



**AURA SIGMUND/MEDICFUSION/VERSAFORM
USABILITY STUDY
EXECUTIVE SUMMARY**

(June 13, 2018)

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EHR Usability Test Report of Aura Sigmund, Aura Medicfusion and Aura Versaform

Product: Aura Sigmund, Aura Medicfusion, Aura Versaform
Version: 4.0

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

Dates of Usability Test: February 2018 thru May 2018
Date of Report: June 13, 2018
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Note: The following study was developed using the NISTIR 7742 template as a guide for reporting our findings: *Customized Common Industry Format Template for Electronic Health Record Usability Testing.*

Executive Summary

A usability test of Aura Sigmund, Aura Medicfusion, Aura Versaform, version 4.0, a modular EHR was conducted between February 2018 through May 2018 by VSS Medical Technologies, Inc. The purpose of this test was to test and validate the usability of the current user interface, and to provide evidence of usability.

During the usability test, 11 healthcare professionals served as participants and used the EHR in simulated, but representative tasks.

This study collected performance data on 31 tasks typically conducted on an EHR. The tasks conducted were related to the following:

- Computerized Provider Order Entry (Medications, Laboratory & Diagnostic Imaging)
- Medications (Drug-Drug and Drug-Allergy Interaction Checks & Medication List)
- Medication Allergy List
- Demographics
- Problem List
- Clinical Decision Support
- Implantable Device List
- Clinical Information Reconciliation

During the 60 minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix). Participants had prior experience using an EHR, but had never seen *Aura* nor used a web based product. The Moderator provided brief demonstration of functionality used during the Usability Study. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHR. During the testing, the administrator timed the test and, along with the data logger, recorded user performance data on paper. 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 each task
- Number and types of errors
- Path deviations
- Participant's verbalizations
- Participant's satisfaction rating 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. The following is a summary of the performance and rating data collected on the EHR.

No.	Task Description	# Part	Task Success (%)	Time to Complete (Avg – Seconds)	Task Failure (%)	Task Std Deviations (%)	Avg Task Rating (*)	Risk Rating (**)
1	Create Medication Allergy List Update Medication Allergy List View Medication Allergy	11	100%	137	0	0	2	5 5 3
2	CPOE - Add Medication CPOE - Update Medication CPOE – View Medication	11	100%	207	0	0	3	5 5 3
3	CPOE – Add Laboratory CPOE – Update Laboratory CPOE – View Laboratory	11	100%	189	0	0	3	3 3 1
4	CPOE – Add Diagnostic Imaging CPOE – Update Diagnostic Imaging CPOE – View Diagnostic Imaging	11	100%	136	0	0	3	3 3 1
5	Trigger Drug-Drug Interaction Check View Drug-Drug Interaction Check	11	100%	248	0	0	3	5 3
6	Trigger Drug-Allergy Interaction Check View Trigger Drug-Allergy Interaction Check	10	100%	99	0	0	3	5 3
7	Record Medication List Update Medication List View Medication List	10	100%	156	0	0	3	5 5 3
8	Record Demographics Update Demographics View Demographics	10	100%	263	0	0	2	1 1 1
9	Record Problem List Update Problem List View Problem List	10	100%	120	0	0	2	4 4 3
10	Enable Clinical Decision Support – Demographics	10	100%	106	0	0	2	2
11	Enable Clinical Decision Support – Medication Allergy	10	100%	60	0	0	3	3
12	Enable Clinical Decision Support – Medication List	10	100%	65	0	0	4	4
13	Enable Clinical Decision Support – Problem List	10	100%	64	0	0	4	4
14	Enable Clinical Decision Support – Lab Test	10	100%	64	0	0	4	3
15	Enable Clinical Decision Support – Vitals	10	100%	55	0	0	4	3
16	Enable Clinical Decision Support – Combination: (Demographics + Medication)	10	100%	70	0	0	4	4
17	Trigger Clinical Decision Support – Demographics View Clinical Decision Support – Demographics	10	100%	76	0	0	3	2 1

No.	Task Description	# Part	Task Success (%)	Time to Complete (Avg – Seconds)	Task Failure (%)	Task Std Deviations (%)	Avg Task Rating (*)	Risk Rating (**)
18	Trigger Clinical Decision Support – Medication Allergy View Clinical Decision Support – Medication Allergy	10	100%	77	0	0	3	3 3
19	Trigger Clinical Decision Support – Medication List View Clinical Decision Support – Medication List	10	100%	78	0	0	4	5 4
20	Trigger Clinical Decision Support – Problem List View Clinical Decision Support – Problem List	10	100%	80	0	0	3	4 3
21	Trigger Clinical Decision Support – Lab Test View Clinical Decision Support – Lab Test	10	100%	115	0	0	3	4 3
22	Trigger Clinical Decision Support – Vitals View Clinical Decision Support – Vitals	10	100%	81	0	0	4	3 2
23	Trigger Clinical Decision Support – Combination: (Demographics + Medication) View Clinical Decision Support – Combination: (Demographics + Medication)	10	100%	86	0	0	4	4 3
24	Trigger Clinical Decision Support – Med Allergy from TOC View Clinical Decision Support – Med Allergy from TOC	10	100%	85	0	0	4	3 3
25	Trigger Clinical Decision Support – Medication List from TOC View Clinical Decision Support – Medication List from TOC	10	100%	91	0	0	4	5 4
26	Trigger Clinical Decision Support – Problem List from TOC View Clinical Decision Support – Problem List from TOC	10	100%	83	0	0	4	4 3
27	Create Implantable Device List Update Implantable Device List View Implantable Device List	10	100%	132	0	0	4	1 1 1
28	Perform Clinical Information Reconciliation View Clinical Information Reconciliation	10	100%	227	0	0	3	4 3

(*) Task Rating: 1= Very Easy, 2=Somewhat Easy, 3=Neither Easy or Difficult, 4= Difficult, 5=Very Difficult

(**) Risk Rating: 1=Very Low, 2=Somewhat Low, 3=Medium, 4=High, 5=Very High

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

1. Major Findings
2. Areas for Improvement

Introduction

The EHR tested for this study was Aura Sigmund, Aura Medicfusion, Aura Versaform, (AURA) version 4.0, a modular EHR. Designed to present medical information to healthcare providers in an ambulatory Behavioral Health Practice and Healthcare Practices (Multiple Specialties), the EHR allows providers to maintain clinical information related to their patients. 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. To this end, measure of effectiveness, efficiency (time to perform tasks; total number of deviations; total number of errors; etc.) were captured during the usability testing.

Method

Participants

A total of 11 participants were tested on the EHR. Participants were contacted by VSS Medical Technologies, Inc. staff to participate in the study. In addition, participants had no direct connection to the development of the EHR. Participants were from 10 separate healthcare facilities who are current small practice clients. Participants were not from Sigmund Software LLC, Versaform or Medicfusion. All participants had the same level of training as all other actual end users but no prior experience using Aura.

The following is a table of participants by characteristics, including demographics, user role, and product experience. Participant names were replaced with Participant IDs so that an individual's data cannot be tied back to individual identities. A summary of the participant demographics can be found in the Appendix.

ID	Gender	Age Range	Education	Occupation/ Role	Professional Experience (Years)	EMR Experience (Years)	Computer Experience (Years)
1	F	50-59	Bachelor's	Clinical Assistant	20	12	23
2	M	50-59	Doctorate	Physician	30	13	25
3	F	40-49	Trade/ Technical/ Vocational	Clinical Assistant	15	13	20
4	F	40-49	Bachelor's	Clinical Assistant	15	13	20
5	F	40-49	Masters	Physician Assistant	5	5	20
6	F	40-49	Bachelor's	Clinical Assistant	16	16	20
7	M	60-69	Doctorate	Physician	40	10	40
8	M	70-79	Doctorate	Physician	49	7	34
9	F	30-39	Trade/ Technical/ Vocational	Certified Clinical Assistant	3	3	20
10	M	50-59	Doctorate	Physician	30	10	20
11	F	50-59	Trade/ Technical/ Vocational	Clinical Assistant	15	7	36

Participants were advised that the test would take 60 minutes; but to allocate 75 minutes for the test. The added 15 minutes was to provide enough time for administrator instructions and time between tasks.

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 1 EHR. Each participant was provided the same set of instructions. The system was evaluated for effectiveness and efficiency as defined by measures collected and analyzed for each participant.

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

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:

- Record/Update Medication Allergy
- Record/Update CPOE Orders of Medication, Laboratory + Diagnostic Imaging type orders
- Trigger Drug-Drug and Drug-Allergy Interaction Checking
- Record/Update Medication List
- Record/Update Demographics
- Record Update Problem List
- Enable, Trigger & View Clinical Decision Rules for Demographics, Medication Allergies, Medications, Problems, Lab Test Results, Vitals and combination of Medication + Demographics.
- Trigger Clinical Decision Rules while incorporating a Transition of Care
- Record/Update Implantable Device List
- Perform Clinical Information Reconciliation (merge CDA into an active patient's record)

Procedures

Upon arrival, participants were greeted and their identity was verified and matched with the participant's name on the schedule. Participants were then assigned a participant ID. All participants signed an informed consent form prior to the testing. The test administrator witnessed each participant's signing of the consent form.

To ensure that the test ran smoothly, two VSS Medical Technologies, Inc. staff members participated in the administration of the test. The test administrator provided the instructions for each test, and noted all comments from the participants; while the data logger noted all times, deviations and errors.

Participants were instructed to perform the tasks:

- After listening to the instructions from the testing administrator
- As quickly as possible
- Without assistance

Task timing began after the completion of the verbal instructions from the administrator; and after an acknowledgement from the participant that they were ready to begin. The task time was stopped once the participant indicated they had successfully completed the task.

Following the test, the administrator gave the participant the post-test questionnaire; and then thanked them for their time.

The VSS Medical Technologies, Inc. staff member responsible for logging data recorded all participants' demographic information, task success rate, task time to complete task, errors, and deviations into a spreadsheet.

Test Location

The test was administered in a setting where participants were isolated from other participants in the study. The test was conducted remotely via an online “GoTo Meeting” session, giving the participant keyboard and mouse control of the Test Administrator’s desktop application. Only the test administrator and logger were with the participants while the study was being administered. To ensure that the environment was comfortable for users, noise levels were kept to a minimum.

Test Environment

The EHR would typically be used in a healthcare facility. In this instance, testing was conducted remotely via an online “GoTo Meeting” session, giving the participant keyboard and mouse control of the Test Administrator’s desktop using the web-based application which was physically located at VSS Medical Technologies, Inc.’s office. The computers used for the testing were PCs running on Windows 10, launching Chrome internet browser. Users also used a mouse and keyboard while interacting with the EHR. AURA application is a web based solution. The application itself was running via Chrome using a test database.

Test Forms and Tools

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

- Informed consent & Non-Disclosure Agreement
- Moderator guide
- Post-test questionnaire
- Usability Study Companion with Medication Allergy Name, Medication name for CPOE-Medications, sample UDIs for Implantable Device functionality.

Examples of these documents are to be found in the Appendix section.

Participant Instructions

The Administrator read the following instructions aloud to each participant:

“Thank you for participating in today’s usability study of Aura Sigmund/Medicfusion/Versaform. In a few minutes, you will be asked to perform a series of tasks and complete a user survey. Please attempt to complete each task as quickly as possible. The idea behind this study is for us to obtain information on where enhancements are needed in the application based on how quickly, and easily, tasks are being performed in Aura.”

Following the procedural instructions, participants were shown the EHR and as their first task, were given 15 minutes to explore the system and make comments and ask questions. Once this task was complete, the administrator gave the following instructions.

“When it is time to perform each task, I will state the instructions and then tell you to begin. Once you have completed the task, please say ‘Done’. After you have completed the task, I will ask for feedback on the actions you had taken during the task. You will be given a specified amount of time to complete each task. This time will not be communicated to you as we are interested in seeing how long each task does take for you to perform.”

Usability Metrics

The goals of this test were to assess:

1. The efficiency of AURA by measuring the length of time it takes for a user to complete specific tasks; and the total number of tasks successfully completed during the study.
2. The efficiency of AURA by measuring the path deviations taken by the user during the tasks.
3. The effectiveness of AURA by measuring the number and types of errors experienced by the user during the tasks.
4. The satisfaction of the user with AURA by logging their comments on the tasks.

Data Scoring

The table below details how each task was scored.

Measure	Rationale and Scoring
Task Time	Timing started when the administrator said 'Begin'. The time ended when the participant said 'Done'. In the event that the participant finished, and did not say 'Done', the administrator stopped the clock when it was clear the participant had completed the task. Task times were only counted if the participant completed the task in the allotted time. The average time per task was calculated for each task.
Errors	The task resulted in an error if the participant: failed to finish the task or if they became 'stuck' and could not proceed without asking for assistance. Task time was not counted when the task resulted in an error. We calculated the error % for each task by taking the total number of errors for each task and divided that number by the total attempts at the task.
Path Deviations	Path deviations were recorded as actions taken during the task that were not part of the necessary actions needed to complete the task. We calculated path deviations by taking the total number of observed deviations and dividing that number by the total number of steps taken using an optimal path.
Task Success	A task was considered a success if the participant completed the task in the allotted time. To calculate the task success rate, we simply divided the total number of successful tasks by the total number of tasks completed. The time designated for each task was determined by taking the optimal time to complete the task and multiplying it by a factor of 1.25 to allow for those users that may not have been fully trained on the application.

Results

Data Analysis and Reporting

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

The testing results for Aura Sigmund, Aura Medicfusion, Aura Versaform are detailed below. The table below easily identifies the tasks performed and the performance level for each task.

No.	Task Description	# Part.	Task Success (%)	Time to Complete (Avg – Seconds)	Task Failure (%)	Task Std Deviations (%)	Avg Task Rating (*)
1	Create/Update Medication Allergy List	11	100%	137	0	0	2
2	Add/Update CPOE - Medications	11	100%	207	0	0	3
3	Add/Update CPOE – Laboratory	11	100%	189	0	0	3
4	Add/Update CPOE – Diagnostic Imaging	11	100%	136	0	0	3
5	Trigger Drug-Drug Interaction Check	11	100%	248	0	0	3
6	Trigger Drug-Allergy Interaction Check	10	100%	99	0	0	3
7	Record/Update Medication List	10	100%	156	0	0	3
8	Record/Update Demographics	10	100%	263	0	0	2
9	Record/Update Problem List	10	100%	120	0	0	2
10	Enable Clinical Decision Support – Demographics	10	100%	106	0	0	2
11	Enable Clinical Decision Support – Medication Allergy	10	100%	60	0	0	3
12	Enable Clinical Decision Support – Medication List	10	100%	65	0	0	4
13	Enable Clinical Decision Support – Problem List	10	100%	64	0	0	4
14	Enable Clinical Decision Support – Lab Test	10	100%	64	0	0	4
15	Enable Clinical Decision Support – Vitals	10	100%	55	0	0	4
16	Enable Clinical Decision Support – Combination: (Demographics + Medication)	10	100%	70	0	0	4
17	Trigger & View Clinical Decision Support – Demographics	10	100%	76	0	0	3
18	Trigger & View Clinical Decision Support – Medication Allergy	10	100%	77	0	0	3
19	Trigger & View Clinical Decision Support – Medication List	10	100%	78	0	0	4
20	Trigger & View Clinical Decision Support – Problem List	10	100%	80	0	0	3
21	Trigger & View Clinical Decision Support – Lab Test	10	100%	115	0	0	3
22	Trigger & View Clinical Decision Support – Vitals	10	100%	81	0	0	4

No.	Task Description	# Part.	Task Success (%)	Time to Complete (Avg – Seconds)	Task Failure (%)	Task Std Deviations (%)	Avg Task Rating (*)
23	Trigger & View Clinical Decision Support – Combination: (Demographics + Medication)	10	100%	86	0	0	4
24	Trigger & View Clinical Decision Support – Med Allergy from TOC	10	100%	85	0	0	4
25	Trigger & View Clinical Decision Support – Medication List from TOC	10	100%	91	0	0	4
26	Trigger & View Clinical Decision Support – Problem List from TOC	10	100%	83	0	0	4
27	Create/Update Implantable Device List	10	100%	132	0	0	4
28	Perform Clinical Information Reconciliation	10	100%	227	0	0	3

(*) Task Rating: 1= Very Easy, 2=Somewhat Easy, 3=Neither Easy or Difficult, 4= Difficult, 5=Very Difficult

Effectiveness

Aura Sigmund, Aura Medicfusion, Aura Versaform is our new web based product and participants had no prior exposure to the product or any web based software. All tasks were successfully executed during the study.

Efficiency

Participants in the study, followed the optimal paths to complete the assigned tasks but were cautious in doing so. However, did comment on the number of clicks that are sometimes required to complete an action. Mixed feedback was received on the configuration of Clinical Decision Rules.

Satisfaction

All participants expressed they found Aura Sigmund, Aura Medicfusion, Aura Versaform to be “user friendly” and appreciated the flexible configuration.

Major Findings

The study showed no major findings. However we found that the most participants did exceed the estimated task time goal due to their lack of product experience. Participants verbalized both their happiness with the system’s workflow and expressed ideas for some minor enhancements. We also recognize there will be a need for training as well as implementation support when rolling Aura Sigmund, Aura Medicfusion, Aura Versaform.

Areas for Improvement

The study confirmed that documentation and training would assist end users in implementing new workflow to aid in best using Aura Sigmund, Aura Medicfusion, Aura Versaform to achieve Meaningful Use.

Sample Non-Disclosure Agreement

**VSS Medical Technologies
Usability Study
Non-Disclosure Agreement**

THIS AGREEMENT is entered into as of _____ 2017, between _____ (“the Participant”) and VSS Medical Technologies, located at Lee Farm Corporate Park, 83 Wooster Heights Road, Suite 210, Danbury, CT 06810 (“the Test Company”).

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 Test Company, 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 Test Company 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: _____

Participant Demographics

Gender

4 Male
7 Female

Total Participants: 11

Occupation/Role

4 Physicians
1 Physician Assistants
1 Certified Clinical Assistants
5 Clinical Assistants

Total Participants: 11

Product Experience

All participants had minimum of 3 years EMR experience.

Sample Post-Test Questionnaire

Post Test Questionnaire

Aura Sigmund/Medicfusion/Versaform
User Summary

1. What was your overall impression of the system?
2. What did you like the most about the system? What did you like the least about the system?
3. What functionality would you like to see in Aura that you don't currently see?
4. Were there any features that surprised you?
5. What features did you expect to see but were absent?
6. Is there anything you would change about Aura?

Comments, Suggestions

Areas for Improvement

Usability Study Companion

Medication Allergy

Penicillin

Medication for CPOE

Tamoxifen Citrate Oral

Implantable Devices

Unique device identifiers (UDI) in formats established by all three UDI issue agencies using data obtained from [AccessGUDID](#):

- **GS1 Issuing Agency**

(01)10884521062856(11)141231(17)150707(10)A213B1(21)1234

- **Health Industry Business Communications Council (HIBCC)**

+B066000325011NS1/\$\$420020216LOT123456789012345/SXYZ456789012345678/16D20130202C1

- **International Council for Commonality in Blood Banking Automation (ICCBBA)**

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Moderator Guide

See Attachment 1

Designated Task Times

No.	Criteria	Task Description	Time Designated (Seconds)
1	170.315(a)(8)	Record/Update Medication Allergy List	52
2	170.315(a)(1)	Record/Update CPOE - Medications	70
3	170.315(a)(2)	Record/Update CPOE – Laboratory	76
4	170.315(a)(3)	Record/Update CPOE – Diagnostic Imaging	69
5	170.315(a)(4)	Trigger Drug-Drug Interaction Check	208
6	170.315(a)(4)	Trigger Drug-Allergy Interaction Check	50
7	170.315(a)(7)	Record/Update Medication List	58
8	170.315(a)(5)	Record/Update Demographics	197
9	170.315(a)(6)	Record/Update Problem List	63
10	170.315(a)(9)	Enable Clinical Decision Support – Demographics	39
11	170.315(a)(9)	Enable Clinical Decision Support – Medication Allergy	39
12	170.315(a)(9)	Enable Clinical Decision Support – Medication List	39
13	170.315(a)(9)	Enable Clinical Decision Support – Problem List	39
14	170.315(a)(9)	Enable Clinical Decision Support – Lab Test	39
15	170.315(a)(9)	Enable Clinical Decision Support – Vitals	39
16	170.315(a)(9)	Enable Clinical Decision Support – Combination (Demographic/Medication)	39
17	170.315(a)(9)	Enable Clinical Decision Support – Medication Allergy When Reconciling Transition of Care Summary	39
18	170.315(a)(9)	Enable Clinical Decision Support – Medication List When Reconciling Transition of Care Summary	39
19	170.315(a)(9)	Enable Clinical Decision Support – Problem List When Reconciling Transition of Care Summary	39
20	170.315(a)(9)	Trigger and View Clinical Decision Support – Demographics	73
21	170.315(a)(9)	Trigger and View Clinical Decision Support – Medication Allergy	69
22	170.315(a)(9)	Trigger and View Clinical Decision Support – Medication List	74
23	170.315(a)(9)	Trigger and View Clinical Decision Support – Problem List	79
24	170.315(a)(9)	Trigger and View Clinical Decision Support – Lab Test	114
25	170.315(a)(9)	Trigger and View Clinical Decision Support – Vitals	77
26	170.315(a)(9)	Trigger and View Clinical Decision Support – Combination (Demographic/Medication)	74
27	170.315(a)(9)	Trigger and View Clinical Decision Support – Medication Allergy When Reconciling Transition of Care Summary	54
28	170.315(a)(9)	Trigger and View Clinical Decision Support – Medication List When Reconciling Transition of Care Summary	55
29	170.315(a)(9)	Trigger and View Clinical Decision Support – Problem List When Reconciling Transition of Care Summary	59
30	170.315(a)(14)	Record/Update Implantable Device List	49
31	170.315(b)(2)	Perform Clinical Information Reconciliation	168