PRACTICESTUDIO USABILITY TESTING REPORT

Created using NISTIR 7742 Standards
April 1, 2018

PRACTICESTUDIO X20

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PRACTICESTUDIO X20

1. INTRODUCTION

1.1 SUMMARY

A usability test of PracticeStudio X20 was performed between 03/29/2018 and 04/02/2018. Our testing environment consisted of 10 participants (defined below). Each test participant was given standard training on the product prior to the study was initiated to ensure exposure and reliable test criteria.

1.2 USABILITY CENTERED DESIGN

The UCD (Usability Centered Design) standard implemented was NISTIR 7741 throughout all criteria.

1.3 TESTING PROCEDURE

An allotment of 60 minutes was reserved for each test participant. Each participant began the testing in a consistent data environment to ensure that said user was presented content in the exact same manner. Once testing began, the test was broken down into 8 routines to allow for a normal patient flow. Within 8 routines consisted 12 criteria as specified below.

ROUTINES AND CRITERIA TESTED

1. Demographics (170.315(a)(5))
2. Allergies (170.315(a)(8))
3. Medications List (170.315(a)(7), 170.315(a)(1))
4. Problem List, CPOE Laboratory, CPOE Radiology (170.315(a)(6), 170.315(a)(2), 170.315(a)(3))
5. E-Prescribing, CPOE Medications (170.315(b)(3), 170.315(a)(4))
6. Clinical Decision Support (170.315(a)(9))
7. Implantable Device List (170.315(a)(14))
8. Clinical Information Reconciliation and Incorporation (170.315(b)(2))

2. TESTING PROCESS AND ENVIRONMENT

2.1 PARTICIPANT LIST

Our participant list was intentionally diverse in education levels and roles to ensure ease of usability. Not all users function in the capacity of the test given as part of their daily roles and routines. The overall objective was to test usability, flow, security, PHI safety, and presentation.

This approach yielded positive empirical data points that allowed for real-world analytics to be processed in accordance with developmental standards.

ID	Gender	Age	Education	Role	Computer Xp
1	Male	30-39	Bachelors	Trainer/Billing	5 years
2	Male	60-69	Bachelors	Trainer/Charts	25 years
3	Female	30-39	Masters	NP	6 years
4	Female	40-49	Associates	LVN, Radiology	10 years
5	Female	30-39	Masters	PA	10 years
6	Female	40-49	Associates	LVN	18 years
7	Female	60-69	College	Office Manager	42 years
8	Female	60-69	High School	Referrals	34 years
9	Female	60-69	Associates	LVN	2 years
10	Female	50-59	Bachelors	Medical Billing	25 years

2.2 TASKS

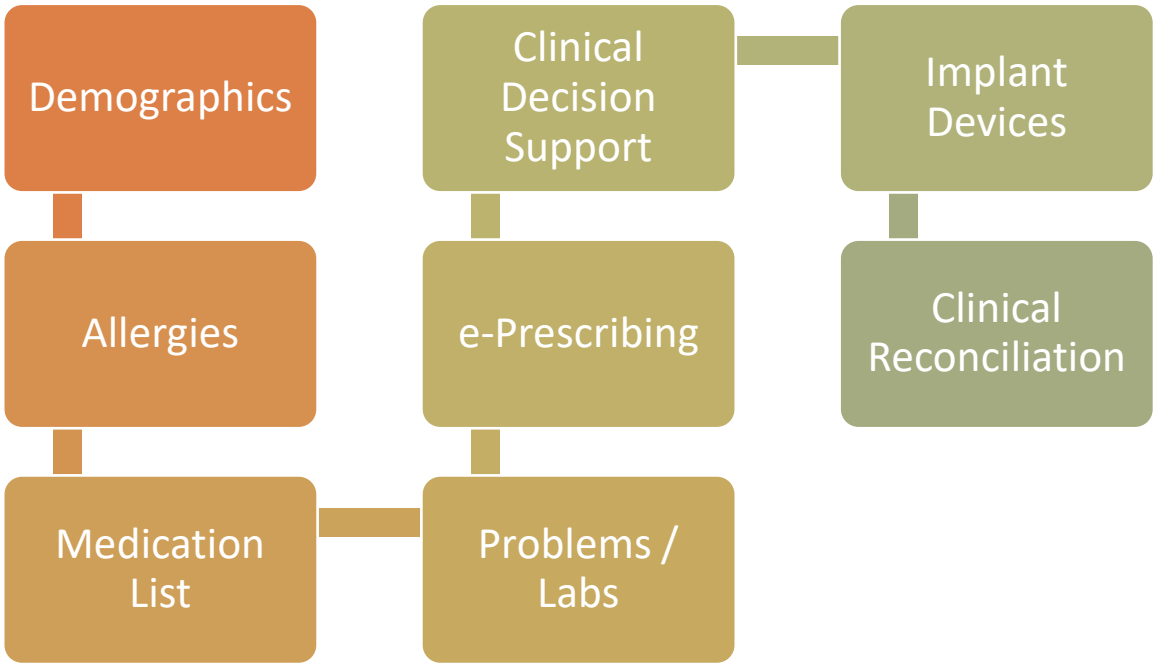
Each user was given a set of tasks in accordance with ONC regulation 170.315.g.3, Safety Enhanced Design. The following tasks were tested, documented, and analyzed according to these standards.

- 170.315(a)(1) CPOE – Medications
- 170.315(a)(2) CPOE – Laboratory
- 170.315(a)(3) CPOE – Diagnostic Imaging
- 170.315(a)(4) Drug-drug, Drug-allergy Interaction Checks
- 170.315(a)(5) Demographics
- 170.315(a)(6) Problem List
- 170.315(a)(7) Medication List
- 170.315(a)(8) Medication Allergy List
- 170.315(a)(9) Clinical Decision Support
- 170.315(a)(14) Implantable Device List
- 170.315(b)(2) Clinical Information Reconciliation and Incorporation

- 170.315(b)(3) Electronic Prescribing

2.3 TASK FLOW PROCESS

Our usability test platform simulated as natural of a patient workflow as possible. As mentioned the introduction, section 1.2, our testing procedure broke these tasks into eight distinct routines. The flow of those routines shown in the figure below.



3. RESULTS

3.1 DATA ANALYSIS AND RESULTS

The usability testing results for the EHRUT are detailed in the following table. The results should be reviewed and perceived from the perspective of our testing format outlined further in section 3.2.

		Path Deviation			Task Time				Errors		Rating	
Routine	Task Success Mean %	Observed Steps	Optimal Steps	Std. Dev	Mean (Seconds)	Standard Deviation (Seconds)	Optimal Time	Std. Dev (Time)	Task Errors Mean	Std. Dev	Task Rating	Std. Dev
1	93	27.5	24	1.5	277.5	43.3	260	12.3	6.67	.42	4.5	.7
2	95	10.2	8	1.3	61.1	20.8	55	4.31	5	.42	4.6	.6
3	88	13.9	11	2.5	59.7	40.7	50	6.85	11.67	.82	4.6	.6
4	92	37.1	31	5.3	147.7	32.1	150	1.62	8	1	4.4	.8
5	96	42	35	4.9	142.2	35.4	140	1.5	4	.4	4.9	.3
6	95	17.3	15	1.4	50.4	6.8	50	.2	5	.4	4.6	.5
7	93	16	13	2.1	41.6	22.5	40	1.13	7	.4	4.9	.3
8	100	15.2	12	2.2	58.2	14.24	60	1.2	0	0	4.8	.4

3.2 TESTING ROUTINES AND INCLUDED CRITERIA

To reiterate our testing procedures and practices, ONC criteria was grouped and organized in a manner that best reflected standard patient flow and standard clinical practices. To best achieve this, criteria was grouped into a single routine in certain cases. Below is how each routine was grouped with ONC criteria requires for a better understanding of data representation.

ROUTINE 1 - DEMOGRAPHICS

Criteria Included: 170.315(a)(5)

Tested all requirements of ONC criteria related to demographic data including new field requirements such as language, birth sex, race, ethnicity, sexual orientation, and gender identity.

ROUTINE 2 – ALLERGIES

Criteria Included: 170.315(a)(8)

Tested all requirements of ONC criteria related to allergies including the ability to add, modify, and review. This will later tie into the drug-allergy checking in section for e-prescribing (b.3).

ROUTINE 3 – MEDICATION LIST

Criteria Included: 170.315(a)(7), 170.315(a)(1)

Tested all requirements of ONC criteria related to CPOE Medications (a.1) and Medication List (a.7). These two criteria were natural companions in the flow of PracticeStudio X20 and worked best for usability testing in a seamless flow.

ROUTINE 4 – PROBLEMS LIST, LABORATORY, AND RADIOLOGY

Criteria Included: 170.315(a)(6), 170.315(a)(2), 170.315(a)(3)

Tested all requirements of ONC related to Problem List (a.6), CPOE Laboratory (a.2), and CPOE Radiology (a.3). PracticeStudio X20 provides a standard and natural workflow to combine these three elements into a single usage test. Separating these tests for individual usage testing would have obscured the resulting analytics data.

ROUTINE 5 – E-PRESCRIBING AND DRUG-DRUG, DRUG-ALLERGY INTERACTION CHECKING

Criteria Included: 170.315 (b)(3), 170.315(a)(4)

Tested all requirements of ONC related to e-Prescribing (b.3) and Drug-Drug, Drug-Allergy Interaction Checking (a.4). PracticeStudio X20 naturally presents all interactions as part of prescribing a medication, thus combining these into a single routine provided the most accurate resulting analytics data.

ROUTINE 6 – CLINICAL DECISION SUPPORT

Criteria Included: 170.315(a)(9)

Tested all requirements of ONC related to Clinical Decision Support (a.9). The support criteria triggered was fired due to previous data entered as part of a previous routine (Routine 4, a.6 and a.2).

ROUTINE 7 – IMPLANTABLE DEVICE

Criteria Included: 170.315(a)(14)

Tested all requirements of ONC related to Implantable Device List (a.14). In this routine the participant created, modified, and reviewed devices for a specific patient.

ROUTINE 8 – **CLINICAL INFORMATION RECONCILIATION**

Criteria Included: 170.315(b)(2)

Tested all requirements of ONC related to Clinical Information Reconciliation and Incorporation which included merging allergies, problems, and medications. Conversely, once an import and merge have been completed, a new interoperable CCDA was produced with merged results.

4. SUMMARY

4.1 AREAS FOR IMPROVEMENT

In the process of reviewing results, inspecting comments, and analyzing usability test data several changes were made where participants took the least optimal path for each task.

- Modified the drug-drug, drug-allergy interaction alert to be more prominent improving speed and reducing clicks.
- During one routine it was determined that one search acted different than others, making this one piece confusing. Changed to be consistent with other searches.
- Modified several UI templates to alter colors and prominence to better segregate data in several areas to improve readability resulting in better performance.

4.2 EFFECTIVENESS

After evaluation of test results and the interaction of test participants, it was determined due to the lack of errors and few task deviations that PracticeStudio X20 is an effective tool for clinicians and clinic staff to document patient information.

4.3 EFFICIENCY

Based on the task times and few deviations it was determined that the flow and layout of PracticeStudio X20 is efficient for end-users.

4.4 SATISFACTION

Based on the review forms contributed by each participant, PracticeStudio X20 was well received by each user and has a high satisfaction level from a usability point of view.