

# CONFIDENCE

IN THE OUTCOMES THAT MATTER MOST TO YOU



**Human Factors Engineering in Software Interface Design. A Vendor's Perspective.**

**Cristina Negrut**  
July, 2017



Romania  
Dracula's Castle

## Agenda

1. Learn to Identify Usability Problems
2. Root Cause Analysis + Solutions
3. Conclusion

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

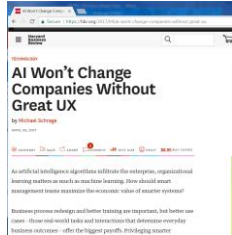
---

---

---

---

Visual Design



User eXperience Design

User experience encompasses all aspects of the end-user's interaction with the company, its services, and its products.

- DON NORMAN

User eXperience Design



Visual Design

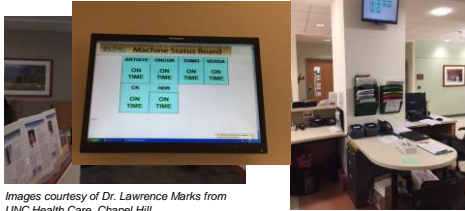
UX

Seven horizontal lines for writing notes.

Seven horizontal lines for writing notes.

Seven horizontal lines for writing notes.

### UX Design Examples



Images courtesy of Dr. Lawrence Marks from UNC Health Care, Chapel Hill

### Usability Defined

Usability is a quality attribute that evaluates how easy user interface are to use.



“To **complicate** is **simple**. In order to complicate, you just need to add something...



- BRUNO MUNARI

*Complicare è facile, semplificare è difficile.*

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

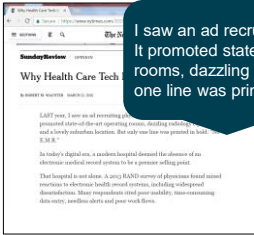
---

---

---

---

---



**No E.M.R.**

Usability & Healthcare



1. Learn to Identify Usability Problems

---

---

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

---

---



13



How steep is your learning curve?

14

Performance



Loading...

15

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

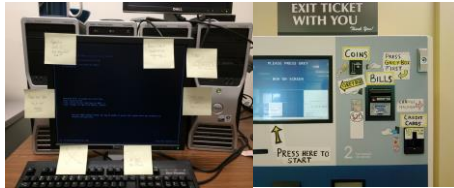
---

---

---

---

Memorability



 A screenshot of a Windows error log window. It displays a list of error messages with details such as the error code, source, and description. Two callout boxes are overlaid on the log:
 

- One box points to an error with the message: "An error has occurred while trying to display an error message." This is a classic Windows error message that often occurs when the system fails to load a resource needed for the error dialog itself.
- Another box points to an error with the message: "Operation completed successfully. There must be something wrong." This is a humorous error message that appears when a system operation completes without any reported issues.

**ERROR AND MESSAGE DIALOGS**  
**Content Usability Guidelines**

Christina Hagnot (1), Nisha Aggarwala (2), Julie Cliff (3),  
 Nikita Handberg (4), Denise Marks (5), Arthur Dick (6),  
 Jim Schewe (7), AM Souch (8)

**Content Subcommittee,**  
**Error Messages Working Group,**  
**Radiation Oncology Safety Stakeholders Initiative**

© 2016 by the American Society of Radiation Oncology (ASRO). All rights reserved. This document is intended for use by members of the ASRO community.

**Foreword to the Radiation Oncology Safety Stakeholders Initiative**

The following document has been developed by the Error Messages Working Group of the Radiation Oncology Safety Stakeholders Initiative (RO-SSI). The goal of the Stakeholders Initiative is to improve the safety of radiation therapy. The RO-SSI team is the product of the collaboration of our knowledge, experience, and expertise in the fields of engineering, electronics, medical physics, biomedical and software engineers, clinical oncologists, experts, physicians, and therapy product manufacturers. The guidelines and principles will be used as the starting point for future development, validation, and implementation of radiation therapy products, including physician and physical process as well as non-physician operations, performance, and usability.

Radiation Oncology Safety Stakeholder's Initiative (RO-SSI).

---

---

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

---

---

### Technical Jargon



19

---

---

---

---

---

---

---

---

---

---

### Ambiguous Language



You need to **deselect** the previous selection to **select** a new dataset.

20

---

---

---

---

---

---

---

---

---

---

### Not Actionable

- Users should be presented with a clear solution
- Don't simply recommend contacting technical support.



21

---

---

---

---

---

---

---

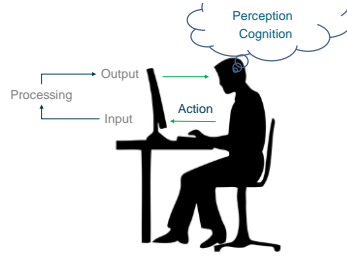
---

---

---

ACCURAY

1. Learn to Identify Usability Problems
2. Root Cause Analysis + Solutions



23

Capability	Humans	Machines
Endurance & Accuracy	Fatigues easily	Excel
Computing & Ability to perform simultaneous operations	Slow and error-prone	Excel
Intuition, Reason inductively	Excel	Not yet

IEC Technical Report 63366-2:2016 Medical devices- Part 2: Guidance on the application of usability engineering to medical devices.

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

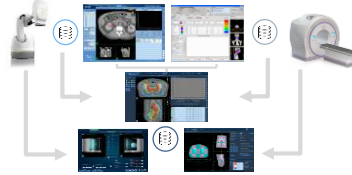
---

---



Capability	Humans	Machines
Memory	Limited short term working memory.  Large long term memory, but unreliable and slow access.	Excellent for repetitive work.  Unaffected by emotions and motivational needs.
Attention	Easily shifted...	

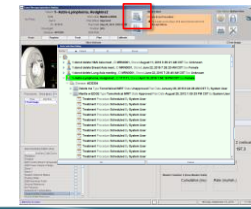
### Consistency & Integration



### Usability Improvements



BEFORE



- All workflows started from the Patient List Selector, including calibration procedures.

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

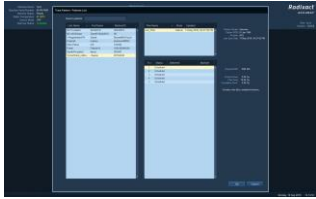
---

---

### Usability Improvements



AFTER



- Introduced Dashboard to optimize workflows based on critical tasks and user roles

---

---

---

---

---

---

---

---

### Examples (cont.)



- Going from single, static display layouts to highly configurable display options to meet diverse user preferences.

BEFORE



AFTER




---

---

---

---

---

---

---

---

1. Learn to Identify Usability Problems
2. Root Cause Analysis + Solutions
3. Conclusion

---

---

---

---

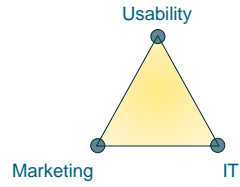
---

---

---

---

### Balancing Needs



---

---

---

---

---

---

---

---

### Balancing Needs



- Research & Development
- Manufacturing
- Regulatory
- Sales
- Marketing
- Finance
- Human Resources
- Applications
- Installation Support and Service
- IT
- Training
- Medical Affairs
- Patient Access
- Legal

---

---

---

---

---

---

---

---

“ If you think you are too small to be effective you have never been in a bed with a mosquito. ”

- BETTE REESE

---

---

---

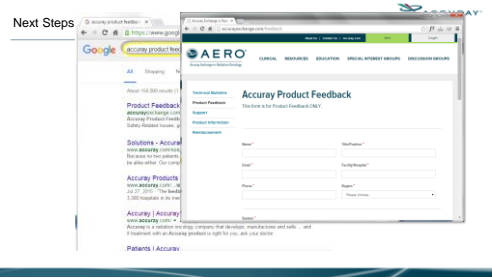
---

---

---

---

---



“ Even if you are on the **right lane** you will be run over if you just sit there.

- WILL ROGERS

**CONFIDENCE**  
IN THE OUTCOMES THAT MATTER MOST TO YOU

---

Thank You

Precise, innovative tumor treatments™

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---