An Ethnographic Approach to Studying Technology Use: Evaluating a Diagnostic Kiosk at Four California Emergency Departments

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“Variables-centred (experimental and quasi-experimental) approaches and ethnographic approaches to the study of information and communication technologies in healthcare have developed as distinct research traditions with remarkably little dialogue between them.”

- Greenhalgh & Swinglehurst, 2011:
Outline

- The kiosk
- Ethnographic methods
- Evaluation results
- Theory
- Conclusion
  - rethinking design, implementation & evaluation of technology
Improving efficiency in overcrowded acute care settings

- more people use emergency departments for non-life threatening medical problems
- 75% of urban EDs are at or above capacity
- increasing wait times, especially for most acute conditions
The UTI diagnostic kiosk

UCSF Urgent Care Clinic
Rapid diagnosis & treatment of UTIs
Women aged 18-64 with history of UTI
Touchscreen and audio
Spanish and English
40-50% eligibility
high patient & clinician satisfaction
2008-2011: Implementing kiosks at four emergency departments

- implementation/study plan

- staff resistance

- few patients eligible for kiosk-expedited care

- UTI program never adopted at one site
- Kiosk eventually abandoned at two sites
- Retained at one site (home institution)
What happened?
Research team perspective: human failure

- Focus on triage nurses:
  - ineffective site champions;
    - “failure of leadership on the nursing side”
  - “culture of independence”
Ethnography

- Study of people in natural settings
- Immersion
- Context, relationships, processes
Ethnographic methods

- **Focus**
  - perceptions
  - practices
  - knowledge

- **Activities**
  - direct or participation observation in real-life settings
  - interviews and focus groups
  - analysis of texts, video ethnography

- **Result**
  - “thick” description
The evaluation

- Four hospital EDs:
  - Two county, two public university-affiliated
  - Bay Area and Central Valley (agricultural region of CA)

- 35 interviews with ED staff, site research staff, and research/design team

- 20 hours of ED observations

- Archival analysis of funding proposals; research team meeting notes; study-related manuscripts and publications
RESULTS:

The kiosks’ journey through four emergency departments...
Institutional approval: “Lots and lots of politics”

- Urban safety net hospital
- Hospital vs. kiosk model of triage
- Politics of research:
  - favoritism
  - territory
- UTI program denied approval
Locating the kiosk

- **Spatial**
  - proximity to registration and triage
  - easy access and privacy for patients

- **Social**
  - Medical tool or a patient device?
  - Socioeconomically & culturally appropriate?

- **Material**
  - hardware and software breakdowns
  - unexpected uses

- **Institutional**
  - ongoing changes to triage systems
Rendering patients (in)eligible: “It’s like a winning lottery ticket”

- “The kiosk is supposed to be easy and reduce wait time, like at an airport, but everyone we sent to the kiosk was ineligible!” (nurse)

- Kiosk as detour in otherwise complex, collaborative, time and space-sensitive process in which mistakes can have dire consequences.
Different patient populations

Why were eligibility rates so different between urgent care clinic and EDs?

- More severe reported symptoms: “Our patients are really sick…”

- Patient populations
  - health status
  - familiarity with/perception of technology

Different contexts → different kiosk
Triaging the kiosk

- “UTIs are an urgent, not an emergent, problem.” (nurse)

- “When it’s slow in the ED, I think that the nurse wants to just room the patient. They don’t want to send them back out into the waiting room [to the kiosk].” (site research coordinator)
Kiosk as virtual clinician: “That’s why we’ll always have jobs”

- low rates of eligibility for kiosk-expedited care = kiosk’s diagnostic inferiority

- diagnosis is clinical and social practice

- Legal/regulatory context of emergency medicine
Revised implementation strategies

1. Behavior change strategies to increase nurses’ “buy in”

2. New modules: chlamydia screening & reproductive health

3. “Expanded criteria” algorithm
Engaging theory

Traditional system design

- technologies have stable, *a priori* properties and capabilities that determine their use and impact
- assumed algorithmic connection between plan (kiosk program) and action (referral/expedited service)

Actor-Network Theory

- Rejects technological determinism, i.e. "technology" and "human work" are *not* conceived as separate categories with fixed properties.
- Characteristics of humans and technologies emerge through their interaction
Success or failure: contested types of evidence

On-the-ground evidence:

- “It would be better if you could say that it will expedite a patient’s care, but this just isn’t true.” (nurse)

- “The juice wasn’t worth the squeeze, as they say.” (ED physician)

Research evidence:

- “I’d have to say that it was a research success, because we basically got out of it exactly what was planned. We made a grant. We said this is what we were going to do. We did it. We got the data. It’s published.” (researcher)

- published data: women who received kiosk-expedited care spent less time (40-57 minutes, on average) in the ED than women who received standard care
Conclusion

- Technology as “rational”, “neutral” tool

  or...

- Artifacts/systems with inscribed understandings of and goals for medical work, but whose actual characteristics emerge in specific social contexts, without fixed, predictable course.
Recommendations for Future Health IT Projects

- Identify “users”/engage in participatory design

- Understand technology implementation as process of institutional and social change

- Negotiate success/failure criteria with all stakeholders

- Rethink implementation strategy & evaluation design; incorporate ethnographic research at all stages
Thank you!