A Blueprint for Digital Health

Beyond the EHR

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The EHRS Blueprint

- The EHR Solutions (EHRS) Blueprint
  - Initially published in 2003
  - A second more comprehensive version published in 2006

- Original focus of the Blueprint
  - Achieving a longitudinal lifetime Electronic Health Record for every person in Canada
  - Interoperability of clinical applications and portals via an information infrastructure
  - Patient-centric health data that is *clinically relevant for sharing*, across the continuum of care, where and when it is needed

- Has guided and shaped investment of approximately $4.2B in federal and provincial funds since 2003
Architecture for EHR Solutions

- **Common** business and technical architecture accepted by jurisdictions and vendors
- Links local clinical systems with jurisdiction and regional registries and repositories using a **data sharing** approach
- Most **cost effective** approach, limiting the number of **integration** points
- Extensible to support new functions, scalable to allow for a **large number** of participating **point-of-service applications**
Refreshing the Blueprint

- Address new priorities for health care IT
- Reflect new digital health functional opportunities
- Align with health system transformation initiatives
- Enable transformation
- Guidelines for new programs
- Now the “Digital Health Blueprint”
Blueprint Focus - Managing Complexity

• Blueprint is a **guide** for managing the complexity and simplifying the implementation of digital health
  – Leveraging existing EHR capabilities
  – Evolutionary and sustainable way
  – End-user needs (clinician and consumer) in the forefront

• Ensuring “Fit-for-Purpose”
  – Aligning use of technology with clinical needs
  – Allows for tailoring of clinical and administrative workflow and decision support based on clinical data, context (role and place) and personal preferences
  – Emphasizing value for providers and patients
Differences Between Blueprints

**EHRS Blueprint**
- Enterprise Architecture for EHR
- Reading and writing of information for sharing
- Systems Interoperability
- Infostructure ICT services
- Singular Scope – interoperable EHR, connecting PoS systems
- Creating new infostructure
- Singular EHRS deployment model

**Digital Health Blueprint**
- Guidance for ICT Strategies and Architectures for Digital Health
- Information as part of process
- Business and Clinical process interoperability
- Business and clinical functions
- Broader scope – functioning in multiple computing environments
- Building upon existing infostructure
- Considerations and methodology for implementation and function-specific deployment models
Five Technology Enablers Impacting Health

These enablers are intertwined, creating a new computing ecosystem which is user-driven. One that is beginning to accelerate in health. One that will transform health delivery.
Digital Health is Complex

• Health care is complex
  – Communications
  – Information
  – Coordination
  – Collaboration
  – Knowledge and Evidence

• Automating aspects of health care with ICT adds another dimension of complexity

• Emerging technologies are disruptive and complex

• Requires thoughtful ICT strategic decisions
Collaborative and Coordinated Care
Technologies are not simply inventions which people employ but are the means by which people are reinvented.

Marshall McLuhan
How?

“Providers must do their part by reengineering care processes to take full advantage of efficiencies offered by health IT...”

Did You Know?

• Clinical and administrative workflow and decision support can be tailored based on:
  – Clinical data
  – Context (role and place)
  – Personal preferences
  – Business rules
  – Clinical practice guidelines

• Benefits
  – Monitoring, evaluating, and management of workflow processes as process improvements are identified
  – Adaptive and agile workflow
Functional Aspects of Digital Health

**Health Information**
- Nature of information
- Where is it stored
- Shared
- Exchanged

**User Interface & Experience**
- Which device
- Centralized
- Consistency

**Digital Health Services**
- Common and reusable
- Cross organizational
- Embedded in devices and applications

**Workflow Across the Care Continuum**
- Configurable
- Rules-based
- Monitored
- Managed

**Communication Across the Care Continuum**
- Real time
- Store and forward
- Push-pull
- Which device(s)

**Health Analytics**
- Real time or periodic
- Contextually appropriate
- Across multiple sources
Digital Health Environments in Scope

- Diagnostics
- EHR Data and Services
- Clinical Applications
- Mobile Apps
- Devices
- HIAL for Interoperability and Process Management
Incorporating the EHRS Blueprint

EHR SOLUTION (EHRS)

EHR INFOSTRUCTURE (EHRI)

Ancillary Data & Services
Health Information Data Warehouse

Longitudinal Record Services

Health Information Access Layer

Point of Service Application
Point of Service Application
EHR Viewer

PoS
PoS
Viewer
Clinical Decision Support Deployment

In Clinical Applications
- CDS based on the data and patient information within the organization
- Organizational clinical guidelines frame the CDS algorithms implemented
- Organizational workflow management based on the local CDS rules and mechanisms

CDS in Mobile Apps
- Generally provided from other clinical systems:
  - EMR/HIS the device is tethered to
  - Information services “in the cloud”

Shared Service
- Common and consistently applied CDS algorithms across multiple organizations, regions, or settings
- Applied against the patient’s EHR
- CDS content and services provided and managed by clinical authority

CDS on information in motion
- Analytics on processes
- Real time alerts
Use of Mobile Devices and Apps

Mobile Apps

- Single function apps
- Real time access
  - Anywhere, anytime
  - Always connected

Clinical Applications

- Workflow support
- Communications

EHR Data and Services

“On the go”
- Workflow support
- Communications

“HIAE for Interoperability and Process”

Diagnostics

- Geo-location context
- App appropriateness – aligned with guidelines, efficacy, safety, usability
From Concept to Implementation

Digital Health Blueprint
Enterprise view of the ICT building blocks for digital health with guidance and considerations for their use

Solution Deployment Models
A framework that documents how and what building blocks are used to support a particular business function

Solution Implementation Profiles
Artifacts which outline the choices for an implementation based on design considerations and technology roadmap

Interoperability points and specifications
Specific Requirements
Interoperability Specs.

RFP
Technical Design Documents
Implementation Plan & Roadmaps
Operational Plan
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Solution Deployment Model
Remote Patient Monitoring

Solution Implementation Profile
Remote Patient Monitoring implementation choices

Interoperability points and specifica-
cations
Specific Requirements
Interoperability Specs.
Remote Patient Monitoring Use Case

• Remote patient monitoring of blood pressure
  – Utilizing a mobile device and app
  – Biometrics to an electronic monitoring service
  – Alerts to family physician
  – Communication to patient
Remote Patient Monitoring - Workflow

1. Referral to RPM service: Based on RM service availability, the clinician refers the patient into a specific RM program (e.g., diabetes management, post-surgical discharge, etc.).

2. RPM Service enrollment: Service determines if the patient qualifies for the RPM program. Patient record and care plan created.

3. Asset Management: New patient request sent to Asset Management. Equipment, ordered, configured, shipped to patient's home.

4. Setup & Training: Setup performed by the patient or care provider, then training delivered remotely or via the care provider.

5. Health data collected & transfer: Biometric & health data collected and transferred to a RPM service provider.


7. Patient follow up as required: Clinician calls or books an appointment with the patient when results vary from Care Plan.

8. Summary data submitted to EHR: Relevant clinical summary data submitted to a Digital Health System (e.g., EHR, EMR, PHR, etc.).
Remote Patient Monitoring

- Medical Devices
- Shared Data and Services
- Interoperability and Process Management Environments (HIAL)
- Mobile Apps
- EMR
- Clinical Applications

Please book appointment

Submit BP Results

Dr. Paul

Mabel

Medical Devices
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Blueprint as a Living Asset

- Blueprint will be continually enhanced, extended, and refined
  - Using a modeling tool and shareable architecture repository
  - Content will periodically versioned and re-published
- Blueprint will be published on the Infocentral Wiki
- New deployment models will emerge and evolve over time based on need
  - *Infoway* will propose deployment models for its specific investment programs and will support development and publication of additional models
  - Deployment models may be developed collaboratively or by individual stakeholders
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In Summary - Blueprint Illustrates

• Leveraging existing investments in the EHRS
• Guide for the solution architecture
  – Appropriate use of various computing environments for specific functionality
  – How to tailor, configure and manage clinical and administrative processes
  – Effective use of modern and emerging technologies
  – Future Infoway investment programs
• Guidance for strategic plans and ICT roadmaps based on priority business functions and implementation choices
Thank You

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