Common Industry Format: What It Is, What It Isn't and Why It's Useful

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9 out of 10 Doctors Prefer the Common Industry Format for Reporting Usability Testing Results

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Precedents and Acknowledgements

- **NIST – IUSR Initiative (1997)**
  - Mary Theofanos
  - Sharon Laskowski
    - CIF was developed by a group of 300+ software organizations led by NIST
    - CIF became an ANSI standard in December, 2001 (ANSI/NCITS 354-2001)
    - CIF approved as ISO standard ISO/IEC 25062:2006
- **NIST Customized CIF for EHR in 2010 (NISTIR 7742)**
  - Svetlana Lowry, NIST
  - Matt Quinn, NIST (AHRQ)
  - Mala Ramaiah, NIST
  - Melinda Jamil, User Centric

Common Industry Format for Usability Test Reports[1]

Version 2.01, June 6, 2001
Comments and questions about this format: iusr@nist.gov

5.3.2 Test Objectives

The following information shall be provided:

Approved Companywide Architecture and Standards Bulletin
Common Industry Format (CIF) for Usability Assessment - Technical Standard

Business Unit Variations	A&M	BCA	P W	S&C	SSG
	None	None	None	None	None
Component/Product	Common Industry Format (CIF) for Usability Test Reports				
Current Version	ANSI/NCITS 354-2001				
Manufacturer	National Institute for Standards & Technology (NIST)				
Standards Declaration	The *Common Industry Format for Usability Test Reports* (CIF) is the Boeing companywide standard that must be used by suppliers of				

5.4 Method

Sufficient information shall be provided to allow an independent tester to testing.

5.4.1 Participants

The following information shall be provided:

5.4.4 Usability Metrics

As defined in Section 4.1, usability is measured by three types of metrics: effectiveness, efficiency, and satisfaction.

The following information shall be provided:

a) Metrics for effectiveness.

b) Metrics for efficiency.

c) Metrics for satisfaction.

Effectiveness and efficiency results shall be reported, even when they are difficult to interpret within the specified context of use. In this case, the report shall specify why the supplier does not consider the metrics meaningful.

What is the Customized Common Industry Format (CIF)?

- **Purpose:** Provide greater visibility and consistency in *describing usability testing processes* and *reporting those results*

- '*Customized*', in this case, means an illustrative example template for electronic health records

  - Primarily, intended for 'summative' or validation usability testing

  - Extended for 'formative' or exploratory usability testing

NISTIR 7742

Customized Common Industry Format Template for Electronic Health Record Usability Testing

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What it is…

- Document outline for reporting usability testing methods and results

- By providing a standard outline we can demonstrate evidence of usability activity in a format that allows
  - independent evaluation of tasks in a single product and
  - comparison across multiple products.

- Reporting framework within current best practices

Guidance

Who uses the CIF?

- User Experience and Usability Professionals
  - Read and report using CIF

- Evaluators of application usability ← i.e., Providers
  - Make informed decisions concerning the release of software applications
  - Evaluate an application's usability test results

- Stakeholders in any organization
  - Many organizations have incorporated the CIF

- Some important points…

CIF Creates Basis for Dialog

- CIF provides a 'report card' for usability testing

- The CIF can create a productive dialog across developers, requirements, project managers, vendors, providers, and end users.

- Areas of discussion include:

  - Who are the users? User population definition

  - What is their context of use?

  - How to measure "success"
    - Functionality vs. clicks
    - Learning: 'Walk up and use' vs. one trial vs. training
    - What is the role of satisfaction?

CIF Provides Background and Context for Reporting…

- Measures of effectiveness and efficiency, and recommends including subjective satisfaction data

  - Measures for efficiency may include:
    - 'Too many clicks'
    - Task time
    - Completion rate efficiency
    - Number of references to the manual

  - Measures for effectiveness may include:
    - Completion Rate
    - Number of Errors

  - Measures of satisfaction may include:
    - System Usability Scale (or SUS)

Illustrative Example

Conducting a Test and Reporting in CIF

- Identify the key user groups
- Identify critical and frequent tasks
- Define measurable usability goals
- Conduct usability testing
- Report using CIF to ensure goals have been met

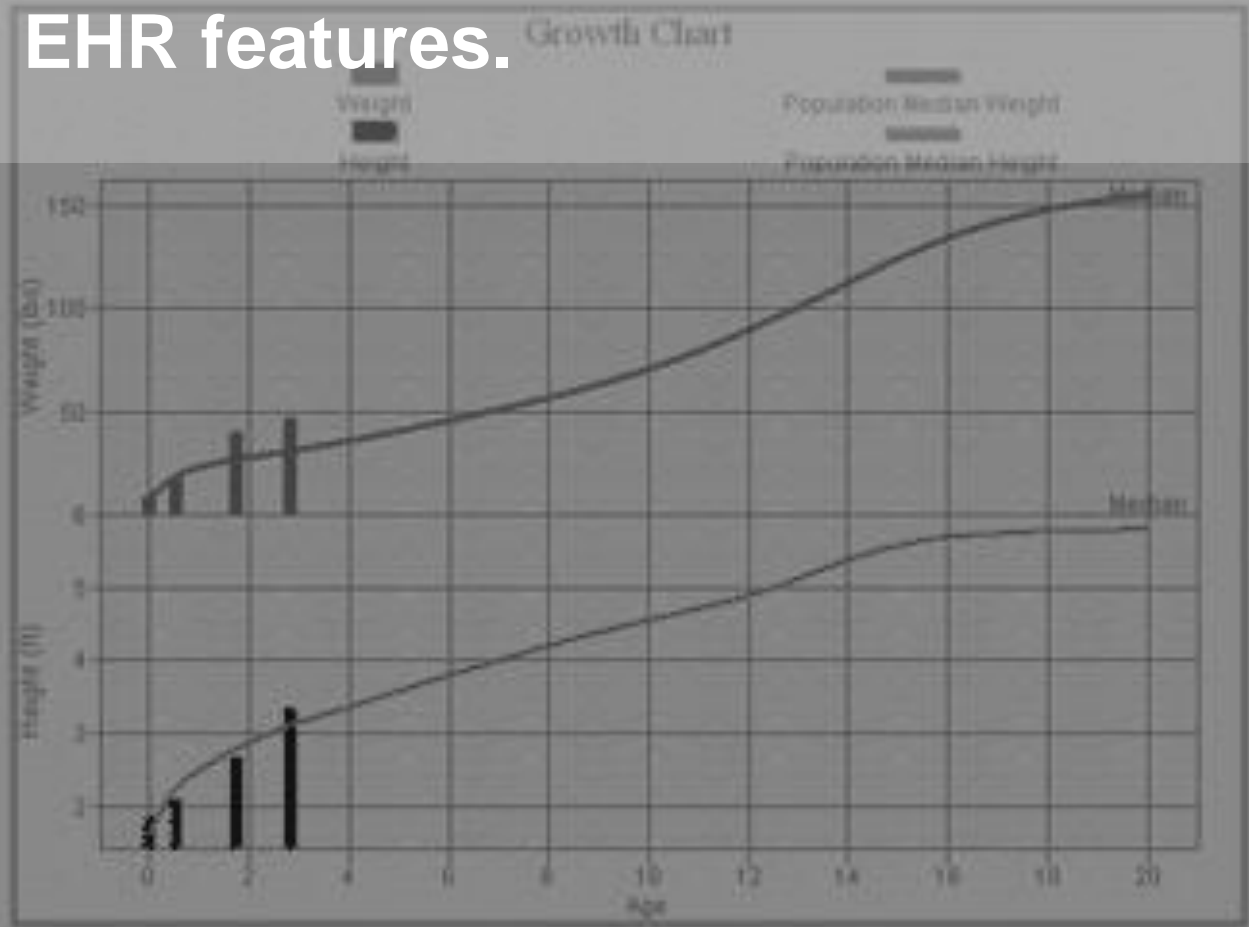**Identify the key user groups**

- **Users who will be doing the tasks**
  - Physician
  - Nurses
  - Administrative staff

Measuring Usability

User Groups: Physicians | Nurses | Administrative

Task	Measuring Usability Relative to Goals		
	Effectiveness Unassisted task completion rate of:	**Efficiency** Maximum user time	**Satisfaction** Post-task ratings on 5-point usability scale:
Task A			
Task B			
Task C			

- **Identify critical and frequent tasks**
- **Critical tasks and frequent tasks will help prioritize EHR features.**

Measuring usability

User Groups: Physicians | Nurses | Administrative

Task	Measuring Usability Relative to Goals		
	Effectiveness Unassisted task	**Efficiency** Maximum user time	**Satisfaction** Post-task ratings on 1-5
Create an appointment for a new patient			
Check patient insur-ance eligibility			
Enter patient vitals			

Benchmark current task efficiency

- **Benchmark current critical and frequent tasks in order to:**
  - Show that the EHR system produces better task efficiency than paper methods
  - Show improved efficiency over an existing electronic system
  - Project ROI for a given period

- **Benchmark by:**
  - Directly measure in current environment
  - Expert estimation

Measuring usability

User Groups: Physicians   **Nurses**   Administrative

Task	Measuring Usability Relative to Goals		
	Effectiveness Unassisted task	**Efficiency** Maximum user time	**Satisfaction** Post-task ratings on 1-5
Create an appointment for a new patient	**Goal:** 100%	**Goal:** 2 mins	**Goal:** 4.00
Check patient insur-ance eligibility	**Goal:** 100%	**Goal:** 1 min	**Goal:** 4.00
Enter patient vitals	**Goal:** 100%	**Goal:** 30 secs	**Goal:** 4.00 avg

Measure usability

- **Test representative tasks with representative users**

- **Measuring usability can be obtained via:**
    - Usability testing
    - Observation
    - Questionnaires
    - Log files

Measuring usability

User Groups: Physicians | **Nurses** | Administrative

Task	Measuring Usability Relative to Goals		
	Effectiveness Unassisted task	**Efficiency** Maximum user time	**Satisfaction** Post-task ratings 1-5
Create an appointment for a new patient	**Goal:** 100% **Actual** 　EHR A: 90% 　EHR B: 100%	**Goal:** 2 mins **Actual** 　EHR A: 4 mins 　EHR B: 1.5 mins	**Goal:** 4.00 **Actual** 　EHR A: 3.00 　EHR B: 4.50
Check patient insur-ance eligibility	**Goal:** 100% **Actual** 　EHR A: 95% 　EHR B: 100%	**Goal:** 1 min **Actual** 　EHR A: 2.5 mins 　EHR B: 1 min	**Goal:** 4.00 **Actual** 　EHR A: 4.00 　EHR B: 5.00
Enter patient vitals	**Goal:** 100% **Actual** 　EHR A: 90% 　EHR B: 100%	**Goal:** 30 secs **Estimated** 　EHR A: 45 secs 　EHR B: 30 secs	**Goal:** 4.00 **Estimated** 　EHR A: 3.25 　EHR B: 4.75

Key Elements

- **Executive Summary**
- **Introduction**
- **Method**
  - Participants
  - Study Design
  - Tasks
  - Procedure
  - Test Location
  - Test Environment
  - Test Forms And Tools
  - Participant Instructions
  - Usability Metrics
- **Results**
  - Data Analysis And Reporting
  - Discussion Of The Findings

- **Appendicies**
  - Format for Document
  - Sample Recruiting Screener
  - Participant Demographics
  - Non-disclosure Agreement And Informed Consent Form
  - Example Moderator's Guide
  - System Usability Scale Questionnaire
  - Incentive Receipt And Acknowledgment Form

Measure / Task	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings 5=Easy
	#	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD)	Mean (SD)
1.[Find item on patient summary screen]							
2.[Use patient chart to find lab results]							
3.[Check vital signs]							

In Closing

- The **highest cost for any large-scale system is human capital**

- **Why is so much time/effort evaluating security, privacy, integration, functionality, etc.?** Because these things can be easily measured, reported, understood, and compared.

- If human capital costs are so high and usability is such an important issue, **why don't we spend as much time/effort understanding human interface…**

In Closing

- Because, it is perceived, there is **no easy way to understand the impact of user performance it is often forgotten or ignored**

- **CIF is a starting point…**

- If you are a **provider selecting among several vendors you should be asking those providers for usability metrics** around variables important to you

Thank You

NISTIR 7742 Can be obtained at:
http://www.nist.gov/manuscript-publication-search.cfm?pub_id=907312

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