Testing Dates: 7/31/18, 8/7/18, and 8/17/18

Report Date: 9/20/18

Product Date: 5/28/18

Version: 2

Report by Strategic Management Consultants
Table of Contents

Executive Summary: Page 3

Introduction: Page 4

Method: Page 5

Study Design: Page 6

Tasks: Page 6

Test Environment: Page 8

Test Forms and Tools: Page 9

Participant Instructions: Page 9

Usability Metrics: Page 10

Effectiveness and Efficiency Results: Page 10

Rational Scoring: Page 11

Satisfaction Results: Page 13

Discussion of Findings: Page 16

User-Centered Design Process: Page 17

Appendices: Page 18

Participant Questions: Page 20

System Usability Scale Questionnaire: Page 22

Computer System Usability Questionnaire: Page 23

References: Page 25
Executive Summary

On 7/31/18, 8/7/18, and 8/17/18, Strategic Management Consultants tested a number of users of Shareable Forms system to ensure the system is ready for EHR certification. The test was conducted onsite with all participant actions and events data audit logged centrally. The purpose was to test and validate the usability of the current user interface and provide evidence of usability of Shareable Forms 2. Ten (10) healthcare providers matching the target demographic criteria participated in the usability test using the EHRUT in simulated, but representative tasks.

Testing data was collected on seven (7) tasks based on normal EHR usage for documentation purposes. Tasks were created based upon the criteria sited within the test procedure structure for measuring data of Electronic Health Record (EHR) technology to the certification criteria defined in certification criteria identified in 45 CFR Part 170 Subpart C of the Health Information Technology: 2015 Edition Health Information Technology (Health IT) Certification Criteria1.

The results showed that that Shareable Forms system is effective and efficient in delivering demographics and other vital information at the point of care that improves workflows and increases patient outcomes. The results state users are satisfied with the system.
Introduction

The Electronic Health Record System Under Test (EHRUT) tested for this study, Shareable Forms 2, was designed to present medical information such as demographics to its users via digital forms on tablets in standard healthcare settings. This study tested the usability of the Shareable Forms 2 software based on its usage within the healthcare setting. The measures of effectiveness, efficiency, and complete documentation rates were captured during usability testing.

Shareable Forms replaces paper documents and digitizes any forms electronically to a tablet. The forms are fully integrated into the healthcare setting via HL7, ADT, SIU, API, and flat files. All data captured is discrete and is recorded on the patients record. Within the system are hard and soft stops that users must complete before moving on to the next field, this allows for complete documentation and is fully customizable. Within the documents demographic data and vitals are collected and recorded. Overall, users who completed the testing acknowledge this software improved their workflow and patient care.
Method

Participants

10 individuals participated in the EHRUT (Shareable Forms 2). Participants were recruited from contacts obtained by Strategic Management Consultants. Those who responded to the invitation to take part in the study were directed to complete the Recruiting Screener document. (Appendix A: Recruiting Screener). Participants meeting the criteria for participation in the study were contacted, scheduled and confirmed for their testing session. Participants in the usability test of Shareable Forms had a variety of healthcare backgrounds and demographic characteristics.

Shareable coordinated with a facility manager to secure an office or meeting room where the participant would conduct the study. The participants were provided the Task instructions to complete (Appendices B: Participant Questions). The Shareable system audit logged all user activity during the session necessary to determine Task time, Task Success, Standard Deviations and Task Errors.

<table>
<thead>
<tr>
<th>Part ID</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Title</th>
<th>EHR Experience (months)</th>
<th>Prof Experience (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>F</td>
<td>60-69</td>
<td>BS</td>
<td>CRNA</td>
<td>72</td>
<td>36</td>
</tr>
<tr>
<td>02</td>
<td>F</td>
<td>50-59</td>
<td>MS</td>
<td>CRNA</td>
<td>12</td>
<td>144</td>
</tr>
<tr>
<td>03</td>
<td>F</td>
<td>50-59</td>
<td>MS</td>
<td>CRNA</td>
<td>12</td>
<td>168</td>
</tr>
<tr>
<td>04</td>
<td>F</td>
<td>50-59</td>
<td>MD</td>
<td>MD</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>05</td>
<td>F</td>
<td>40-49</td>
<td>MS</td>
<td>CRNA</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>06</td>
<td>M</td>
<td>50-59</td>
<td>MS</td>
<td>CRNA</td>
<td>120</td>
<td>156</td>
</tr>
<tr>
<td>07</td>
<td>F</td>
<td>50-59</td>
<td>MS</td>
<td>CRNA</td>
<td>60</td>
<td>168</td>
</tr>
<tr>
<td>08</td>
<td>F</td>
<td>40-49</td>
<td>MS</td>
<td>CRNA</td>
<td>60</td>
<td>108</td>
</tr>
<tr>
<td>09</td>
<td>M</td>
<td>50-59</td>
<td>MD</td>
<td>MD</td>
<td>60</td>
<td>300</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>30-39</td>
<td>BS</td>
<td>Analyst</td>
<td>60</td>
<td>84</td>
</tr>
<tr>
<td>Part ID</td>
<td>Assistive Technology</td>
<td>Computer Experience (months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>No</td>
<td>168</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>No</td>
<td>168</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>No</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>No</td>
<td>168</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>No</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>No</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>No</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>No</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>No</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>No</td>
<td>480</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Study Design**

Shareable Forms was evaluated for effectiveness, efficiency and satisfaction as defined by the following measures collected and analyzed for each participant:

- Number of tasks successfully completed without assistance
- Participant comments
- Satisfaction rating of the system

**Tasks**

The seven (7) tasks were made up based upon the test procedure structure for evaluating the standard of Electronic Health Record (EHR) technology as defined in 45 CFR Part 170 Subpart C of the Health Information Technology: Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology.

The task focused on the following 2015 Edition certification criteria specified by ONC:

- Section 170.315 (a)(5) Demographic
**TASK 1: Add New Patient to the List**

A patient has come in for their surgery. They are not showing up and must be added to the system manually with a new case. Please enter in the required fields for Mr. Julio Jones (DOB: 1/11/1980) within Shareable Forms.

*Enter and save this new patient information in Shareable*

**Task 2: Enabling Forms (Add Forms to the Patient Record)**

Mr. Jones needs to have the correct forms enabled to allow medical staff to properly document his surgery. Navigate to the Patient Profile and turn on the following forms: Patient Intake, Pre-Op, Anesthesia Record, and Share Quality tabs.

*Select all of the forms listed above in the application*

**Task 3: Enter in Patient Intake Information (Add Allergies, Smoking History, Current Medication)**

After the forms have been selected the patient’s intake information needs to be filled out if not present in the EMR. Mr. Jones has indicated he has an allergy to Penicillin, does not smoke, current living will, and no history of past surgeries. The patient is currently taking Lipitor once a day

*Enter in the allergy, smoking history, living will, current medications, surgical history information listed above to the patients record*

**Task 4: Enter the Surgeon, MD/DO, and CRNA for a Procedure (Adding Physician to Record)**

The surgeon to perform Mr. Jones procedure at the time of booking the appointment was unknown and therefore did not exists in the EMR. Surgeon 1 has been assigned to the case, Dr. Mehan is listed as the MD, and Beta User is the CRNA. Entering these names will now become part of the medical record.

*Enter in surgeon, MD, and CRNA names listed above on the Anesthesia record.*
**Task 5: Anesthesia Times (Start + In Room)**

A vital piece of information required for each patient’s record is the anesthesia start and in room times. For this patient, Mr. Jones, the Anesthesia Start time is today’s date at 14:04 PM and the In Room time begins at 14:37.

*Key in the times listed above for the Anes Start and In room*

**Task 6: Surgical Procedure (Procedure and Anesthesia Type)**

If the specific procedure is not known beforehand or entered in the EMR, it must be entered in the anesthesia record before the surgery begins. For this example, it is an elective procedure for Cataracts with a Regional Block. The type of anesthesia being used in this case is MAC.

*Type in the procedure listed above on the iPad and select the appropriate anesthesia type*

**Task 7: Vitals Grid (Oxygen and Temp)**

A patient’s vitals must be captured during a procedure for a complete medical record, on this example you will only focus on 2 vitals (O2 and Temp). The initial levels for patient Julio Jones are 92 L/min O2 along with body temperature of 98 degrees. 15 minutes later when the readings were completed again, both levels were the same.

*Enter in the patient’s oxygen levels along with body temperature for the initial reading followed up 15 minutes later with no change*

**Test Environment**

**Facilities**

While the Shareable App typically would be used in a hospital, healthcare office, or ambulatory surgery center facility, testing of the Shareable system was conducted remotely. The Shareable application itself ran as an iOS App on a Wifi connection.

**Environment setup**

Participants were asked to access and perform tasks within their own Shareable Forms Staging environment that mirrors their Production environment in software version, forms and rules.
Environment

<table>
<thead>
<tr>
<th>Computer Type</th>
<th>Tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation System</td>
<td>iOS</td>
</tr>
<tr>
<td>Interaction Style</td>
<td>Touch</td>
</tr>
<tr>
<td>Display screen size</td>
<td>9.7 inches (250 mm) with a 4:3 aspect ratio</td>
</tr>
<tr>
<td>Display resolution</td>
<td>2,048 × 1,536 px (264 ppi)</td>
</tr>
<tr>
<td>Display color settings</td>
<td>Default</td>
</tr>
<tr>
<td>System Platform</td>
<td>iOS App</td>
</tr>
<tr>
<td>Type of System</td>
<td>Test App</td>
</tr>
<tr>
<td>Connection</td>
<td>Wifi</td>
</tr>
</tbody>
</table>

Test Forms and Tools

As part of the usability test, several documents and instruments were used. Examples of the documents used during the usability test, including an informed consent form, the tasks, and post-test questionnaires, in the appendices. Study was conducted by Strategic Management Consultants through use of electronic video chat (Zoom) while using a demo environment on the tablet.

Participant Instructions

The administrator read the following instructions aloud to each participant:

Thank you for participating in this study. Your input is very important. Our session today will last about 30 to 40 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. Please note that we are not testing you; we are testing the system. Therefore, if you have any difficulty this may mean that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application.

Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. I did not have any involvement in its creation, so please be honest with your opinions.

All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time. Should you feel it necessary you are able to withdraw at any time during the testing.

Participants were then given seven (7) tasks to complete.
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:

- Effectiveness of Shareable Forms by measuring participant success rates and errors.
- Efficiency of Shareable Forms by measuring the average task time and path deviations.
- Satisfaction of Shareable Forms by measuring ease-of-use ratings

Effectiveness and Efficiency

<table>
<thead>
<tr>
<th>Task</th>
<th>Task Success - Mean (%)</th>
<th>Task Success - SD (%)</th>
<th>Task Path Deviation - Observed #</th>
<th>Task Path Deviation - Optimal #</th>
<th>Task Time Deviation - Mean Observed Seconds</th>
<th>Task Time - SD (seconds)</th>
<th>Task Time Deviation - Mean Optimal Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>TASK 1: Add New Patient to the List</td>
<td>100</td>
<td>100</td>
<td>3</td>
<td>3</td>
<td>39</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>Task 2: Enabling Forms</td>
<td>100</td>
<td>100</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Task 3: Enter in Patient Intake Information</td>
<td>100</td>
<td>100</td>
<td>5</td>
<td>5</td>
<td>192</td>
<td>52</td>
<td>120</td>
</tr>
<tr>
<td>Task 4: Enter the Surgeon, MD/DO, and CRNA for a Procedure</td>
<td>100</td>
<td>100</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Task 5: Anesthesia Times</td>
<td>100</td>
<td>100</td>
<td>2</td>
<td>2</td>
<td>31</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Task 6: Surgical Procedure</td>
<td>100</td>
<td>100</td>
<td>3</td>
<td>3</td>
<td>13</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Task 7: Vitals Grid</td>
<td>100</td>
<td>100</td>
<td>3</td>
<td>3</td>
<td>1044</td>
<td>40</td>
<td>1020</td>
</tr>
<tr>
<td>Task</td>
<td>Task Errors Mean (%)</td>
<td>Task Errors - Standard Deviation (%)</td>
<td>Task Rating - Scale Type</td>
<td>Task Rating</td>
<td>Task Rating - SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>----------------------</td>
<td>--------------------------------------</td>
<td>--------------------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TASK 1: Add New Patient to the List</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.8</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2: Enabling Forms</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.8</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 3: Enter in Patient Intake Information</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.3</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 4: Enter the Surgeon, MD/DO, and CRNA for a Procedure</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 5: Anesthesia Times</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.8</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 6: Surgical Procedure</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.7</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 7: Vitals Grid</td>
<td>0</td>
<td>0</td>
<td>Likert Scale</td>
<td>4.7</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rationale and Scoring**

**Effectiveness:**

**Task Success**

A task was counted as “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. Results are provided as a percentage.

**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 “Fail.” No task times were taken for failed attempts.
The total number of errors was calculated for each task and divided by the total number of times that task was attempted. Results are presented as the average error rate.

Note: Not all deviations are counted as errors

### Efficiency:

**Task Time**

Each task was timed via system audit log from when the administrator said “Begin” until the participant said, “Done.” If he or she failed to say “Done,” the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.

### Satisfaction:

**Ease of Use ratings**

Participant’s subjective impression of the ease of use of the application was measured by administering both a single post-task question as well as two post-session questionnaires.

**System Satisfaction**

After each task, the participant determined on a scale of “Strongly Disagree” (1) to “Strongly Agree” (5) their subjective satisfaction with performance on the task. These data are averaged across participants.
Satisfaction

Individual Task Satisfaction

Participants verbally indicated their satisfaction with the ease of use for each task using a scale of “Strongly Disagree” (1) to “Strongly Agree” (5)
Individual Participant Satisfaction

In general, the participants were satisfied with the ease of use of the Shareable Forms system. The following chart displays overall satisfaction for each participant:

Overall, I am satisfied with how easy it is to use this system

Answered: 11  Skipped: 0

<table>
<thead>
<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree (1)</td>
<td>9.09%</td>
</tr>
<tr>
<td>Disagree (2)</td>
<td>9.09%</td>
</tr>
<tr>
<td>Neutral (3)</td>
<td>27.27%</td>
</tr>
<tr>
<td>Agree (4)</td>
<td>45.45%</td>
</tr>
<tr>
<td>Strongly Agree (5)</td>
<td>9.09%</td>
</tr>
</tbody>
</table>
System Usability Scale

The Likert Scale is a simple 5-point scale to rate “How efficient were the steps needed to complete this task?”. This scale was 1 (Very inefficient) to 5 (Very efficient).

The information is effective in helping me complete the tasks and scenarios

90% of participants found our solution to be useable for their daily routines

Discussion of Findings

In general, the participants performed very well and felt satisfied with the Shareable Forms system. A few of the participants struggled initially with some portions of a few tasks but in
general most were able to successfully complete a majority of the tasks with little or no difficulty. Participants were mostly able to perform all tasks successfully on their own with no assistance or external documentation. The participant average performance rate was very high, as were the overall participant satisfaction rates. The Shareable Forms system appears to be a highly usable within the EHR.

**Summary of Major Findings**

This evaluation demonstrated that the Shareable Forms system is a usable system with a relatively short learning curve. Participants with minimal amounts of experience using unfamiliar portions of the Shareable Forms system before the study experienced little initial difficulty understanding the navigation and information architecture. Participants with more experience were able to solve most tasks without difficulty or error.

**Areas for Improvement**

The following is a partial list of potential areas for improvement. Making these and other minor enhancements will improve the overall user experience of the Shareable Forms system and increase the effectiveness, efficiency, and satisfaction for both experienced and novice Shareable Forms users.

- Auto Calculation of BMI
  - The system will automatically calculate the patient’s body mass index (BMI) based upon entry of the height and weight
- Make Phone Number a Required Field
  - The phone number allows a user to change his or her password by receiving SMS text of a security code in order to change.
- Auto Vitals
  - The ability to integrate with vitals machines and import the readings into the application real-time
- Site Form Templates
  - Currently there is not an ability to have form templates specific to a facility. This feature would allow multiple facilities to be in one Shareable Forms environment using different form templates.

**User-Centered Design Process**

**Outline**

1. Plan
   a. Develop a plan and assemble a team
b. Team includes Project Manager, UX Designer/Usability Expert and Developers

c. Kick off the project

2. Analyze

a. Learn what the user needs are
b. Analyze current workflow
c. Develop personas
d. Write scenarios
e. Set project goals

3. Design

a. Create requirements in PM system
b. Create wireframes
c. Create backlog user stories for each feature
d. Develop prototype

4. Test and Refine

a. Validate application meets design specification
b. Create usability testing plan
c. User test application and analyze results
d. Implement any changes and retest

Description

The Shareable UCD process starts in the “Planning” phase by establishing what the strategic product priorities are based on user input, competition and compliance. Team members are assigned to the project which includes one or more features. The team is comprised of a Project Manager, UX Designer/Usability expert and Developers. In the “Analyze” phase the project is kicked off by reviewing the desired features and documenting the user workflows. We document the personas and the scenarios associated to the features. Following this the team sets the project goals with projected dates of delivery. In the “Design” phase requirements are captured in the PM system to begin tracking the work. The UX designer creates wireframes to assist in the designing of the screens and user workflows within the application. Next the team creates the backlog user stories necessary to meet the criteria set by the requirements. A prototype of the feature(s) is created so that internal stakeholders can review and approve. In the “Test and Refine” phase the prototype is validated against the design specifications. Once validated the Usability expert drafts a usability test plan which is followed by conducting the usability test. Once the test results are analyzed the team decides if changes to the design need to be implemented and retested.

At this time Shareable UCD process is an internally created process modeled from the following industry best standards NISTIR 7741, NISTIR 7742 and 9241-210:2010 (Appendix E). It is designed to allow the organization to be nimble while at the same time take into account the usability needs of our users. As we grow our team the goal is to assign resources to incorporated/certify a UCD Industry Standard into our existing processes.

Appendices

Appendix A: Recruiting Screener

1. Are you male or female?

2. Have you participated in a focus group or usability test in the past 6 months?
3. Do you, or does anyone in your home work in marketing research, usability research, and/or web design?

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

5. Which of the following best describes your age?  

6. Which of the following best describes your education level?  
   - No high school diplomas
   - High school graduate
   - Some college, no degree
   - Trade school vocational degree
   - Associates degree
   - Bachelor's degree
   - Master's degree
   - Doctorate degree

7. Do you require any assistive technologies to use a computer?

8. Please describe your medical or nursing credentials

9. What is your current job title?

10. How long have you held this position? (Number of years):

11. What type of facility do you work in and what is your role there?

12. How are medical records handled at your (main) workplace?  
   ___All Paper ___Some Paper/Some Electronic ___All Electronic

13. How many EHRs do you use, or have you worked with?

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

15. About how many hours per week do you spend using a computer?

16. What computer platform(s) do you usually use?  
   ___PC _____Mac ____ Other

17. In the last month, about how often have you used an electronic health record?
   ___Did not use last month ___Every day ___A few times a week

Shareable Forms 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.

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

I understand and consent to the use and release of the video recording by Shareable Forms.

I understand that the information and video is for research purposes only and that my name and image will not be used for any purpose other than research. I relinquish any rights to the video and understand the video recording may be copied and used by Shareable Forms without further permission.

I understand and agree that the purpose of this study is to make software applications more useful and usable in the future.

I understand and agree that the data collected from this study may be shared outside of Shareable Forms. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

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

Please check one of the following:
____ YES, I have read the above statement and agree to be a participant.
____ NO, I choose not to participate in this study.

Signature: _______________________________ Date _____________________

Appendices B: Participant Questions

Task 1: Add New Patient to the List
A patient has come in for their surgery. They are not showing up and must be added to the system manually with a new case. Please enter in the required fields for Mr. Julio Jones (DOB: 1/11/1980) within Shareable Forms.

*Enter and save this new patient information in Shareable*

**Task 2: Enabling Forms (Add Forms to the Patient Record)**

Mr. Jones needs to have the correct forms enabled to allow medical staff to properly document his surgery. Navigate to the Patient Profile and turn on the following forms: Patient Intake, Pre-Op, Anesthesia Record, and Share Quality tabs.

*Select all of the forms listed above in the application*

**Task 3: Enter in Patient Intake Information (Add Allergies, Smoking History, Current Medication)**

After the forms have been selected the patient’s intake information needs to be filled out if not present in the EMR. Mr. Jones has indicated he has an allergy to Penicillin, does not smoke, current living will, and no history of past surgeries. The patient is currently taking Lipitor once a day.

*Enter in the allergy, smoking history, living will, current medications, surgical history information listed above to the patients record*

**Task 4: Enter the Surgeon, MD/DO, and CRNA for a Procedure (Adding Physician to Record)**

The surgeon to perform Mr. Jones procedure at the time of booking the appointment was unknown and therefore did not exists in the EMR. Surgeon 1 has been assigned to the case, Dr. Mehan is listed as the MD, and Beta User is the CRNA. Entering these names will now become part of the medical record.

*Enter in surgeon, MD, and CRNA names listed above on the Anesthesia record.*

**Task 5: Anesthesia Times (Start + In Room)**

A vital piece of information required for each patient’s record is the anesthesia start and in room times. For this patient, Mr. Jones, the Anesthesia Start time is today's date at 14:04 PM and the In Room time begins at 14:37.
**Task 6: Surgical Procedure (Procedure and Anesthesia Type)**

If the specific procedure is not known beforehand or entered in the EMR, it must be entered in the anesthesia record before the surgery begins. For this example, it is an elective procedure for Cataracts with a Regional Block. The type of anesthesia being used in this case is MAC.

*Type in the procedure listed above on the iPad and select the appropriate anesthesia type*

**Task 7: Vitals Grid (Oxygen and Temp)**

A patient’s vitals must be captured during a procedure for a complete medical record, on this example you will only focus on 2 vitals (O2 and Temp). The initial levels for patient Julio Jones are 92 L/min O2 along with body temperature of 98 degrees. 15 minutes later when the readings were completed again, both levels were the same.

*Enter in the patient’s oxygen levels along with body temperature for the initial reading followed up 15 minutes later with no change*

---

**Appendix C: System Usability Scale Questionnaire**
<table>
<thead>
<tr>
<th>1. I think that I would like to use this system frequently</th>
<th><img src="image" alt="Likert Scale" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I found the system unnecessarily complex</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>3. I thought the system was easy to use</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>4. I think that I would need the support of a technical person to be able to use this system</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>5. I found the various functions in this system were well integrated</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>6. I thought there was too much inconsistency in this system</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>7. I would imagine that most people would learn to use this system very quickly</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>8. I found the system very cumbersome to use</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>9. I felt very confident using the system</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
<tr>
<td>10. I needed to learn a lot of things before I could get going with this system</td>
<td><img src="image" alt="Likert Scale" /></td>
</tr>
</tbody>
</table>
Appendix D: Computer System Usability Questionnaire

1. Overall, I am satisfied with how easy it is to use this system
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   It was simple to use this system

2. It was simple to use this system
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   I can effectively complete my work using this system

3. I can effectively complete my work using this system
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   It was easy to learn to use this system

4. It was easy to learn to use this system
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   The system gives error messages that clearly tell me how to fix problems

5. The system gives error messages that clearly tell me how to fix problems
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   Whenever I make a mistake using the system, I recover easily and quickly

6. Whenever I make a mistake using the system, I recover easily and quickly
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   The information is effective in helping me complete the tasks and scenarios

7. The information is effective in helping me complete the tasks and scenarios
   Strongly Disagree
   Disagree
   Neutral
   Agree
   Strongly Agree
   The organization of information on the system screens is clear

8. The organization of information on the system screens is clear
   Strongly Disagree
   Disagree
Neutral
Agree
Strongly Agree

The information is effective in helping me complete the tasks and scenarios

9. The information is effective in helping me complete the tasks and scenarios
Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree
Overall, I am satisfied with this system

10. Overall, I am satisfied with this system
Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

Appendix E. References


NIST 7741 - NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records


NIST 7742 - Customized Common Industry Format Template for Electronic Health Record Usability Testing


https://www.iso.org/standard/52075.html