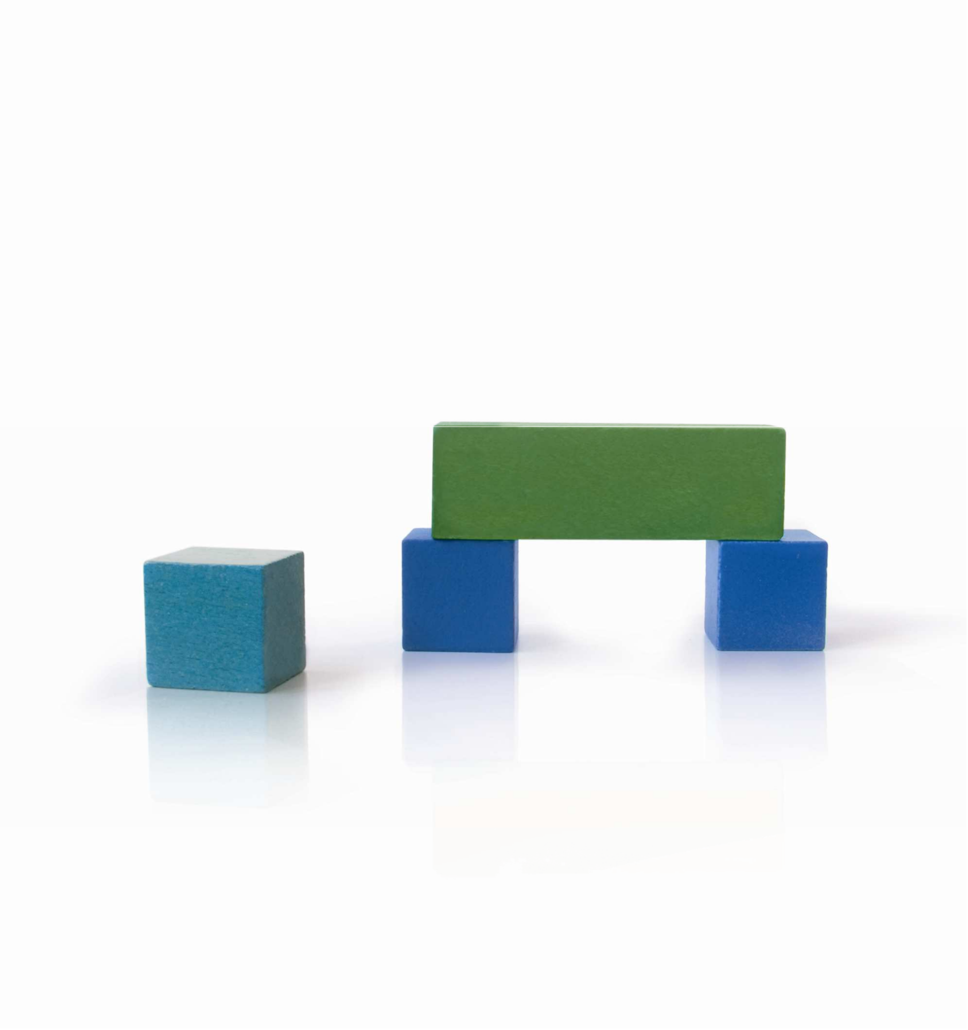
Connected Healthcare

ICW Professional Exchange Server

Overview



connect. manage. personalize.

Agenda

1. PXS Overview
2. Communication between PXS & MPI
3. PXS Document Registry
4. Authentication
5. User Management
6. Audit
7. Patient Consent

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1. **PXS Overview**
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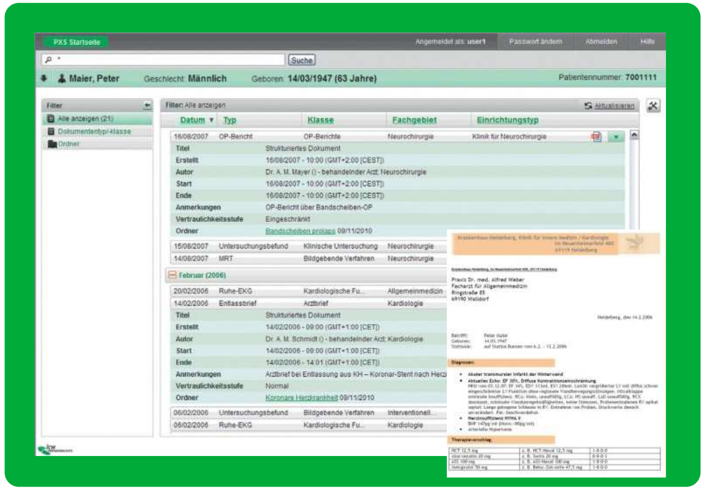
ICW Professional Exchange Server
Networking Based on IHE Standards

Medical Data Exchange Based on Standard Technologies



Maier, Peter Geschlecht: **Männlich** Geboren: **14/03/1947 (63 Jahre)** Patientennummer: **7001111**

Filter: Alle anzeigen

Datum	Typ	Klasse	Fachgebiet	Einrichtungstyp
16/08/2007	OP-Bericht	OP-Berichte	Neurochirurgie	Klinik für Neurochirurgie

Titel	Strukturiertes Dokument
Erstellt	16/08/2007 - 10:00 (GMT+2:00 [CEST])
Autor	Dr. A. M. Mayer () - behandelnder Arzt: Neurochirurgie
Start	16/08/2007 - 10:00 (GMT+2:00 [CEST])
Ende	16/08/2007 - 10:00 (GMT+2:00 [CEST])
Anmerkungen	OP-Bericht über Bandscheiben-OP
Vertraulichkeitsstufe	Eingeschränkt
Ordner	Bandscheiben prolaps 09/11/2010

15/08/2007	Untersuchungsbefund	Klinische Untersuchung	Neurochirurgie
14/08/2007	MRT	Bildgebende Verfahren	Neurochirurgie

Februar (2006)

20/02/2006	Ruhe-EKG	Kardiologische Fu...	Allgemeinmedizin
14/02/2006	Entlassbrief	Arztbrief	Kardiologie

Titel	Strukturiertes Dokument
Erstellt	14/02/2006 - 09:00 (GMT+1:00 [CET])
Autor	Dr. A. M. Schmidt () - behandelnder Arzt: Kardiologie
Start	14/02/2006 - 09:00 (GMT+1:00 [CET])
Ende	14/02/2006 - 14:01 (GMT+1:00 [CET])
Anmerkungen	Arztbrief bei Entlassung aus KH – Koronar-Stent nach Herz
Vertraulichkeitsstufe	Normal
Ordner	Koronare Herzkrankheit 09/11/2010

06/02/2006	Untersuchungsbefund	Bildgebende Verfahren	Interventionell...
06/02/2006	Ruhe-EKG	Kardiologische Fu...	Kardiologie

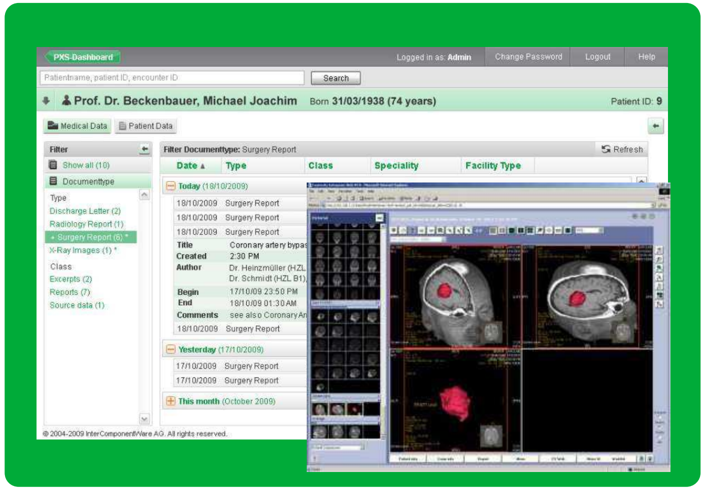
Praxis Dr. med. Alfred Weber
Facharzt für Allgemeinmedizin
Ringstraße 85
69190 Walldorf

Heidelberg, den 14.2.2006

Diagnosen:

- Akuter transmuraler Infarkt der Hinterwand
- Aktuelles Echo: EF 30%, Diffuse Kontraktionseinschränkung
- Herzinsuffizienz NYHA II
- arterielle Hypertonie

Therapievorschlag:



Prof. Dr. Beckenbauer, Michael Joachim Born **31/03/1938 (74 years)** Patient ID: **9**

Filter
Show all (10)
Documenttype
Type
Discharge Letter (2)
Radiology Report (1)
+ Surgery Report (6) *
X-Ray Images (1) *
Class
Excerpts (2)
Reports (7)
Source data (1)

Filter Documenttype: Surgery Report

Date	Type	Class	Speciality	Facility Type
Today (18/10/2009)				
18/10/2009	Surgery Report			
18/10/2009	Surgery Report			
18/10/2009	Surgery Report			

Title	Coronary artery bypas
Created	2:30 PM
Author	Dr. Heinzmüller (HZL Dr. Schmidt (HZL B1)
Begin	17/10/09 23:50 PM
End	18/10/09 01:30 AM
Comments	see also Coronary An

18/10/2009	Surgery Report
Yesterday (17/10/2009)	
17/10/2009	Surgery Report
17/10/2009	Surgery Report
This month (October 2009)	

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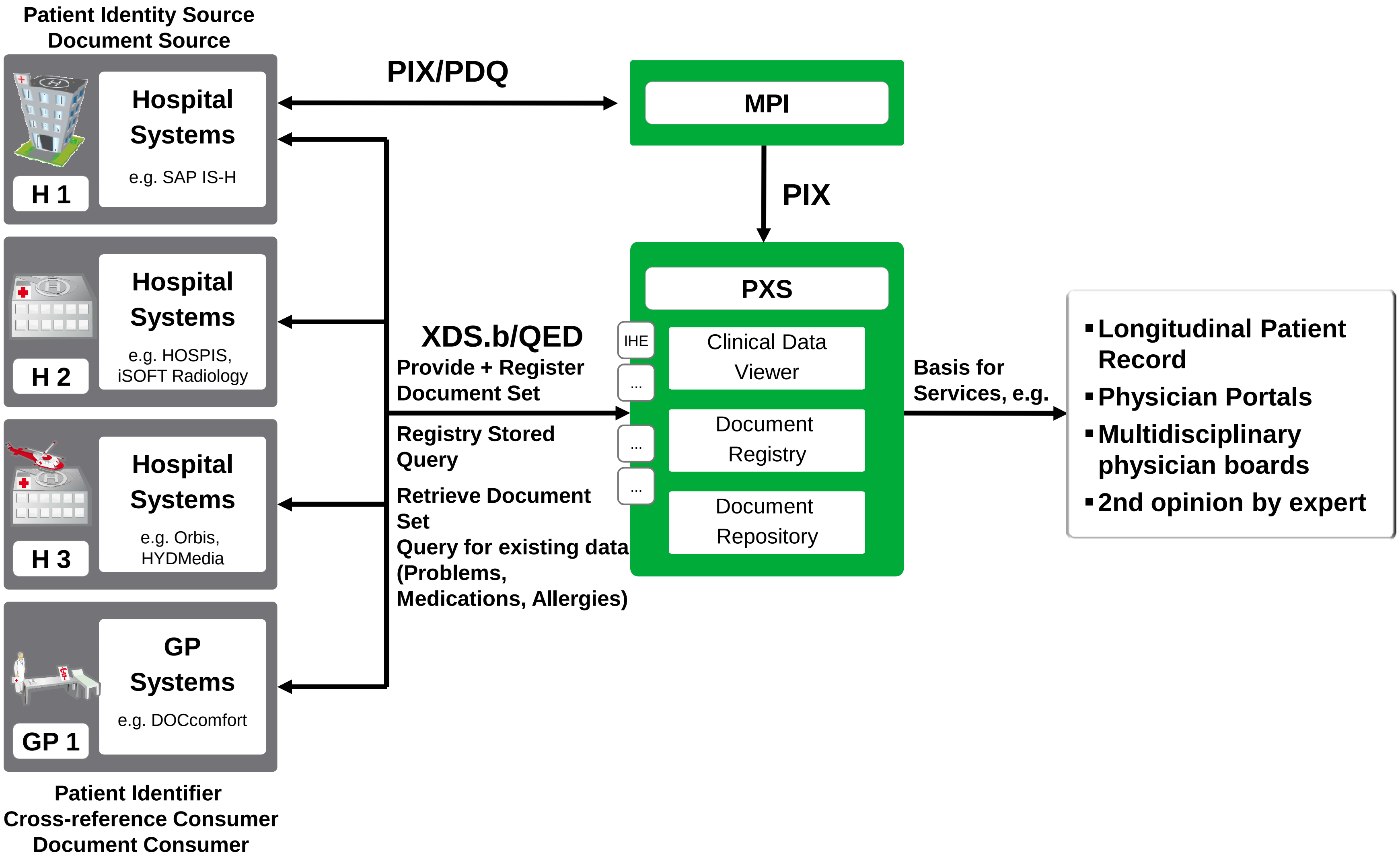
- Uniform, consolidated, cross-organizational view of electronic medical documents from integrated source systems
- Seamless, standards-based integration (XDS.b, XDS.I b, XCA, DSUB, QED, BPPC, ATNA, CT)
- Efficient management of medical data and documents

  PDF, GIF, TIFF, JPEG, DICOM, XML, RTF

  Display of CDA and CCR documents including XSLT transformation
- Extraction of discrete medical data from CCD documents

  Problems, allergies, medications
- Retrieve structured information (QED)
- Notification and subscription functions
- Simple integration with non IHE-compliant source systems
- Highly scalable for regional and national-level networks

PXS as Infrastructure Solution in a XDS Scenario



Patient Identity Source
Document Source

- H 1: Hospital Systems, e.g. SAP IS-H
- H 2: Hospital Systems, e.g. HOSPIS, iSOFT Radiology
- H 3: Hospital Systems, e.g. Orbis, HYDMedia
- GP 1: GP Systems, e.g. DOCcomfort

Patient Identifier
Cross-reference Consumer
Document Consumer

PIX/PDQ

MPI

PIX

PXS

- Clinical Data Viewer
- Document Registry
- Document Repository

XDS.b/QED

Provide + Register Document Set

Registry Stored Query

Retrieve Document Set

Query for existing data (Problems, Medications, Allergies)

Basis for Services, e.g.

- Longitudinal Patient Record
- Physician Portals
- Multidiciplinary physician boards
- 2nd opinion by expert

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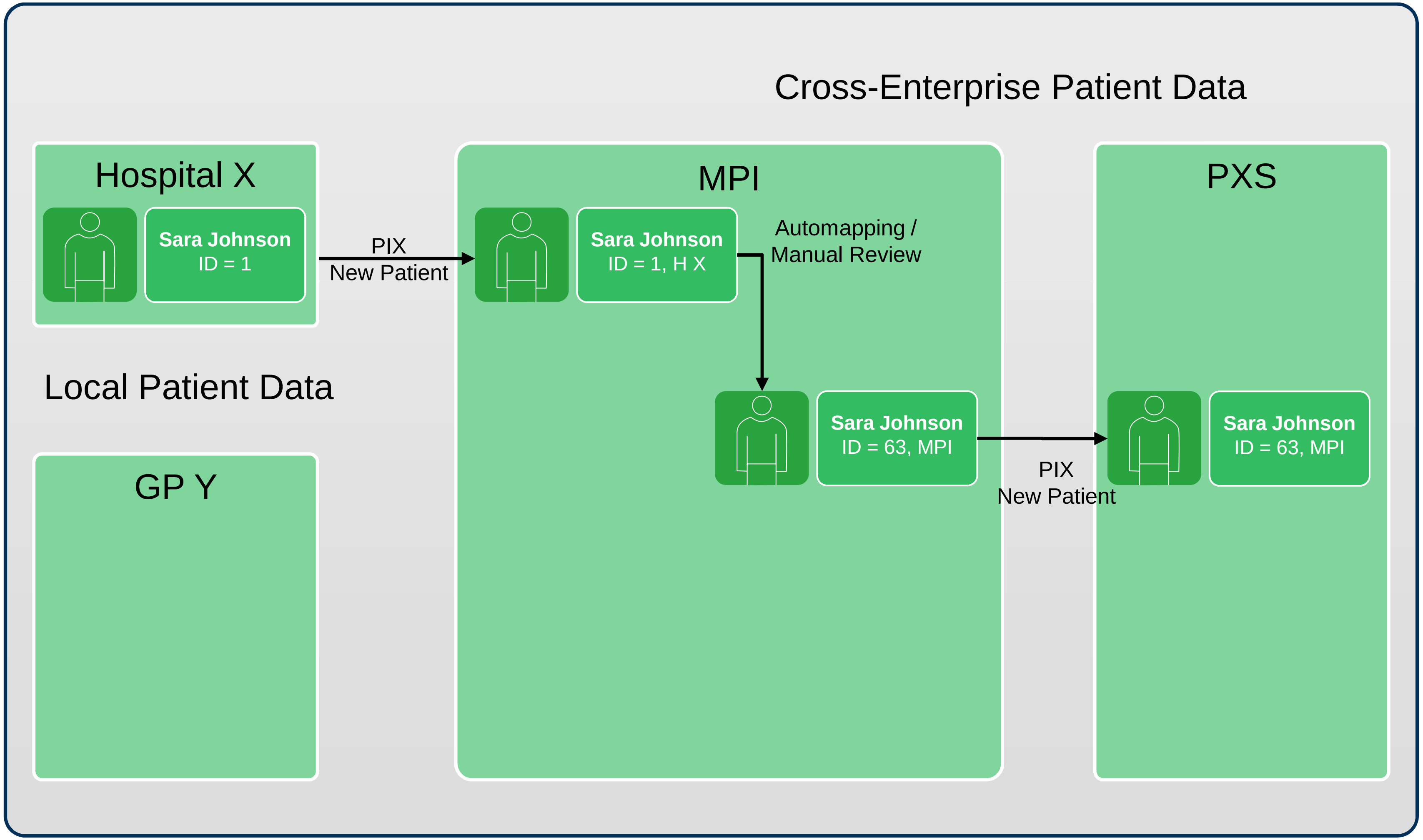
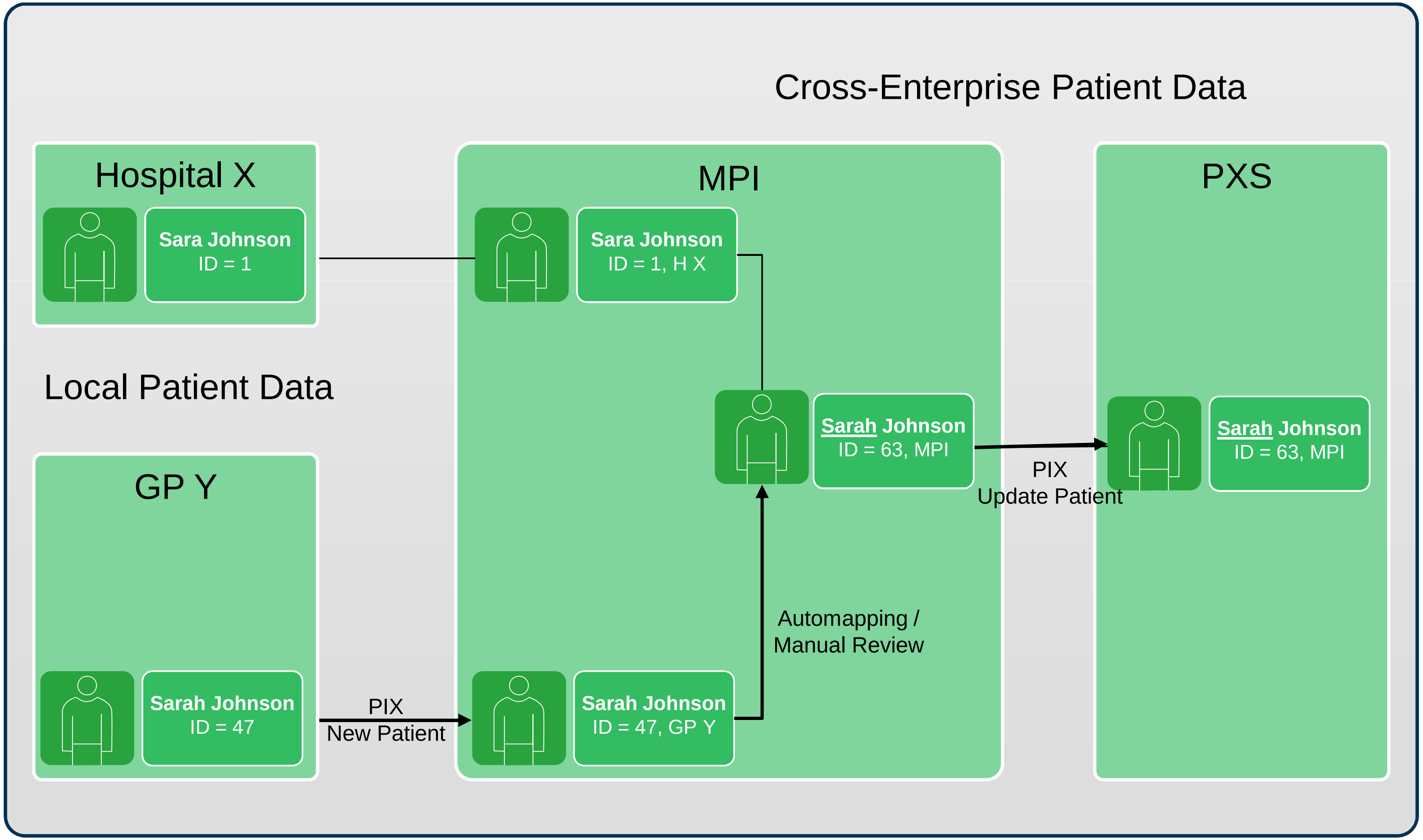
Communication between PXS and MPI

- Communication of patient demographics from MPI to PXS using IHE XDS.b compliant interfaces (PIX Feed ITI-08):
  - Create (ADT^A01, ADT^A04, ADT^A05)
  - Change (ADT^A08)
  - Merge (ADT^A40)
- Additionally primary systems (e.g. Patient admission, document sources) are able to use the IHE transactions ITI-10 (PIX Update Notification) & ITI-21 (Patient Demographics Query) to retrieve the global patient identfier from the Patient Identity Source.

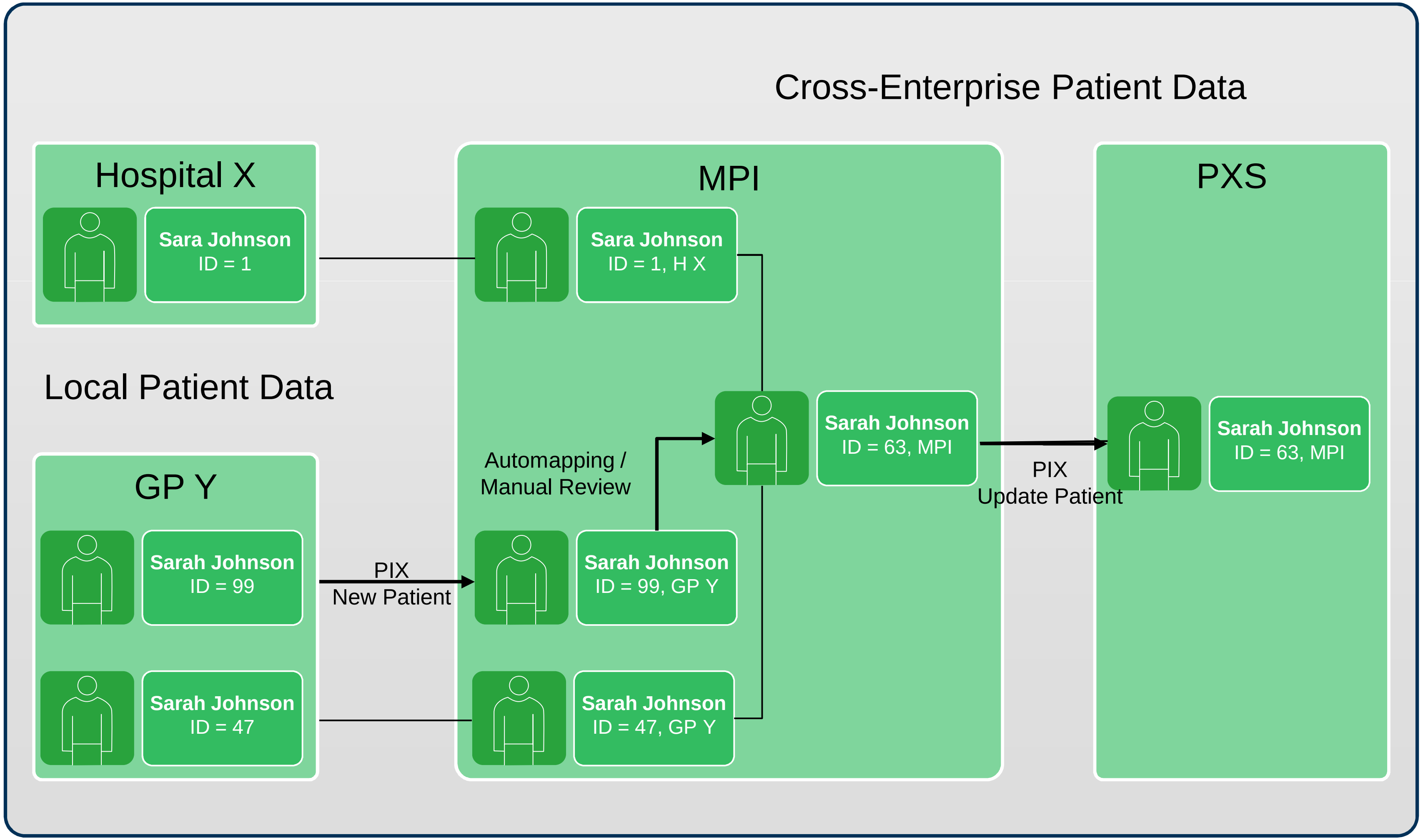
Patient Representation in MPI and PXS: Local create and MPI create



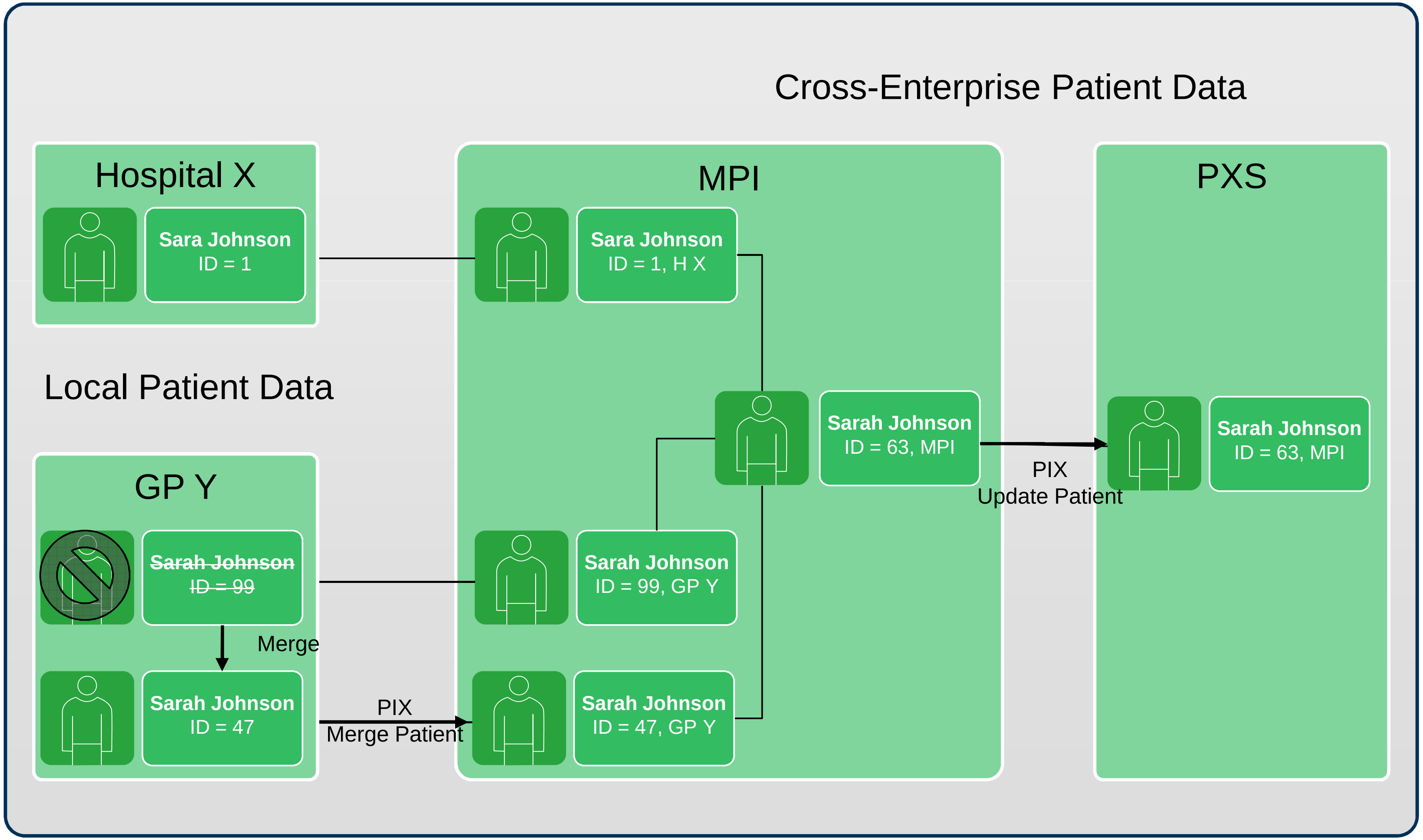
Patient Representation in MPI and PXS: Local create and MPI+PXS update



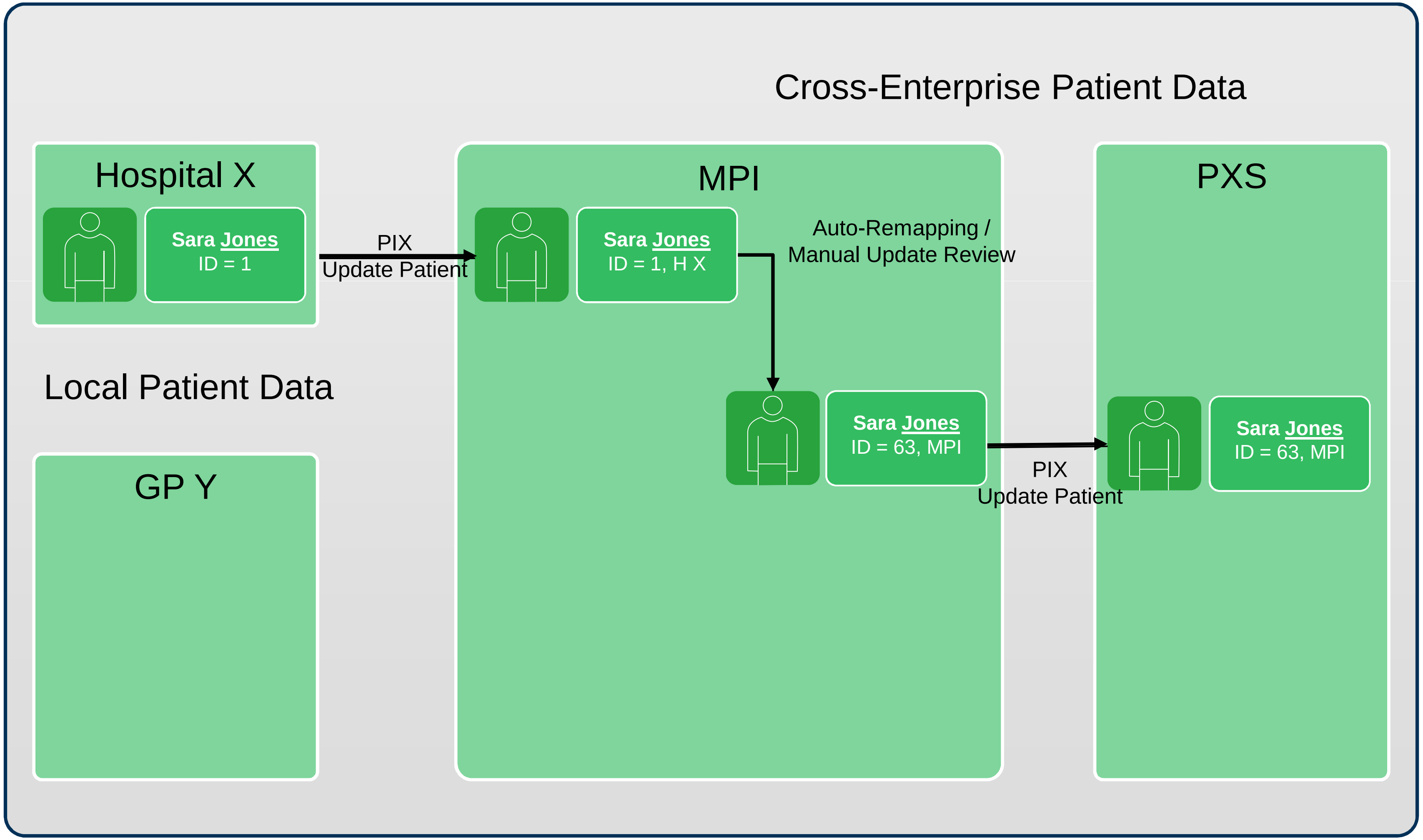
Patient Representation in MPI and PXS: Local Merge Step 1



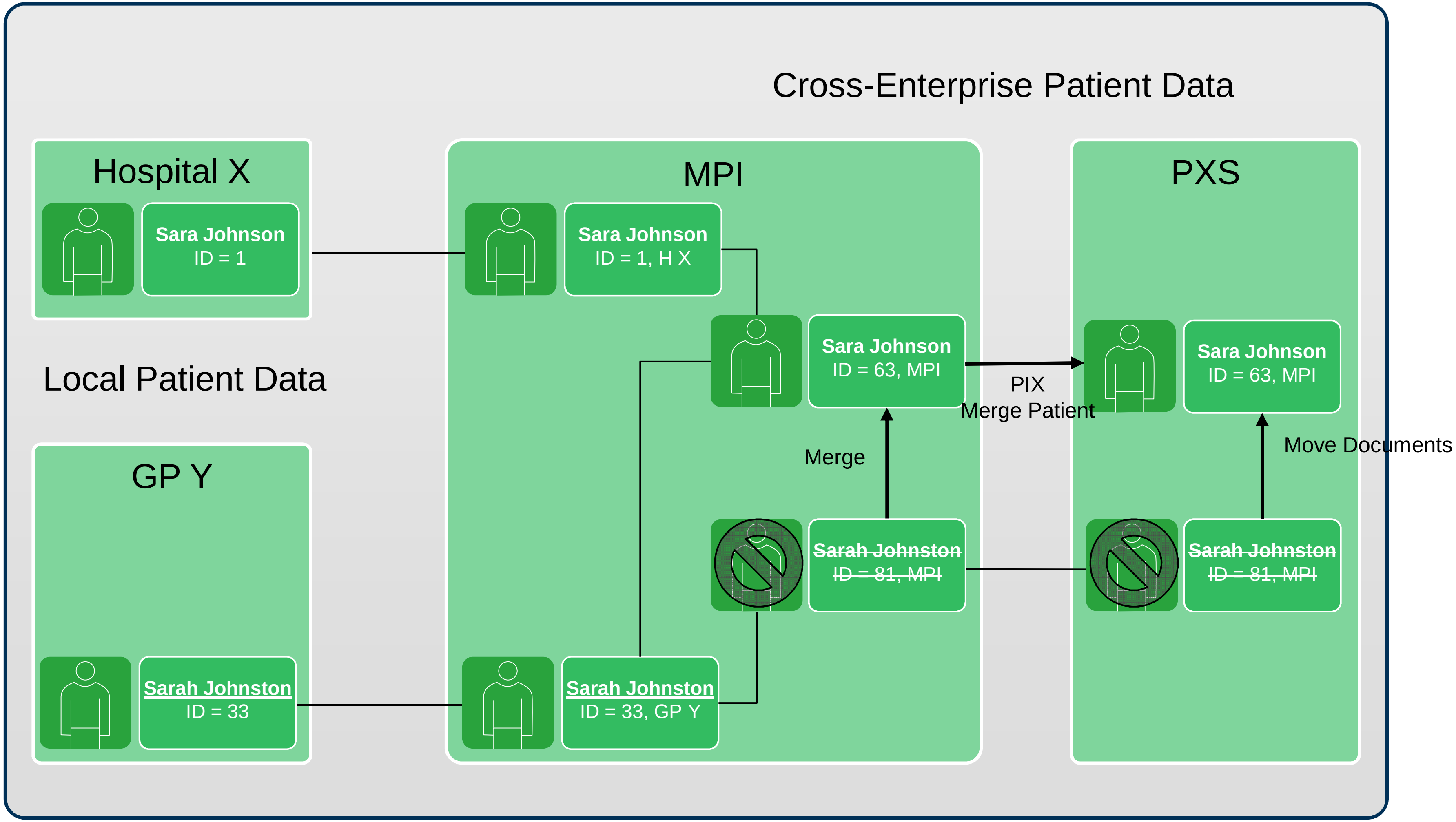
Patient Representation in MPI and PXS: Local Merge Step 2



Patient Representation in MPI and PXS: Local update and MPI+PXS update



Patient Representation in MPI and PXS: MPI merge and PXS update



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PXS Document Registry

- IHE XDS.b compliant interfaces (Revision 5 & 6)
  - Patient Identity Feed HL7v2
  - Register Document Set-b
  - Registry Stored Query
- Storage of
  - Patient demographics
  - Document meta data
  - Folders
  - Submission Sets
  - Relationships among each others (Parent-Child-Relationship, Transformation, Addendum etc.)
- Support of multiple repositories

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PXS - Authentication

- Authentication of users and integrated systems
  - username and password
  - X.509 client certificate
  - SAML 2.0 Tokens
- Creation of SAML 2.0 Tokens for known users over Secure Token Service (STS)
- Customizable password rules

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User Management in PXS

- PXS supports local and centralized user stores
  - Local user store means reading demographics, authentication and authorization information from application‘s database
    - PXS comes with administration GUI for local user management
  - Centralized user store means using demographics, authentication and authorization information from directory server via LDAP
    - Administration of central user management through existing tools
  - Also supports **hybrid approach**
    - Application checks both, first local user store and then central user store until it finds a user by that name
  - Central user store may be an existing LDAP directory server (e.g. MS Active Directory, Apache DS)

User Administration in PXS

- Manage user accounts in local user store through fully integrated GUI
  - Stores user name, demographics, and contact data
  - Supports clinical, administrative, and system user accounts
  - Generates secure one-time passwords (must be changed by user after first login)
  - Supports direct role assignment to users as well as role assignment via groups
- Use *Groups* to collect users with similar data access needs
  - Add a role to hundreds of users by modifying one *Group*

Centralized User Administration

- Customers with a central Directory Server can use their existing administration tools
    - Can use vendor‘s GUI (e.g. Microsoft Management Console for AD) or third-party tools for administration
    - Control access rights in PXS by assigning OUs („**O**rganizational **U**nits“) to user accounts
    - Use PXS User Administration GUI to map PXS roles to Directory Server‘s OUs

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PXS - Audit

- Audit Events
  - Application start, stop, and configuration changes
  - Login, Logout
  - Viewing document metadata, document content
  - Searching for patients
  - Every machine interface access (document creation, document queries, patient creation, subscribing and unsubscribing for notifications, ...)
- Audit Events will be sent to an IHE ATNA compliant Audit Record Repository

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Patient Consent

- PXS relies on patient consents as defined by IHE BPPC
- For each patient there can be one active „Patient Consent Acknowledgment“ document
  - Generated and registered by a XDS Document Source
    - or by PXS when triggered through a dedicated web service
  - Has a validity start and end date
  - Points to 1 of the 5 supported privacy policies
    - Policies cover multiple levels of consent between „share everything“ and „share nothing (opt-out)“

Patient Consent

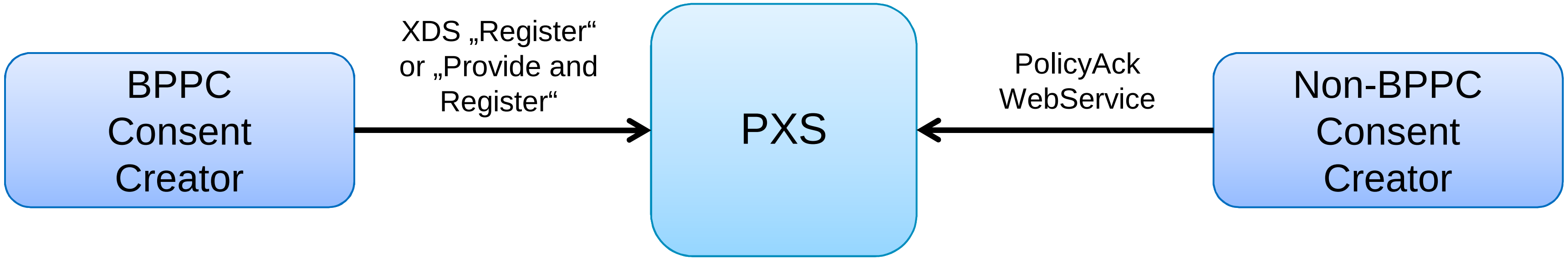
The 5 current policies

Policy	Policy OID / Event Code	Display Name	Description
1	1.2.840.113619.20.2.9.1	Publish	Patient **does not agree** to share their medical documents through the exchange and **does not allow** the user to override view restrictions in emergency situations. Patient **agrees** that their medical documents are published to the exchange.
2	1.2.840.113619.20.2.9.2	No Publish or Share	Patient **does not agree** to share their medical documents through the exchange and **does not allow** the user to override view restrictions in emergency situations. Patient **does not agree** that their medical documents are published to the exchange.
3	1.2.840.113619.20.2.9.3	Publish with Override	Patient **does not agree** to share their medical documents through the exchange, but **allows** the user to override view restrictions in emergency situations. Patient **agrees** that their medical documents are published to the exchange.
4	1.2.840.113619.20.2.9.4	Publish and Share	Patient **agrees** to share their medical documents through the exchange, but **does not allow** the user to override view restrictions in emergency situations. Patient agrees that their medical documents are published to the exchange.
5	1.2.840.113619.20.2.9.5	Publish and Share with Override	Patient **agrees** to share their medical documents through the exchange and **allows** the user to override view restrictions in emergency situations. Patient agrees that their medical documents are published to the exchange.

Patient Consent

How do BPPC consents enter the system?

- XDS Document Source systems can create a standardized consent document (IHE BPPC profile) and register it in PXS
  - Consent document is a CDA
    - Contains a reference to the privacy policy that the patient agreed to
    - Contains a time frame for how long this consent is valid
- Systems that are not BPPC-compliant may use a proprietary WebService that creates and registers a BPPC consent
  - Only need to pass patient identifier, validity duration and policy OID



BPPC Consent Creator

XDS „Register“ or „Provide and Register“

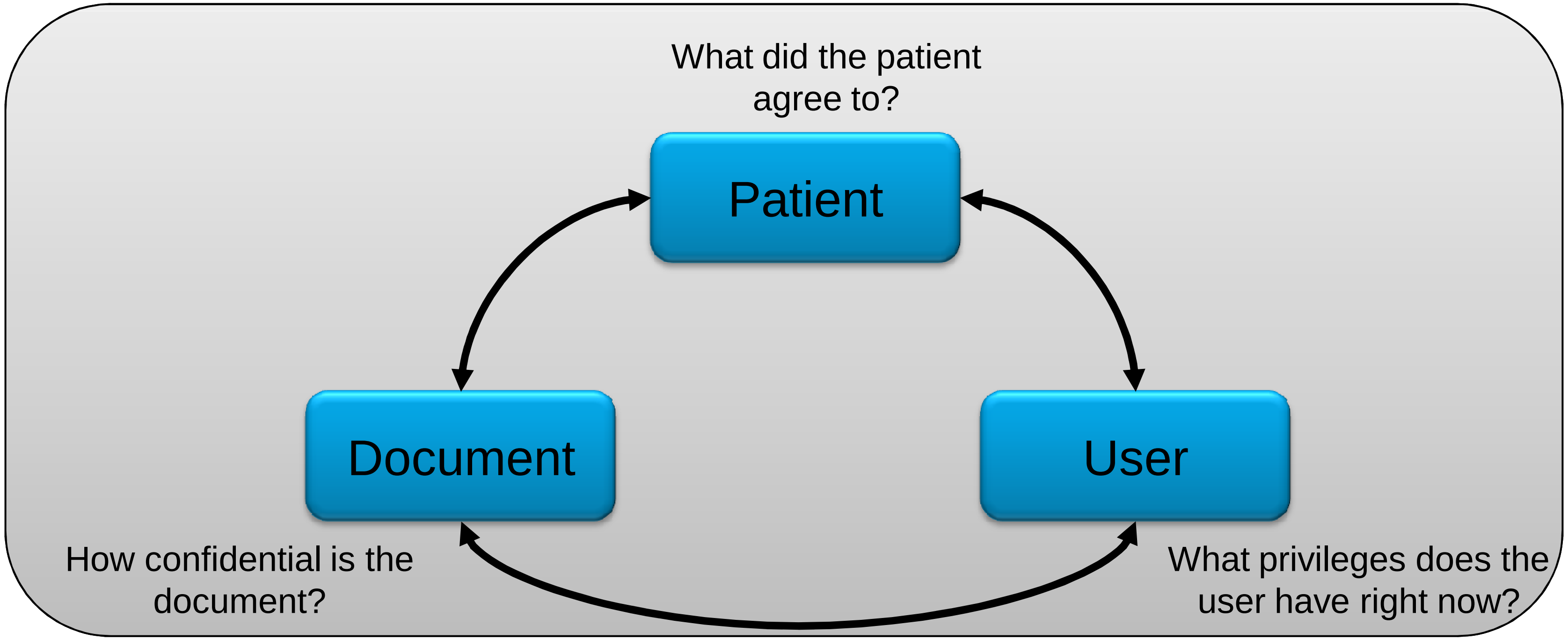
PXS

PolicyAck WebService

Non-BPPC Consent Creator

Patient Consent Enforcement

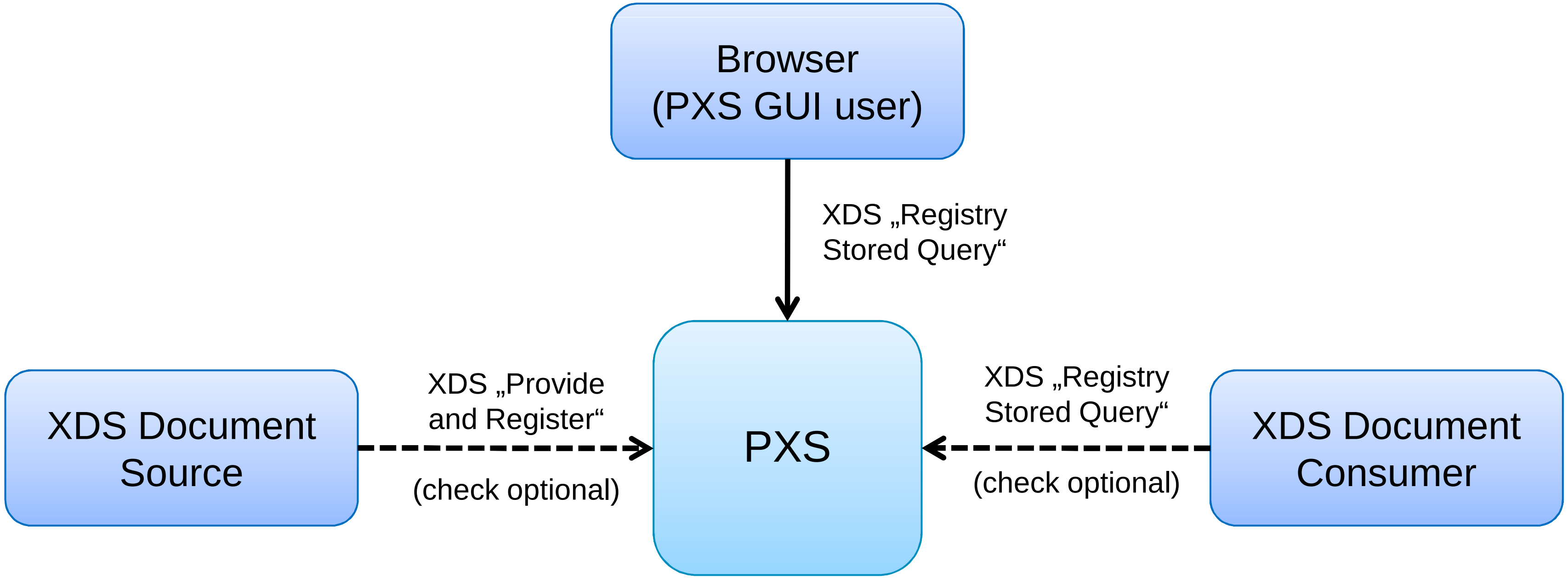
- PXS Consent Enforcement relies on 3 elements
  - The patient‘s selected (or assumed) privacy policy (i.e. Consent)
  - The document‘s confidentiality level
  - The user‘s privilege level


What did the patient agree to?
Patient
Document
User
How confidential is the document?
What privileges does the user have right now?

Patient Consent Enforcement

When is it applied?

- Consent Enforcement applies to the user interface and (optionally) to the „XDS Registry Stored Query“ and „XDS Provide and Register-b“ transactions



Patient Consent Enforcement

How is it applied in the GUI?

- The user selects a patient record
  - The application checks if the patient has agreed to share their medical documents through the exchange (policies 4 or 5) and what roles the user has
    - If the patient agreed to policy 4 or 5 the user will see only documents with a confidentiality code that matches his roles (e.g. only documents that have the codes for “normal” and “restricted”, but not for “very restricted”)
  - The application checks if the patient has agreed to allow the user to override view restrictions in emergency situations (policies 3 and 5) and what roles the user has
    - If the patient agreed to policy 3 or 5 and the user has the role for security overrides, the application displays a security override button
      - The button is only displayed if there are documents that the user cannot see without a security override

Patient Consent Enforcement

How is it applied via XDS?

- A document source attempts to register a document for a patient
  - The application checks if the patient has **not** allowed that their medical documents are published to the exchange (policy 2)
    - If the patient agreed to policy 2 the document is rejected
- A document consumer attempts to query documents for a patient
  - The application checks if the patient has **not** agreed to share their medical documents through the exchange (policies 1, 2 or 3)
    - If so, the query is rejected