MD:Notes

designing an information service for public hospitals

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Purpose of Project

- Understand how public hospitals are making the transition from paper records to electronic medical records
- Design an information system that meets their needs
- Specific focus on how 2 Bay Area hospitals work with progress notes

Public Hospital Waiting Room

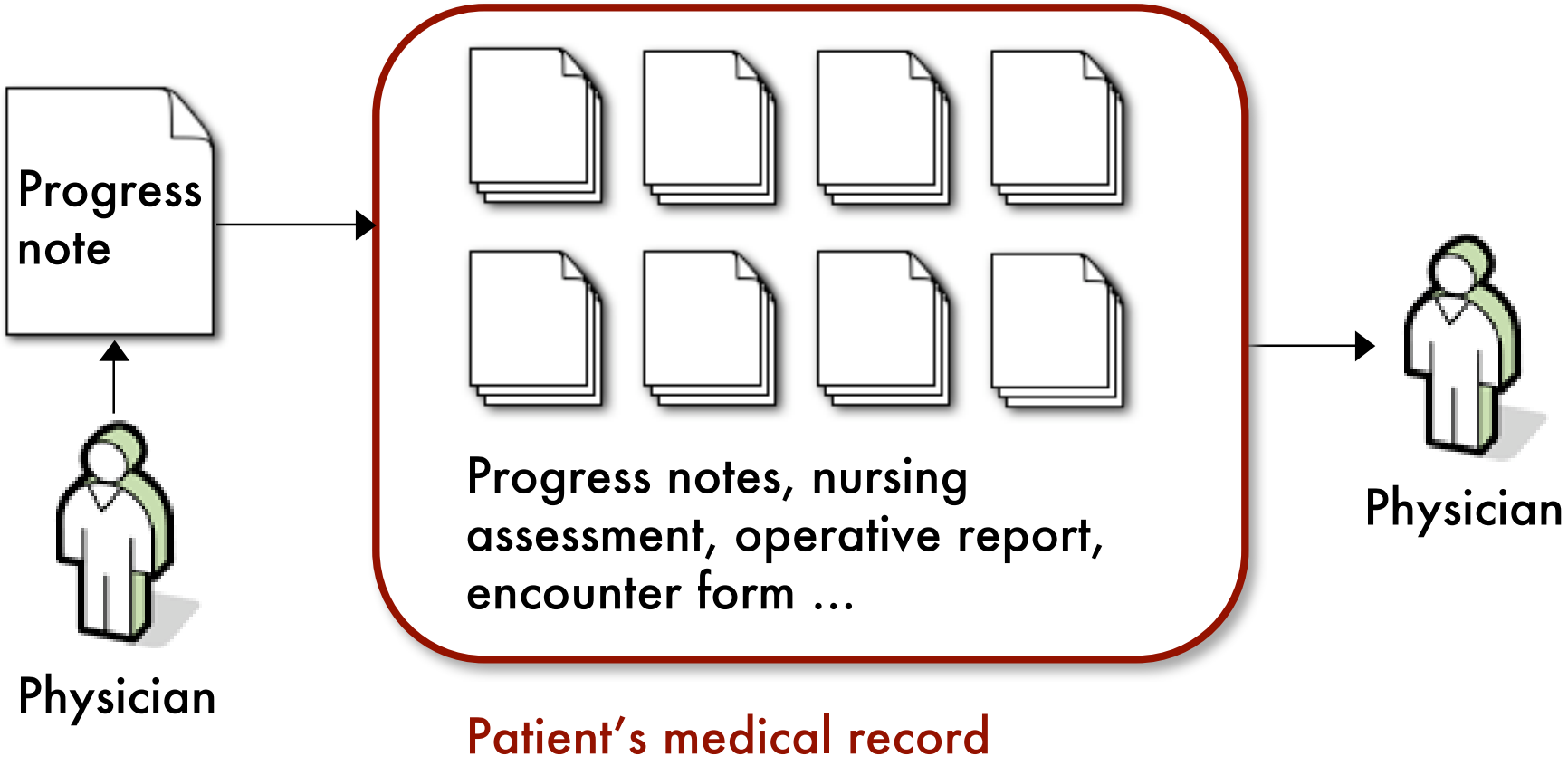
Photo from Flickr user Andy and Elayne

Our Methods

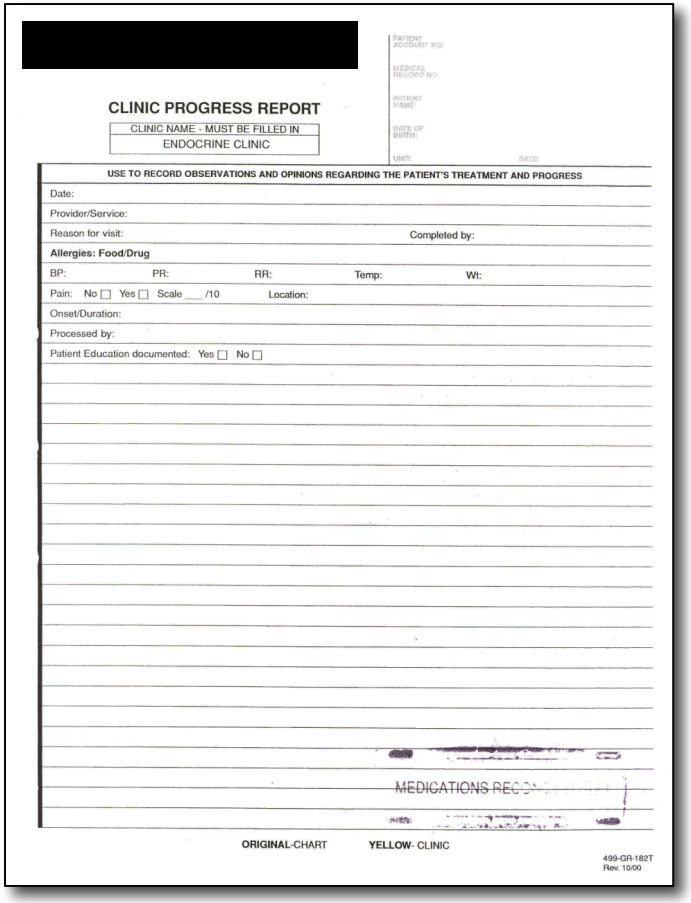
- Contextual inquiry - interviewed 14 people from 2 public hospitals
- Sequence diagrams
- Affinity notes
- Paper prototype with usability test
- Functional prototype

About Progress Notes

Notes written by a physician to describe a patient's condition during a visit, assessment and plan for treatment



Handwritten vs Electronic Progress Notes



CLINIC PROGRESS REPORT

CLINIC NAME - MUST BE FILLED IN
ENDOCRINE CLINIC

USE TO RECORD OBSERVATIONS AND OPINIONS REGARDING THE PATIENT'S TREATMENT AND PROGRESS

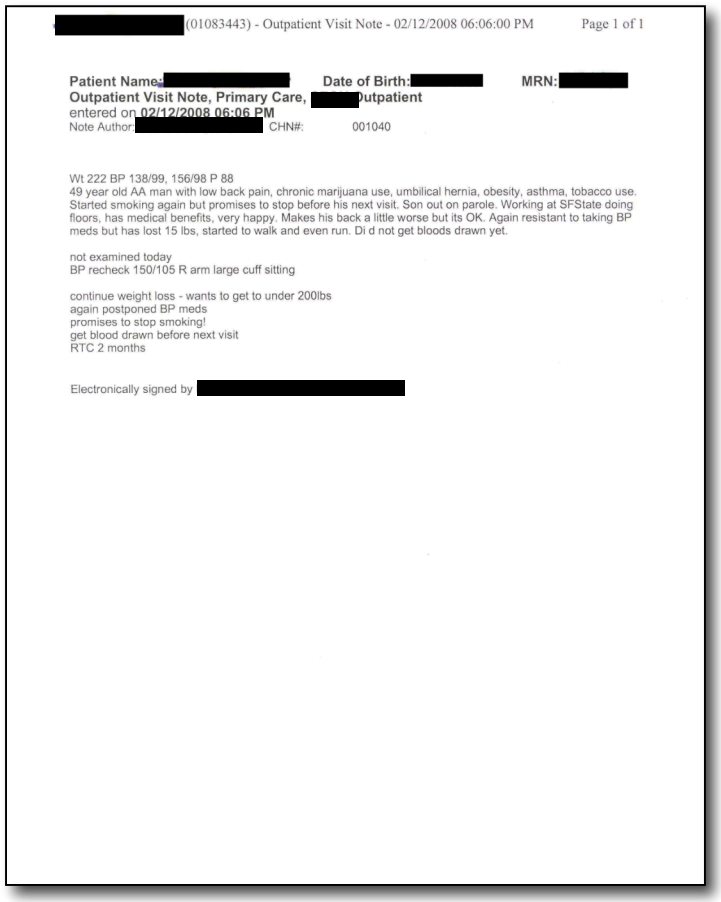
Date:
Provider/Service:
Reason for visit: Completed by:
Allergies: Food/Drug
BP: PR: RR: Temp: Wt:
Pain: No ☐ Yes ☐ Scale ___ /10 Location:
Onset/Duration:
Processed by:
Patient Education documented: Yes ☐ No ☐

MEDICATIONS REC

ORIGINAL-CHART **YELLOW**- CLINIC

499-GR-182T
Rev. 10/00

Handwritten



[redacted] (01083443) - Outpatient Visit Note - 02/12/2008 06:06:00 PM Page 1 of 1

Patient Name: [redacted] **Date of Birth:** [redacted] **MRN:** [redacted]
Outpatient Visit Note, Primary Care, [redacted] **Outpatient**
entered on **02/12/2008 06:06 PM**
Note Author: [redacted] CHN#: 001040

Wt 222 BP 138/99, 156/98 P 88
49 year old AA man with low back pain, chronic marijuana use, umbilical hernia, obesity, asthma, tobacco use. Started smoking again but promises to stop before his next visit. Son out on parole. Working at SFState doing floors, has medical benefits, very happy. Makes his back a little worse but its OK. Again resistant to taking BP meds but has lost 15 lbs, started to walk and even run. Di d not get bloods drawn yet.

not examined today
BP recheck 150/105 R arm large cuff sitting

continue weight loss - wants to get to under 200lbs
again postponed BP meds
promises to stop smoking!
get blood drawn before next visit
RTC 2 months

Electronically signed by [redacted]

Electronic note - dictation, typing, speech recognition

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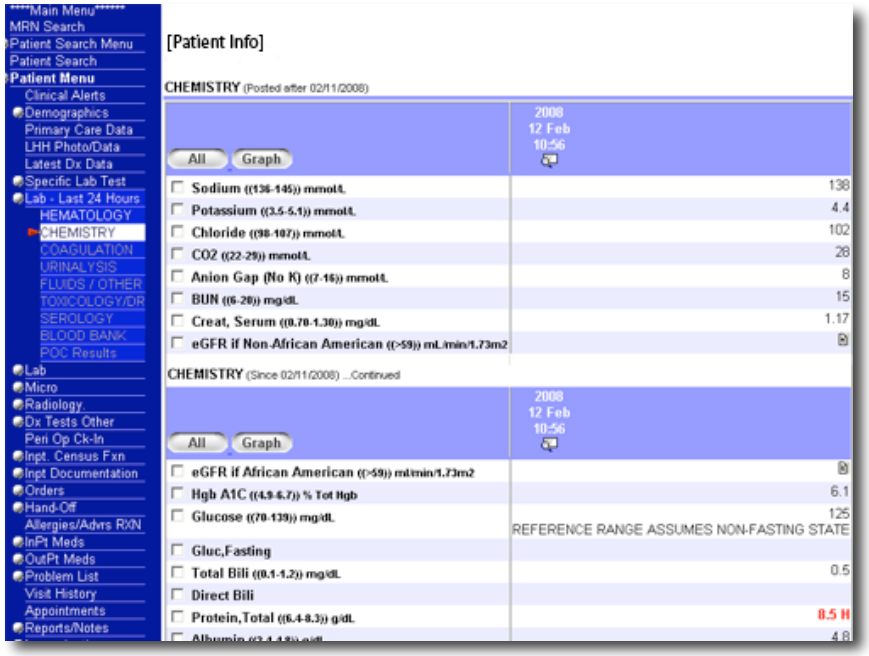
Paper Chart vs. Electronic Record

http://flickr.com/photos/annzas/2151972335/



- Handwritten, printed progress notes
- Orders
- Photos …

- Electronic progress notes
- Lab results, reports
- X-Ray reports …

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Missing Charts

- 10% to 80% charts are missing - “This is really devastating”
- Physicians and nurses try to locate chart
- Physician questions patient to reconstruct history
- Physician orders new tests

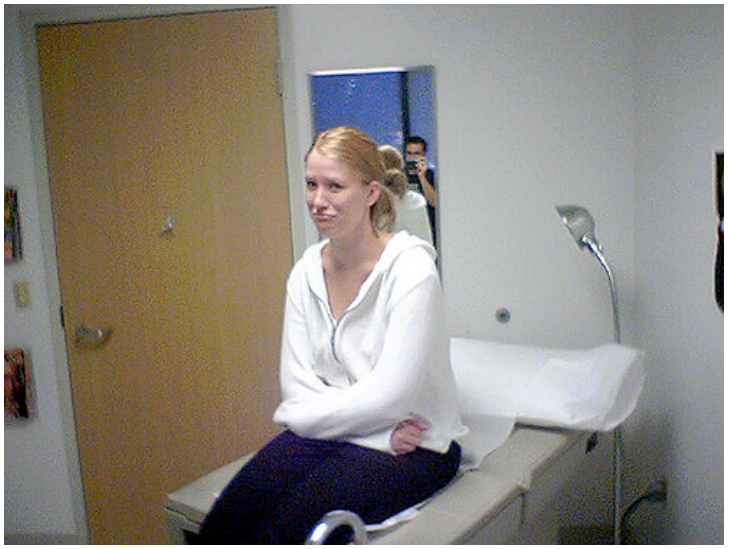


Photo from Flickr user kris247

Handwriting vs Dictating Notes

Write note by hand

Intent: Create note

Trigger: Patient visit concluded

1. In exam room, get progress note form in notebook
2. Look in paperwork for patient MRN
3. Fill out form with physician ID, patient MRN, note category
4. Write summary of visit
5. Put note in chart and give to nurse

Dictate note

Intent: Create note

Trigger: Patient visit concluded

1. Go to dictation station
2. Look at schedule
3. Find patient MRN
4. Refer to directions on using system
5. Call system on landline, listen to instructions
6. Enter required info using touchtone phone - physician ID, patient MRN, note category ID, etc.
7. Repeat note category via speech
8. Speak summary of visit
9. Repeat physician ID, patient MRN via speech
10. Hang up, wait for transcription

Pain Points in Existing Tools

- Writing by hand - hard to retrieve
- Dictation (landline)
  - In-patient settings
  - Some physicians dislike dictating
  - Touch-tone phones
  - Time lag for transcription
- Typing
  - Some physicians can’t type
  - In-patient settings

Key Takeaways for Design

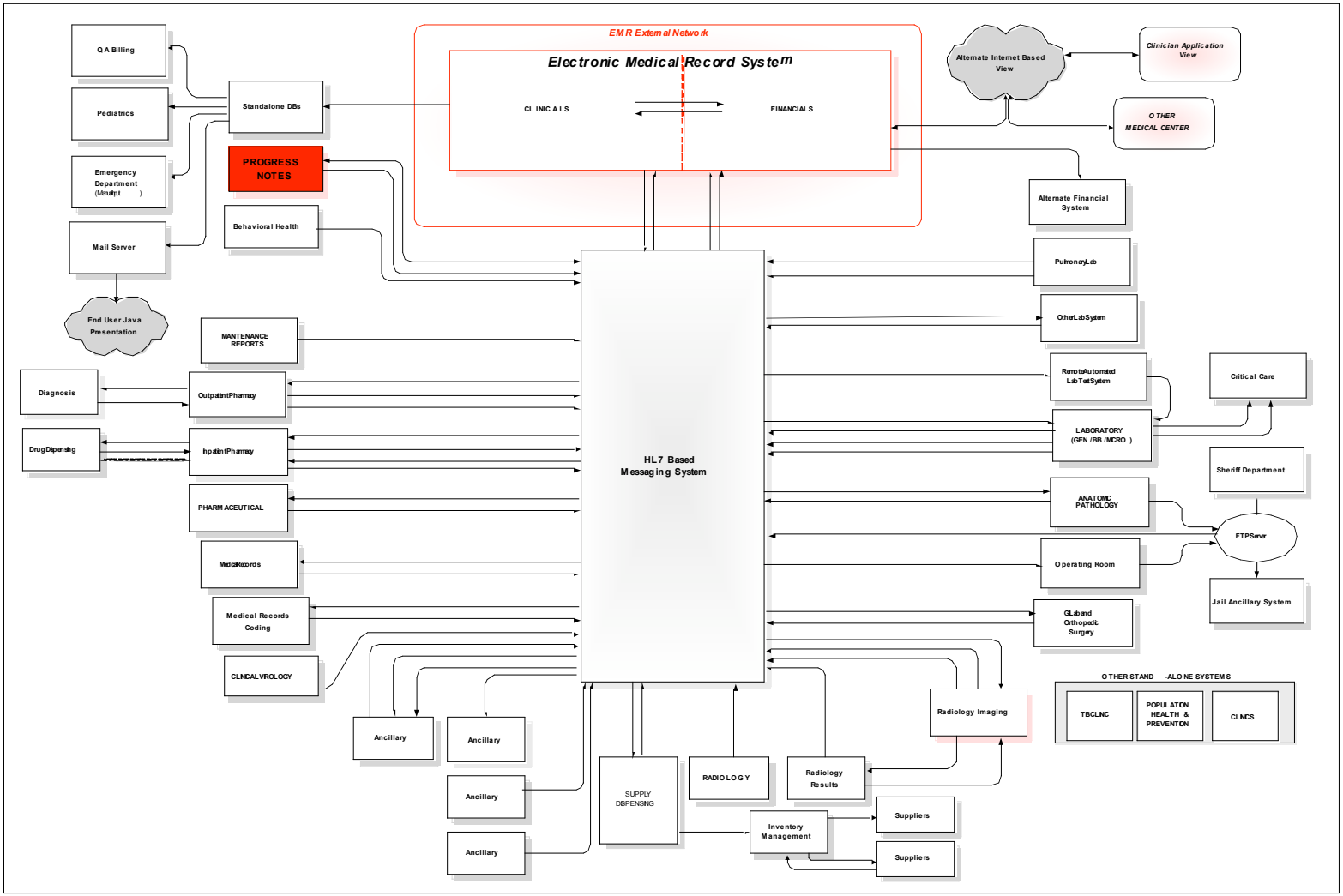
- One application
  - Create & find notes
  - Multiple methods - speaking, typing
  - Multiple devices
- Based on physician's schedule
- Speech recognition replaces dictation
- Compatible with existing systems, ROI

Prototype Design and Usability Test

Results:

- Some users had no major problems
- Novice user did not understand the prototype

Complex system environment



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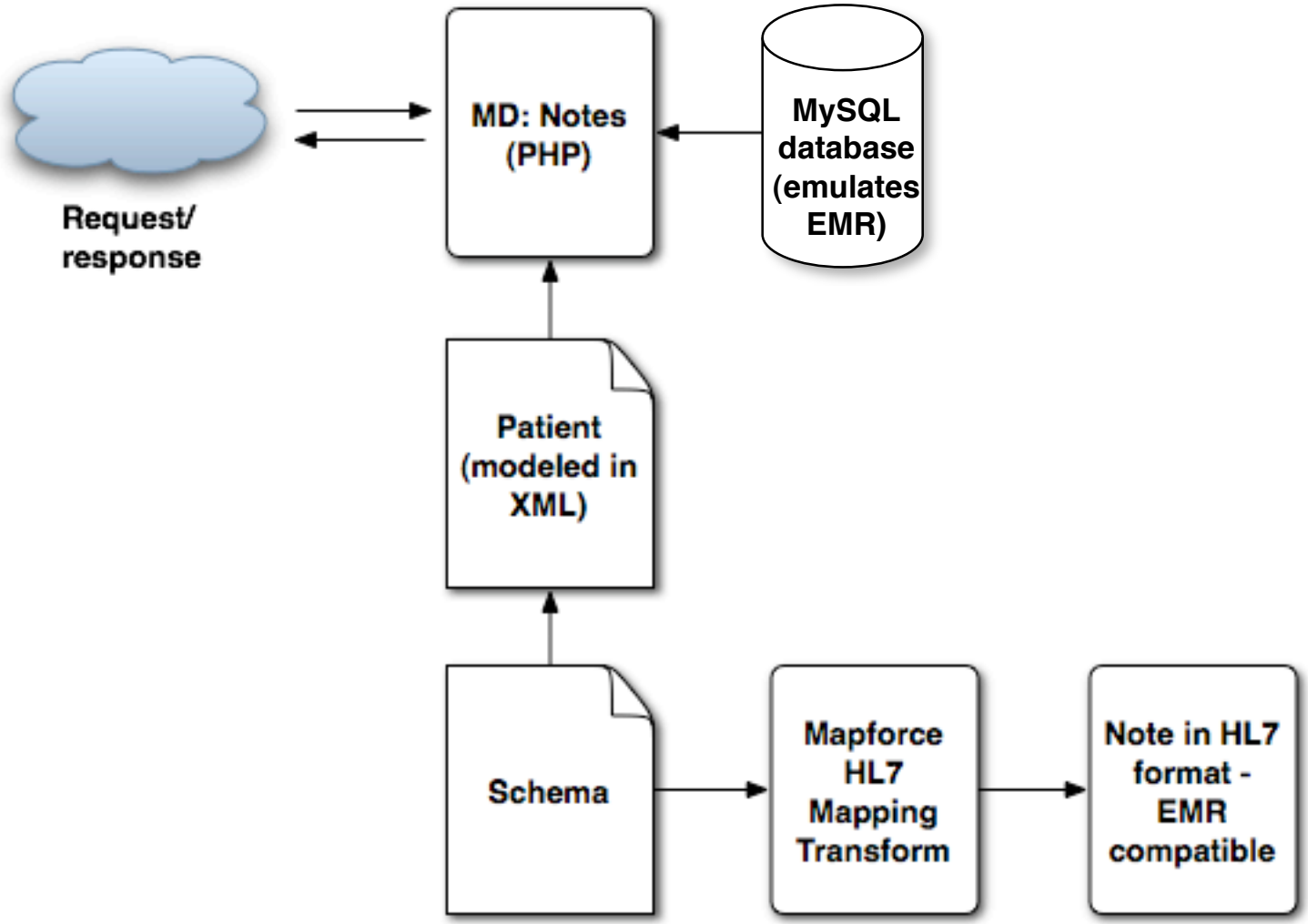
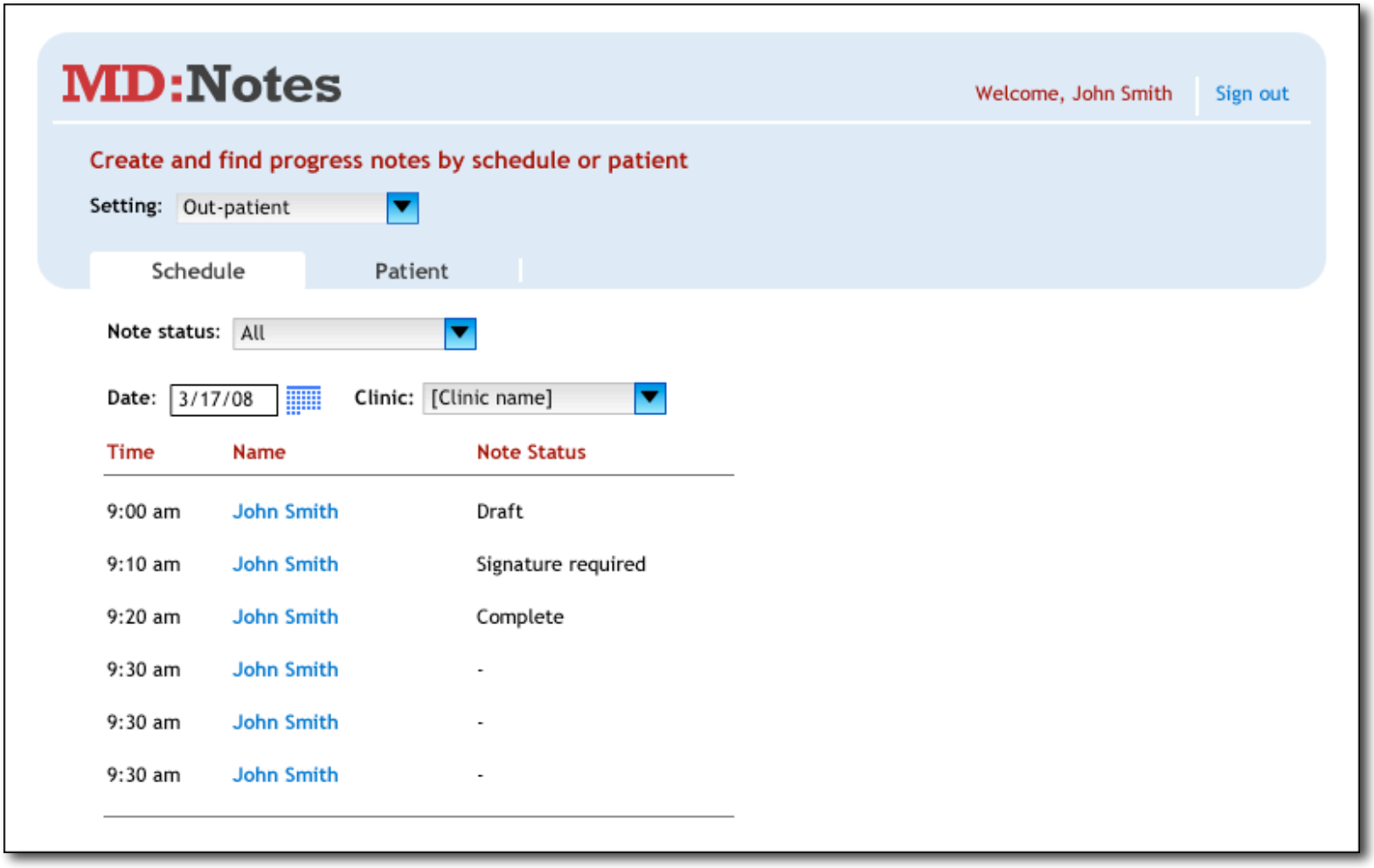
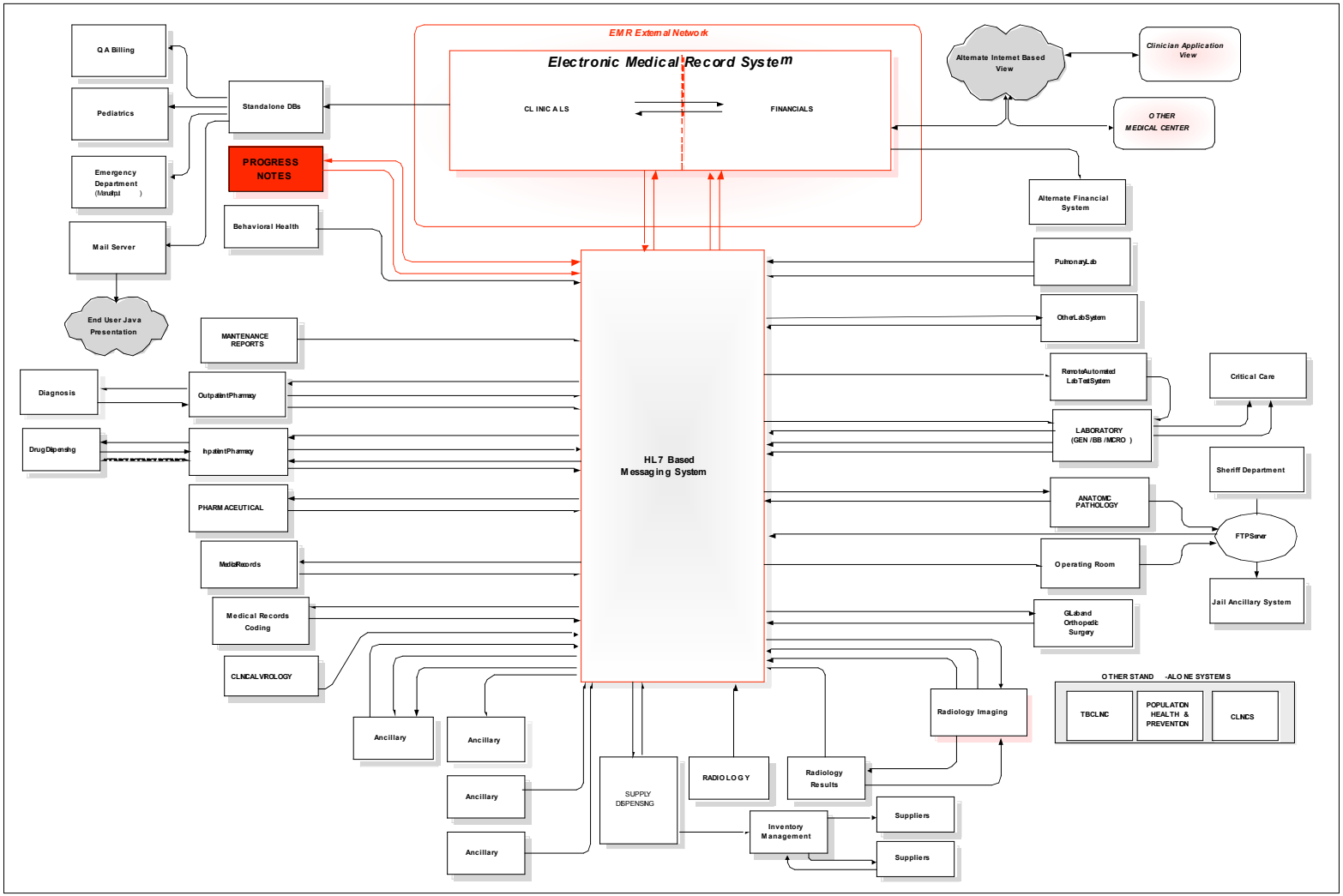
Technical Architecture



Prototype demo



Preventing a new information silo



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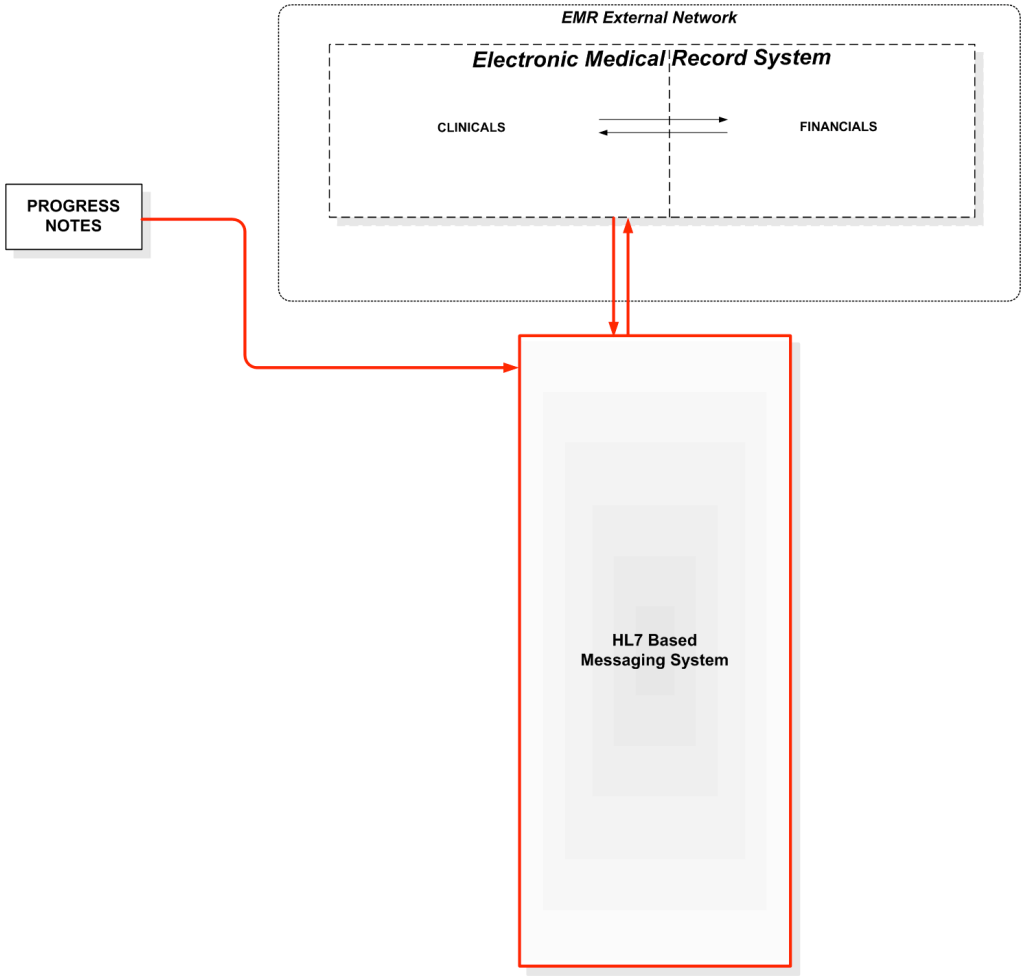

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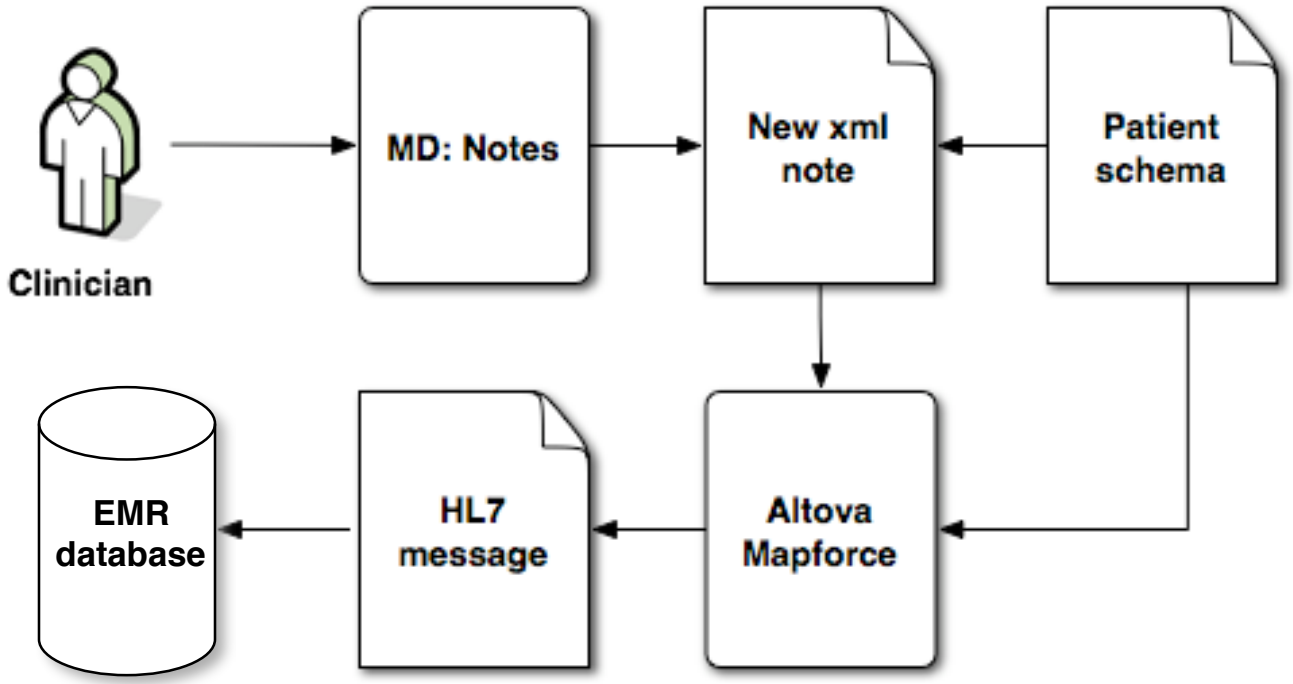
Converting to the HL7 Standard

- A healthcare messaging standard for system interoperability.
- Must be able to send progress notes to the EMR!



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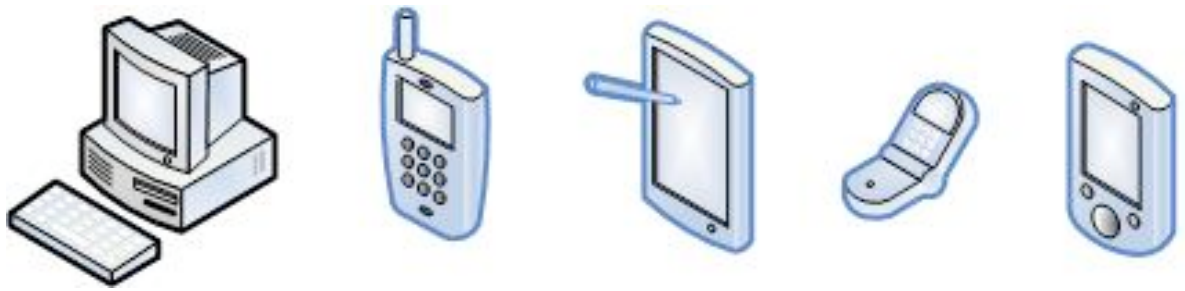
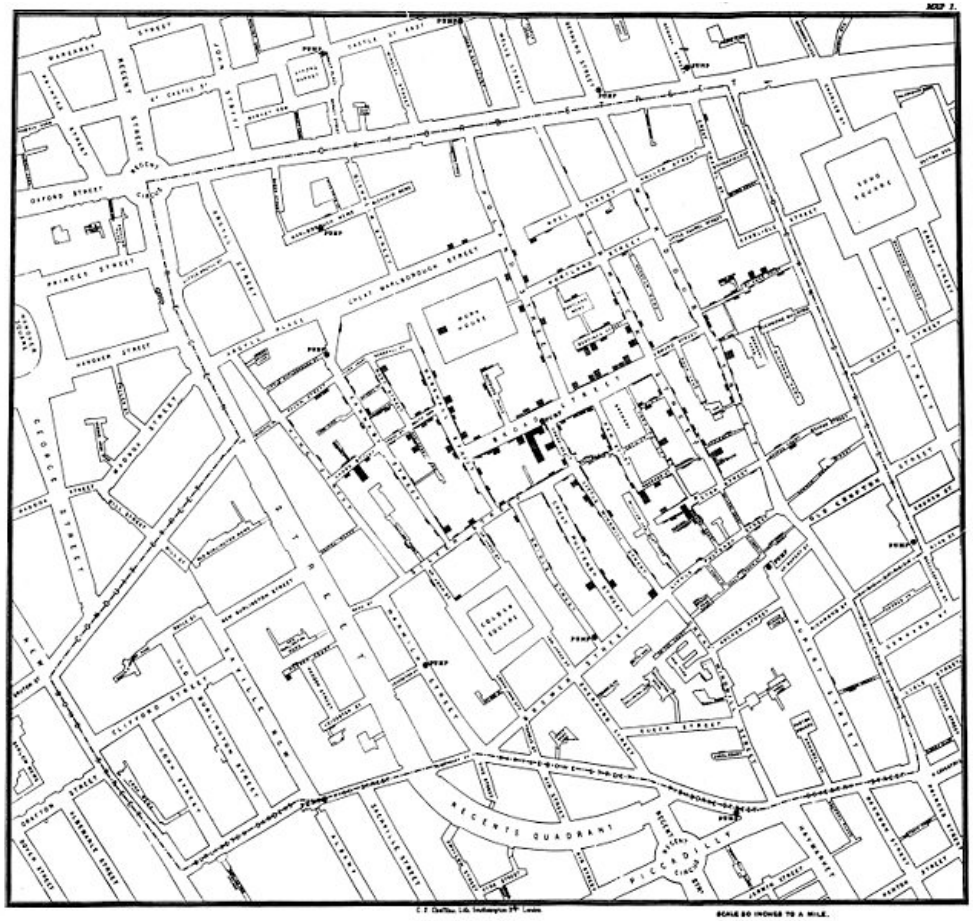
Future Work

- Integration
- Templates
- Security
- Extending the patient model
- Supporting multiple devices



Future Work, cont.

- Exploiting network effects
- Taking advantage of standards



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Summary

- Many hospitals have problems managing patient information
- Our product makes it easier to enter and retrieve notes

Questions

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