MANAGING FHIR INNOVATIONS IN HEALTHCARE ORGANIZATIONS: THE UNIVERSITY OF UTAH EXPERIENCE

2018 UNIVERSITY OF WASHINGTON FHIR WORKSHOP
SEPTEMBER 24, 2018

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DISCLOSURES

• In the past year, I have been a consultant or sponsored researcher on clinical decision support for ONC*, Hitachi, McKesson InterQual, and UC San Francisco

• Several of the apps, services, and tools described are being commercialized to enable wider impact

*via various subcontractors
AGENDA

• Background and Rationale for FHIR Innovations
• University of Utah IAPPS Initiative
• Governance, Strategy, and Program Considerations
• Overview of Technical Approach
• Lessons Learned and Recommendations
UNIVERSITY OF UTAH HEALTH

- Clinical context
  - 4 hospitals, 10 community clinic centers
  - 1,100 physicians, 2 million annual visits
  - 34,000 annual discharges

- Technical context
  - Epic system-wide since 2014
  - On Epic 2017
  - About to upgrade to 2018
RATIONALE FOR FHIR INNOVATIONS

• Enables tackling important problems for which native EHR functionality is inadequate
  • Provides an alternate strategy to “ask and hope”
• Feasible to accomplish as a part of a holistic EHR optimization strategy
  • Epic, Cerner, and other major EHR vendors are supportive
• Can harness the innovation of others
  • Local stakeholders, other institutions, vendors
• Could potentially commercialize solutions
• Powerful enabler for externally funded R&D
UNIVERSITY OF UTAH IA APPS INITIATIVE

• Acronym for Interoperable Apps and Services
• Goal: improve patient care and the provider experience through innovative, interoperable extensions to native Epic functionality
• Multi-stakeholder initiative started by University of Utah in 2016
• Core part of larger Re-Imagine EHR initiative
GOVERNANCE AND RESOURCING

• Steering committee co-chaired by CIO & CMIO
  – Charged with strategy, prioritization, and resourcing

• Multi-disciplinary project team
  – IT and Informatics, including 7 team members trained and certified in developing new EHR interfaces including FHIR
  – GApp Lab (therapeutic gaming)
  – Clinical and external collaborators

• Baseline operational investment + external funding
  – ~$20M in external grant funding secured leveraging interoperability infrastructure
INITIAL STRATEGY

• Gain experience with initial implementations
• Complete a few projects end-to-end prior to widely soliciting for potential projects
• Establish processes and resources for efficient development, deployment, support, and eventual retirement of apps and services
• Educate and empower various stakeholders to effectively provide value
• Ensure security as an essential priority
CONSIDERATIONS FOR PRIORITIZATION

• Does Epic already do this well?
• Will Epic tackle this problem soon?
• Are there existing operational practices that will be changed? Do they want to change?
• What is the likely clinical impact?
• What is the likely financial impact?
• Is there a committed clinical champion?
• Are there additional resources available?
• How hard will it be to implement?
SECURITY / INFRASTRUCTURE

• Independent code review
• Third party code audit
• Currently focused on implementations inside the firewall
  – Broad nature of FHIR scopes is an issue
• Environments strategy that supports volume testing
EVALUATION

• Critical for understanding impact and demonstrating ROI
  – Use
  – Satisfaction
  – Clinical and financial impact
• Need to explicitly prioritize
• High synergy with research
RESEARCH SYNERGY

• Multiple grants awarded (> $20M); more in pipeline. Examples:
  • NCI grant for individualized cancer risk management
  • CMS grant for HIE data integrated with EHR via SMART on FHIR
  • Hitachi sponsored research for diabetes predictive modeling and decision support delivered via SMART on FHIR
  • PCORI contract for integrating tobacco cessation across 30 federally quality health centers leveraging CDS Hooks
  • AHRQ proposal for lung cancer screening decision support and shared decision making using SMART on FHIR and CDS Hooks

• Well-suited to multi-institutional grant applications
EPIC-SUPPORTED INTEGRATION POINTS

• Interconnect, HL7 FHIR*
  – Allows obtaining real-time data, placing orders, & saving data

• ClinKB/Active Guidelines, HL7 SMART*
  – Allows embedding any Web-based “App” into Epic

• BPA Web services, HL7 CDS Hooks*
  – Allows an external Web service to provide CDS

*Potential for interoperability with EHRs beyond Epic
APPROACH TO DATA: NATIVE + CUSTOM FHIR

- Epic Chronicles Database
- Epic APIs (FHIR, other)
- Custom Web Service APIs
- FHIR Wrapper

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APP FRAMEWORK: SMART

EHR

FHIR Wrapper

SMART Launch Token

Usual authentication

User

OpenCDS

Rewritten SMART Launch URL

Display

Data

Guidance

Obtain Access Token

Data Retrieval

App
CDS SERVICE FRAMEWORK: CDS HOOKS

- EHR
  - BPA Web Services
  - FHIR Wrapper
- CDS Hooks Adapter
  - CCDA
  - FHIR + OAuth 2.0 Access Token
- CDS Service (OpenCDS)
  - Guidance Card
  - OAuth 2.0 Token
  - FHIR
LESSONS LEARNED AND RECOMMENDATIONS

• Lessons learned
  – FHIR, SMART, and CDS Hooks should be a part of a leading healthcare organization’s holistic approach to EHR optimization
  – Baseline operational investment is critical
  – There is high synergy with research
  – Custom FHIR interfaces are often needed to meet user needs

• Recommendations
  – Make a baseline operational investment
  – Incrementally add institutional capacity, e.g., via external grants
THANK YOU!

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