Observation Research
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Acknowledgements

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Observation research is used to learn about users, their goals, and their environments in the user’s natural setting.

Also known as ethnographic research, naturalistic observation, contextual observation, field observation, field research, observation and interview.
Learn about users, their goals, and their environments in the user’s natural setting.

Identify user’s unmet needs i.e., opportunities.

Identify workarounds, and more important, the causes of the workarounds.

Implement solutions to avoid workarounds and/or incorporate good workarounds into workflow/technology processes.
Best Timing in the Software Development Lifecycle

- Takes place early in the process long before any screens are built and likely before features and functions are identified.
- No. Can’t observe interactions that don’t exist. Must observe early, middle, constant, always.
Exercise:

Hands, Heels, Ceiling
Example 1: A seemingly straightforward measure in an EHR

125 mmHg
SYSTOLIC

75 mmHg
DIASTOLIC
There are 40 legitimate ways of recording bp in standard EHRs.
More Legit Blood Pressure Reporting Entries

- Seated, Systolic pre-Injection
  
- Right Foot
  - w/o meds
  
- After exercise
  
- Meds too low

- Standing... etc, etc
- 4 pages later
  - 75
  - 125

- Non-compliant

- Improved

18 more
WORKAROUNDS TO BARCODE MEDICATION ADMINISTRATION SYSTEMS: THEIR OCCURRENCES, CAUSES, AND THREATS TO PATIENT SAFETY

Koppel, Wetterneck, Telles, Karsh (JAMIA)
31 Causes of workarounds e.g.,

Unreadable medication–barcodes (crinkled, smudged, torn, missing, covered by another label)

malfunctioning scanners

Don’t forget to scan label!
Causes:

- unreadable or missing patient-ID-wristbands (chewed, soaked, wrong, missing)
  - Elderly
  - Children
  - Moving (unit or floor or nursing home)
- And: *Covered and *Contact isolation
- New: *Intentional (not in paper)
Causes

- Uncertain wireless connectivity

- Dumb programming
  \[2 \times 10 = 20?\]
Many other causes...
Now, The fun stuff:
15 identified Workarounds

Barcodes affixed to:
- RN clipboard
- Scanner itself
- In nurses’ pockets,
- Belt-rings,
- Worn as bangles
More places we found extra copies of pt. barcodes (1st workaround, continued)

- Nurses’ desk
- Medication cart
- Supply room
- Med dispensing machine
- Doorjamb
- Baby crib
- Other places...
The ED e–Whiteboard

Robert Wears’ example of new electronic ED whiteboard: Displayed all: pt name, team, stage of movement through ED, pending data, additional information, etc.

But, new e–whiteboard’s computer console inconveniently located. Staff could not all look at e–whiteboard and make immediate changes or notes. Loss of flexibility: Staff can’t physically interacted with board, i.e., Move names, add notes, participate.
ED e–Whiteboard (2)

- Wears’ photo: The ED staff all leaning against the new e–whiteboard looking at the old whiteboard
- New whiteboard (a head board?)
<table>
<thead>
<tr>
<th>Name</th>
<th>Bay</th>
<th>Team</th>
<th>DX</th>
<th>Tests</th>
<th>Admit?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Waiting for CT Scan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mom looking for parking space</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Where’s Harry with that lab report?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Call his dad xxxxxxxx</td>
</tr>
</tbody>
</table>
Also, the e-whiteboard couldn’t put up a little magnetic teddy bear to denote infant patients
Workarounds

No Comment
More workarounds
Workarounds in tightly coupled systems: *Outsmarting smart pumps and physicians*

The 85% solution
Application Analysis (NISTIR 7804)

- Application Analysis:
  - description of the application’s basic functions
  - analysis of the user characteristics
  - task analysis describing the interactions between users and the application
  - analysis of the anticipated environment of use related to interactions with the application
  - identification of critical user tasks related to aspects of patient safety
Details for Planning & Executing the Method

- Determine research questions/issues that need to be addressed
- Identify who and where to observe
- Create Observation Guide
- Conduct observations
- Compile data
- Draw Conclusions and Report to team
Exercise

- Identify issue to address.
- Make observations in public space regarding identified issue.
- Take notes on observations.
Impact of the Observation Research Methods

- Share learning from observations.
- Share sample outcomes from previous observation studies e.g., unmet needs, workflow.
So... The secret to identifying usability (and many interoperability) issues

Look
Finding and Fixing

Ask and Listen
Finding and Fixing

Question self-reports
Workflow Analysis
Why Document Workflow?

To Avoid This
Goals of Workflow Analysis

- Measure workflow efficiency as part of a process improvement strategy
- Evaluate productivity, improve utilization, and reduce human effort
- Measure return on investment of “newly” implemented health IT product
- Inform the design of “next generation” health IT product
How is Workflow Documented?

Analysis of the Provider Visit

Check-In

- What type of information is gathered by the front desk at check-in?
  - Verification of name and address
  - Verification of insurance
  - Copy of insurance card
  - HIPAA forms
  - Other:

- If you are using a EHR, what information must be entered or checked at each visit?
  - Address, insurance information

- List any information that goes forward with the chart after check-in.
  - Superbill
  - Extra labels
  - Patient H/ROS Forms if new patient
  - Other:

- Do you collect co-pays at check-in?  Yes ☐  No ☐

How does the clinical staff know that the patient has arrived?

- Chart is in the rack
- If patients back up in waiting room, front desk staff go find the MA

Rooming the Patient

- Who takes the patient to the exam room?  MA ☐  MD ☐  Nurse ☐  Other:

- Is the chart reviewed for outstanding tasks by the rooming staff?  Yes ☐  No ☐

- How is this information communicated to the provider for action?
  - MA creates list on sticky-posted on outside of chart

- What information is gathered before the provider sees the patient?
  - Reason for visit
  - Vital signs
  - Medications reviewed
  - Allergies reviewed
  - Other:

- Are any tests done before the provider sees the patient?  Yes ☐  No ☐
  - If yes, please list:
    - Glucose, A1c for diabetes

- Is the information gathered written on a specific type of form?  Yes ☐  No ☐
  - If yes, is the form specific to a type of visit?  Yes ☐  No ☐

How does the provider know that the patient is ready to be seen?

- Checklist on the outside of the door

Current State Process Flowsheet: Provider Visit

1. Patient appears to the spot
2. Patient signs in: collect demographics, verify insurance, billing information verified
3. Eligibility checked by Internet or phone call
4. Co-pay?  Yes ☐  No ☐
5. Collect the co-pay
6. MA documents findings in the paper chart
7. MA checks the vital signs, asks about the reason for the visit, verifies medications and allergies
8. MA takes the record and room the patient
9. Patient returns to waiting room: front desk notifies the MA verbally that the patient is here and puts the medical record, superbill, and labels in a tray
10. Provider sees patient: reviews H/ROS documentation; writes needed prescriptions, updates medications, writes requisitions for tests, lists notes on the superbill
11. Provider hands the patient scripts and requisitions and superbill
12. Does patient stop at the front desk as requested?  Yes ☐  No ☐
13. END Patient and subsequent data sent to the system
14. Patient leaves
15. Provider still has incomplete documentation for the visit: not usually done until the end of the day
16. Is visit complete?  Yes ☐  No ☐
17. Send record and superbill to billing
18. Provider completes documentation
What is that Funny Notation?

- Basic Flowchart
- Standards: BPMN (Object Management Group)
When should I Document Workflow?

- When you are evaluating the impact of health information technology on your organization
- When you are looking at overall process improvement in your organization
- When you are looking for the cause of workflow “bottlenecks”
Planning & Executing Workflow Analysis

✓ Identify areas of interest that are related to or contribute to variation in the process to be observed
  o e.g., different roles, physical location, environmental, cognitive, social, organization characteristics

✓ Identify key tasks performed in the current workflow

✓ Identify tasks and task categories to observe and time during data collection
Planning & Executing Workflow Analysis

- Determine the number of observations that are needed to account for variation in the process
- Identify who and where observations will take place
- Select data entry tool
Planning & Executing Workflow Analysis

- Conduct Observer Training/Pilot Testing
- Perform Observation and Timing activities
- Complete Data Analysis
Planning & Executing Workflow Analysis

For Software Pre-implementation/Post-implementation Study:

- Implement new/changed system
- Allow time for familiarization
- Repeat Observation and Timing
- Complete Data Analysis
Acknowledgements:

HRSA Health IT Adoption Toolbox

Guide to Remediating the Unintended Consequences of EHRs’ Implementation and Use. Now on the ONC website:

http://www.healthit.gov/ucguide
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