, AZ by Self (DOX EMR). 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, 12 healthcare providers of which 5 were Physicians and 7 were Nurses and Medical Assistants, matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 10 tasks typically conducted on an EHR:

1. Find information in Patient Chart and Viewing the Demographics
2. Computerized Provider Order entry – Medications
3. Computerized Provider Order entry – Laboratories
4. Computerized Provider Order entry – Diagnostic Imaging
5. Problem List
6. Medication List
7. Medication Allergy List
8. Drug-Drug, Drug-Allergy interactions Check
9. Clinical Decision Support
10. Implantable Device List

During the 120 minutes one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix 3). They were instructed that they could withdraw at any time. Participants had prior experience with the EHR. 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 and, along with the data logger(s) recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task.

The following types of data were collected for each participant:

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

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire and were compensated with appropriate amount 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.

Task\Measure	N	Task Success	Steps Taken	Task Time		Errors	Task Ratings 5= Easy Likert Scale
	#	Mean (SD)	(Observed/ Optimal)	Mean(SD)	Deviations (Observed /Optimal)	Mean (SD)	Mean(SD)
Find information in Patient Chart	5	5 (0)	3 / 3	30 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry- Medications	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry-Labs	5	5 (0)	6 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry-Imaging	5	5 (0)	6 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Problem List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Medication List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Medication Allergy List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Drug-Drug, Drug-Allergy interactions Check	5	4 (0.26)	7 / 7	30 (0)	0 / 0	0 (0)	5 (0)
Clinical Decision Support	5	5 (0)	8 / 7	60 (0)	0 / 0	0 (0)	5 (0)
Implantable Devices List	5	5 (0)	5 / 4	60	0 / 0	0 (0)	5 (0)

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 90.

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

- Major findings
    Users found the system very user friendly and easy to navigate. A well laid out navigation menu and tab structure is provided to move around the application.

- Areas for improvement
    There are not any major findings where the users want to be improved.

2. INTRODUCTION

The EHRUT tested for this study was DOX EMR version 5.2.0. Designed to present medical information to healthcare providers in Ambulatory setting, the EHRUT consists of complete patient charting and medical records. 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 were captured during the usability testing.

3. METHOD

i.   PARTICIPANTS

A total of 12 participants were tested on the EHRUT. Participants in the test were 5 Providers (physicians) and 7 Nurses and Medical Assistants. Participants had no direct connection to the development of or organization producing the EHRUT. Participants were not from the testing or 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 the test purposes, end-user characteristics were identified and translated into a recruitment screener used to solicit potential participants. An example of the screener is provided in Appendix [1].

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

SL No	Part ID	Gender	Age	Education	Occupation/ Role	Prof. Exp.	Comp. Exp.	Product Exp.	Assistive Tech Needs
1	1	Male	50	MD	Physician	22 Y	6 Y	4 Y	Yes
2	2	Female	36	MD	Physician	10 Y	10 Y	10 Y	No
3	3	Male	42	MD	Physician	16 Y	10 Y	8 Y	No
4	4	Male	38	MD	Physician	12 Y	12 Y	10 Y	No
5	5	Female	28	MD	Physician	2 Y	2 Y	2 Y	No
6	6	Female	48	Grad RN	Nurse	23 Y	4 Y	4 Y	No
7	7	Female	27	Grad RN	Nurse	4 Y	4 Y	4 Y	No
8	8	Male	33	Grad RN	Medical Asst.	7 Y	6 Y	4 Y	No
9	9	Female	30	Grad RN	Nurse	5 Y	3 Y	3 Y	No
10	10	Female	28	Grad RN	Nurse	2 Y	2 Y	2 Y	No
11	11	Male	32	Grad RN	Medical Asst.	4 Y	4 Y	4 Y	No
12	12	Male	35	Grad RN	Medical Asst.	8 Y	6 Y	6 Y	No

12 participants (matching the demographics in the section on Participants) were recruited and 12 participated in the usability test. 0 participants failed to show for the study.

Participants were scheduled for 30 minute sessions with a 10 minutes break in between each session for debrief by the administrator(s) and data logger(s), and to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics as provided by the recruiting firm.

ii.   STUDY DESIGN

Overall, the objective of this test was to uncover areas where the application performed well – that is, effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the participants. The data from this test may serve as a baseline for future tests with an updated version of the same EHR and/or comparison with other EHRs provided the same tasks are used. In short, this testing serves as both a means to record or benchmark current usability, but also to identify areas where improvements must be made.

During the usability test, participants interacted with the given EHR. Each participant used the system in the same location, and was provided with the same instructions. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each participant:

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

Additional information about the various measures can be found in Section 3.9 on Usability Metrics.

iii.   TASKS

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

1. Find patient's last visit date in patient summary screen and view demographics
2. Add Problems
3. Add Medications
4. Add Medication Allergies
5. Add Implantable Devices
6. CPOE-Medications
7. CPOE-Labs

8. CPOE-Imaging
9. Check the Drug-Drug and Drug-Allergy Indications
10. Clinical Decision Support

Tasks were selected based on their frequency of use, criticality of function, and those that may be most troublesome for users. Tasks should always be constructed in light of the study objectives.

iv.   PROCEDURES

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

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The usability testing staff conducting the test was experienced usability practitioners.

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

Participants were instructed to perform the tasks (see specific instructions below):
- As quickly as possible making as few errors and deviations as possible.
- Without assistance; administrators were allowed to give immaterial guidance and clarification on tasks, but not instructions on use.

- Without using a think aloud technique.

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

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), compensated them for their time, and thanked each individual for their participation.

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

v.   TEST LOCATION

The test facility included a waiting area and a quiet testing room with a table, computer for the participant, and recording computer for the administrator. Only the participant and administrator were in the test room. All observers and the data logger worked from a separate room where they could see the participant's screen and face shot, and listen to the

audio of the session. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient temperature within a normal range. All of the safety instruction and evacuation procedures were valid, in place, and visible to the participants.

vi.   TEST ENVIRONMENT

The EHRUT would be typically be used in a healthcare office or facility. In this instance, the testing was conducted in typical exam room environment. For testing, the computer used was an IBM thinkpads which has the ink capability running Windows 8.1 OS. The participants used a mouse, a pointer pen and keyboard when interacting with the EHRUT. The application was set up by the DOX EMR according to the DOX EMR's documentation describing the system set-up and preparation. The application itself was running on a windows platform using a test DB 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).

vii.   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 3-6 respectively. The Moderator's Guide was devised so as to be able to capture required data.
The participant's interaction with the EHRUT was captured and recorded digitally with screen capture software running on the test machine. The test session were electronically transmitted to a nearby observation room where the data logger observed the test session.

viii.   PARTICIPANT INSTRUCTIONS
The administrator reads the following instructions aloud to the each participant.

Thank you for participating in this study. Your input is very important. Our session today will last about 120 minutes. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application.

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

Following the procedural instructions, participants were shown the EHR and as their first task, were given time (30 minutes) to explore the system and make comments. Once this task was complete, the administrator gave the following instructions:

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

ix.   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 [EHRUT] by measuring participant success rates and errors
2. Efficiency of [EHRUT] by measuring the average task time and path deviations
3. Satisfaction with [EHRUT] by measuring ease of use ratings

4. DATA SCORING

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

Measures	Rationale and Scoring
Effectiveness: Task Success	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. 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. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task performance time, as benchmarked by expert performance under realistic conditions, is recorded when constructing tasks. Target task times used for task times in the Moderator's Guide must be operationally defined by taking multiple measures of optimal performance and multiplying by some factor [e.g., 1.25] that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was [x] seconds then allotted task time performance was [x * 1.25] seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.
Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.
Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.

Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was
	stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. 12 Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the [EHRUT] overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire. Questions included, "I think I would like to use this system frequently," "I thought the system was easy to use," and "I would imagine that most people would learn to use this system very quickly." See full System Usability Score questionnaire in Appendix 5.13

Table: Details of how data were scored.

5. RESULTS

i. DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above.

The usability testing results for the EHRUT are detailed below Table. 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. [Furthermore, the data should be presented in forms such as the table below so that the tasks can be easily identified and their performance results examined and compared.]

Task\Measure	N	Task Success	Steps Taken	Task Time		Errors	Task Ratings 5= Easy Likert Scale
	#	Mean (SD)	(Observed/ Optimal)	Mean(SD)	Deviations (Observed /Optimal)	Mean (SD)	Mean(SD)
Find information in Patient Chart	5	5 (0)	3 / 3	30 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry- Medications	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry-Labs	5	5 (0)	6 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Computerized Provider Order entry-Imaging	5	5 (0)	6 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Problem List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Medication List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Medication Allergy List	5	5 (0)	5 / 4	60 (0)	0 / 0	0 (0)	5 (0)
Drug-Drug, Drug-Allergy interactions Check	5	4 (0.26)	7 / 7	30 (0)	0 / 0	0 (0)	5 (0)
Clinical Decision Support	5	5 (0)	8 / 7	60 (0)	0 / 0	0 (0)	5 (0)
Implantable Devices List	5	5 (0)	5 / 4	60	0 / 0	0 (0)	5 (0)

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 90. Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average.

ii.   DISCUSSION OF THE FINDINGS

The physicians and the other providers were asked to use the system in their respective field of expertise. They were asked to benchmark against their current system usage or the manual process.

a) EFFECTIVENESS

The users found the system very effective. The clear cut menu driven approach to each section of the patient chart made them easily navigate to the section they want to attempt and complete the data capture for that section. They can go to any section from anywhere which was liked by the users very much.

b) EFFICIENCY

The time taken to complete the tasks is very minimal as they need not search for the functionality. They can easily navigate to the section where they to capture the patient information and complete it in no time.

c) SATISFACTION

The users are very satisfied by the application as it gives them what they require. Easy to capture the patient information and give better care to the patient.

d) MAJOR FINDINGS

There are not any major findings where the users want to be improved.

e) AREAS FOR IMPROVEMENT

There are not any major findings where the users want to be improved.

6. APPENDICES

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

1: Sample recruiting screener.
2: Participant demographics.
3: Non-Disclosure Agreement (NDA) and Informed Consent Form.
4: Moderator's Guide
5: System Usability Scale Questionnaire

Appendix 1: SAMPLE RECRUITING SCREENER

The purpose of a screener to ensure that the participants selected represent the target user population as closely as possible. (Portions of this sample screener are taken from www.usability.gov/templates/index.html#Usability and adapted for use.)

Recruiting Script for Recruiting Firm

Hello, my name is _____, calling from DOX EMR. We are recruiting individuals to participate in a usability study for an electronic health record. We would like to ask you a few questions to see if you qualify and if 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, you will be paid to participate. Can I ask you a few questions?

1. Are you male or female? [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] [Recruit Mix]

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]
Professional Demographics
8. What is your current position and title? (Must be healthcare provider)
   - 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? (Recruit according to the intended users of the application) [e.g., private practice, health system, government clinic, etc.]

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]

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?

19. How does your work environment patient records? [Recruit according to the demographics of the intended users]

- On paper
- Some paper, some electronic
- All electronic

Contact Information

Those are all the questions I have for you. Your background matches the people we're looking for. [If you are paying participants or offering some form of compensation, mention] For your participation, you will be paid [amount].

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:

Before your session starts, we will ask you to sign a release form allowing us to videotape your session. The videotape will only be used internally for further study if needed. Will you consent to be videotaped?

This study will take place at Paramus Office Testing Labs. I will confirm your appointment a couple of days before your session and provide you with directions to our office. What time is the best time to reach you?

Appendix 2: PARTICIPANT DEMOGRAPHICS

Following is a high-level overview of the participants in this study.

Gender

Men	[6]
Women	[6]
Total (participants)	[12]

Occupation/Role

RN/BSN	[7]
Physician	[5]
Admin Staff	[0]
Total (participants)	[12]

Years of Experience

Years experience	[20]

Facility Use of EHR

All paper	[0]
Some paper, some electronic	[4]
All electronic	[8]
Total (participants)	[12]

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of _____, *2013*, between _____("the Participant") and the testing organization DOX EMR, 2625 E Greenway Pkwy, #112-36, Phoenix, AZ 85032.

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

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

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

Signature: _____Date:

_____

Informed Consent

DOX EMR would like to thank you for participating in this study. The purpose of this study is to evaluate an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototype and give your feedback. The study will last about *120* minutes. At the conclusion of the test, you will be compensated for your time.

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

I understand and consent to the use and release of the videotape by *DOX EMR*. I understand that the information and videotape is for research purposes only and that my name and image will not be used for any purpose other than research. I relinquish any rights to the videotape

and understand the videotape may be copied and used by *DOX EMR* 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 *DOX EMR* and *DOX EMR's* client. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

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

Please check one of the following:
- YES, I have read the above statement and agree to be a

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

Signature: _____Date: _____

Appendix 4: MODERATOR'S GUIDE

EHRUT Usability Test
Moderator's Guide
Administrator _____
Data Logger _____
Date _____Time _____
Participant # _____
Location _____

Prior to testing
- Confirm schedule with Participants
- Ensure EHRUT lab environment is running properly
- Ensure lab and data recording equipment is running properly

Prior to each participant:
- Reset application
- Start session recordings with *tool*

Prior to each task:
- Reset application to starting point for next task

After each participant:
- End session recordings with *tool*

After all testing
- Back up all video and data files

Orientation (*10* minutes)
Thank you for participating in this study. Our session today will last *120* minutes. During that time you will take a look at an electronic health record system.

I will ask you to complete a few tasks using this system and answer some questions. We are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. You will be asked to complete these tasks on your own trying to do them as quickly as possible with the fewest possible errors or deviations. Do not do anything more than asked. If you get lost or have difficulty I cannot answer help you with anything to do with the system itself. Please save your detailed comments until the end of a task or the end of the session as a whole when we can discuss freely.

I did not have any involvement in its creation, so please be honest with your opinions.

The product you will be using today is Electronic Medical Records*, DOX EMR version 5.2.0*
We are recording the audio and screenshots of our session today. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time.

Do you have any questions or concerns?

Preliminary Questions (*5* minutes)
What is your job title / appointment?

How long have you been working in this role? What

are some of your main responsibilities?

Tell me about your experience with electronic health records.

Task 1: First Impressions (*300 Seconds*)
This is the application you will be working with. Have you heard of it? ____Yes ____No If
so, tell me what you know about it.
- *Show test participant the EHRUT.*
- Please don't click on anything just yet. What do you notice? What are you able to do here? Please be specific.

Notes / Comments: Two of the participants have already seen the product during a Road Show.

Task 2: Patient Summary Screen (*300 Seconds*)
Before going into the exam room and you want to review *Patient's* chief complaint, history, and vitals.
Find this information.

Success:
- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Comments:

Task Time: _____Seconds

Observed Errors and Verbalizations:
Comments:

Rating:
Overall, this task was: 4

Administrator / Note taker Comments:
Task 3: Find Lab Results (*300 Seconds*)
On her last visit, you sent *Patient* to get a colonoscopy. Locate these results and review the notes
from the specialist.

Success:
- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Comments:

Task Time: _____ Seconds
Comments:

Observed Errors and Verbalizations:
Comments:

Rating:
Overall, this task was: 3
Show participant written scale: "Very Easy" (1) to "Very Difficult" (5)
Administrator / Note taker Comments:

Task 4: Prescribe medication (*600 Seconds*)
Take the participant to the starting point for the task. Ensure that this patient has a drug-drug and a drug-food allergy to the drug chosen. This will put force the participant to find other drugs and use other elements of the application.
After examining *Patient,* you have decided to put this patient on a statin – *drug name*. Check for any interactions and place an order for this medication.
Success:
- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Comments:
Task Time: _____ Seconds
Comments:
Observed Errors and Verbalizations
Comments:
Rating:
Overall, this task was: 3
Show participant written scale: "Very Easy" (1) to "Very Difficult" (5)
Administrator / Note taker Comments:

Final Questions (*10 Minutes*)
What was your overall impression of this system?
What aspects of the system did you like most?
What aspects of the system did you like least?
Were there any features that you were surprised to see?

What features did you expect to encounter but did not see? That is, is there anything that is missing in this application?
Compare this system to other systems you have used. Would
you recommend this system to your colleagues?

Administer the SUS

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

Sl. No.	Description	Strongly Disagree				Strongly Agree
1	I think that I would like to use this system Frequently					
2	I found the system unnecessarily complex					
3	I thought the system was easy to use					
4	I think that I would need the support of a technical person to be able to use this System					
5	I found the various functions in this system were well integrated					
6	I thought there was too much inconsistency in this system					
7	I would imagine that most people would learn to use this system very quickly					
8	I found the system very cumbersome to use					
9	I felt very confident using the system					
10	I needed to learn a lot of things before I could get going with this system					

EHR Usability Test Report of DOX EMR Version 5.2 for B11 Criteria

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

DOX EMR utilized a UCD (model) to test and improve usability of the new B11 functionalities. DOX EMR's UCD is based on the Government standards defined by NISTIR 7741. Additionally, DOX adhered to the USCDI Version 1 standards for data capture and interoperability. DOX EMR continually accepts and encourages suggestions in an open user forum and have used suggestions from our users to improve our current design. User feedback is solicited regarding both usability and patient health information safety.

• **Name:** NIST Interagency/Internal Report (NISTIR) – 7741

NISTIR 7741, "NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records,"

• **Description;** Used to provide guidance on methods and approaches using user-centered design (UCD) principles to design user interfaces and usability testing methods that *ensure EHRs are efficient, effective, and satisfying for users improve EHR usability* and lead to better overall user experience.

• **Citation**:

Schumacher, R. and Lowry, S. (2010), (NISTIR 7741) NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, NIST Interagency/Internal Report (NISTIR), National Institute of Standards and Technology, Gaithersburg, MD, [online], https://doi.org/10.6028/NIST.IR.7741, https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=907313 (Accessed July 24, 2025)

https://www.nist.gov/publications/nistir-7741-nist-guide-processes-approach-improving-usability-electronic-health-records

DOX EMR Version 5.2
Date of Usability Test: 5/27/2025
Date of Usability Report: 5/30/2025
Report Prepared By: Bart Ripperger, President/Manager

Contents

1. EXECUTIVE SUMMARY

A usability test of DOX EMR version 5.2 was conducted on 5/27/2025 in Arizona by Self (DOX EMR). The purpose of this test was to test and validate the usability of the current user interface, and provide evidence of usability in the **DOX EMR**. During the usability test, 10 healthcare providers of which 5 were Physicians and 5 were Medical Assistants, matching the target demographic criteria served as participants and used DOX EMR in a simulated, but representative tasks.

This study collected performance data on New B11 tasks typically conducted on an EHR to test all B11 criteria:

1. Evidence Based DSI
2. Predictive DSI (Supported)

During the 30 minutes' one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix 3). They were instructed that they could withdraw at any time. Participants had prior experience with the EMR. 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 and, along with the data logger(s) recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task.

The following types of data were collected for each participant:

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

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire. 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 DOX EMR. The Following is a summary of the performance and rating data collected on **DOX EMR**.

Task\Measure	N	Task Success	Steps Taken	Task Time		Errors	Task Ratings 5= Easy Likert Scale
	#	Mean (SD) %	(Observed/ Optimal)	Mean(SD)	Deviations (Observed /Optimal)	Mean (SD) %	Mean(SD)
Evidence Based DSI	10	100 (0)	6 / 6	75 (4)	75 / 60	0 (0)	4.75 (0)
Predictive DSI (Supported)	10	100 (0)	6/6	60 (4)	60/60	0 (0)	4.75 (0)

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 87.

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

- Major findings

     Users found the system very user friendly and easy to navigate. A well laid out navigation menu and tab structure is provided to move around the application.

- Areas for improvement

     There are not any major findings where the users want to be improved.

2. INTRODUCTION

The EHRUT tested for this study was DOX EMR version 5.2. Designed to present medical information to healthcare providers in Ambulatory setting. DOX EMR consists of complete patient charting and medical records. The usability testing attempted to represent Real World testing/ 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 were captured during the usability testing.

3. METHOD

I.   PARTICIPANTS

A total of 10 participants were tested on the EHRUT. Participants in the test were 5 Providers (physicians) and 5 Medical Assistants. Participants had no direct connection to the development of or organization producing the EHRUT. Participants were not from the testing or 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 the test purposes, end-user characteristics were identified and translated into a recruitment screener used to solicit potential participants. An example of the screener is provided in Appendix [1].

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

SL No	Part ID	Gender	Age	Education	Occupation/ Role	Prof. Exp.	Comp. Exp.	Product Exp.	Assistive Tech Needs
1	P1	Female	33	Trade/technical/vocational training	Medical Assistant	10 Y	10 Y	7 Y	No
2	P2	Male	40	Trade/technical/vocational training	Medical Assistant	15 Y	15 Y	7 Y	No
3	P3	Male	34	Trade/technical/vocational training	Medical Assistant	7 Y	7 Y	6 Y	No
4	P4	Female	35	Trade/technical/vocational training	Medical Assistant	9 Y	9 Y	7 Y	No
5	P5	Female	37	Trade/technical/vocational training	Medical Assistant	10 Y	9 Y	8 Y	No
6	P6	Female	43	Doctorate degree	Physician	11 Y	11 Y	7 Y	No

7	P7	Male	68	Doctorate degree	Physician	40 Y	33 Y	7 Y	No
8	P8	Female	55	Doctorate degree	Physician	23 Y	23 Y	9 Y	No
9	P9	Male	58	Doctorate degree	Physician	28 Y	21 Y	11 Y	No
10	P10	Male	58	Doctorate degree	Physician	28 Y	23 Y	11 Y	No

10 participants (matching the demographics in the section on Participants) were recruited and 10 participated in the usability test. 0 participants failed to show for the study.

Participants were scheduled for 30 minute sessions with a 10 minutes break in between each session for debrief by the administrator(s) and data logger(s), and to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics.

II. STUDY DESIGN

Overall, the objective of this test was to uncover areas where the application performed well – that is, effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the participants. The data from this test may serve as a baseline for future tests with an updated version of the same EMR and/or comparison with other EMRs 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 can be made.

During the usability test, participants interacted with the given EMR. Each participant used the system in the same type of environment, and was provided with the same instructions. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each participant:

- Number of tasks successfully completed within the allotted time without assistance
- Time to complete the tasks
- Number and types of errors
- Path deviations
- Participant's verbalizations (comments)
- Participant's satisfaction ratings of the system
  Additional information about the various measures can be found in Section 3.9 on Usability Metrics.

III. TASKS

A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might complete using DOX EMR, including:

1. Evidence Based DSI and all related certification functionality. Specifics listed below. Tasks were created to include and use:

    clinical guidelines and research, use specific data points to trigger alerts, reminders, or other forms of support

    specific data elements, (problems, medications, allergies, demographics, laboratory results, vital signs, unique device identifiers for implantable devices, procedures), Feedback and source attributes identified in § 170.315(b)(11)(iv)(A)

2. Predictive DSI (Supported)

    Predictive DSIs and use data expressed in the USCDI V1 (United States Core Data for Interoperability) standard created to include and use:

    specific data elements, Feedback and source attributes identified in § 170.315(b)(11)(iv)(B),

    PDSI is supported only, DOX EMR does not supply PDSI.

IV. PROCEDURES

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

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The usability testing staff conducting the test was experienced testing usability for users (practitioners and staff).

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

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

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

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

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5).

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

V. TEST LOCATION

The test was performed remotely in existing customer's offices via MS Teams meeting. The remote facilities/ testing sites included a quiet testing room with a table and a computer for the participant. The test proctor was hosting the MS Teams meeting and recorded testing results on their host computer, as the administrator. The participant and

administrator were on the TEAMS conference call. Additionally, observers and the data logger were on the conference call and they could see the both the participant's screen and face shot, and listen to the audio of the session. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient temperature within a normal range. All of the safety instruction and evaluation procedures were valid, in place, and visible to the participants.

VI. TEST ENVIRONMENT

The EMR would be typically be used in a healthcare office or facility. In this instance, the EHRUT was conducted in typical exam room environment. For testing, the computers used were a mix of desk top and lap top computers, running Windows 10 or 11 OS with a 15"- 19" screens/monitors with a minimum resolution 1366X768. The participants used a mouse and keyboard or touch pad on lap tops when interacting with the EHRUT.

The application was set up by DOX according to DOX EMR's documentation describing the system set-up and preparation. The application itself was running on a Chrome or Edge browser and on windows platform using a test DB on a LAN connection. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation and real world experience, since these were users of the system, being tested on new B11 functionality. Additionally, participants were

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

VII.   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 3-6 respectively. The Moderator's Guide was devised so as to be able to capture required data.

The participant's interaction with the EHRUT was captured and recorded digitally with screen capture software running on the test machine by the data logger who was additionally on the Teams web conference observing the test session.

VIII.   PARTICIPANT INSTRUCTIONS

The administrator reads 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 120 minutes. During that time, you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application. Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. I did not have any involvement in its creation, so please be honest with your opinions. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time. Should you feel it necessary you are able to withdraw at any time during the testing.

Following the procedural instructions, participants were shown the EMR and as their first task, were given time (30 minutes) to explore the new B11 functionality and make comments. Once this task was complete, the administrator gave the following instructions:

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

IX.   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 **DOX EMR** by measuring participant success rates and errors
2. Efficiency of **DOX EMR** by measuring the average task time and path deviations
3. Satisfaction with **DOX EMR** by measuring ease of use ratings

4. DATA SCORING

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

Measures	Rationale and Scoring
Effectiveness: **Task Success**	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. 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. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task performance time, as benchmarked by expert performance under realistic conditions, is recorded when constructing tasks. Target task times used for task times in the Moderator's Guide must be operationally defined by taking multiple measures of optimal performance and multiplying by some factor [e.g., 1.25] that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was [x] seconds then allotted task time performance was [x * 1.25] seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.
Effectiveness: **Task Failures**	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.

Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.

Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the [EHRUT] overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire. Questions included, "I think I would like to use this system frequently," "I thought the system was easy to use," and "I would imagine that most people would learn to use this system very quickly." See full System Usability Score questionnaire in Appendix 5.13

Table: Details of how data were scored.

5. RESULTS

i. DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above.

The usability testing results for DOX EMR are detailed below Table. 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	Steps Taken	Task Time		Errors	Task Ratings 5= Easy Likert Scale
	#	Mean (SD) %	(Observed/ Optimal)	Mean(SD)	Deviations (Observed /Optimal)	Mean (SD) %	Mean(SD)
Evidence Based DSI	10	100 (0)	6 / 6	75 (4)	75 / 60	0 (0)	4.75 (0)
Predictive DSI (Supported)	10	100 (0)	6/6	60 (4)	60/60	0 (0)	4.75 (0)

The results from the SUS (System Usability Scale) summary scored the subjective satisfaction with the system based on performance with these tasks to be: 87. Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average.

ii. DISCUSSION OF THE FINDINGS

The physicians and the other staff were asked to use the system in their respective field of expertise. They were asked to benchmark against their current system usage or the manual process.

- EFFECTIVENESS

The users found the system very effective. The clear cut menu driven approach to each section of the patient chart made them easily navigate to the section they want to attempt and complete the data capture for that section. They can go to any section from anywhere which was liked by the users very much.

- EFFICIENCY

The time taken to complete the tasks is very minimal as they need not search for the functionality. They can easily navigate to the section where they to capture the patient information and complete it in no time.

- SATISFACTION

The users are very satisfied by the application as it gives them what they require. Easy to capture the patient information and give better care to the patient.

- MAJOR FINDINGS

There are not any major findings where the users want to be improved.

- AREAS FOR IMPROVEMENT

There are not any major findings where the users want to be improved.

6. APPENDICES

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

1: Sample recruiting screener.
2: Participant demographics.
3: Non-Disclosure Agreement (NDA) and Informed Consent Form.
4: Moderator's Guide
5: System Usability Scale Questionnaire

Appendix 1: SAMPLE RECRUITING SCREENER

The purpose of a screener to ensure that the participants selected represent the target user population as closely as possible. (Portions of this sample screener are taken from www.usability.gov/templates/index.html#Usability and adapted for use.)

Recruiting Script

Hello, my name is _____, calling from DOX EMR. We are recruiting individuals to participate in a usability study for an electronic health record. We would like to ask you a few questions to see if you qualify and if 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, you will be paid to participate. Can I ask you a few questions?

1. Are you male or female? [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] [Recruit Mix]

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]

Professional Demographics

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

- Medical Assistant _____
- 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? (Recruit according to the intended users of the application) [e.g., private practice, health system, government clinic, etc.]

11. Which of the following describes your highest level of education? [e.g., high school graduate/GED, Technical/ Vocational, 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]

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 EMRs do you use or are you familiar with?

19. How does your work environment capture/ record patient records? [Recruit according to the demographics of the intended users]

- On paper
- Some paper, some electronic
- All electronic

Contact Information

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:

Before your session starts, we will ask you to sign a release form allowing us to record your session. The recording will only be used internally for further study if needed. Will you consent to the recording?

This study will take place at your Office with the DOX EMR administrators via MS Teams web conference meeting . I will confirm your appointment a couple of days before your session and provide you with directions to our office. What time is the best time to reach you?

Appendix 2: PARTICIPANT DEMOGRAPHICS

Following is a high-level overview of the participants in this study.

Gender

Men	[5]
Women	[5]
Total (participants)	[10]

Occupation/Role

Medical Assistant	[5]
Physician	[5]
Admin Staff	[0]
Total (participants)	[10]

Years of Experience

Years' experience	[47]
Facility Use of EMR	
All paper	[0]
Some paper, some electronic	[2]
All electronic	[8]
Total (participants)	[10]

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of _____, *2025*, between _____ ("the Participant") and the testing organization **DOX EMR,** 20235 N Cave Creek Rd, # 104- 265, Phoenix, AZ, 85024.

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

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

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

Participant's printed name:

_____

Signature: _____**Date:** _____

Informed Consent

DOX EMR would like to thank you for participating in this study. The purpose of this study is to evaluate new functionality of an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototype and give your feedback. The study will last about *120* minutes.

Agreement
I understand and agree that as a voluntary participant in the present study conducted by *DOX EMR,* I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and video recorded by DOX EMR.

I understand and consent to the use and release of the video recording by *DOX EMR*. I understand that the information and recording 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 recording and understand the recording may be copied and used by *DOX EMR* 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 DOX EMR and *its* clients. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

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

Please check one of the following:
- YES, I have read the above statement and agree to be a participant

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

Signature: _____ **Date:** _____

Appendix 4: MODERATOR'S GUIDE

EHRUT **Usability Test Moderator's Guide**

Administrator _____ Data recorder _____ Date

_____Time _____ Participant # _____ Location

_____

Prior to testing
- Confirm schedule with Participants
- Ensure testing environment is running properly
- Ensure web conference and data recording equipment is running properly

Prior to each participant:
- Reset application
- Start session recordings with *tool*

Prior to each task:
- Reset application to starting point for next task

After each participant:
- End session recordings with *tool*

After all testing
- Back up all video and data files

Orientation (*10* minutes)
Thank you for participating in this study. Our session today will last **30 minutes**. During that time you will take a look at an electronic health record system.

I will ask you to complete a few tasks using this system and answer some questions. We are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. You will be asked to complete these tasks on your own trying to do them as quickly as possible with the fewest possible errors or deviations. Do not do anything more than asked. If you get lost or have difficulty, I cannot answer or help you with anything to do with the system itself. Please save your detailed comments until the end of a task or the end of the session as a whole when we can discuss freely.

I did not have any involvement in its creation, so please be honest with your opinions.

The product you will be using today is Electronic Medical Records, DOX EMR *version 5.2*
We are recording the audio and screenshots of our session today. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time.

Do you have any questions or concerns?

Preliminary Questions (*5* minutes)
What is your job title / appointment?

How long have you been working in this role?

What are some of your main responsibilities?

Tell me about your experience with electronic health records.

Task 0: First Impressions
This is the application you will be working with. Have you heard of it? _____Yes _____No If so, tell me what you know about it.
- *Show test participant the EHRUT.*
- Please don't click on anything just yet. What do you notice? What are you able to do here? Please be specific.

Notes / Comments: participants have already seen the product, however the B11 functionality is new.

Task 1: Evidence Based DSI
While making the Order for Medication, Labs, Imaging, creating the note on patient and other various trigger points, Decision Support Intervention rules fire and give information to the provider to take actions upon.
Success:
- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed
Comments:
Task Time: _____Seconds
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: 5
Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)
Administrator / Note taker Comments:
Comments:

Task 2: Predictive DSI Selection
Provider will look for available PDSI to use.
Success:
- Easily completed
- Completed with difficulty or help :: Describe below

- Not completed

Comments:
Task Time: _____Seconds
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: 5
Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)
Administrator / Note taker Comments:

Final Questions (*10 Minutes*)
What was your overall impression of this
system? What aspects of the system did you
like most?
What aspects of the system did you like least?
Were there any features that you were surprised to see?
What features did you expect to encounter but did not see? That is, is there anything that is
missing in this application?
Compare this system to other systems you have used.
Would you recommend this system to your colleagues?

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

Sl. No.	Description	Strongly Disagree				Strongly Agree
1	I think that I would like to use this system Frequently					
2	I found the system unnecessarily complex					
3	I thought the system was easy to use					
4	I think that I would need the support of a technical person to be able to use this System					
5	I found the various functions in this system were well integrated					
6	I thought there was too much inconsistency in this system					
7	I would imagine that most people would learn to use this system very quickly					
8	I found the system very cumbersome to use					
9	I felt very confident using the system					
10	I needed to learn a lot of things before I could get going with this system					