

VERSAFORM'S / SIGSOLO'S USABILITY STUDY
EXECUTIVE SUMMARY

(June–July 2015)

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EHR USABILITY TEST REPORT OF VERSAFORM/SIGSOLO

Product: VersaForm EHR Certified

Version: 3.301

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

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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

Usability tests of VersaForm, version 3.301, a complete EHR, were conducted during the months of June and July 2015 by VersaForm Systems Corp. 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 tests, 3 healthcare professionals served as participants and used the EHR in simulated, but representative tasks.

This study collected performance data on 10 tasks typically conducted on an EHR. The tasks conducted were related to the following:

- Clinical Decision Support
- Computerized Provider Order Entry
- 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 (Appendix B). All participants had prior experience with the EHR. The moderator provided brief demonstration of the new functionality implemented to satisfy Clinical Decision Support and Clinical Information Reconciliation. 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	Number of Participants	Task Success	Time to Complete (Avg)	Errors Total	Deviations Total	Avg Task Rating (*)
1	Trigger Clinical Decision Smoking Status Alert	3	Error! Not a valid link. Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.

No.	Task Description	Number of Participants	Task Success	Time to Complete (Avg)	Errors Total	Deviations Total	Avg Task Rating (*)
2	Trigger Clinical Decision Falls Risk Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
3	Trigger Clinical Decision Allergy Alert	3	Error! Not a valid link.	Error! Not a valid link.	0	Error! Not a valid link.	Error! Not a valid link.
4	Trigger Clinical Decision Problem List Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
5	Trigger Clinical Decision Lab Result Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
6	Trigger Clinical Decision Combined Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
7	Trigger Clinical Decision Vital Signs Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
8	Trigger Clinical Decision Medication Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
9	Add E-Rx Medication	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.

No.	Task Description	Number of Participants	Task Success	Time to Complete (Avg)	Errors Total	Deviations Total	Avg Task Rating (*)
10	Merge CDA into current patient record	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.

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

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

- Major Findings
- Areas for Improvement

Introduction

The EHR tested for this study was VersaForm, version 3.01, a complete EHR. Designed to present medical information to healthcare providers in small ambulatory healthcare settings, 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 of 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 3 participants were tested on the EHR. Participants were contacted by VersaForm Systems Corp. staff to participate in the study. Participants had no direct connection to the development of the EHR. Participants were from 3 separate doctors' offices who are current clients of VersaForm Systems. Participants had varying levels of expertise, depending on their normal use of the EHR.

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.

Participant ID	Gender	Education	Occupation/Role	EMR Experience (Years)
1	Male	MD	Solo practitioner	9
2	Male	College graduate	Billing	3
3	Male	DPM	Owner	10

75% of all participants recruited for the test participated.

Participants were advised that the test would take about 60 minutes. Extra time was allocated 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, and also to identify areas where improvements should be made.

During the usability test, participants interacted with one 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:

- Trigger Clinical Decision Smoking Cessation Alert
- Trigger Clinical Decision Falls Risk Alert
- Trigger Clinical Decision Allergy Alert to Document Allergies
- Trigger Clinical Decision Problem Alert for Dementia
- Trigger Clinical Decision Lab Result Alert for Abnormal Cholesterol
- Trigger Combined Clinical Decision Alert for Diagnosis of Diabetes without Hemoglobin Lab Result
- Trigger Vital Signs Alert(s) to Document BMI or BMI Follow-up When BMI is Out of Range
- Trigger Clinical Decision Medication Alert to Document Medications
- Add E-Rx Medication
- Merge CDA into an active patient's record

Tasks were selected based on their frequency of use, criticality of function, and those that may be most troublesome for users.

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 participant's supervisor or co-worker witnessed each participant's signing of the consent form.

To ensure that the test ran smoothly, two VersaForm 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 VersaForm staff member responsible for logging data recorded all participants' demographic information, task success rates, time to complete tasks, errors, and deviations into a spreadsheet.

Test Location

The testing was conducted remotely using "GoToMeeting", so the participants chose their own local testing locations and computer to use. Each participant was given keyboard and mouse control of the desktop application installed on a virtual machine. The test administrator and logger were in the meeting 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 doctor's office. In this instance, testing was conducted remotely via an online "GoToMeeting" session, giving the participant keyboard and mouse control of the Test Administrator's desktop which was physically located in Deb Runyan's home office. The participants used their own computers to connect to the meeting. Participants used a mouse and keyboard while interacting with the EHR. The VersaForm application is a desk top solution. VersaForm was running on a virtual Windows 2012 Server using a test database.

Test Forms and Tools

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

- Informed Consent & Non-Disclosure Agreements
- Moderator's Guide
- Post-test Questionnaire

Examples of these documents are in the Appendix.

Participant Instructions

The administrator read the following instructions aloud to each participant:

"Thank you for participating in today's usability study of VersaForm/SigSolo. 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 VersaForm to obtain information on where enhancements are needed in the application based on how quickly and easily tasks can be performed in VersaForm/SigSolo."

Following the procedural instructions, participants were shown the EHR and were given about 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 took 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:

- The efficiency of VersaForm/SigSolo 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.
- The efficiency of VersaForm/SigSolo by measuring the path deviations taken by the user during the tasks.
- The effectiveness of VersaForm/SigSolo by measuring the number and types of errors experienced by the user during the tasks.
- The satisfaction of the user with VersaForm/SigSolo 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 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.

Measure	Rationale and Scoring
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 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 1.3 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 VersaForm/SigSolo are detailed below. The table below easily identifies the tasks performed and the performance level for each task.

No.	Task Description	Number of Participants	Task Success	Time to Complete (Avg)	Errors Total	Deviations Total	Avg Task Rating (*)
1	Trigger Clinical Decision Smoking Status Alert	3	Error! Not a valid link. Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
2	Trigger Clinical Decision Falls Risk Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
3	Trigger Clinical Decision Allergy Alert	3	Error! Not a valid link.	Error! Not a valid link.	0	Error! Not a valid link.	Error! Not a valid link.
4	Trigger Clinical Decision Problem List Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
5	Trigger Clinical Decision Lab Result Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.

No.	Task Description	Number of Participants	Task Success	Time to Complete (Avg)	Errors Total	Deviations Total	Avg Task Rating (*)
6	Trigger Clinical Decision Combined Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
7	Trigger Clinical Decision Vital Signs Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
8	Trigger Clinical Decision Medication Alert	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
9	Add E-Rx Medication	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.
10	Merge CDA into current patient record	3	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.	Error! Not a valid link.

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

Effectiveness

All were slowed down by inexperience with newer functionality and by functions that they do not usually do. They could complete the tasks but not necessarily in the allotted time. One participant was having problems with his mouse and clicked on the wrong thing more than once because of that.

Efficiency

For the most part, participants in the study followed the optimal paths to complete the assigned tasks with minimal deviations. However, some did comment on the number of clicks that were required to complete certain actions.

Satisfaction

All participants expressed they found VersaForm/SigSolo to be "user friendly".

Major Findings

Participants verbalized both their happiness with the new functions and their interest in getting the new version installed so they can use those functions.

Areas for Improvement

All commented on the inconsistencies in the process of entering new diagnoses.

One suggested adding something that indicates the program is working during the waiting involved in the reconciliation process and adding something to indicate that the whole process is complete after problem reconciliation is completed.

APPENDICES

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VersaForm/SigSolo Usability Study Consent Form

VersaForm would like to thank you for your participation in this study. The purpose of the study is to evaluate the usability of VersaForm’s EMR. Your participation in this study will include performing specific tasks within VersaForm/SigSolo and completing a short survey following the study. The study should take approximately #60 minutes. The information collected by VersaForm during the study is for research purposes only. Your participation in this study is voluntary, so you are free to withdraw at any point during the study.

By signing below, I agree to participate in the study.

Name of Participant	
Education	
Occupation/Role	
Professional Experience	
Years of EMR Experience	
Location	
Date of Study	

Signature – Participant

Printed Name

Date

Signature –Witness

Printed Name

Date

VersaForm/SigSolo Usability Study Non-Disclosure Agreement

THIS AGREEMENT is entered into as of _____ 2015, between _____ ("the Participant") and VersaForm Systems Corporation, located at 83 Wooster Heights Rd, 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 VersaForm Systems Corp., 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 VersaForm Systems Corp. 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

Male	3
Female	0

Total Participants 3

Occupation/Role

Physician	2
LPN	0
RN	0
Staff	1

Total Participants 3

Product Experience

Participants had between 3 and 10 years EMR experience.

Post Test Questionnaire

What was your overall impression of the system? _____

What did you like the most about the system? What did you like the least about the system? _____

If you could change one part of VersaForm/SigSolo, what would you change? _____

Were there any features that surprised you? _____

What features did you expect to see but were absent? _____

If you could add one piece of functionality to VersaForm/SigSolo, what would you add? _____

Comments, Suggestions

Areas for Improvement

Moderator's Guide

See Attachment 1 for the full Guide.

Designated Task Times

No.	Task Description	Time Designated (Seconds)
1	Trigger Clinical Decision Smoking Status Alert	Error! Not a valid link.
2	Trigger Clinical Decision Falls Risk Alert	Error! Not a valid link.
3	Trigger Clinical Decision Allergy Alert	Error! Not a valid link.
4	Trigger Clinical Decision Problem Alert	Error! Not a valid link.
5	Trigger Clinical Decision Lab Result Alert	Error! Not a valid link.
6	Trigger Clinical Decision Combined Alert	Error! Not a valid link.
7	Trigger Clinical Decision Vital Signs Alert	Error! Not a valid link.
8	Trigger Clinical Decision Medication Alert	Error! Not a valid link.
9	Add eRx Medication	Error! Not a valid link.
10	Merge CDA into Current Patient Record	Error! Not a valid link.