Presentasjon for FHIR Fagforum #10

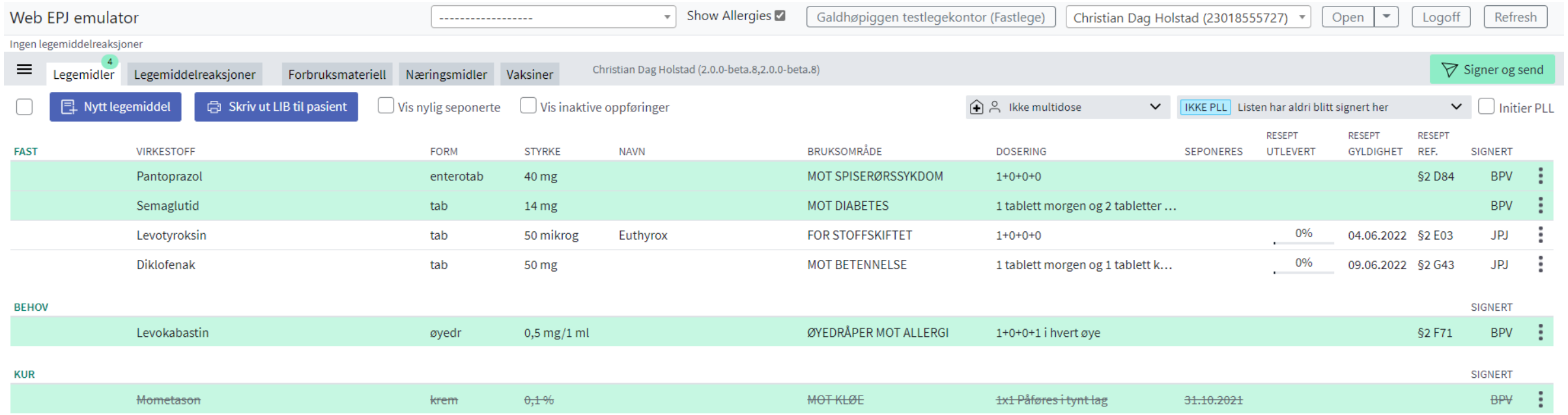
FHIR og Sentral forskrivningsmodul

Norsk helsenett

Februar 2022, Dag Hammer

01.02.2022

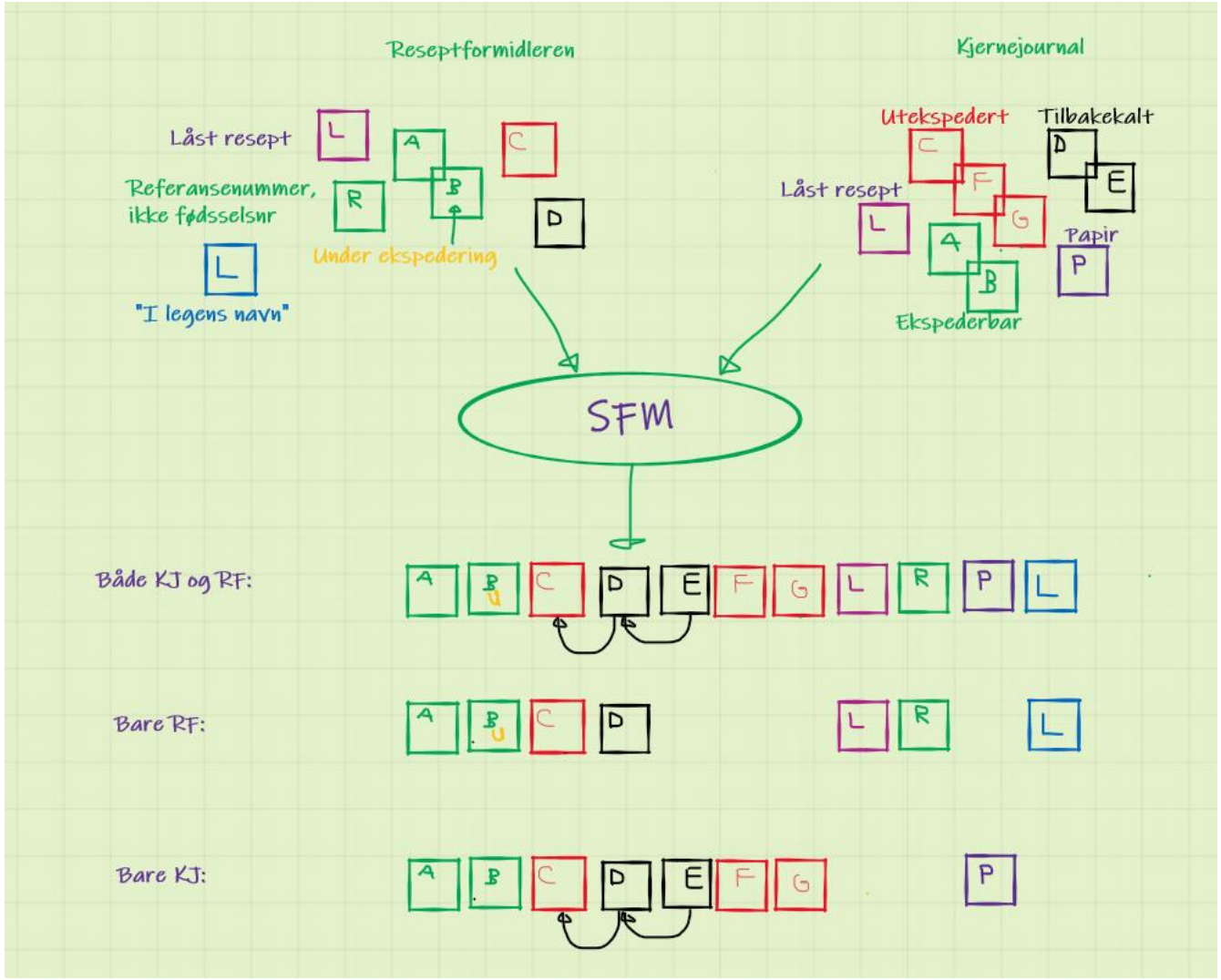
SFM er først og fremst modul for legemiddelbehandling i EPJ



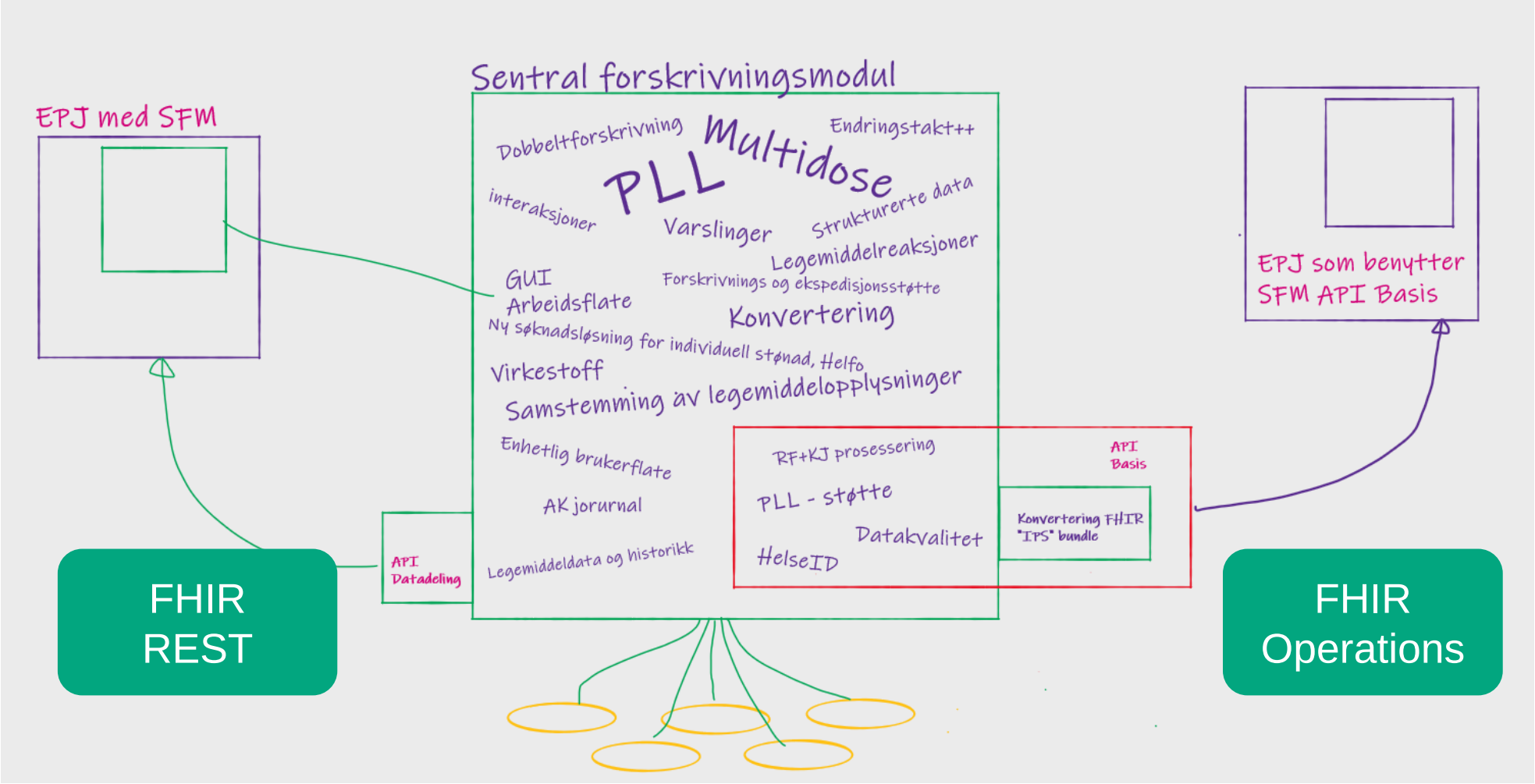
Samhandling med nasjonale systemer

Kompleksitet ligger i juss og tilgang
SFM samler informasjon og presentere konsistent

Basis API tilbyr sammenstilte data på «samme måte» som SFM GUI viser dem fram

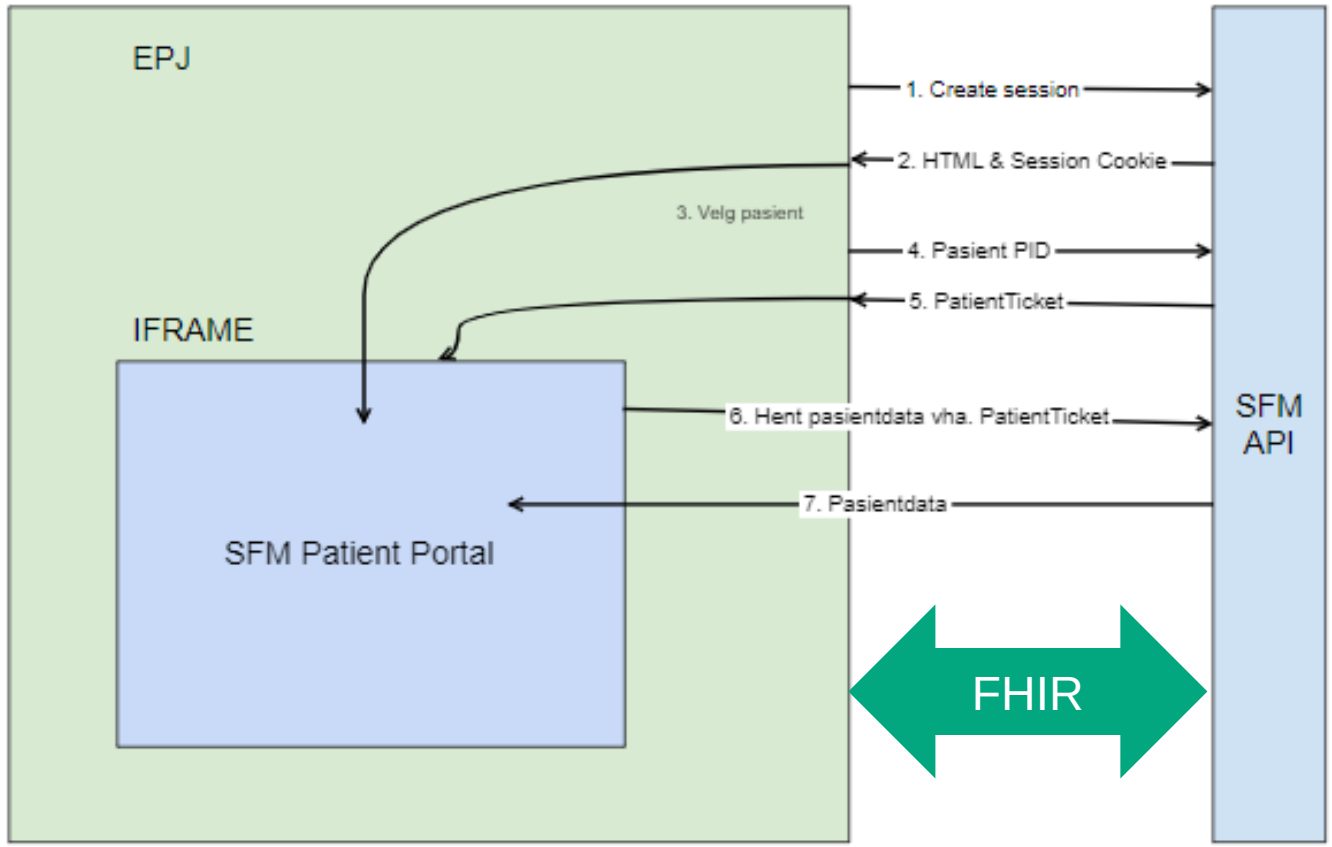


SFM har to publiserte API (i tillegg til noen støttefunksjoner)



SFM

Application architecture

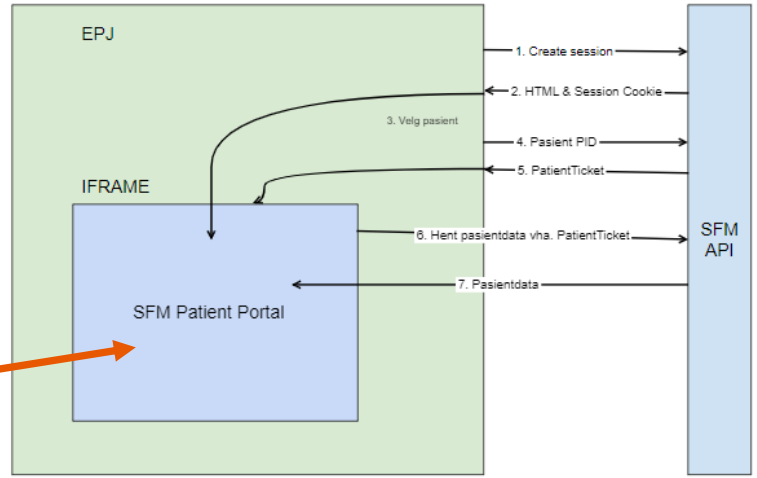


Hvorfor ikke «SMART»?

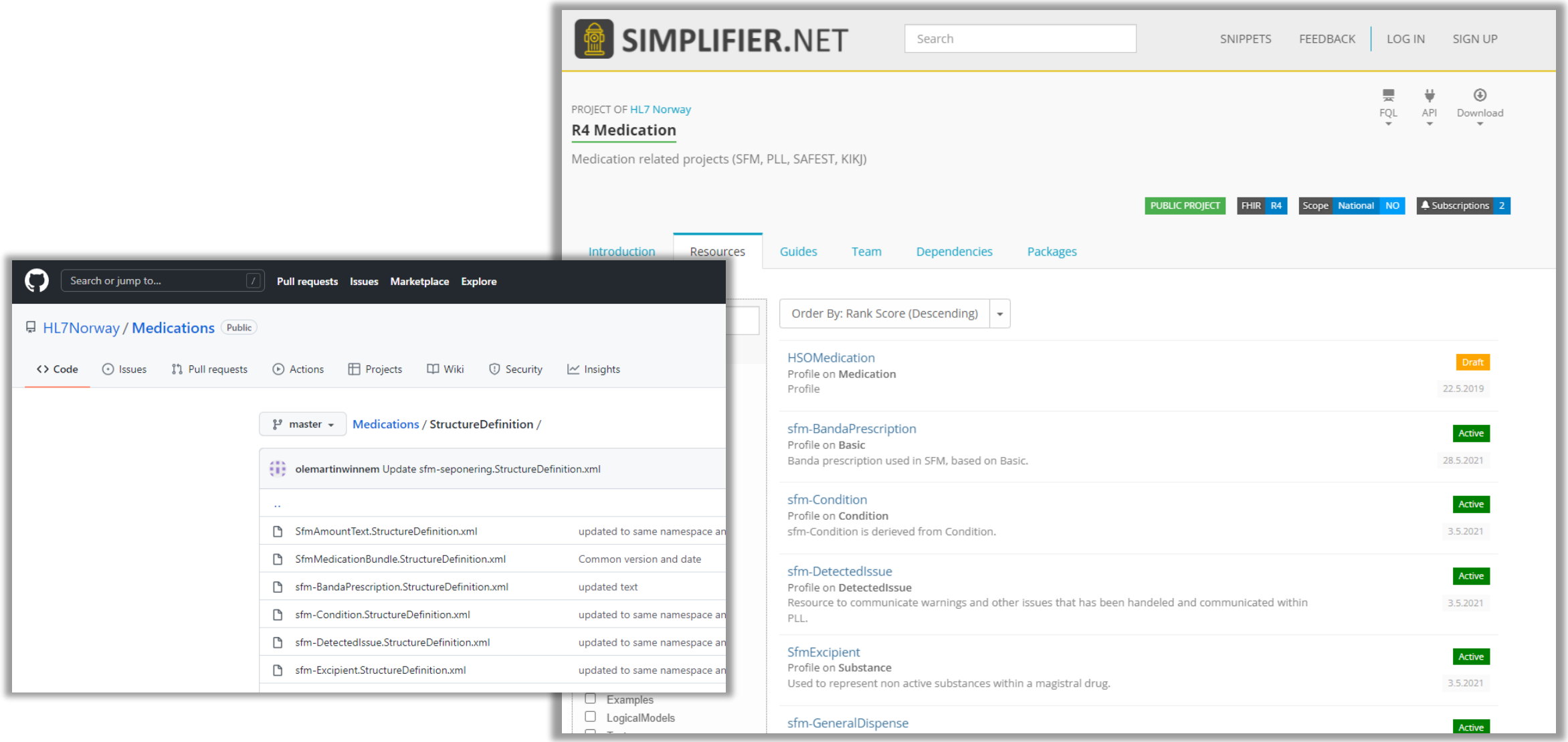
- En SMART applikasjon vil ha tilgang til data i EPJ
- SFM har egen lagring av data, og kun minimalt behov for tilleggsdata.
- Tilleggsdata (målinger/diagnose) skrives av EPJ til SFM i API

- SFM plattform kan kjøre andre applikasjoner i kontekst, - på ide-stadiet foreløpig

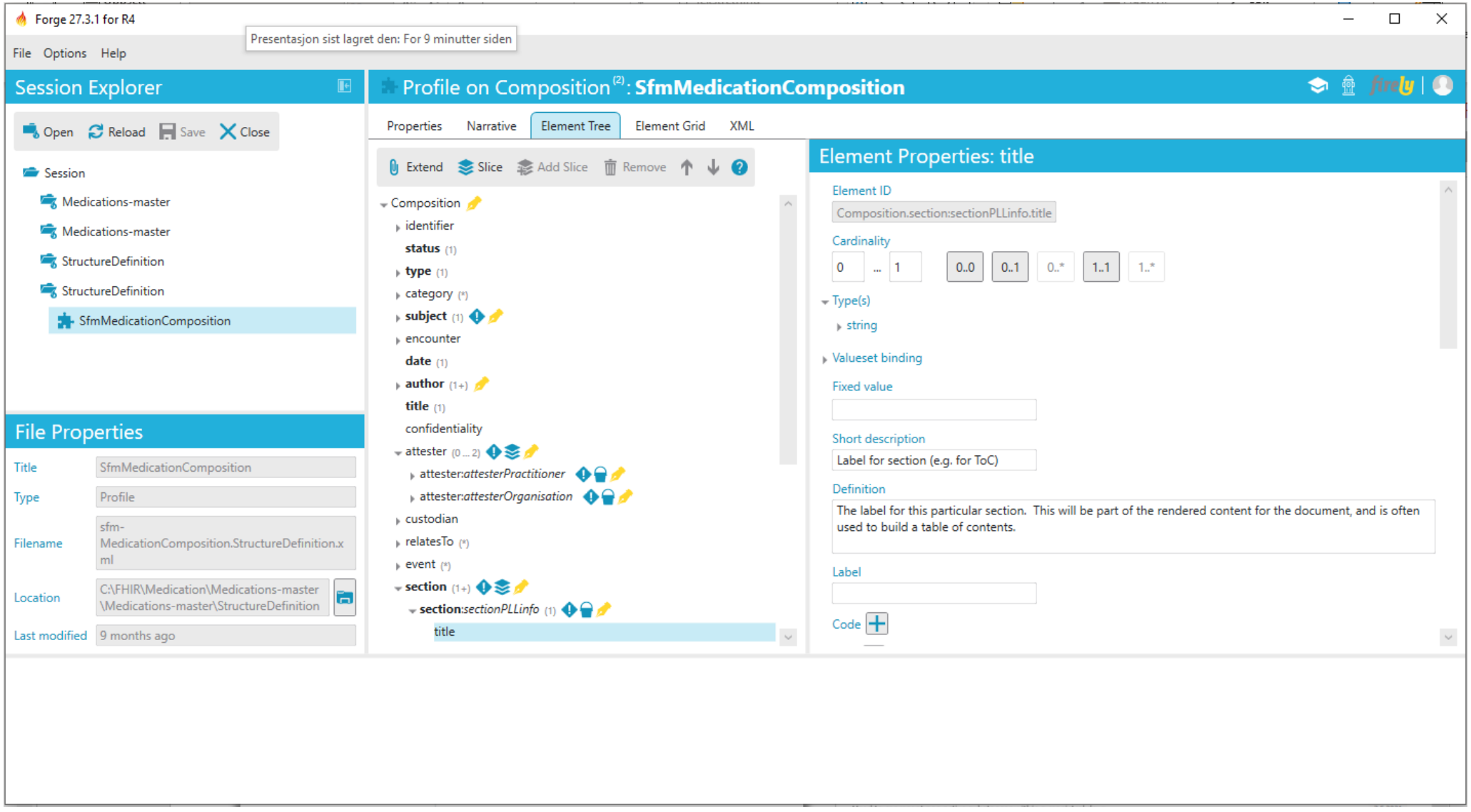
EPJ FHIR API



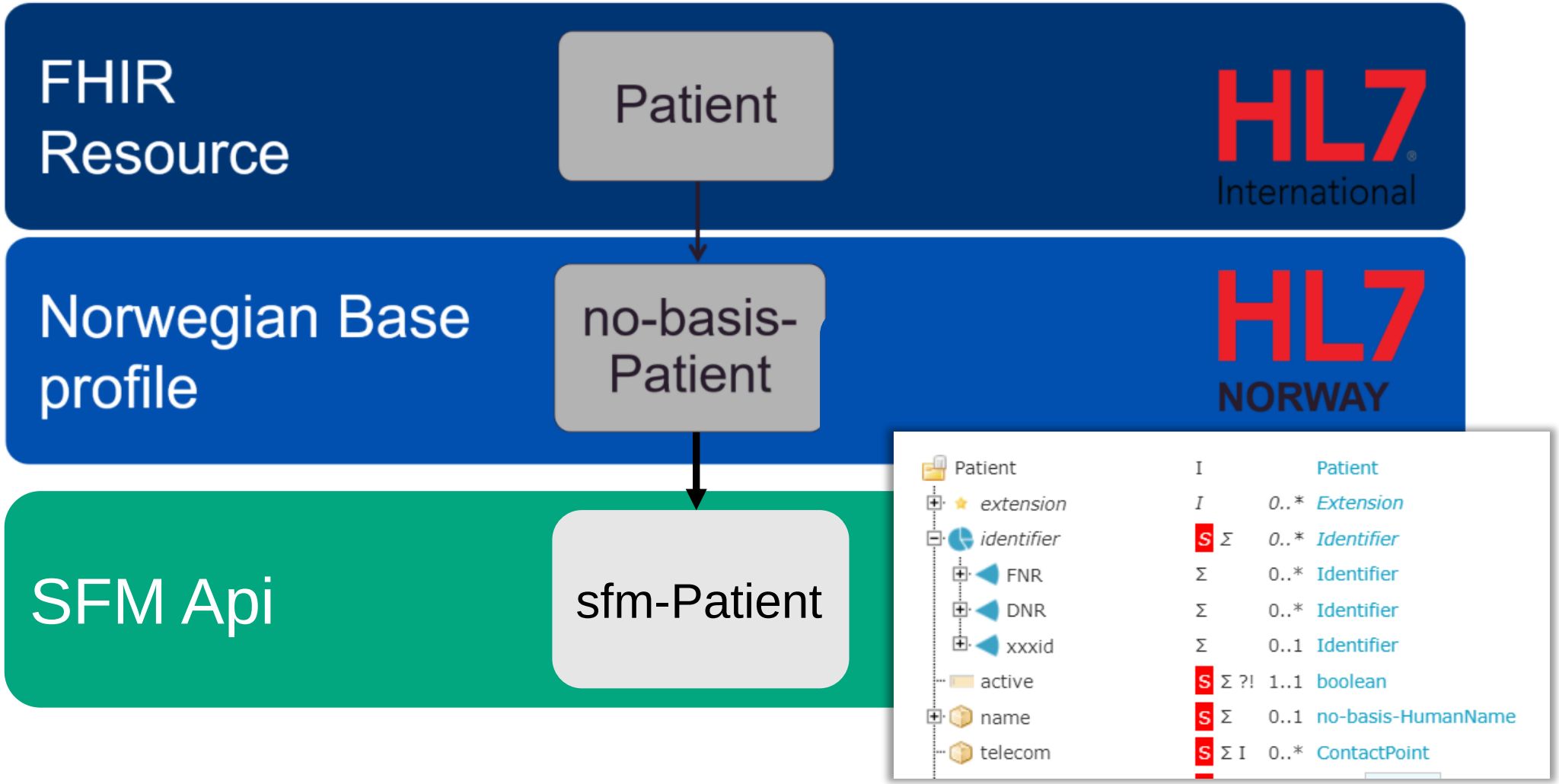
Dokumentasjon og verktøy



FORGE for profilering

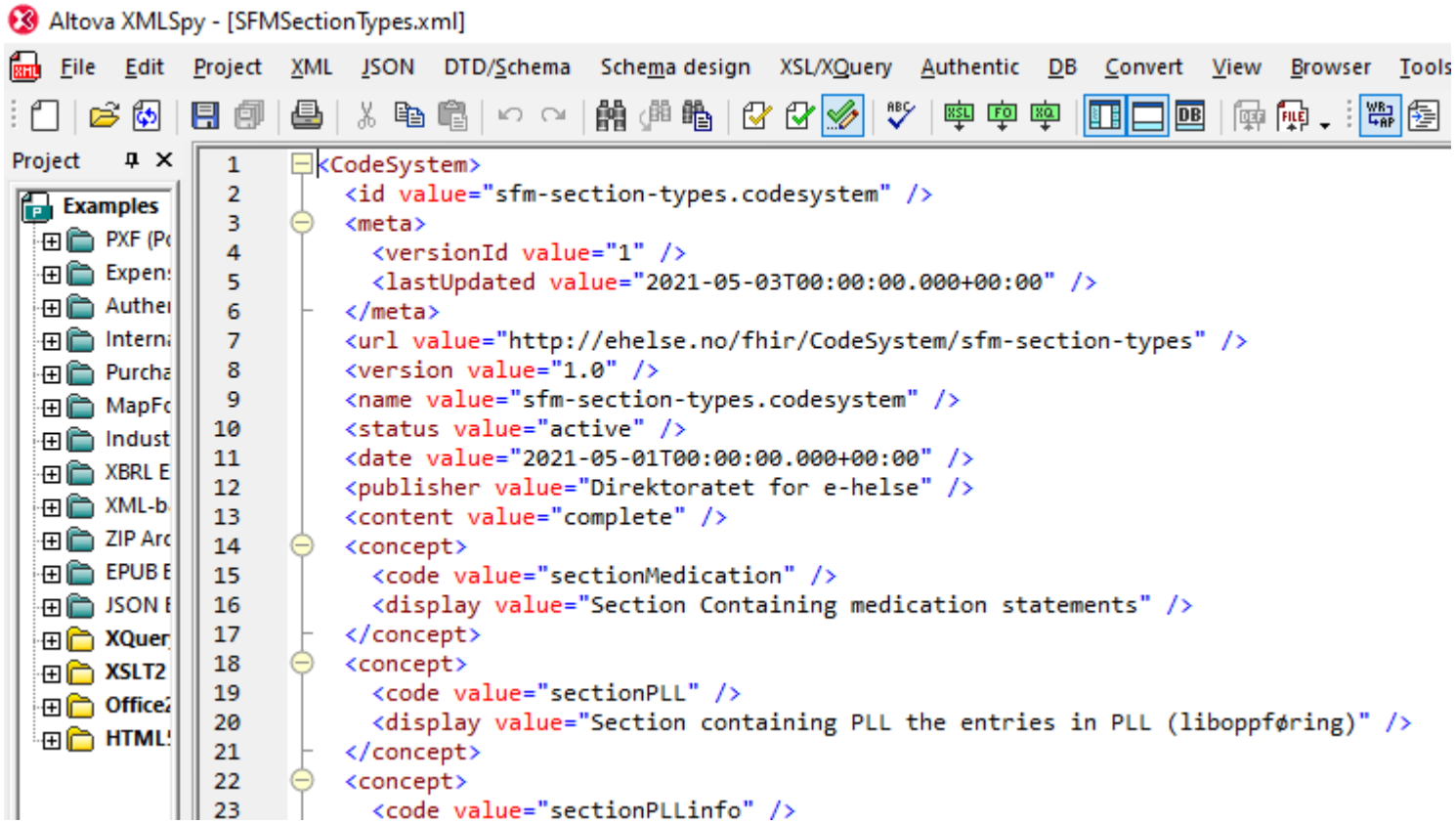


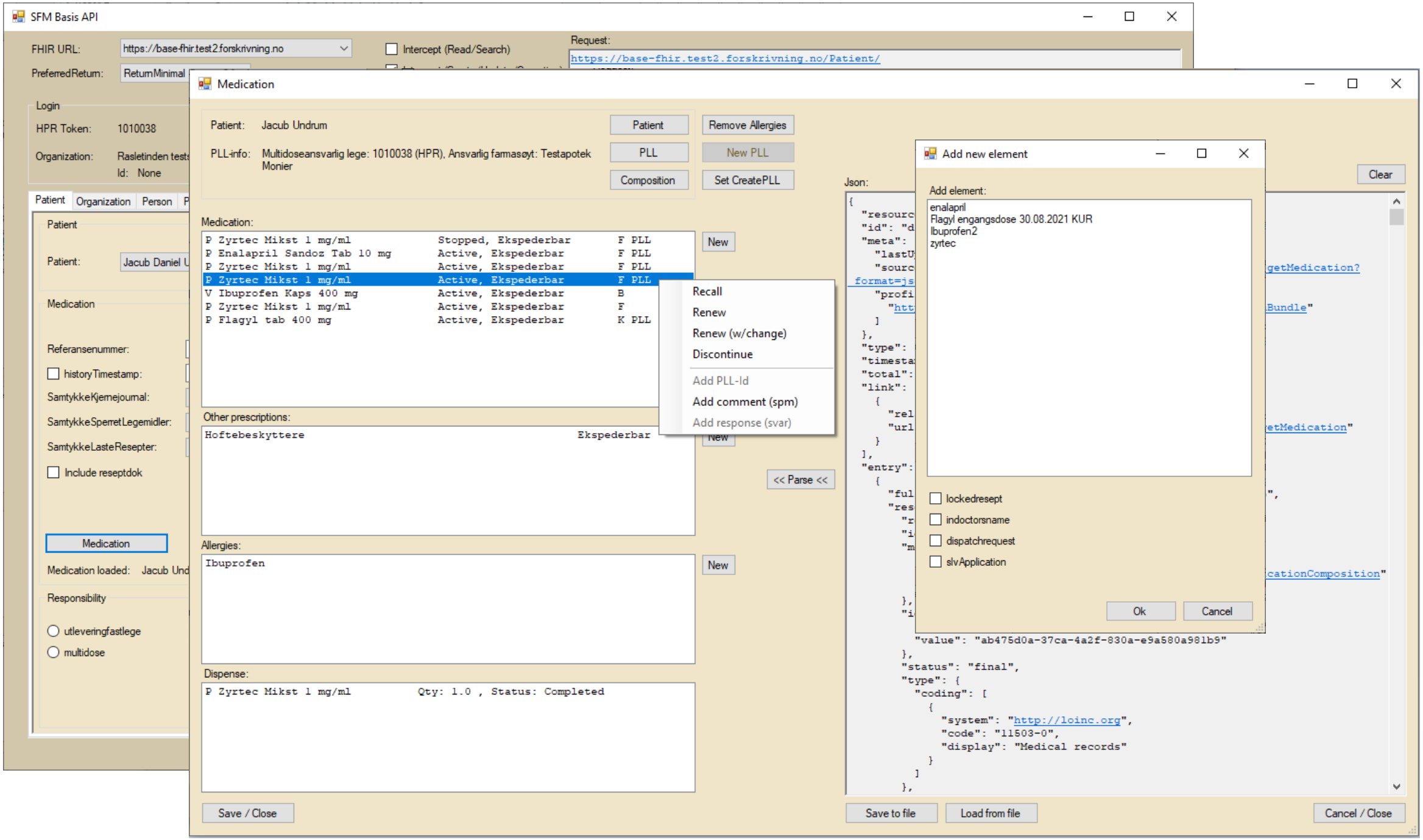
Norsk profileringsmodell



XMLSpy for andre ressurser

CodeSystems
OperationDefinitions
SearchParamteters
ValueSet




SFM Basis API
FHIR URL:
https://base-fhir.test2.forskrivning.no
Intercept (Read/Search)
Request:
https://base-fhir.test2.forskrivning.no/Patient/
PreferredRetum:
Login
HPR Token:
1010038
Organization:
Id: None
Patient
Organization
Person
Patient:
Jacub Daniel U
Medication
Referansenummer:
historyTimestamp:
SamtykkeKjernejournal:
SamtykkeSperretLegemidler:
SamtykkeLasteResepter:
Include reseptdok
Medication
Medication loaded:
Responsibility
utleveringfastlege
multidose
Medication
Patient:
Jacub Undrum
PLL-info:
Multidoseansvarlig lege: 1010038 (HPR), Ansvarlig farmasøyt: Testapotek Monier
Patient
PLL
Composition
Remove Allergies
New PLL
Set CreatePLL
Medication:
P Zyrtec Mikst 1 mg/ml Stopped, Ekspederbar F PLL
P Enalapril Sandoz Tab 10 mg Active, Ekspederbar F PLL
P Zyrtec Mikst 1 mg/ml Active, Ekspederbar F PLL
P Zyrtec Mikst 1 mg/ml Active, Ekspederbar F PLL
V Ibuprofen Kaps 400 mg Active, Ekspederbar B
P Zyrtec Mikst 1 mg/ml Active, Ekspederbar F
P Flagyl tab 400 mg Active, Ekspederbar K PLL
New
Recall
Renew
Renew (w/change)
Discontinue
Add PLL-Id
Add comment (spm)
Add response (svar)
Other prescriptions:
Hoftebeskyttere Ekspederbar
New
<< Parse <<
Allergies:
Ibuprofen
New
Dispense:
P Zyrtec Mikst 1 mg/ml Qty: 1.0 , Status: Completed
Save / Close
Json:
Clear
getMedication?
Bundle"
etMedication"
cationComposition"
"value": "ab475d0a-37ca-4a2f-830a-e9a580a981b9"
"status": "final",
"type": {
"coding": [
"system": "http://loinc.org",
"code": "11503-0",
"display": "Medical records"
Save to file
Load from file
Cancel / Close
Add new element
Add element:
enalapril
Flagyl engangsdose 30.08.2021 KUR
Ibuprofen2
zyrtec
lockedresept
indoctorsname
dispatchrequest
slvApplication
Ok
Cancel

Microsoft FHIR

https://github.com/microsoft/fhir-server

README.md

FHIR Server for Azure

A .NET Core implementation of the FHIR standard.

CI Build & Deployment	Azure Government Deployment
Azure Pipelines succeeded	Azure Pipelines succeeded

FHIR Server for Azure is an open-source implementation of the emerging HL7 Fast Healthcare Interoperability Resources (FHIR) specification designed for the Microsoft cloud. The FHIR specification defines how clinical health data can be made interoperable across systems, and the FHIR Server for Azure helps facilitate that interoperability in the cloud. The goal of this Microsoft Healthcare project is to enable developers to rapidly deploy a FHIR service.

With data in the FHIR format, the FHIR Server for Azure enables developers to quickly ingest and manage FHIR datasets in the cloud, track and manage data access and normalize data for machine learning workloads. FHIR Server for Azure is optimized for the Azure ecosystem:

- Scripts and ARM templates are available for immediate provisioning in the Microsoft Cloud
- Scripts are available to map to Azure AAD and enable role-based access control (RBAC)

FHIR Server for Azure is built with logical separation, enabling developers with flexibility to modify how it is implemented, and extend its capabilities as needed. The logic layers of the FHIR server are:

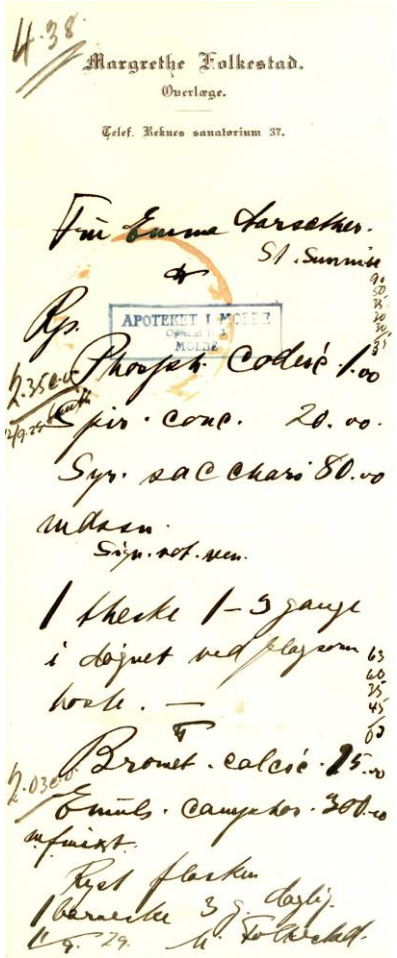
- Hosting Layer – Supports hosting in different environments, with custom configuration of Inversion of Control (IoC) containers.
- RESTful API Layer – The implementation of the APIs defined by the HL7 FHIR specification.
- Core Logic Layer – The implementation of the core FHIR logic.
- Persistence Layer – A pluggable persistence provider enabling the FHIR server to connect to virtually any data persistence utility. FHIR Server for Azure includes a ready-to-use data persistence provider for Azure Cosmos DB (a globally replicated database service that offers rich querying over data).

Microsoft FHIR server

- Stort sett veldig bra
- Ikke et alternativ når vi startet, migrering fra egenutviklet FHIR server til MS
- Noen småbugs, og noen avvik fra standard (f.eks. i OperationOutcome)
- Taklet ikke alle UTF, kjent regex problem (non breaking space)
- Litt læring underveis.
- SFM har businesslogikk bak dataelementer: f.eks. henter tilleggs informasjon fra HPR for Practitioner
- Vi «mistet» Swagger på veien…

SFM og FHIR

Hva skjedde på veien?




```
<import namespace="http://www.kith.no/xmlstds" schemaLocation="../../felleskomponenter/k
<import namespace="http://www.kith.no/xmlstds/felleskomponent1" schemaLocation="../../fe
<import namespace="http://www.kith.no/xmlstds/eresept/forskrivning/2013-10-08" schemaLoc
<element name="Resept">
    <complexType>
        <sequence>
            <element name="Forskrivningsdato" type="date"/>
            <element name="Utloper" type="date"/>
            <element name="Vernepliktig" type="boolean" minOccurs="0"/>
            <element name="SoktIndividRefusjon" type="boolean" minOccurs="0"/>
            <element name="Frikort" type="boolean" minOccurs="0"/>
            <element name="Vergeinnsynsreservasjon" type="boolean" minOccurs="0"/>
            <element name="TilEgenPraksis" type="boolean" minOccurs="0"/>
            <element name="RekvLegensNavn" type="boolean" minOccurs="0"/>
            <element name="RefNr" type="string" minOccurs="0"/>
            <element name="Spesialitet" type="kith:CV" minOccurs="0"/>
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                <element ref="m1:ReseptDokHandelsvare"/>
            </choice>
            <element ref="m1:Instituert" minOccurs="0"/>
            <element ref="m1:EkspAnm" minOccurs="0"/>
            <element ref="m1:Utlending" minOccurs="0"/>
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            <element name="TidligsteUtlevering" type="date" minOccurs="0"/>
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        </sequence>
    </complexType>
</element>
```
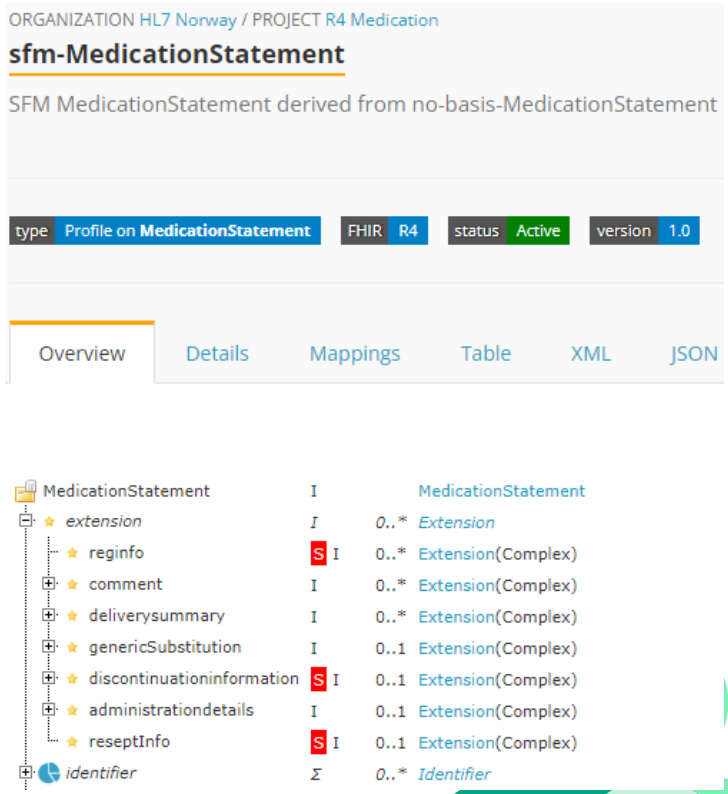



IPS

Composition	I			Composition
identifier	Σ	0..1	Identifier	
status	Σ ?!	1..1	code	Binding
type	Σ	1..1	CodeableConcept	Binding
subject	S Σ I	1..1	Reference(Patient)	
encounter	Σ I	0..1	Reference(Encounter)	
date	Σ	1..1	dateTime	
author	Σ I	1..*	Reference(Practitioner | Device | Pati	
title	Σ	1..1	string	
confidentiality	Σ ?!	0..1	code	Binding
attester	Σ	0..*	BackboneElement	
custodian	Σ I	0..1	Reference(Organization)	
relatesTo	Σ	0..*	BackboneElement	
event	*Σ*	*0..**	*BackboneElement*	
section	*S I*	*1..**	*BackboneElement*	
(All Slices)				
sectionMedications	S I	1..1	BackboneElement	
sectionAllergies	S I	1..1	BackboneElement	
sectionProblems	S I	1..1	BackboneElement	
sectionProceduresHx	S I	0..1	BackboneElement	
sectionImmunizations	S I	0..1	BackboneElement	
sectionMedicalDevices	S I	0..1	BackboneElement	
sectionResults	I	0..1	BackboneElement	
sectionPastIllnessHx	I	0..1	BackboneElement	
sectionFunctionalStatus	I	0..1	BackboneElement	
sectionPlanOfCare	I	0..1	BackboneElement	
sectionSocialHistory	I	0..1	BackboneElement	
sectionPregnancyHx	I	0..1	BackboneElement	
sectionAdvanceDirectives	I	0..1	BackboneElement	
sectionEncounters	I	0..1	BackboneElement	

HL7.FHIR.UV.IPS\International Patient Summary Implementation Guide - FHIR v4.0.1

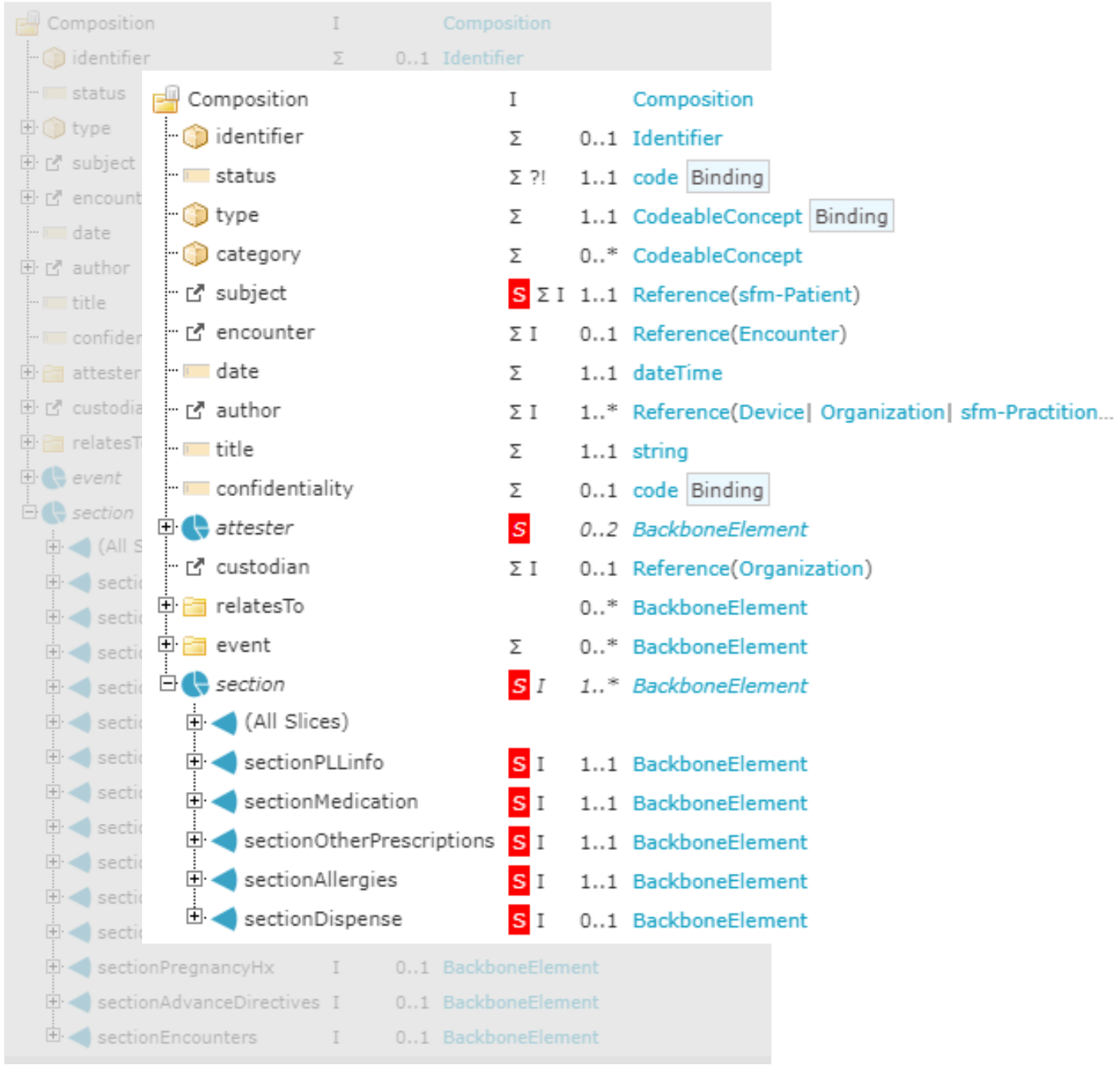
Trillium II | International Patient Summary - SIMPLIFIER.NET

SFM MedicationBundle (Basis API)

https://simplifier.net/r4medication/sfmmedicationcomposition

HL7.FHIR.UV.IPS\International Patient Summary Implementation Guide - FHIR v4.0.1

Trillium II | International Patient Summary - SIMPLIFIER.NET



Datadeling (API for SFM Fullversjon)

SFM Datadeling API Implementation Guide

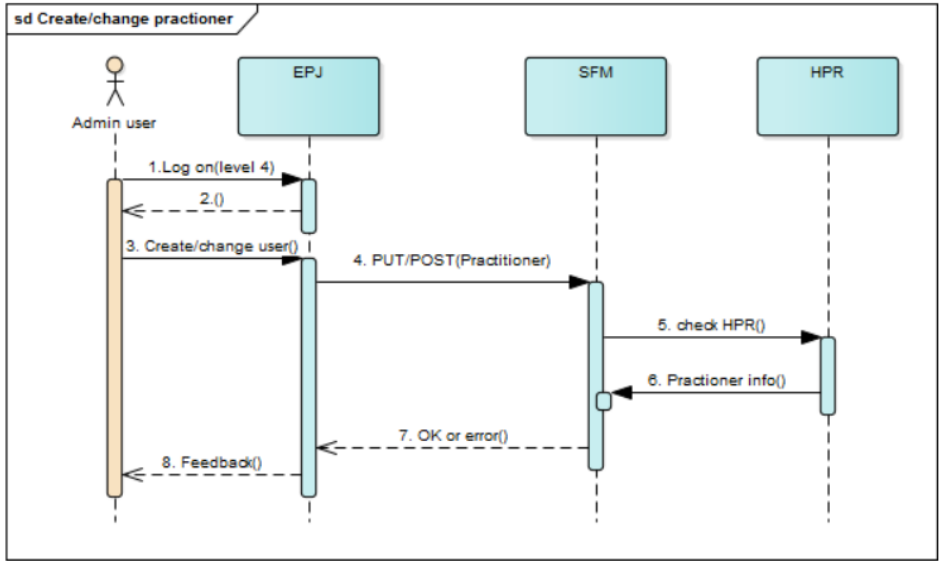
Practitioner

Introduction

Using the Practitioner resource in SFM is restricted to using the sfm-Practitioner resource

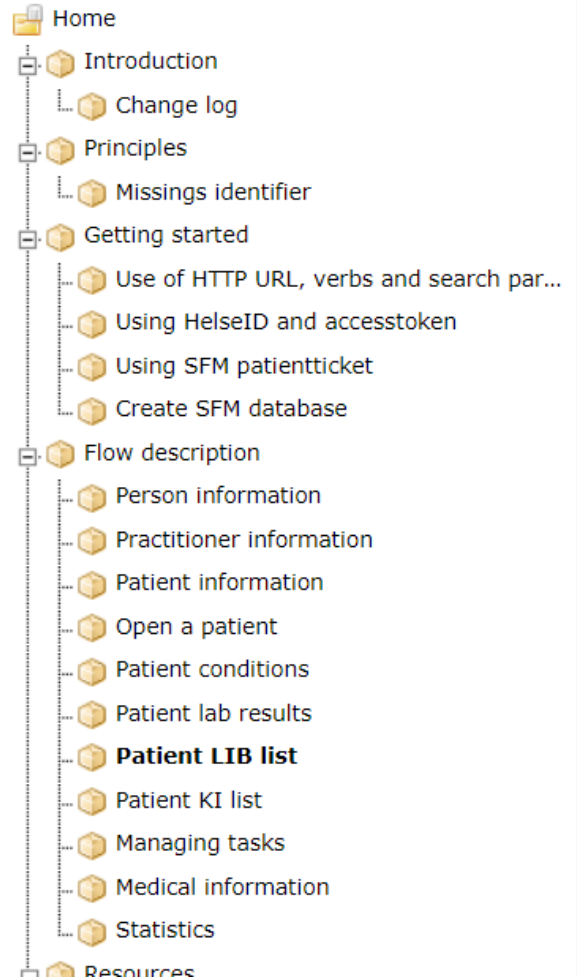
The resource is avaialble to make it possible for EPJ systems to write and update information about the users. SFM is checking practitioner information against **HPR** (*Helsepersonellregisteret* - the norwegian official registry for healthcare professionals) in order make sure that the information provided from the EPJ is correct.

Write practitioner information



Datadeling (API for SFM Fullversjon)

SFM Datadeling API Implementation Guide



Patient LIB list

Introduction

The sfm-lib-List resource in SFM is used to represent the patients current medica
Bruk or *medication in use*), a snapshot for a given time or aggregated list for a pe

The resource is avaialble to make it possible for EPJ systems to retreive current,
prescriptions from SFM.

Only the commands GET is made available for practitioners. The resource can b
purposes and different input parameters is specified.

The LIB list could be requested based on different puposes:

- Using it in correspondance
- Presenting it in patient overview
- Using it for medication administration
- Input to a curve system

Each purpose requires differnt type of data as input and feedback.

Correspondance

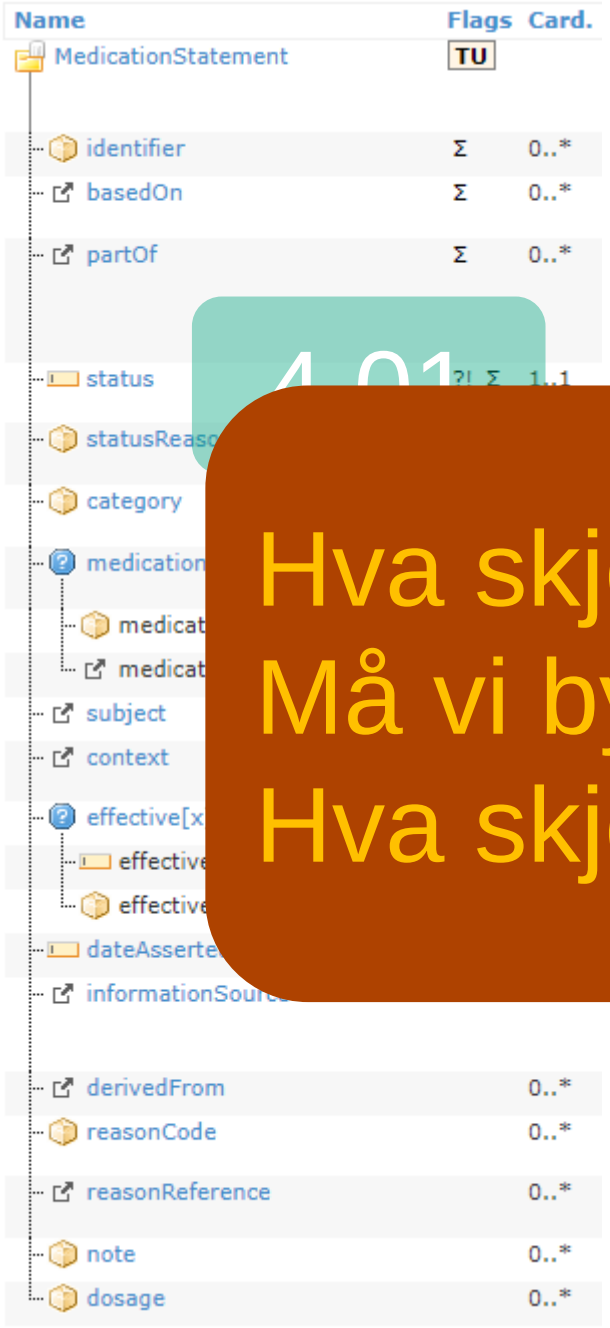
LIB in correspondance requires only the patient ticket as input parameter. It retur
statements with short dosage and/or textual dosage is returned. No structured do

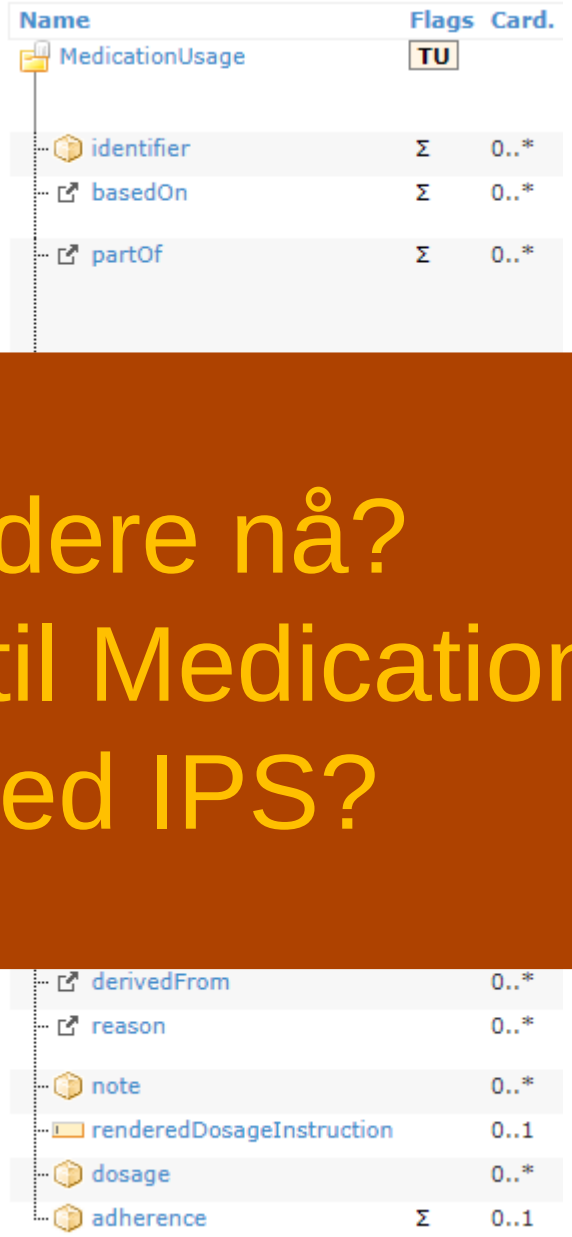
Leverandøroppfølging

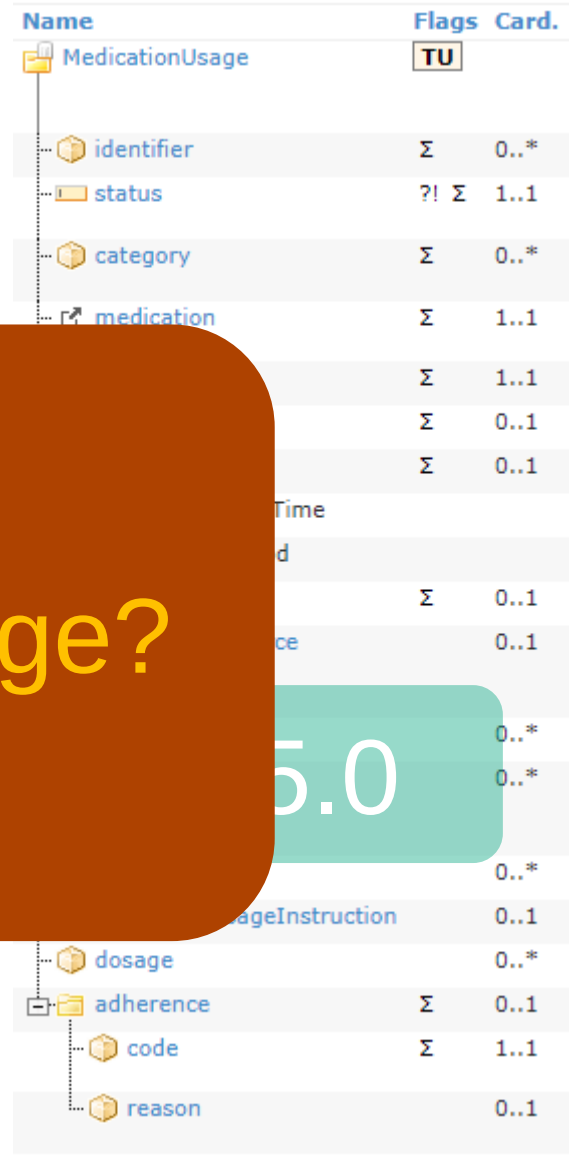
Leverandørene får tips og tilgang til eksempelkode
Vi har benyttet .NET FHIR API (FireLy), men noen ser på Graham Grieve sin Delphi implementasjon

Testsystemer tilgjengelig på internet
Integrasjon med HelseID i test.

Ukentlige statusmøter når det trengs







Hva skjer videre nå?
Må vi bytte til MedicationUsage?
Hva skjer med IPS?

SFM på lufta!

Dag Hammer la ut på okt 27, 2021

Onsdag 27.10.2021 ble hurradagen for SFM.

Lars Ødegaard fra Åros legekontor ble den første som sendte resept med SFM

Første SFM resept

BasisAPI

HELSEPLATTFORMEN

felles pasientjournal i Midt-Norge

Meona

i-SOLUTIONS HEALTH

Helse Vest

Hvor går vi nå?

- FHIR 5?
- Nasjonale profiler medication og PLL/IPS
- Versjonering av profiler
- Versjonering av API

Norsk helsenett