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Safety Enhanced & Design

System Usability Report

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Executive Summary

A usability test of Maximus version 1.0 was concluded on **08/01/2023 08/03/2023 and 08/04/2023** by the Maximus QA team. The purpose of this test was to test and validate the experience of the current user Maximus EHR interface and provide evidence of usability in the SUT (Maximus V1.0). During the usability test, users including healthcare providers matching the target demographic criteria served as participants and used Maximus in the production environment. This study collected performance data on **31** tasks, as required by the ONC.

1. Update the prescription for the same medication with the new dispense amount. Task rating on efficiency.
2. Update the prescription for the same medication with the new dispense amount. Task rating on ease of use.
3. Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on efficiency.
4. Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on ease of use.
5. Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on ease of use.
6. Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on efficiency.
7. In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on easy of use.
8. In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on efficiency.
9. Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on ease of use.
10. For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on ease of use.
11. Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on efficiency.
12. For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on efficiency.
13. Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on ease of use.
14. Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on efficiency.
15. Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on efficiency.

16. Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on ease of use.
17. For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on efficiency.
18. Add a new patient into the EHR with the following demographic information. Any additional information is optional. Task rating on ease of use.
19. For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on ease of use.
20. Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on efficiency.
21. Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on ease of use.
22. Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on ease of use.
23. Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on efficiency.
24. Document the patient's implantable device with the following details. Task rating on efficiency.
25. Document the patient's implantable device with the following details. Task rating on ease of use.
26. Generate the Continuity of Care document for Alex Test. -Efficiency Rating
27. Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. -Efficiency Rating
28. Navigate to the Continuity of Care Document and assign Alex Test as the patient. -Efficiency Rating
29. Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Ease Rating
30. Navigate to the Continuity of Care Document and assign Alex Test as the patient.- Ease Rating
31. Generate the Continuity of Care document for Alex Test. - Ease Rating

During the 1.5-hours 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 no prior experience with Maximus V1.0. The administrator introduced the test and instructed participants to complete a series of tasks (given one at a time) using the Maximus V1.0. 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. A brief demonstration of each task was provided to the users before the start of each test. The following types of data were collected for each participant:

1. Number of tasks completed within the allotted time without assistance
2. Time to complete the tasks
3. Number and types of errors
4. Path deviations
5. Participant's verbalizations
6. Participants' 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. No compensation or incentive was given to the participants. Various recommended metrics, following the examples outlined in the ***NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records***, were used to evaluate the usability of Maximus1.0.

		Task Success		Task Path Deviation		Task Time				Task Errors		Task Rating		
N #	*Task*	*Mean (%)*	SD (%)	Observed#	Optimal	Mean (sec)	SD (sec)	Deviation - Observed	Deviation- Optimal	Mean	SD	Rating	Task Rating	Rating Scale Type
	Identifier													
								(sec)		(%)	(%)		Standard Deviation	
A1.1	Update the prescription for the same medication with the new dispense amount. Task rating on efficiency.	100	30	11	11	59	35	35	17	21	60	4.3	1.2	Likert
A1.2	Update the prescription for the same medication with the new dispense amount. Task rating on ease of use.	100	30	11	11	59	35	35	17	21	60	4.5	1.1	Likert
A1.3	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on efficiency.	100	30	19	19	129	60	60	34	14	40	4.5	0.8	Likert
A1.4	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on ease of use.	100	30	19	19	129	60	60	34	14	40	4.3	1.1	Likert

A2.1	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on efficiency.	92	0	11	10	90	50	50	26	46	50	4.2	1.3	Likert
A2.2	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save it. You will finish the order in the next task. Task rating on efficiency.	92	0	11	10	90	50	50	26	46	50	4.2	1.1	Likert
A2.3	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on easy of use.	100	0	3	3	51	39	39	8	17	40	4.5	0.8	Likert

A2.4	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on efficiency.	100	0	3	3	51	39	39	8	17	40	4.4	0.8	Likert
A3.1	Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on ease of use.	100	0	5	5	75	45	45	45	0	0	4.6	0.7	Likert
A3.2	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on ease of use.	100	0	3	3	44	43	43	44	0	0	4.9	0.3	Likert
A3.3	Start an imaging order for the patient below. Do not enter any additional order details; just save them.	100	0	5	5	75	45	45	45	0	0	4.5	0.7	Likert

	Task rating on efficiency.													
A3.4	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on efficiency.	100	0	3	3	44	43	43	44	0	0	4.8	0.3	Likert
A4.1	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on ease of use.	100	30	11	11	59	35	35	17	21	60	4.3	1.2	Likert
A4.2	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on efficiency.	100	30	11	11	59	35	35	17	21	60	4.5	1.1	Likert
A4.3	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on efficiency.	100	30	19	19	129	60	60	34	14	40	4.5	0.8	Likert

A4.4	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on ease of use.	100	30	19	19	129	60	60	34	14	40	4.3	1.1	Likert
A5.1	For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on efficiency.	58	50	6	5	103	46	46	13	75	90	4.4	1	Likert
A5.2	Add a new patient into the EHR with the following demographic information. Any additional information is optional. Task rating on ease of use.	100	0	41	41	126	33	33	48	10	30	4.8	0.4	Likert
A5.3	For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on ease of use.	58	50	6	5	103	46	46	13	75	90	4	1.4	Likert
A9.1	Open an encounter for this patient. In the Diabetic Foot Exam	100	0	4	4	62	21	21	28	0	0	4.3	1.3	Likert

	notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on efficiency.													
A9.2	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on ease of use.	100	0	6	6	74	32	32	16	25	50	4.8	0.6	Likert
A9.3	Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on ease of use.	100	0	4	4	62	21	21	28	0	0	4.3	1.2	Likert
A9.4	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on efficiency.	100	0	6	6	74	32	32	16	25	50	4.8	0.6	Likert
A14.1	Document the patient's implantable device with	78	30	91	78	145	75	75	78	31	50	4.2	1.3	Likert

	the following details. Task rating on efficiency.													
A14.2	Document the patient's implantable device with the following details. Task rating on ease of use.	78	30	91	78	145	75	75	78	31	50	4.2	1.4	Likert
B2.1	Generate the Continuity of Care document for Alex Test. -Efficieny Rating	71	47	4	3	52	32	32	7	29	71	4.3	1.1	Likert
B2.2	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Efficiency Rating	11	33	7	5	63	6	6	17	47	228	3	1.4	Likert
B2.3	Generate the Continuity of Care document for Alex Test. - Ease Rating	71	47	4	3	52	32	32	7	29	71	4.3	1	Likert
B2.4	Navigate to the Continuity of Care Document and assign Alex Test as the patient. - Efficiency Rating	72	46	5	4	96	48	48	13	6	47	3.6	1.4	Likert

B2.5	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Ease Rating	11	33	7	5	63	6	6	17	47	228	3.4	1.2	Likert
B2.6	Navigate to the Continuity of Care Document and assign Alex Test as the patient.- Ease Rating	72	46	5	4	96	48	48	13	6	47	3.8	1.4	Likert

Introduction

The Maximus(SUT) is tested in this study was designed to present medical information to healthcare providers in a healthcare setting. 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 system under test. To this end, measures of effectiveness, efficiency, and user satisfaction, such as Performance, Errors, and time on task, were captured during the usability testing.

Methods

PARTICIPANTS

Participants were recruited by Maximus, LLC and were not provided any incentive for their time and participation. In addition, participants had no direct connection to the developing organization producing the software. Participants were not from the testing or supplier organization. Participants were allowed to have the same orientation as the actual end-users receive. For the test purposes, end-user characteristics were translated into a recruitment screener used to select potential participants; an example of a screener is provided in Appendix 1.

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

A total of 10 participants were involved in the testing of the Maximus V1.0. All members recruited for this usability testing were Clinical Assistants, MD, Nurses & Physician's Assistants. All participants who participated in the usability test were scheduled for a 1.5-hour session. This session was further divided into 7 slots of 10 mins with 5 min in between each slot for debriefing 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.

#	Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
1	MXP-001	F	40-49	Bachelor's degree	Clinical Assistant	144	230	0	No
2	MXP-002	F	40-49	Master's degree	Physician's Assistant	120	280	0	No
3	MXP-003	M	40-49	Master's degree	Physician's Assistant	160	230	0	No
4	MXP-004	M	30-39	Master's degree	MD	144	250	0	No
5	MXP-005	F	30-39	Bachelor's degree	Clinical Assistant	87	210	0	No
6	MXP-006	M	30-39	Bachelor's degree	RN	84	240	0	No
7	MXP-007	F	50-59	Bachelor's degree	RN	160	280	0	No
8	MXP-008	M	30-39	Bachelor's degree	Physician's Assistant	120	220	0	No
9	MXP-009	M	30-39	Bachelor's degree	Physician's Assistant	90	240	0	No
10	MXP-010	M	40-49	Master's degree	MD	150	240	0	No

Study Design

The overall goal of this test was to discover areas where the application performed well – that is, a user can perform the task effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the users. 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. Each participant used the system remotely and was provided with the same instructions. The system was evaluated for **Effectiveness, Efficiency & Ease of Use/ Satisfaction** as defined by measures collected and analyzed for each participant:

1. Number of tasks completed within the allotted time without assistance
2. Time to complete the tasks
3. Number and types of errors
4. Path deviations
5. Participant's verbalizations (comments)
6. Participant's satisfaction ratings of the system

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

Tasks

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

Task Measure Maximus V1.0	*N* #
170.315 (a)(1) CPOE – Medication	Update the prescription for the same medication with the new dispense amount. Task rating on efficiency.
	Update the prescription for the same medication with the new dispense amount. Task rating on ease of use.
	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on efficiency.
	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on ease of use.
170.315 (a)(2) CPOE-Laboratory	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on ease of use.
	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on efficiency.
	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on easy of use.
	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on efficiency.
170.315 (a)(3) CPOE–Diagnostic Imaging	Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on ease of use.
	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on ease of use.
	Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on efficiency.
	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on efficiency.
170.315 (a)(4) DDDA	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on ease of use.
	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on efficiency.
	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on efficiency.
	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on ease of use.
170.315(a)(5) Demographics	For the patient, enter the details about his sexual orientation and gender identity in his chart. Task rating on efficiency.
	Add a new patient into the EHR with the demographic information. Any additional information is optional. Task rating on ease of use.
	For the patient, enter the details about his sexual orientation and gender identity in his chart. Task rating on ease of use.
170.315 (a)(9) Clinical Decision Support	Open a patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on efficiency.
	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on ease of use.
	Open a patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on ease of use.
	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on efficiency.

170.315 (a)(14) Implantable Device List	Document the patient's implantable device with the following details. Task rating on efficiency.
	Document the patient's implantable device with the following details. Task rating on ease of use.
170.315 (b)(2) Clinical Information Reconciliation and Incorporation	Generate the Continuity of Care document for Alex Test. -Efficiency Rating
	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data into the patient chart. -Efficiency Rating
	Generate the Continuity of Care document for Alex Test. - Ease Rating
	Navigate to the Continuity of Care Document and assign Alex Test as the patient. - Efficiency Rating
	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Ease Rating
	Navigate to the Continuity of Care Document and assign Alex Test as the patient.- Ease Rating

Procedures

Upon joining the remote session, participants were welcomed and their identity was **cross-checked** with a name on the recruit list. Each member was then assigned a participant ID. To ensure that the test was conducted smoothly, two staff members participated in the test, the usability test administrator and the test data logger. 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 test 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 and 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 completed the task.
- Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), and thanked each individual for their participation. Participants' demographic information, task success rate, time on task, errors, deviations, and post-test questionnaires were recorded into a spreadsheet.

TEST LOCATION

The tests were performed remotely via Ring Central remote assistance software.

TEST ENVIRONMENT

The Maximus software would be typically used in a healthcare office or facility. For testing, the participant used a Desktop PC running Windows operating system. The participants used a mouse & keyboard when interacting with the SUT. In Maximus usability testing, we used **19 Inch display monitor with 1280 to 1600 Screen Resolution**. The application was set up by the Maximus Development Team according to the requirements for each task. The application itself was running on a Chrome web browser using a high-speed internet connection. Technically, the system performance (i.e. response time) was representative of what actual users would experience in field implementation. Additionally, participants were instructed not to change any of the default system settings (such as web page Zoom, Web Browser Theme).

TEST FORMS AND TOOLS

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

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

Examples of these documents can be found in Appendices respectively. The Moderator's Guide was devised to be able to capture required data. The participant's interaction with the SUT was remotely monitored using Ring Central Software.

PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to each participant (also see the full moderator's guide in Appendix 4):

> *"Thank you for participating in this study. Your input is very important. Our session today will last about 90 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 can withdraw at any time during the testing."*

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

> *For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have 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.*

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 Maximus V1.0 by measuring participant success rates and errors.
2. **Efficiency** of Maximus V1.0 by measuring the average task time and path deviations.
    a. Participants should not use a think-aloud technique during the testing session. 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.
3. **Ease of Use / Satisfaction** with Maximus V1.0 by measuring ease of use ratings.

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 was 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.
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 a "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors.[11] 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 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 completed were included in the average task time analysis. The average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Ease of Use / Satisfaction: Task Rating	Participants' 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.A 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 Maximus V1.0 overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire.

RESULTS

DATA ANALYSIS AND REPORTING: The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. There were no participants who failed to follow the session. The usability testing results for the Maximus V1.0 are detailed below

		Task Success		Task Path Deviation		Task Time				Task Errors		Task Rating		
N #	*Task*	*Mean (%)*	SD (%)	Observed#	Optimal	Mean (sec)	SD (sec)	Deviation - Observed	Deviation- Optimal	Mean	SD	Rating	Task Rating	Rating Scale Type
	Identifier													
								(sec)		(%)	(%)		Standard Deviation	
A1.1	Update the prescription for the same medication with the new dispense amount. Task rating on efficiency.	100	30	11	11	59	35	35	17	21	60	4.3	1.2	Likert
A1.2	Update the prescription for the same medication with the new dispense amount. Task rating on ease of use.	100	30	11	11	59	35	35	17	21	60	4.5	1.1	Likert
A1.3	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on efficiency.	100	30	19	19	129	60	60	34	14	40	4.5	0.8	Likert
A1.4	Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on ease of use.	100	30	19	19	129	60	60	34	14	40	4.3	1.1	Likert

A2.1	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on efficiency.	92	0	11	10	90	50	50	26	46	50	4.2	1.3	Likert
A2.2	Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save it. You will finish the order in the next task. Task rating on efficiency.	92	0	11	10	90	50	50	26	46	50	4.2	1.1	Likert
A2.3	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on easy of use.	100	0	3	3	51	39	39	8	17	40	4.5	0.8	Likert

A2.4	In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on efficiency.	100	0	3	3	51	39	39	8	17	40	4.4	0.8	Likert
A3.1	Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on ease of use.	100	0	5	5	75	45	45	45	0	0	4.6	0.7	Likert
A3.2	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on ease of use.	100	0	3	3	44	43	43	44	0	0	4.9	0.3	Likert
A3.3	Start an imaging order for the patient below. Do not enter any additional order details; just save them.	100	0	5	5	75	45	45	45	0	0	4.5	0.7	Likert

	Task rating on efficiency.													
A3.4	For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on efficiency.	100	0	3	3	44	43	43	44	0	0	4.8	0.3	Likert
A4.1	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on ease of use.	100	30	11	11	59	35	35	17	21	60	4.3	1.2	Likert
A4.2	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on efficiency.	100	30	11	11	59	35	35	17	21	60	4.5	1.1	Likert
A4.3	Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on efficiency.	100	30	19	19	129	60	60	34	14	40	4.5	0.8	Likert

A4.4	Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on ease of use.	100	30	19	19	129	60	60	34	14	40	4.3	1.1	Likert
A5.1	For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on efficiency.	58	50	6	5	103	46	46	13	75	90	4.4	1	Likert
A5.2	Add a new patient into the EHR with the following demographic information. Any additional information is optional. Task rating on ease of use.	100	0	41	41	126	33	33	48	10	30	4.8	0.4	Likert
A5.3	For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on ease of use.	58	50	6	5	103	46	46	13	75	90	4	1.4	Likert
A9.1	Open an encounter for this patient. In the Diabetic Foot Exam	100	0	4	4	62	21	21	28	0	0	4.3	1.3	Likert

	notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on efficiency.													
A9.2	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on ease of use.	100	0	6	6	74	32	32	16	25	50	4.8	0.6	Likert
A9.3	Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on ease of use.	100	0	4	4	62	21	21	28	0	0	4.3	1.2	Likert
A9.4	Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on efficiency.	100	0	6	6	74	32	32	16	25	50	4.8	0.6	Likert
A14.1	Document the patient's implantable device with	78	30	91	78	145	75	75	78	31	50	4.2	1.3	Likert

	the following details. Task rating on efficiency.												
A14.2	Document the patient's implantable device with the following details. Task rating on ease of use.	78	30	91	78	145	75	75	78	31	50	4.2	1.4	Likert
B2.1	Generate the Continuity of Care document for Alex Test. -Efficieny Rating	71	47	4	3	52	32	32	7	29	71	4.3	1.1	Likert
B2.2	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Efficiency Rating	11	33	7	5	63	6	6	17	47	228	3	1.4	Likert
B2.3	Generate the Continuity of Care document for Alex Test. - Ease Rating	71	47	4	3	52	32	32	7	29	71	4.3	1	Likert
B2.4	Navigate to the Continuity of Care Document and assign Alex Test as the patient. - Efficiency Rating	72	46	5	4	96	48	48	13	6	47	3.6	1.4	Likert

B2.5	Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. - Ease Rating	11	33	7	5	63	6	6	17	47	228	3.4	1.2	Likert
B2.6	Navigate to the Continuity of Care Document and assign Alex Test as the patient.- Ease Rating	72	46	5	4	96	48	48	13	6	47	3.8	1.4	Likert

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

Major Findings

Some users took a little extra time on Clinical Information Reconciliation and Clinical Decision Support during the import of the CCDA file. Overall they were satisfied with the current user workflow and mentioned a few suggestions in regards to improvement of the user flow.

Areas For Improvement

Some users reported a few UI issues in the left menu and suggested improvements. Along with the improvement in navigation, users suggested improvement in the Search functionality. Searching methods provided in the system are unclear & puzzled some users while navigating.

Discussions of the Findings

Effectiveness:

Most users appreciated the new system. They were excited to see the new UI & UX of Maximus.

Efficiency:

Most of the tasks were completed by the users on time with deviations in Computerized Provider Entry, Clinical Information Reconciliation & Clinical Decision Support.

Satisfactions:

All the users were satisfied with the overall workflow and provided a few suggestions to make it more user-friendly.

Areas For Improvement:

The users were a little unsatisfied with a few issues in UI, they Suggested improving the search module as well as suggested including an application tour, in which an application guides the user on performing a different task.

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: Example Moderator's Guide
5: System Usability Scale Questionnaire

Appendix 1: SAMPLE RECRUITING SCREENER

The purpose of a screener is to ensure that the participants selected to represent the target user population as closely as possible. (Portions of this sample screener are taken from https://www.usability.gov/how-to-and-tools/resources/templates.html & adapted for use.)

Recruiting Script for Recruiting Firm

Hello, my name is, _____calling from *Insert name of the recruiting firm.* 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. Can I ask you a few questions?

1. If not obvious Are you male or female? Recruit a mix of participants
2. Have you participated in a focus group or usability test in the past *xx* 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 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/Ph.D.), other (explain).

Computer Expertise

12. Besides reading emails, 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. Would you be able to participate in the date, time? If so collect contact information May I get your contact information?

1. Name of participant:
2. Address:
3. City, State, Zip:
4. Daytime phone number:
5. Evening phone number:
6. Alternate cell phone number:
7. Email address:

This study will take place remotely. I will confirm your appointment a couple of days before your session and provide you with GoToMeeting conference call details. What time is the best time to reach you?

Appendix 2: PARTICIPANT DEMOGRAPHICS

The report should contain a breakdown of the key participant demographics. A representative list is shown below. Following is a high-level overview of the participants in this study.

Gender	
Men	**5**
Women	**5**
Total (Participants)	**10**
Occupation / Role	
Medical Doctors	**2**
Physician Assistants	**2**
Nurse Practitioners	**2**
Clinical Assistants	**2**
Registered Nurse	**2**
Total (Participants)	**10**
Years of technology experience	
0-5	**10**
6-10	**0**
10+	**0**

Total Participants	**10**
Facility Use of EHR	
All Paper	**0**
All Electronic	**10**
Some Paper, Some Electronic	**0**
Total Participants	**10**

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of _____, *20__*, between ("the Participant") and the testing organization *Maximus, LLC* ———————————— located at *Address*.

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 *Maximus, LLC* 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 *Maximus V1.0* and is being disclosed solely for 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

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

Agreement

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

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 *Maximus, LLC* and *Maximus* 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 the 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: EXAMPLE MODERATOR'S GUIDE

Moderator's Guide

Administrator: _____ **Data Logger:** _____ **Date:**_____
Time: _____ **Participant #:** _____ **Location:**_____

Before testing
- Confirm schedule with Participants.
- Ensure MAXIMUS lab environment is running properly.
- Ensure lab and data recording equipment is running properly.

Before each participant:
- Reset application.

Before each task:
- Reset application to the starting point for next task.

Orientation

Thank you for participating in this study. Our session today will last ***1.5 hours***. 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 ask. If you get lost or have difficulty I cannot answer help me 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 Maximus V1.0. Some of the data may not make sense as it is placeholder data.
> 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

1. What is your job title/appointment?
2. How long have you been working in this role?
3. What are some of your main responsibilities?
4. Tell me about your experience with electronic health records.

1: CPOE – Medication:

The users were asked to perform the following tasks for the usability testing for CPOE – Medication.

1. Update the prescription for the same medication with the new dispense amount. Task rating on efficiency.
2. Update the prescription for the same medication with the new dispense amount. Task rating on ease of use.
3. Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on efficiency.
4. Document an order for the following medication. Enter the SIG in your format. Then print the prescription. Task rating on ease of use.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* ☐ *Screen B* ☐ *Drop Down B*[1] ☐ *"OK" Button* ☐ *Screen X*

- ☐ Correct
- ☐ Minor Deviations / Cycles Describe below
- ☐ Major Deviations Describe the below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

2: CPOE – Labs:

The users were asked to perform the following tasks for the usability testing for CPOE – Labs.

1. Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on ease of use.
2. Start a lab order for the patient's CBC test with the information in the table. Do not enter any additional order details; just save them. You will finish the order in the next task. Task rating on efficiency.
3. In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on ease of use.
4. In the same lab order, check to see that Diabetes is already on the patient's diagnosis list. Associate Diabetes as the diagnosis to the order. Task rating on efficiency.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* ☐ *Screen B* ☐ *Drop Down B*[1] ☐ *"OK" Button* ☐ *Screen X*

- ☐ Correct

☐ Minor Deviations / Cycles Describe below
☐ Major Deviations Describe the below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

3: CPOE – Imaging

The users were asked to perform the following tasks for the usability testing for **CPOE– Imaging**

1. Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on ease of use.
2. For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on ease of use.
3. Start an imaging order for the patient below. Do not enter any additional order details; just save them. Task rating on efficiency.
4. For the same patient, check that concussion, sequela has been added to his Diagnosis List. Then add concussion, sequela as a diagnosis for this imaging order. Task rating on efficiency.

Success:

☐ Easily completed
☐ Completed with difficulty or help Describe below
☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* □ *Screen B* □ *Drop Down B*[1] □ *"OK" Button* □ *Screen X*

☐ Correct
☐ Minor Deviations / Cycles Describe below
☐ Major Deviations Describe the below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

4: Drug-drug, Drug-allergy Interaction Checks for CPOE

The users were asked to perform the following tasks for the usability testing for **Drug-drug, Drug-allergy Interaction Checks for CPOE**

1. Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on ease of use.
2. Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on efficiency.
3. Order the following medication. Override the alert because the drug may be life-saving for the patient. Task rating on efficiency.
4. Set up your alerts to only show up for Severe drug interations and Severe allergy reactions for your username. Task rating on ease of use.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* □ *Screen B* □ *Drop Down B*[1] □ *"OK" Button* □ *Screen X*

- ☐ Correct
- ☐ Minor Deviations / Cycles Describe below
- ☐ Major Deviations Describe the below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments

5: Demographics

The users were asked to perform the following tasks for the usability testing for Demographics.

1. For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on efficiency.
2. Add a new patient into the EHR with the following demographic information. Any additional information is optional. Task rating on ease of use.
3. For this patient, enter the following details about his sexual orientation and gender identity in his chart. Task rating on ease of use.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help:: Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* ☐ *Screen B* ☐ *Drop Down B*[1] ☐ *"OK" Button* ☐ *Screen X…*

- ☐ Correct
- ☐ Minor Deviations / Cycles:: Describe below
- ☐ Major Deviations:: Describe below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: ____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

6: Clinical Decision Support

The users were asked to perform the following tasks for the usability testing for Clinical Decision Support.

1. Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on efficiency.
2. Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on ease of use.
3. Open an encounter for this patient. In the Diabetic Foot Exam notification, find and print the diagnostic therapeutic information so you can provide it to your patient. Task rating on ease of use.
4. Turn off clinical support reminders for Rare Diseases for all providers in this practice. Task rating on efficiency.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help:: Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* ☐ *Screen B* ☐ *Drop Down B*[1] ☐ *"OK" Button* ☐ *Screen X…*

- ☐ Correct
- ☐ Minor Deviations / Cycles:: Describe below
- ☐ Major Deviations:: Describe below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: ____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

7: Implantable Device List:

The users were asked to perform the following tasks for the usability testing for the Implantable Device List

1. Document the patient's implantable device with the following details. Task rating on efficiency.
2. Document the patient's implantable device with the following details. Task rating on ease of use.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help:: Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A □ Screen B □ Drop Down B[1] □ "OK" Button □ Screen X…*

- ☐ Correct
- ☐ Minor Deviations / Cycles:: Describe below
- ☐ Major Deviations:: Describe below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

8: Clinical Information Reconciliation and Incorporation

The users were asked to perform the following tasks for the usability testing for **Clinical Information Reconciliation and Incorporation.**

1. Generate the Continuity of Care document for Alex Test. -Efficiency Rating
2. Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data onto his chart. -Efficiency Rating
3. Navigate to the Continuity of Care Document and assign Alex Test as the patient. -Efficiency Rating
4. Reconcile the problem list, medication, and allergy information sent in the Continuity of Care document and incorporate the data on to his chart. - Ease Rating

5. Navigate to the Continuity of Care Document and assign Alex Test as the patient.- Ease Rating
6. Generate the Continuity of Care document for Alex Test. - Ease Rating

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help :: Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A □ Screen B □ Drop Down B[1] □ "OK" Button □ Screen X…*

- ☐ Correct
- ☐ Minor Deviations / Cycles:: Describe below
- ☐ Major Deviations:: Describe below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments:

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

Questionnaire	Very Difficult				Very Easy
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

Final Questions

a. What was your overall impression of this system?
b. What aspects of the system did you like most?
c. What aspects of the system did you like least?
d. Were there any features that you were surprised to see?
e. What features did you expect to encounter but did not see? That is, is there anything that is missing in this application?
f. Compare this system to other systems you have used.
g. Would you recommend this system to your colleagues?

2025

Safety Enhanced & Design

System Usability Report

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Umer Sohail

Report Date

11/09/2025

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Document Owner

Umer Sohail

Table of Contents

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Executive Summary

A usability test of Maximus version 1.0 for **170.315(a)(5) Demographics** was concluded on **11/07/2025** by the Maximus QA team. The purpose of this test was to test and validate the experience of the current user Maximus EHR interface and provide evidence of usability in the SUT (Maximus V1.0). During the usability test, users including healthcare providers matching the target demographic criteria served as participants and used Maximus in the production environment. This study collected performance data on **5** tasks, as required by the ONC.

1. For the patient, enter the following details: Sex Parameter for clinical use and Personal Pronoun.
2. Add Sex Parameter for clinical use, Personal Pronouns, and Preferred Name during new patient creation.
3. For the patient, update the following details: Sex Parameter for clinical use, Personal Pronouns, and Preferred Name.
4. Review the display of Preferred Name, Sex Parameter for clinical use, and Pronouns.
5. Search Patient Using Preferred Name.

During the 1 hour 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 no prior experience with Maximus V1.0. The administrator introduced the test and instructed participants to complete a series of tasks (given one at a time) using the Maximus V1.0. 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. A brief demonstration of each task was provided to the users before the start of each test. The following types of data were collected for each participant:

1. Number of tasks completed within the allotted time without assistance
2. Time to complete the tasks
3. Number and types of errors
4. Path deviations
5. Participant's verbalizations
6. Participants' 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. No compensation or incentive was given to the participants. Various recommended metrics, following the examples outlined in the ***NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records***, were used to evaluate the usability of Maximus1.0.

		Task Success		Task Path Deviation		Task Time				Task Errors		Task Rating		
N #	***Task***	***Mean (%)***	**SD (%)**	**Observed#**	**Optimal**	**Mean (sec)**	**SD (sec)**	**Deviation - Observed**	**Deviation- Optimal**	**Mean**	**SD**	**Rating**	**Task Rating**	**Rating Scale Type**
	Identifier													

								(sec)		(%)	(%)		Standard Deviation	
A5-1	For the patient, enter the following details: Sex Parameter for clinical use and Personal Pronoun.	82	20	9	5	68	15	15	8	12	10	4.2	1.2	Likert
A5-2	Add Sex Parameter for clinical use, Personal Pronouns, and Preferred Name during new patient creation.	95	18	11	9	95	18	20	9	8	9	4.7	1.1	Likert
A5-3	For the patient, update the following details: Sex Parameter for clinical use, Personal Pronouns, and Preferred Name.	91	19	8	7	82	16	18	8	10	8	4.5	1.3	Likert
A5-4	Review the display of Preferred Name, Sex Parameter for clinical use, and Pronouns.	100	0	5	5	55	8	3	2	0	0	4.8	1.0	Likert

A5-5	Search Patient Using Preferred Name	95	20	7	5	60	14	17	7	5	7	4.6	1.4	Likert

Introduction

The Maximus(SUT) is tested in this study was designed to present medical information to healthcare providers in a healthcare setting. 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 system under test. To this end, measures of effectiveness, efficiency, and user satisfaction, such as Performance, Errors, and time on task, were captured during the usability testing.

Methods

PARTICIPANTS

Participants were recruited by Maximus, LLC and were not provided any incentive for their time and participation. In addition, participants had no direct connection to the developing organization producing the software. Participants were not from the testing or supplier organization. Participants were allowed to have the same orientation as the actual end-users receive. For the test purposes, end-user characteristics were translated into a recruitment screener used to select potential participants; an example of a screener is provided in Appendix 1. Recruited participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. Below is a table of participants by characteristics, including demographics, professional experience, computer experience, and user needs for assistive technology. Participant names were replaced with Participant IDs so that an individual's data cannot be traced back to individual identities.

A total of 10 participants were involved in the testing of the Maximus V1.0. All members recruited for this usability testing were Clinical Assistants, MD, Nurses & Physician's Assistants. All participants who participated in the usability test were scheduled for a 1 hour session. This session was further divided into 6 slots of 10 mins with 5 min in between each slot for debriefing 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.

#	Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
1	P11	M	40-49	Doctorate degree	MD	130	144	0	No
2	P12	M	40-49	Master's degree	Physician's Assistant	168	180	0	No
3	P13	F	50-59	Doctorate degree	MD	235	156	0	No
4	P14	F	40-49	Master's degree	Physician's Assistant	135	144	0	No
5	P15	M	40-49	Bachelor's degree	Nurse	180	156	0	No
6	P16	M	40-49	Doctorate degree	MD	130	204	0	No
7	P17	M	50-59	Doctorate degree	MD	210	192	0	No
8	P18	F	50-59	Bachelor's degree	Nurse	210	156	0	No

9	P19	M	40-49	Doctorate degree	MD	132	156	0	No
10	P20	F	40-49	Master's degree	Physician's Assistant	120	60	0	No

Study Design

The overall goal of this test was to discover areas where the application performed well – that is, a user can perform the task effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the users. 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. Each participant used the system remotely and was provided with the same instructions. The system was evaluated for **Effectiveness, Efficiency & Ease of Use/ Satisfaction** as defined by measures collected and analyzed for each participant:

1. Number of tasks completed within the allotted time without assistance
2. Time to complete the tasks
3. Number and types of errors
4. Path deviations
5. Participant's verbalizations (comments)
6. Participant's satisfaction ratings of the system

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

Tasks

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

Task Measure **Maximus V1.0**	***N*** **#**
170.315(a)(5) Demographics	For the patient, enter the following details: Sex Parameter for clinical use and Personal Pronoun
	Add Sex Parameter for clinical use, Personal Pronouns, and Preferred Name during new patient creation.
	For the patient, update the following details: Sex Parameter for clinical use, Personal Pronouns, and Preferred Name.
	Review the display of Preferred Name, Sex Parameter for clinical use, and Pronouns.
	Search Patient Using Preferred Name.

Procedures

Upon joining the remote session, participants were welcomed and their identity was **cross-checked** with a name on the recruit list. Each member was then assigned a participant ID. To ensure that the test was conducted smoothly, two staff members participated in the test, the usability test administrator and the test data logger. 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 test 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 and 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 completed the task.

- Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), and thanked each individual for their participation. Participants' demographic information, task success rate, time on task, errors, deviations, and post-test questionnaires were recorded into a spreadsheet.

TEST LOCATION

The tests were performed remotely via Ring Central remote assistance software.

TEST ENVIRONMENT

The Maximus software would be typically used in a healthcare office or facility. For testing, the participant used a Desktop PC running Windows operating system. The participants used a mouse & keyboard when interacting with the SUT. In Maximus usability testing, we used **19 Inch display monitor with 1280 to 1600 Screen Resolution**. The application was set up by the Maximus Development Team according to the requirements for each task. The application itself was running on a Chrome web browser using a high-speed internet connection. Technically, the system performance (i.e. response time) was representative of what actual users would experience in field implementation. Additionally, participants were instructed not to change any of the default system settings (such as web page Zoom, Web Browser Theme).

TEST FORMS AND TOOLS

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

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

Examples of these documents can be found in Appendices respectively. The Moderator's Guide was devised to be able to capture required data. The participant's interaction with the SUT was remotely monitored using Ring Central Software.

PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to each participant (also see the full moderator's guide in Appendix 4):

> *"Thank you for participating in this study. Your input is very important. Our session today will last about 60 minutes. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application. Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. I did not have any involvement in its creation, so please be honest with your opinions. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time. Should you feel it necessary you can withdraw at any time during the testing."*

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

> *For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have 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.*

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 Maximus V1.0 by measuring participant success rates and errors.
2. **Efficiency** of Maximus V1.0 by measuring the average task time and path deviations.
    a. Participants should not use a think-aloud technique during the testing session. 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.
3. **Ease of Use / Satisfaction** with Maximus V1.0 by measuring ease of use ratings.

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 was 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.
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 a "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors.[11] 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 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 completed were included in the average task time analysis. The average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Ease of Use / Satisfaction: Task Rating	Participants' 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.A 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 Maximus V1.0 overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire.

RESULTS

DATA ANALYSIS AND REPORTING: The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. There were no participants who failed to follow the session. The usability testing results for the Maximus V1.0 are detailed below.

		Task Success		Task Path Deviation		Task Time				Task Errors		Task Rating		
N #	*Task*	*Mean (%)*	SD (%)	Observed#	Optimal	Mean (sec)	SD (sec)	Deviation - Observed	Deviation- Optimal	Mean	SD	Rating	Task Rating	Rating Scale Type
	Identifier													
								(sec)		(%)	(%)		Standard Deviation	
A5-1	For the patient, enter the following details: Sex Parameter for clinical use and Personal Pronoun.	82	20	9	5	68	15	15	8	12	10	4.2	1.2	Likert
A5-2	Add Sex Parameter for clinical use, Personal Pronouns, and Preferred Name during new patient creation.	95	18	11	9	95	18	20	9	8	9	4.7	1.1	Likert
A5-3	For the patient, update the following details: Sex Parameter for clinical use, Personal Pronouns, and Preferred Name.	91	19	8	7	82	16	18	8	10	8	4.5	1.3	Likert
A5-4	Review the display of Preferred Name, Sex Parameter	100	0	5	5	55	8	3	2	0	0	4.8	1.0	Likert

	for clinical use, and Pronouns.													
A5-5	Search Patient Using Preferred Name	95	20	7	5	60	14	17	7	5	7	4.6	1.4	Likert

Major Findings

No major findings were reported. Overall, they were satisfied with the current user workflow.

Areas For Improvement

A few participants found it difficult to find the fields; recommended improvement: larger font size or better field grouping. Besides that, no other recommendations were received.

Discussions of the Findings

Effectiveness:

Most users appreciated the new system. They were excited to see the new UI & UX of Maximus.

Efficiency:

Most of the demographics-related tasks were completed by users within an acceptable time range. Minor deviations were observed in tasks involving entry of new demographic fields (Sex Parameter, Personal Pronouns, and Preferred Name), as users took additional time to locate and enter these details. Review and search tasks showed relatively higher efficiency with fewer delays.

Satisfactions:

All the users were satisfied with the overall workflow and provided a few suggestions to make it more user-friendly.

Areas For Improvement:

The users were a little unsatisfied with a few issues in UI, they Suggested improving the search module as well as suggested including an application tour, in which an application guides the user on performing a different task.

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: Example Moderator's Guide
5: System Usability Scale Questionnaire

Appendix 1: SAMPLE RECRUITING SCREENER

The purpose of a screener is to ensure that the participants selected to represent the target user population as closely as possible. (Portions of this sample screener are taken from https://www.usability.gov/how-to-and-tools/resources/templates.html & adapted for use.)

Recruiting Script for Recruiting Firm

Hello, my name is, _____calling from *Insert name of the recruiting firm.* 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. Can I ask you a few questions?

1. If not obvious Are you male or female? Recruit a mix of participants
2. Have you participated in a focus group or usability test in the past *xx* 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 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/Ph.D.), other (explain).

Computer Expertise

12. Besides reading emails, 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. Would you be able to participate in the date, time? If so collect contact information May I get your contact information?

1. Name of participant:
2. Address:
3. City, State, Zip:
4. Daytime phone number: s
5. Evening phone number:
6. Alternate cell phone number:
7. Email address:

This study will take place remotely. I will confirm your appointment a couple of days before your session and provide you with GoToMeeting conference call details. What time is the best time to reach you?

Appendix 2: PARTICIPANT DEMOGRAPHICS

The report should contain a breakdown of the key participant demographics. A representative list is shown below. Following is a high-level overview of the participants in this study.

Gender	
Men	**5**
Women	**5**
Total (Participants)	**10**
Occupation / Role	
Medical Doctors	**2**
Physician Assistants	**2**
Nurse Practitioners	**2**
Clinical Assistants	**2**
Registered Nurse	**2**
Total (Participants)	**10**
Years of technology experience	
0-5	**10**
6-10	**0**
10+	**0**
Total Participants	**10**
Facility Use of EHR	
All Paper	**0**
All Electronic	**10**
Some Paper, Some Electronic	**0**
Total Participants	**10**

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of _____, *20__*, between ("the Participant") and the testing organization *Maximus, LLC* ———————————— located at *Address*.

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 *Maximus, LLC* 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 *Maximus V1.0* and is being disclosed solely for the Participant's participation in today's usability study. By signing this form the Participant acknowledges that she 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

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

Agreement

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

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 *Maximus, LLC* and *Maximus* 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 the 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: EXAMPLE MODERATOR'S GUIDE

Moderator's Guide

Administrator: _____ **Data Logger:** _____ **Date:** _____

Time: _____ **Participant #:** _____ **Location:**_____

Before testing
- Confirm schedule with Participants.
- Ensure MAXIMUS lab environment is running properly.
- Ensure lab and data recording equipment is running properly.

Before each participant:
- Reset application.

Before each task:
- Reset application to the starting point for next task.

Orientation

Thank you for participating in this study. Our session today will last ***1 hour***. 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 ask. If you get lost or have difficulty I cannot answer help me 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 Maximus V1.0. Some of the data may not make sense as it is placeholder data.
> 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

1. What is your job title/appointment?
2. How long have you been working in this role?
3. What are some of your main responsibilities?

Tell me about your experience with electronic health records

Demographics

The users were asked to perform the following tasks for the usability testing for Demographics.

1. For the patient, enter the following details: Sex Parameter for clinical use and Personal Pronoun.
2. Add Sex Parameter for clinical use, Personal Pronouns, and Preferred Name during new patient creation.
3. For the patient, update the following details: Sex Parameter for clinical use, Personal Pronouns, and Preferred Name.
4. Review the display of Preferred Name, Sex Parameter for clinical use, and Pronouns.
5. Search Patient Using Preferred Name.

Success:

- ☐ Easily completed
- ☐ Completed with difficulty or help:: Describe below
- ☐ Not completed *Comments:*

Task Time: _____ Seconds

Optimal Path: *Screen A* □ *Screen B* □ *Drop Down B*[1] □ *"OK" Button* □ *Screen X…*

- ☐ Correct

- ☐ Minor Deviations / Cycles:: Describe below
- ☐ Major Deviations:: Describe below *Comments:*

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: ____

Show participant has written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Notetaker Comments

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

Questionnaire	Very Difficult				Very Easy
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

Final Questions

a. What was your overall impression of this system?
b. What aspects of the system did you like most?
c. What aspects of the system did you like least?
d. Were there any features that you were surprised to see?
e. What features did you expect to encounter but did not see? That is, is there anything that is missing in this application?
f. Compare this system to other systems you have used.
g. Would you recommend this system to your colleagues?