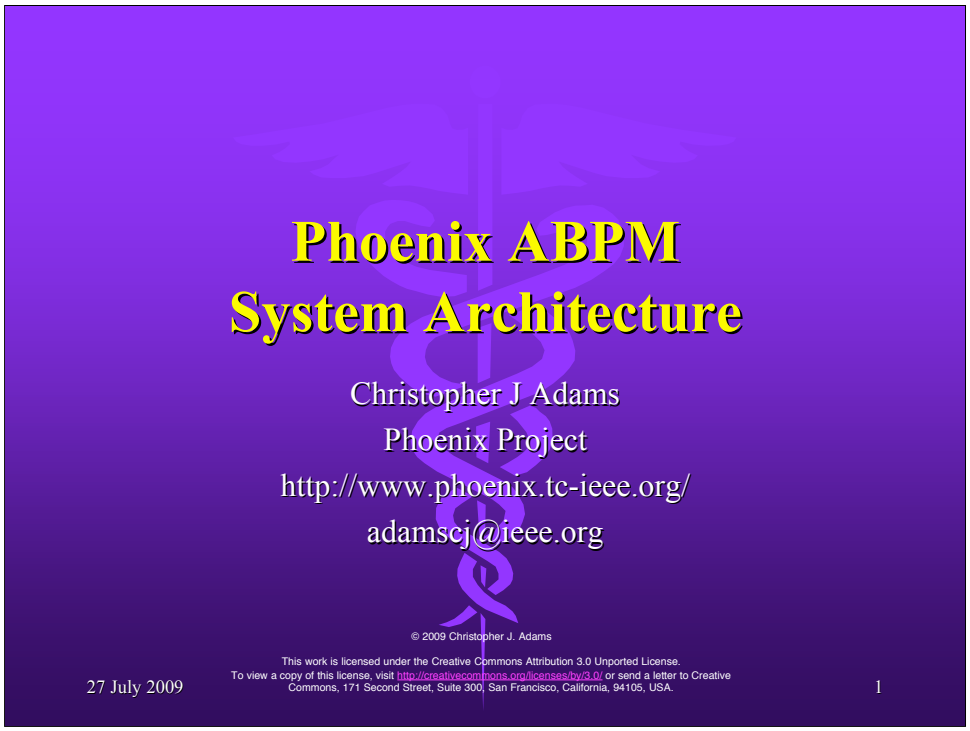
Phoenix ABPM
System Architecture
Christopher J Adams
Phoenix Project
http://www.phoenix.tc-ieee.org/
adamscj@ieee.org
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- Enterprise Viewpoint
  - Vision + Mission (Why)
  - Architectural Requirements
- Engineering Viewpoint
- Shared Inquiry

Not today:
- Context & scope
- Usage scenarios
- Computational viewpoint
- Information viewpoint
- Technology viewpoint

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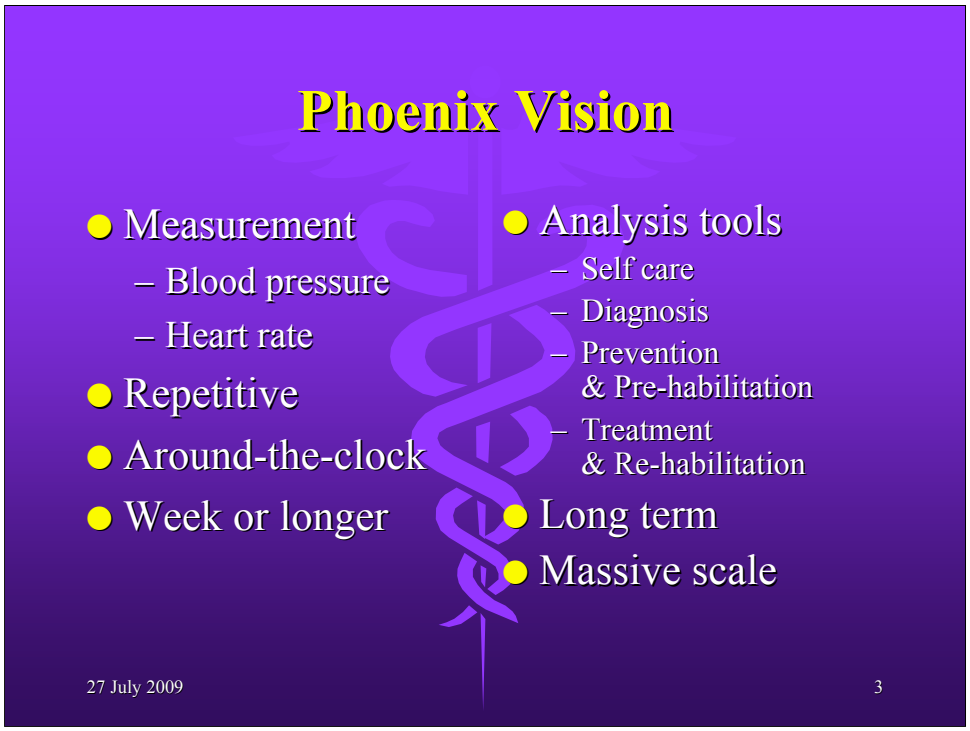


Repetitive -- automatic, periodic measurement

Around-the-clock -- regardless of person's activity

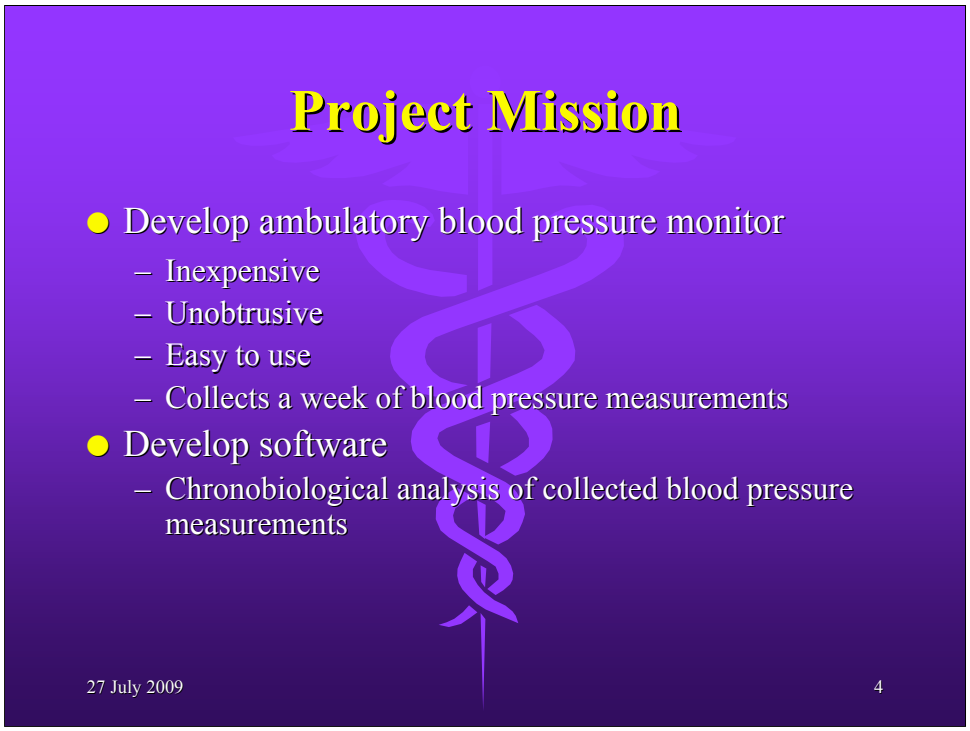
Week or longer -- initially, collect at least one week of data per session

Long term -- data for an individual may span the individual's life

Massive scale

From current load of hundreds of sessions per year

To millions of sessions per year



Inexpensive

•Price not a barrier to use
•Less expensive than blood pressure cuff
•Less expensive than wrist watch (< US$50)
•Less expensive than "two bushels of yams" (globally affordable, < US$10)

Unobstrusive

•When wearing monitor, patient can
    •Forget about, be unaware of device
    •No more encumbering than wrist watch, Band-aid™, piece of jewelry
•Usable wherever the patient is
    •At home, at work
    •Not only in clinical setting

Easy to use

•Easier to use than current BP cuffs, home BP monitors
•Patient can:
    •Ignore device
    •Determine that device is functioning normally
    •Observe a blood pressure and heart rate measurement
•Device is automatic -- takes measurements regardless of patient behavior
•Allows manually initiated measurements

Architectural Requirements

- Inexpensive
  - Open source
  - Free intellectual property, volunteer labor
- Highly decomposed
  - Consequence of open source
  - Each component quickly engineered by very small team (usually one person)
- Extensible -- highly recomposable
  - Consequence of multiple actors, vaguely organized
  - Evolving user classes, usage scenarios, environments
  - Highly re-usable components

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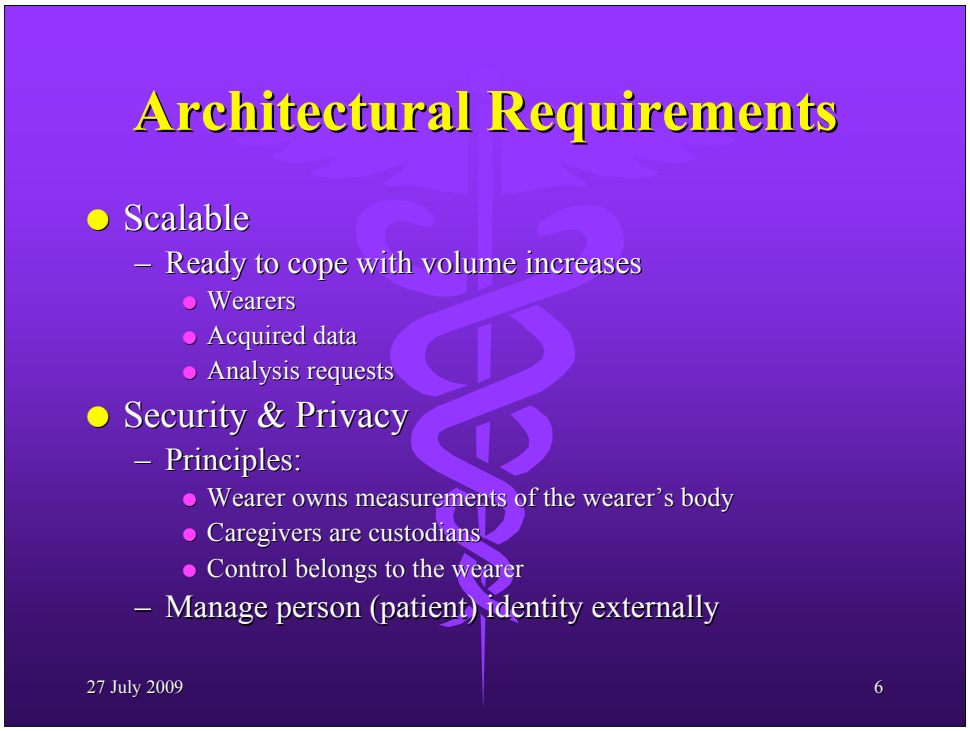
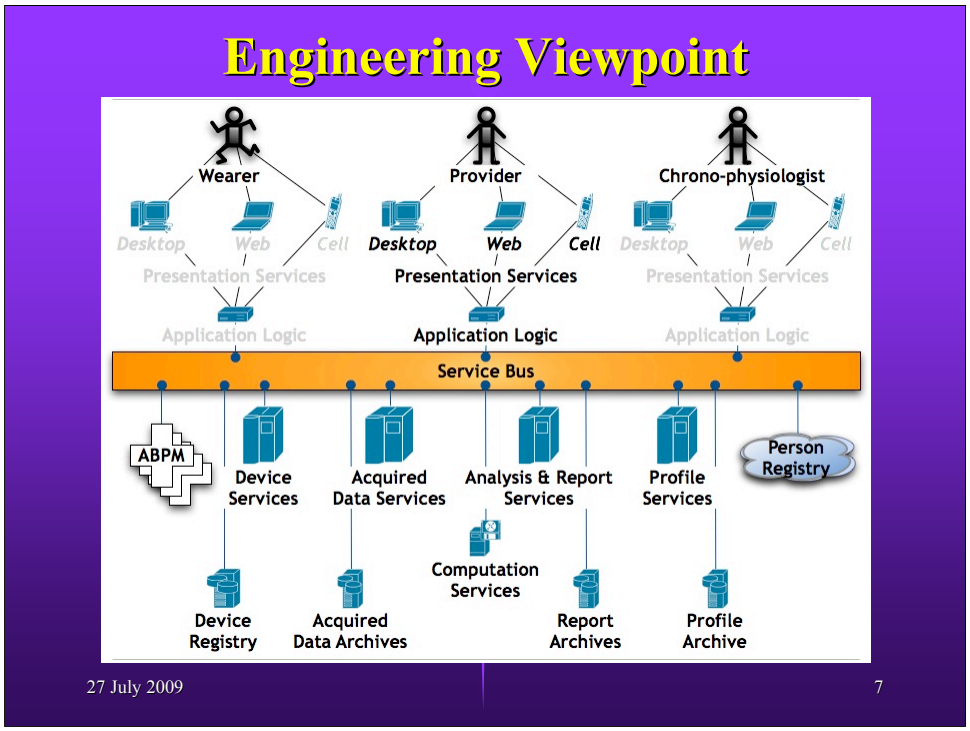
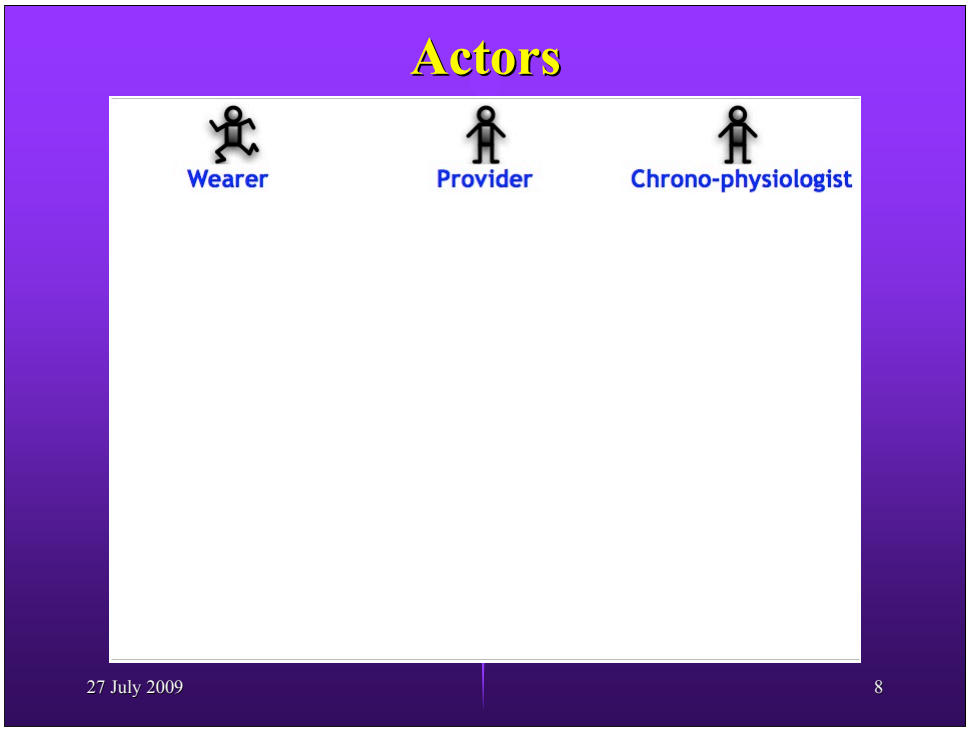


NOTE: Project has not yet investigated security issues



Here is a preview of the architecture.

The following slides will assemble the architecture in comprehensible chunks.



Actors -- Users of the device or software

Wearer

The person whose vital signs are measured by the device

Varies with setting

- •Patient
- •Self-care subject
- •Athlete
- •Student

Provider

The person who fits the wearer with the device & provides analytic services

- •Clinician
- •Pharmacist
- •Coach
- •Teacher

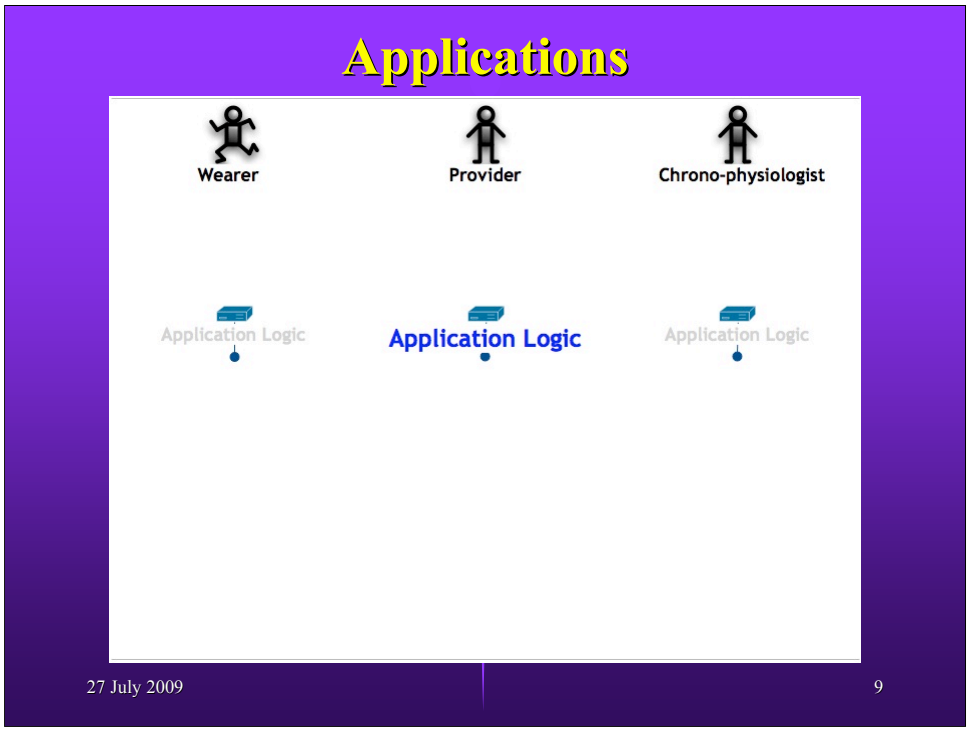
ISSUE: Do not yet know if a person may play both Wearer and Provider roles

Chrono-physiologist

The person who models whole populations of wearers

Develops profiles for parametric analysis techniques

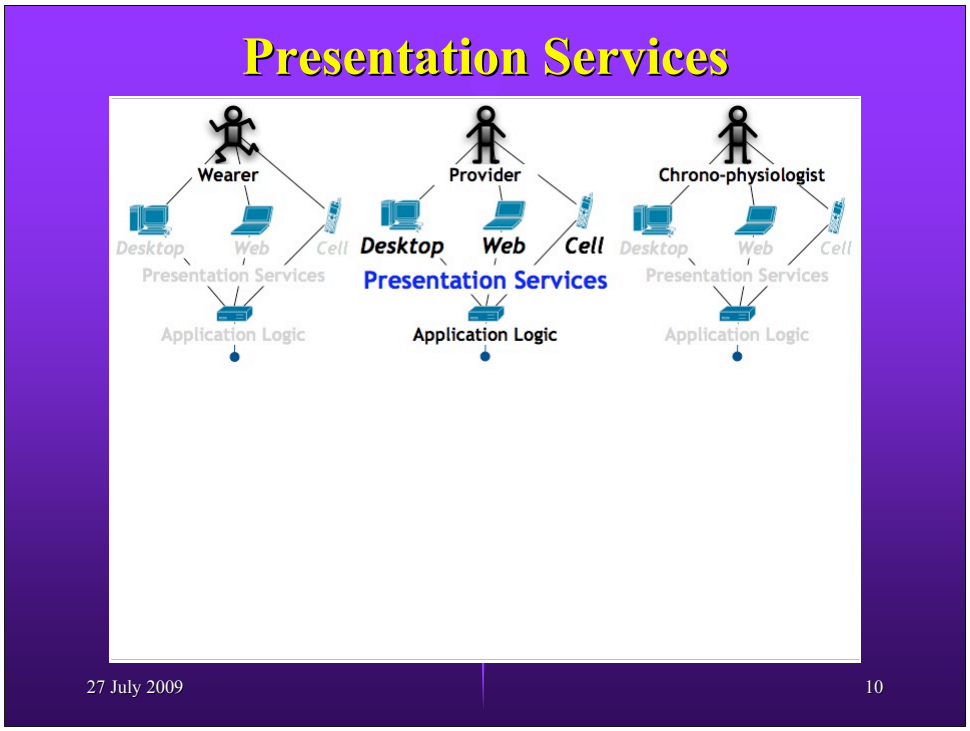
Develops new analysis techniques



Each user class has its own workflow(s)

Applications are at least actor-specific, if not workflow-specific

Expect the user classes to evolve --> new applications over time



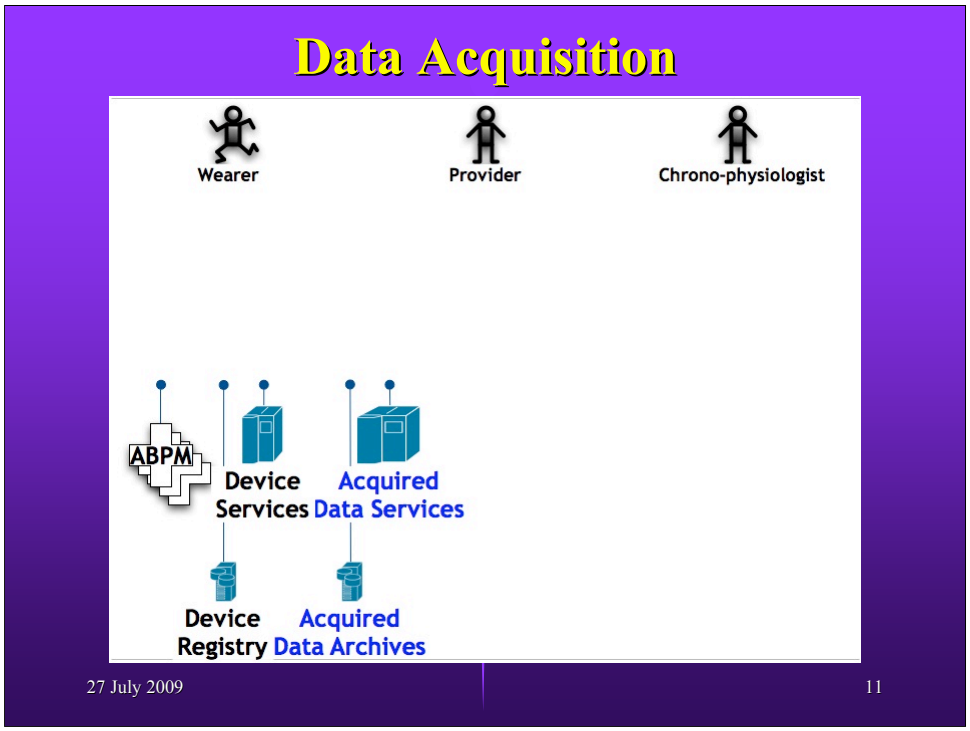
Presentation & user interface technology will vary with setting, user class, and individual preference

•Desktop applications -- the current norm

•Internet application

•Mobile / cell phone application

Not all channels make sense for all features



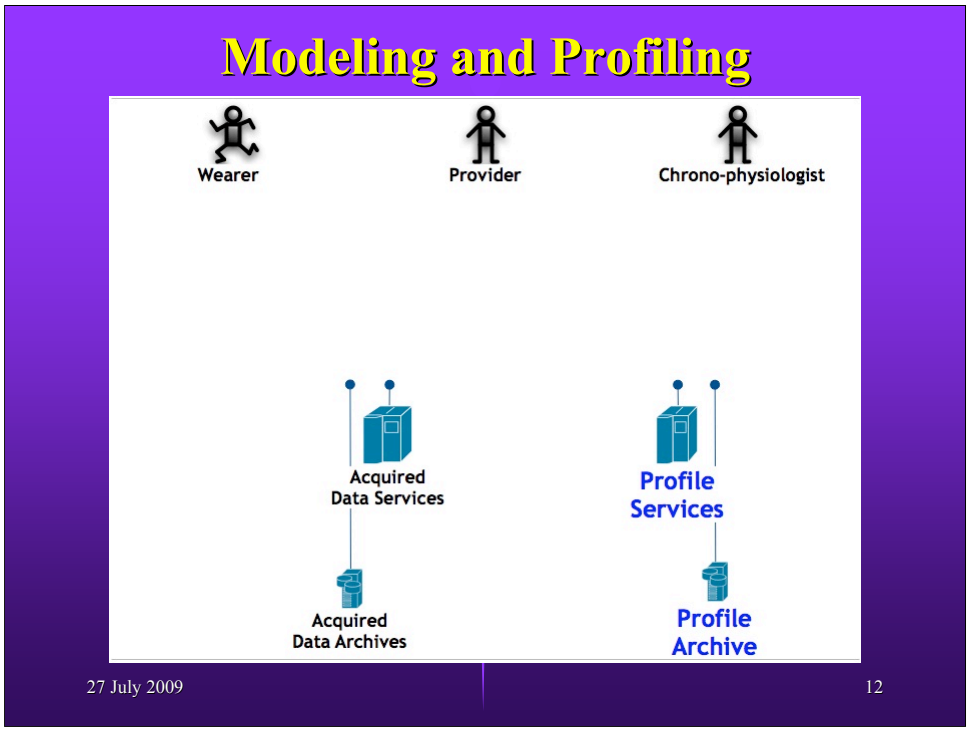
Device measures the wearer

Each measurement accompanied by
•Time-stamp
•Device ID

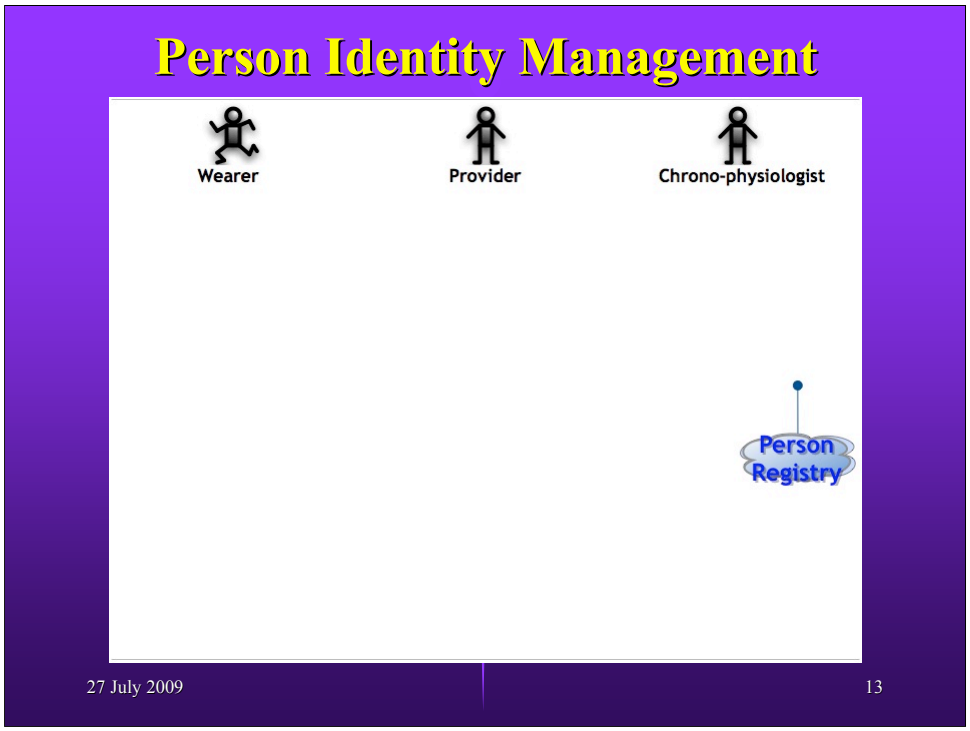
Measurements are uploaded and archived via data acquisition services

Each device
•Has status
•Has maintenance records
•Has make, model and version
•May have assignment to a wearer

Services include:
•Adapting a specific make, model, version to Phoenix canonical model
•*Linking sessions into coherent time series?*



Chrono-physiologist models blood pressure profiles needed for analysis techniques



For Privacy -->manage person (patient) identity externally

There may be multiple registries

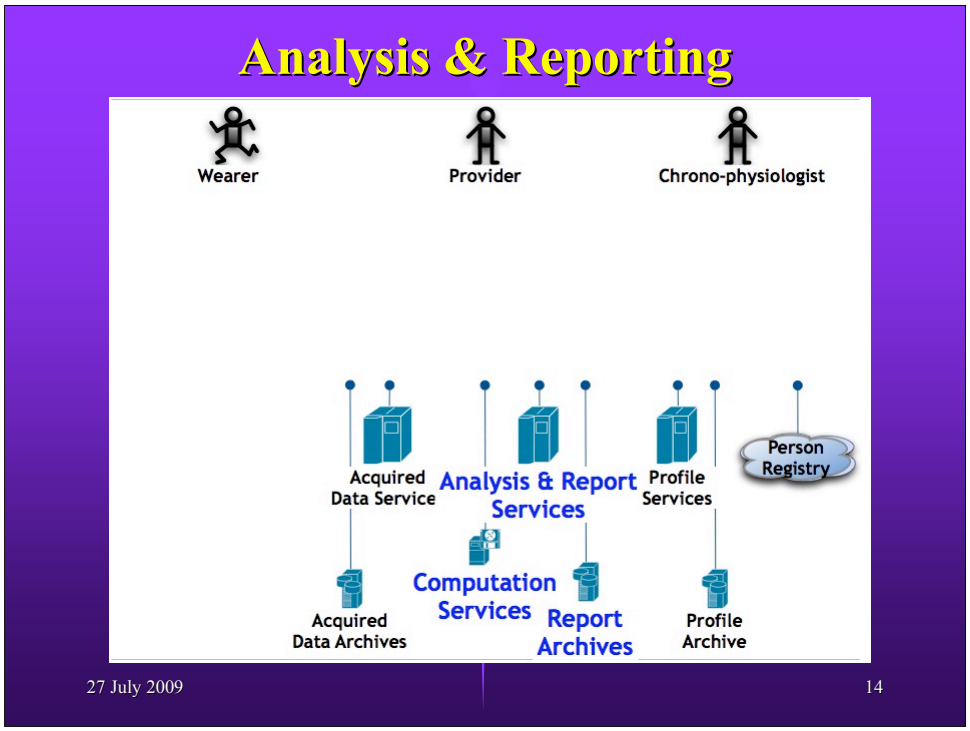
- Responsible for authentication

When link between person and data is needed

1. Person registers
2. Person logs into registry to obtain key token
3. Links based on key token

System never attempts to decode token

ISSUE: Project has not yet investigated security ramifications

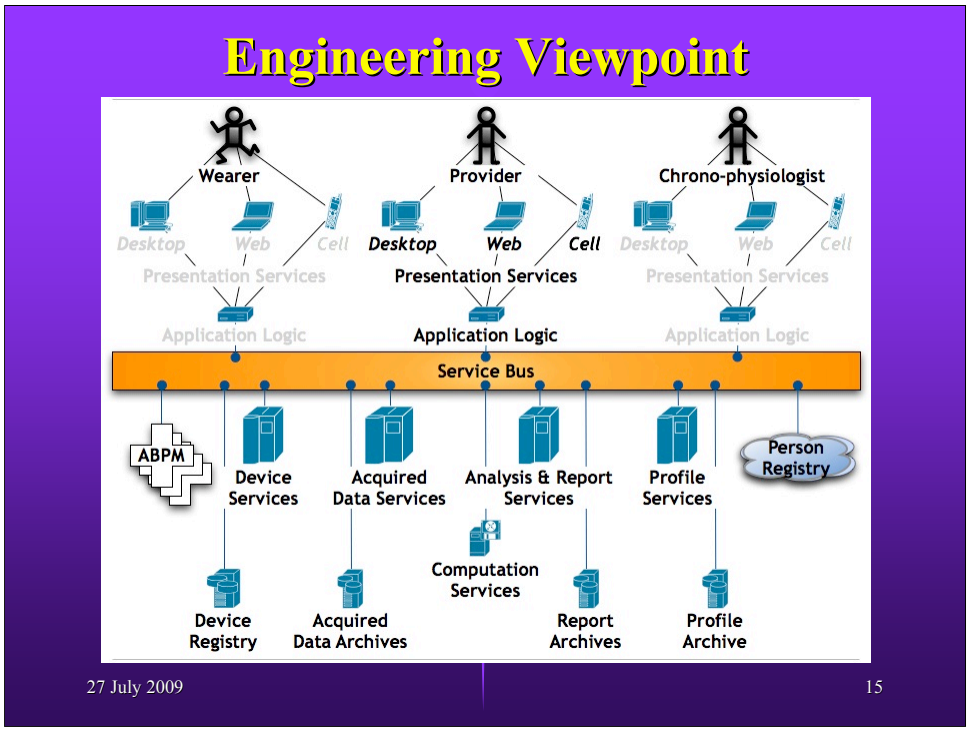


Provider assesses the data collected by the system

The analysis techniques encoded within a computational services

Procedures are defined as a collection of

Generation of reports (e.g., sphygmochron)



The whole system is hung together off a “Service Bus”

•Responsible for routing each service request to correct service provider

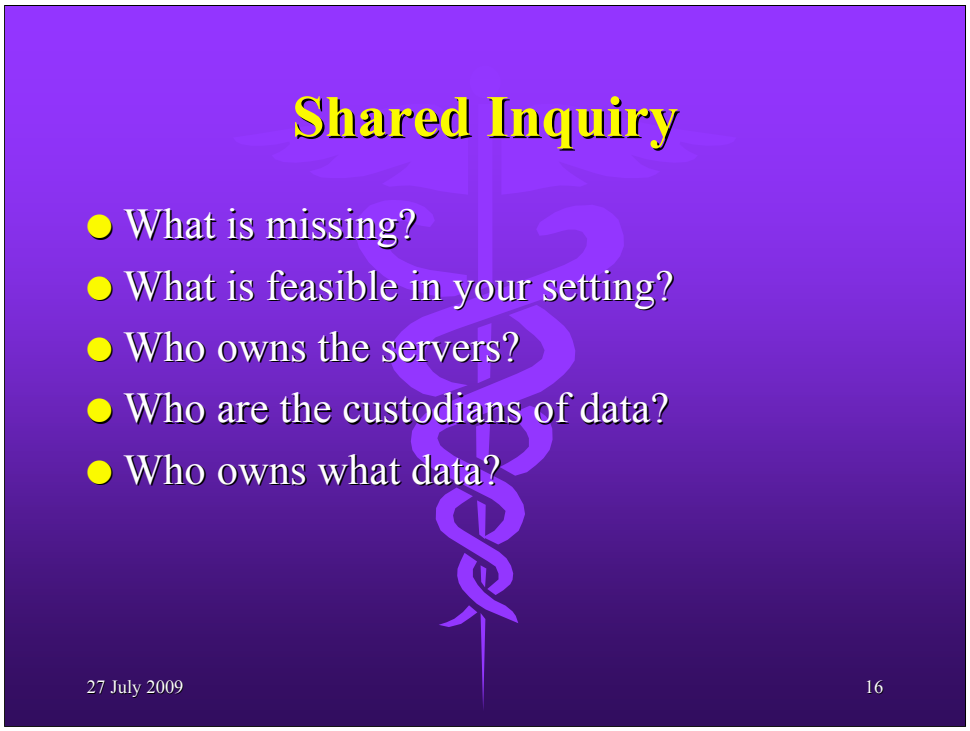
Should support multiple versions of the server configuration

End result

•Layered

•Service oriented

•Can be distributed


Shared Inquiry
What is missing?
What is feasible in your setting?
Who owns the servers?
Who are the custodians of data?
Who owns what data?
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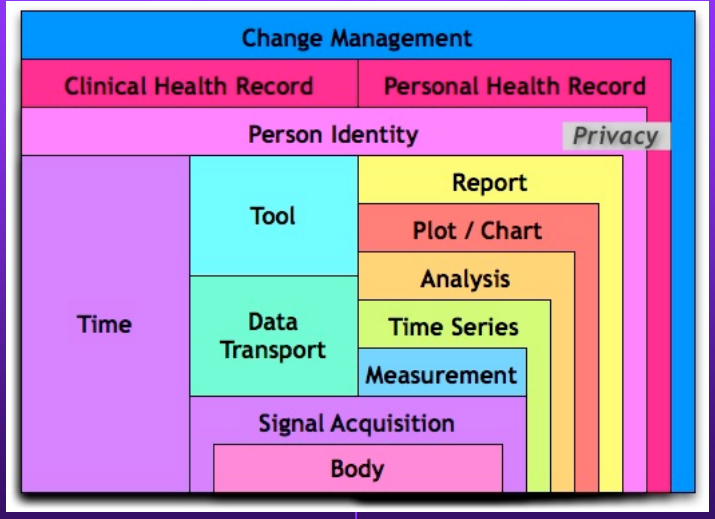
Appendix
Computational Viewpoint



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