

# SMART on FHIR Enablement of Clinical Applications to Accelerate Solution Delivery

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# Software Reusability

One of the HOLY GRAILS of software development

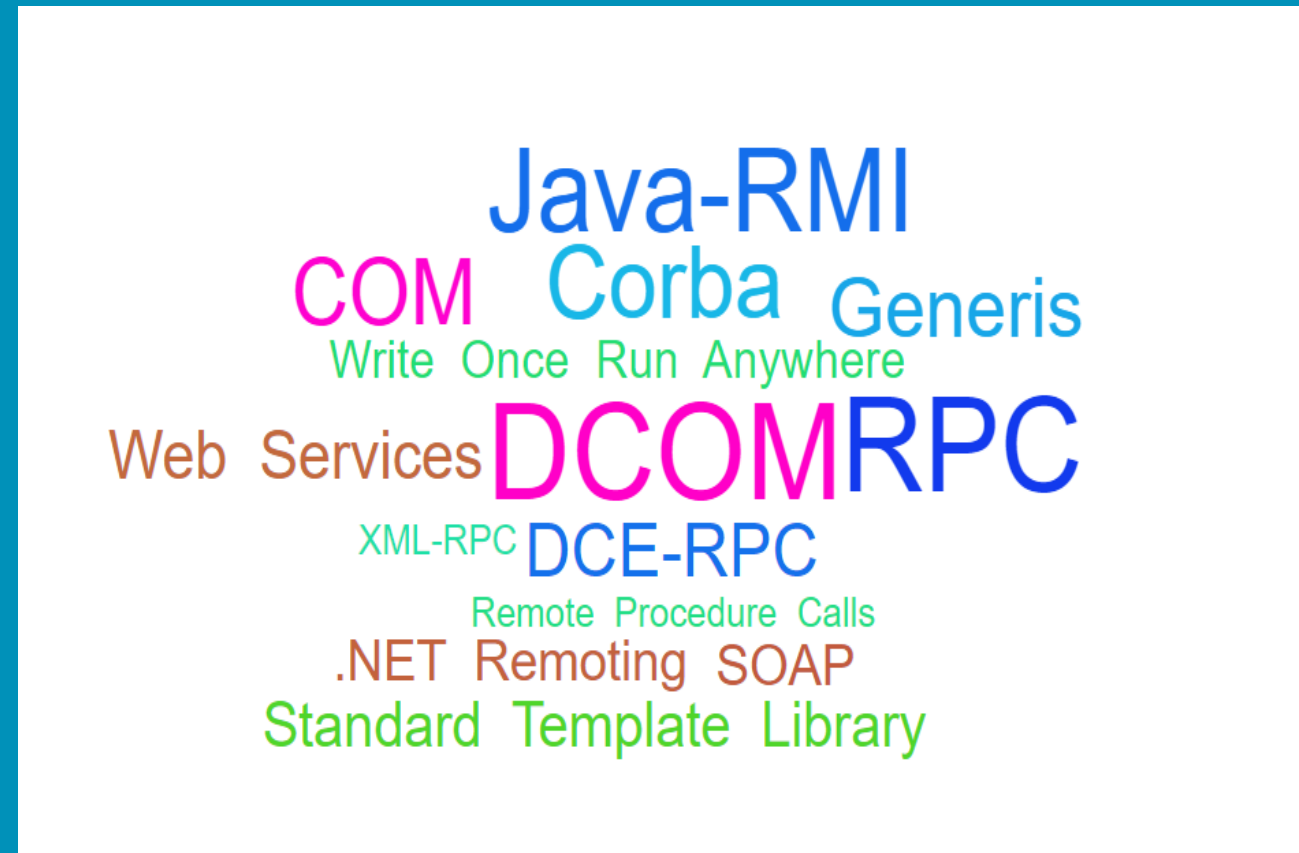
- Lowers Development Cost
- Increases Productivity
- Improves Time to Market

Very successful at the code level

- Subroutines
- Libraries (Jars, DLLs)
- Generics
- Objects, Inheritance

Distributed Computing and Remoting historically less successful

- Seen much mention of DCOM/CORBA/DCE/RPC lately?
- REST seems to be the industry grand slam for APIs



# The Elevator Pitch

SMART on FHIR (and FHIR) as a solution for general distributed computing

~~BEER~~



NOT JUST FOR

~~BREAKFAST~~

**EHRs**

~~ANYMORE~~



- FHIR and SMART on FHIR enable existing (clinical) applications as clients
- Create library of SMART on FHIR micro-applications for integration

# FHIR Enabling Clinical Applications

## UHG/Optum/UHC Clinical Applications

MBMNow  
Oncology

FHIR Server

RQS  
Risk and Quality

FHIR Server

ICUE  
Utilization Management

FHIR Server

Optum Clinical Manager  
Clinical Dashboard

FHIR Server

DateCore  
Suspect Conditions &  
Resubmit

FHIR Server

OptumCare  
Referral Utility

FHIR Server

## SMART on FHIR Micro-Applications

Medication Management

Prior Auth Case Submission

Gaps-in-Care

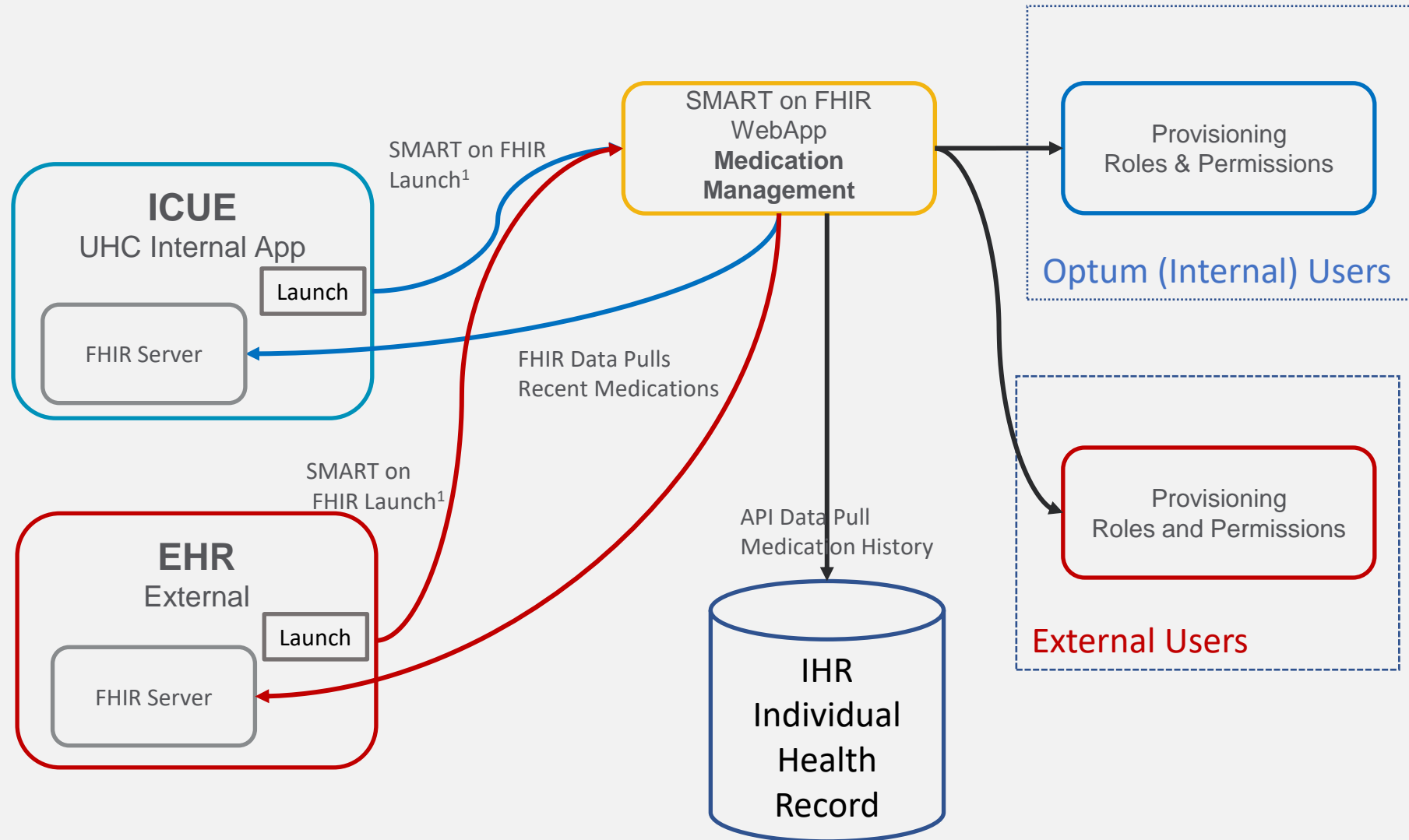
Care Estimator

Lab Estimator

# Medication Management Example

UHC  
Application  
Internal  
Integration

EHR @ Health  
System  
External  
Integration



# Medication Management Screen Shot

## Medications

### Group medications

### Show

Include inactive medications

### Sort by

### Active 20

<b>Carboplatin Injection Solution 10 mg/mL</b> <b>CARBO</b> platin <i>Brand · Alkylating agents</i>	Unit of use: 350 mg/ m <sup>2</sup> 1 Time per Month	
<b>Concerta Methylphenidate Oral Tablet Extended Release 36 mg</b> <i>Brand · CNS stimulants</i>	Unit of use: 18 mg Every Morning (QAM)	● New script needed ● Post-Discharge
<b>Cyclophosphamide 50 mg Oral Capsule</b> <i>Generic · Alkylating agents</i>	Unit of use: 150 mg Daily (QD)	
<b>Dilaudid Injection Solution 2 mg/mL</b> <span style="background-color: #4a5568; color: white; padding: 2px;">New</span> <i>Brand · Narcotic analgesics</i>	Unit of use: 0.2 mg/kg Nightly at Bedtime (HS)	
<b>Docetaxel Intravenous Concentrate 30 mg/5mL</b> <i>Generic · Mitotic inhibitors</i>	Unit of use: 60 mg/m <sup>2</sup> Every 3 weeks	
<b>DOXOrubicin liposome HCl Injection Solution 50 mg/mL LipoDox 50 [DSC]</b> <i>Brand · Antibiotics / Antineoplastics</i>	Unit of use: 2 mg/mL	
<b>Econazole Nitrate Topical Foam 1% Ecoza</b> <span style="background-color: #4a5568; color: white; padding: 2px;">Changed</span> <i>Generic · Topical antifungals</i>	Unit of use: Cover affected areas Daily (QD)	
<b>Fluticasone Propionate Nasal Suspension 50 mcg/actuation</b> <span style="background-color: #4a5568; color: white; padding: 2px;">New</span> <i>Brand · Nasal steroids</i>	Unit of use: 50 mcg/spray Every 12 Hours (Q12H)	● Not taken as prescribed ● Adverse reactions reported
<b>irinotecan liposome Injection Solution 1000 Unit/mL</b> <i>Generic · Miscellaneous antineoplastics</i>	Unit of use: 70 mg/m <sup>2</sup> Every 2 weeks	
<b>Levemir FlexTouch Subcutaneous Solution Pen-injector 100 Unit/mL</b> <i>Generic · Insulin</i>	Unit of use: 0.1 units/kg 3 Times Daily (TID)	● Not picked up

Member began taking	Prescribed	Purpose	Instructions / SIG
July 31, 2019	Dr. Meghana Rajashekar July 12, 2019	type 2 diabetes	Twice daily dosing, administer the evening dose with the evening meal, at bedtime, or 12 hours after the morning dose
Claims last fill date	Pharmacy	Days supply	Refills remaining
November 16, 2019	Walgreens	30	2

# Development Notes

## Software Components

Launch

- Standardized App Launch Library

FHIR Server

- FHIR Server Library<sup>1</sup>

Provisioning  
Roles &  
Permissions

- Provisioning Integration Library<sup>2</sup>

<sup>1</sup>Important simplification – The FHIR Server is NOT general purpose.

The FHIR Queries are known in advance.

HAPI-FHIR resource provider implementation only needs to meet use case.

<sup>2</sup>Provisioning - Work in progress.

Internal users are active directory based and managed through corporate processes.

External users roles and permissions are managed by external clients.

Possible integrations include

- Passing role on launch
- External application management console
- Client data feed or batch upload
- External API

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