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Functional Requirements for the NHIN
IBM Response to NCVHS Panel

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What is the intent of the NHIN?

- The recent NHIN forum at the NIH made it clear that there are many different views on what the NHIN is / should become
- IBM Viewpoint: *The primary goal of the NHIN is to promote the secure sharing of electronically-available patient clinical and demographic data to authorized users throughout the United States*
- Implicit functional requirements
  - Patient identification, matching, and lookup
  - "Document" submission, location and retrieval
- Implicit non-functional requirements
  - Data storage, transmission, and auditing capabilities that meet/exceed HIPAA, NIST and other related standards for the protection of privacy data
  - Authentication, role-based authorization and patient-consent
  - Internet-based with a low barrier to entry
  - Performance, dependability, and scalability are critical to adoption

Initial NHIN Functionality

- IBM Viewpoint: *The initial NHIN should focus on access to patient demographics, active meds, allergies, immunizations, recent lab results, and recent or chronic diagnoses and treatments*
  - Nationwide access to these data elements gives the most immediate “bang for the buck”
  - Standards such as the HL7 Clinical Data Architecture (CDA) or HL7 2.x/3.x already exist that provide an easy means of exchanging clinical data. IBM views the selection and promotion of standards as a key to the success of the system
  - Initial focus should be on driving electronic capture of these data elements and establishing the framework and policies for sharing the data across multiple communities
  - By adopting these standards, edge systems can easily integrate with the NHIN without major conversions or “rip-and-replace” and bring the data into their own workflow reasonably transparently
  - These basic data elements are sufficient to provide a basic EHR and also support the consumer empowerment, biosurveillance, and even chronic care “breakthrough” areas

“Core” vs “Edge”

- IBM Viewpoint: *The initial NHIN should not attempt to provide the same type of workflow and decision support capabilities as commercial EMR and clinical systems can*
  - The NHIN should not hinder these capabilities either
  - Even basic decision support such as drug-drug or drug-allergy interactions require codified data and recurring costs and administrative support
  - There are no adopted standards for clinical workflow, and different environments operate differently. Ambulatory, in-patient, and ER/ED workflows differ, large- vs small-practice, teaching hospitals vs community hospitals, etc
  - Support capabilities that work well in a closed environment generally do not work well in an open environment with multiple edge system vendors. It isn’t unusual for different units within the same hospital or clinic to lack interoperability for exactly this reason
  - It is better to get a basic NHIN established and functional quickly; let the users drive the evolution of the NHIN
  - At the same time, standards and policy bodies should be working out the issues that inhibit the growth and adoption of the NHIN (these are not technical issues)

Essential vs Non-Essential NHIN Functional Requirements*

Essential	Non-Essential
– Audit and logging – Authentication – Authorization – Confidentiality – Data access – Data filtering – Data integrity – Data source – Data retrieval (pull) – Identity/information correlation – Record location	– Data quality – Data rendering – Data routing – Data transmission (push) – Data usage – Persistent data storage – Transient data

* These are all important issues, but not all should be or even can be adequately addressed by the NHIN

Questions to Consider

- Who will use the NHIN and how? Care providers are a given, but what about
  - Patients?
  - CDC and related governmental agencies
  - Researchers? Federal, state? Private?
  - Insurance companies?
  - Quality-of-Care initiatives?
  - Employers?
- How will access to the NHIN be granted and administered at the nationwide level? The prototype architectures will all support the necessary authentication and authorization protocols, but the policies and administration are a much bigger challenge.
- Should clinical data standards (e.g., DICOM, LOINC, SNOMED, NCPDP SCRIPT) be adopted as part of the initial NHIN, raising the barrier to entry but improving the long-term usability of the system?

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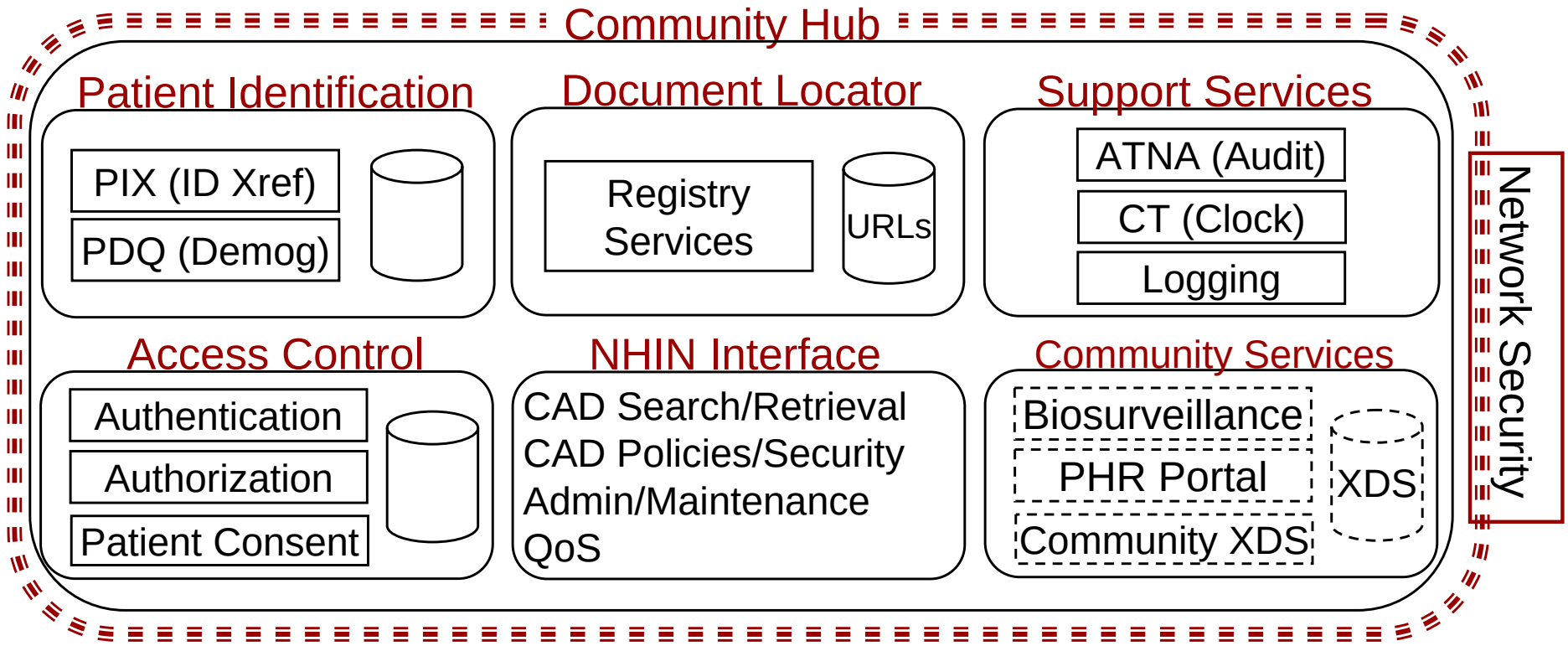
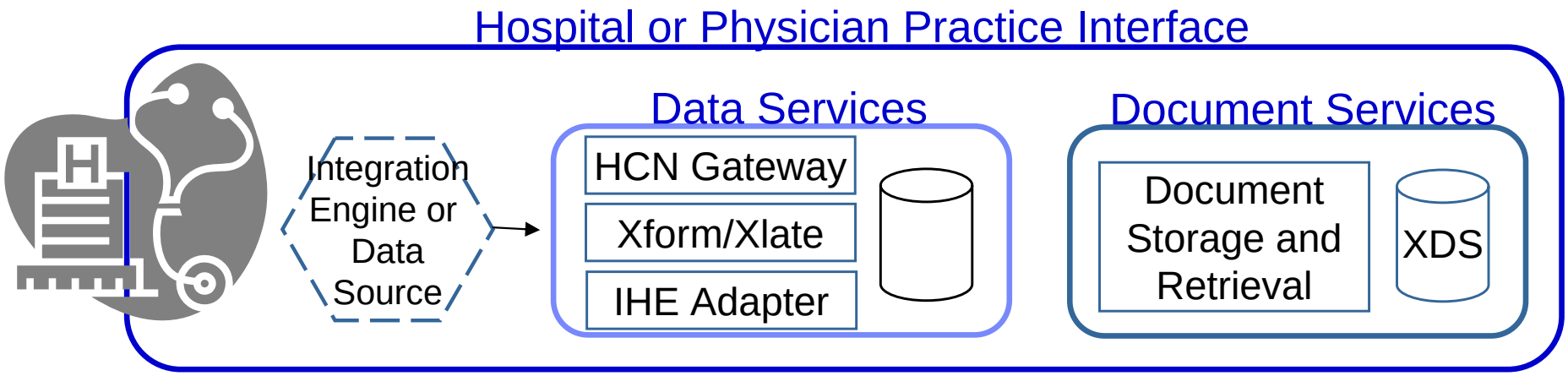
Reference Slides (IBM NHIN Architecture)

IBM NHIN Architecture Guiding Principles

- Community-Centric
  - Document repositories normalize and store clinical data within a community
  - Repositories are hosted by individual hospitals/practices and/or shared within the community
  - Community hub provides patient lookup/cross-referencing, document locator, security and support services
  - The community hub is the gateway to other communities
- Drive and conform to standards
  - Instantiation of IHE (www.ihe.net) interoperability framework using Java/J2EE
  - Clinical events stored as HL7 CDA(r2)-compliant documents
- Provide security & privacy w/o sacrificing usability or research value
  - Anonymous/pseudonymous data that can be re-identified where permitted
  - Supports other data views (registries, biosurveillance, outcomes analysis, quality of care)
- Practical
  - Scalable and cost-effective to support every level of practice
  - Point-of-care performance is critical to adoption

NHIN Architecture Project Community Architecture





Cross-Community Interaction

- All cross-community interactions are brokered through the NHIN interface, using other community services as needed
- Authentication and authority uses a federated model, with trust relationships established at the NHIN level
- Cross-community patient lookup is based on directed demographic matching
  - Identity is established by matching demographic data between the local and remote PDQ databases, with a conservative threshold
  - Once a patient has been positively identified in another community, both communities will maintain that relationship
  - Self-training system. Future system could include automated “spiders” that look for matches during non-peak hours
- Once a positive patient match is obtained, document search and retrieval is identical to the intra-community model and transparent to the user