Data collection in pathology and reporting to quality registries based on openEHR

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REGIONALA CANCERCENTRUM I SAMVERKAN

Background and project goals

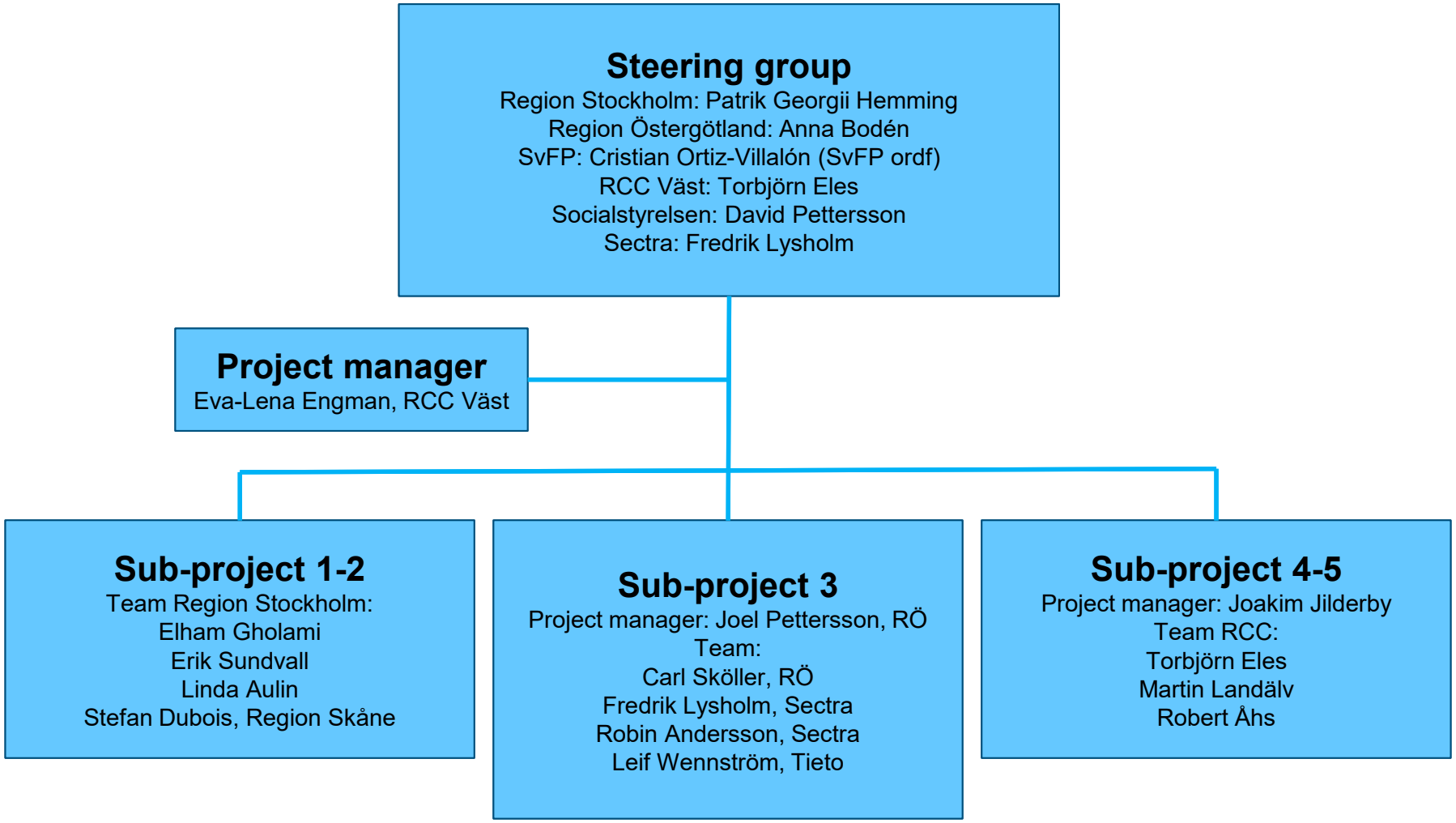
Background

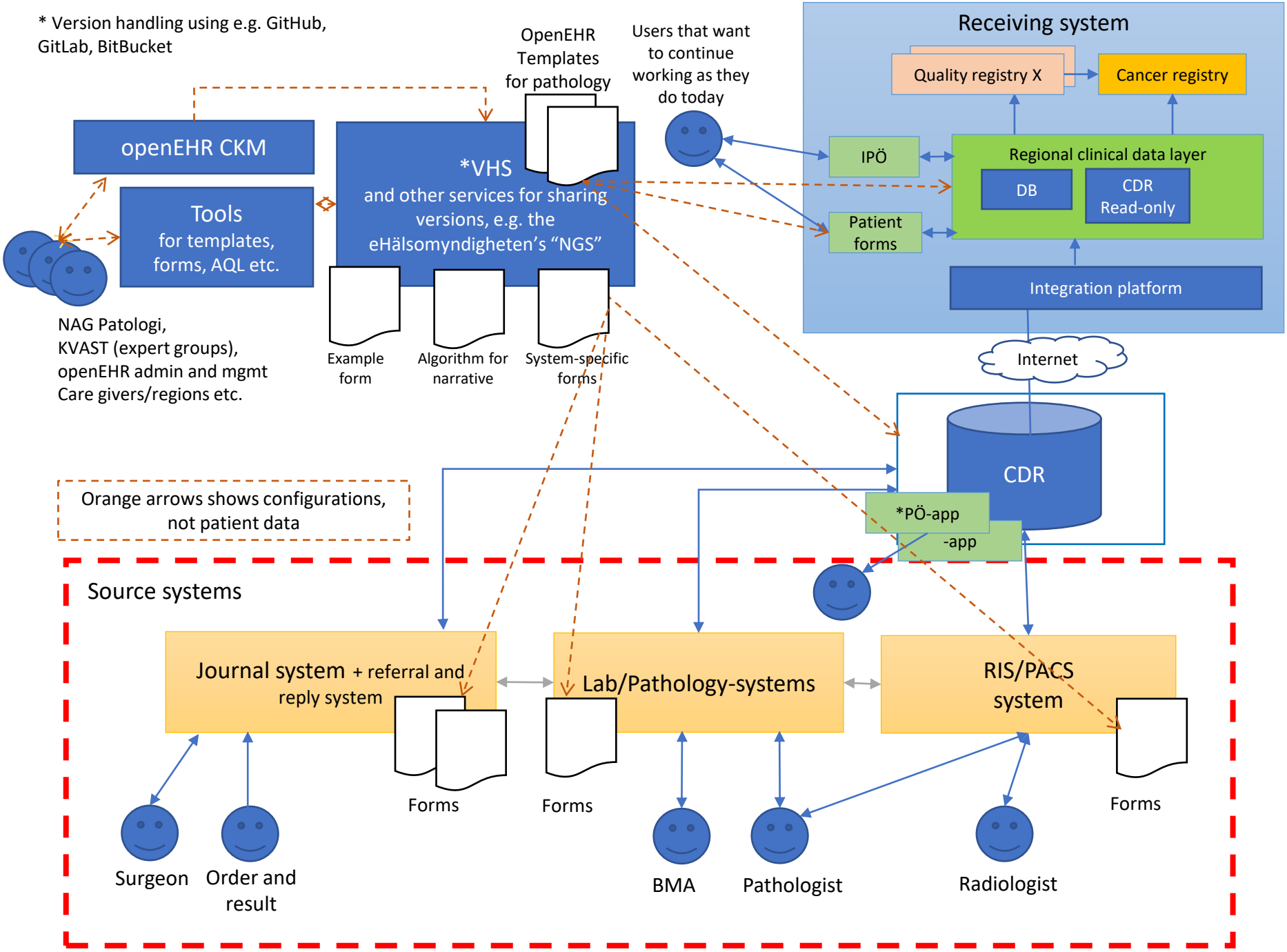
- Enable structured reporting of pathology and radiology data
- NSG SVI has finalized a process for how structured protocols should be defined. NAG Pathology has now started working according to this process.

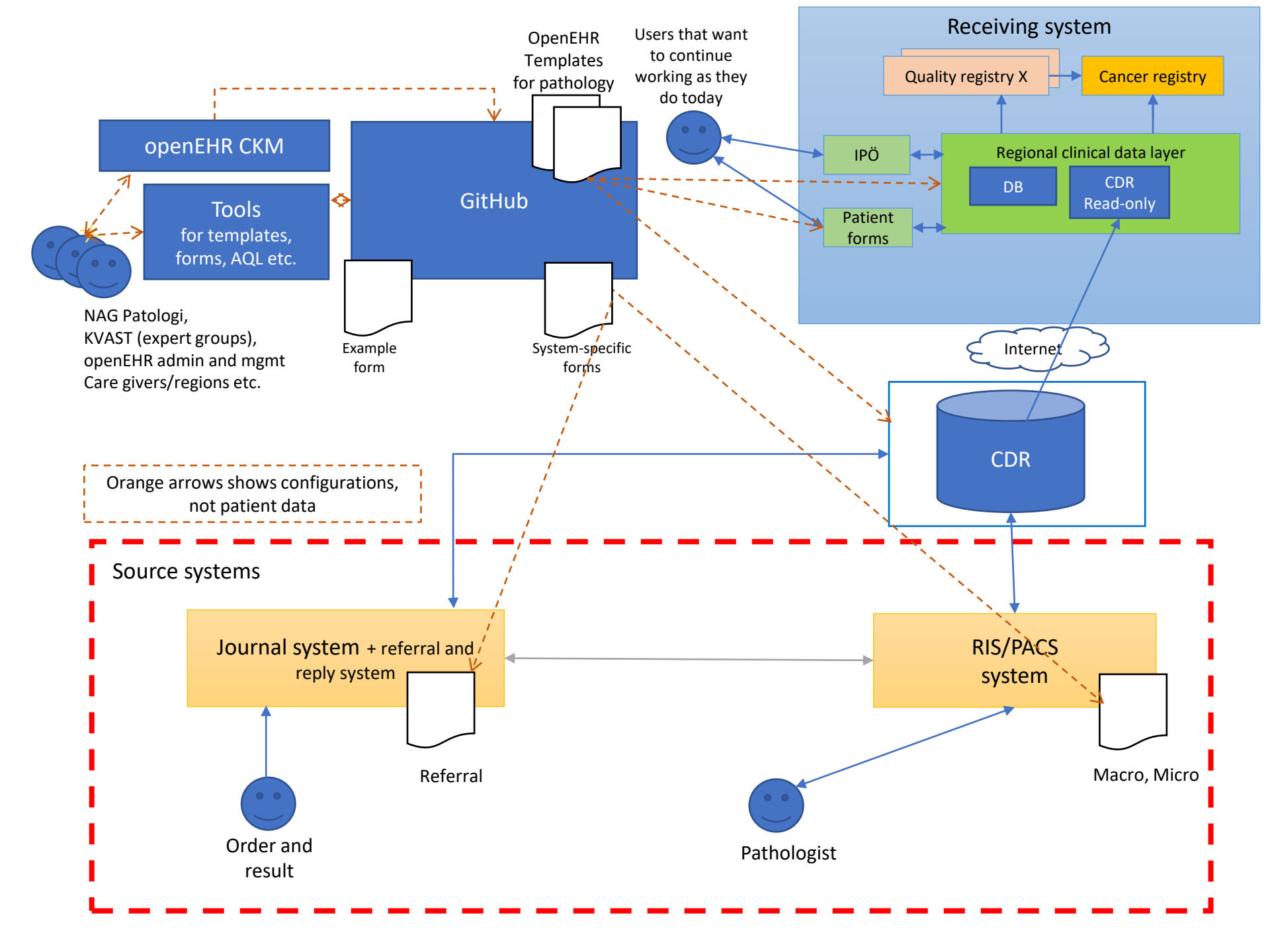
Project goals

- Develop forms and templates using openEHR to facilitate a standardized data capture at the pathology laboratory
- Evaluate how easy these templates can be imported by Region Östergötland's, Sectra's and INCA's systems to administrate openEHR template updates in clinical care and quality registries
- Creating a demo environment showing a care flow from a referring unit via a regional CDR to the national quality register for breast cancer.

Project organisation




* Version handling using e.g. GitHub, GitLab, BitBucket
OpenEHR Templates for pathology
Users that want to continue working as they do today
Receiving system
Quality registry X
Cancer registry
openEHR CKM
*VHS
and other services for sharing versions, e.g. the eHälsomyndigheten's "NGS"
IPÖ
Regional clinical data layer
DB
CDR Read-only
Tools
for templates, forms, AQL etc.
Patient forms
Integration platform
NAG Patologi,
KVAST (expert groups),
openEHR admin and mgmt
Care givers/regions etc.
Example form
Algorithm for narrative
System-specific forms
Internet
CDR
*PÖ-app
-app
Orange arrows shows configurations, not patient data
Source systems
Journal system + referral and reply system
Lab/Pathology-systems
RIS/PACS system
Forms
Forms
Forms
Surgeon
Order and result
BMA
Pathologist
Radiologist


Receiving system
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Example form
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Internet
CDR
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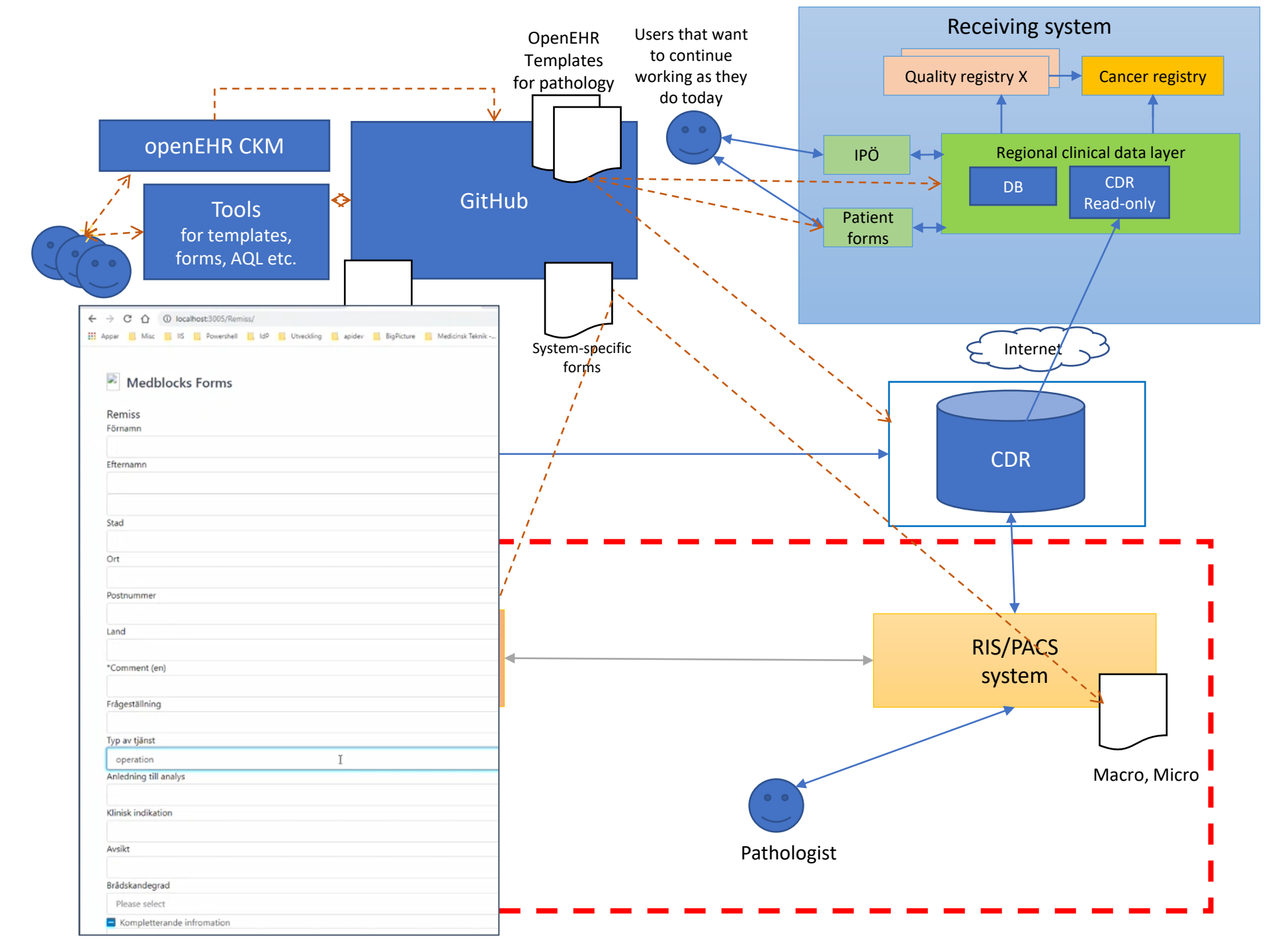
Source systems
Journal system + referral and reply system
RIS/PACS system
Referral
Macro, Micro
Order and result
Pathologist


Receiving system
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Read-only
Patient
forms
OpenEHR
Templates
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Users that want
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Tools
for templates,
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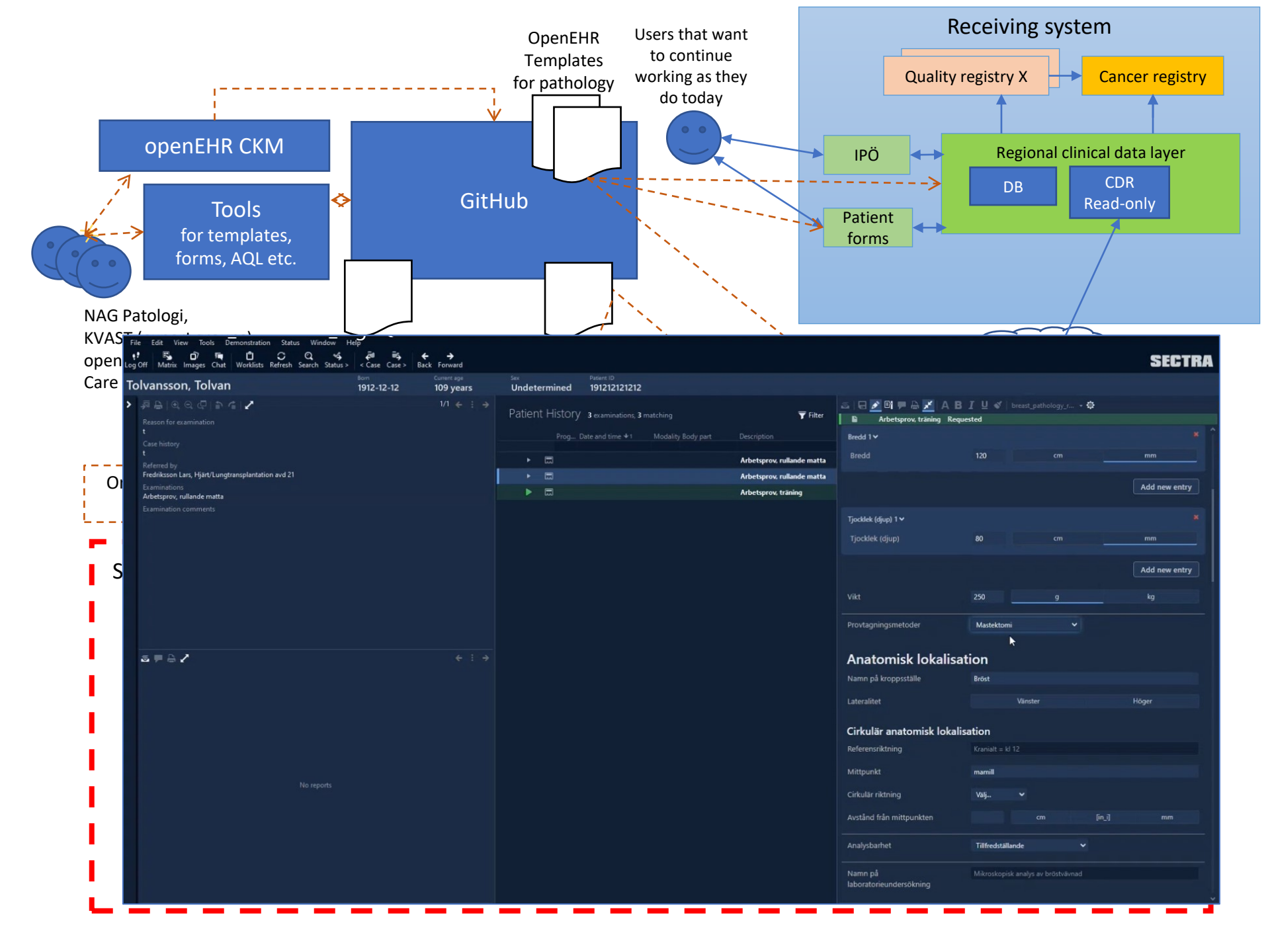
GitHub
System-specific
forms
Internet
CDR
RIS/PACS
system
Macro, Micro
Pathologist
Medblocks Forms
Remiss
Förnamn
Efternamn
Stad
Ort
Postnummer
Land
*Comment (en)
Frågeställning
Typ av tjänst
operation
Anledning till analys
Klinisk indikation
Avsikt
Brådskandegrad
Please select
Kompletterande infromation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IPÖ
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CDR Read-only
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Patient forms
NAG Patologi,
SECTRA
Tolvansson, Tolvan
Patient History
Anatomisk lokalisation
Cirkulär anatomisk lokalisation

OpenEHR Users that want

Receiving system

registry

layer

y

AQL-frågor

AQL-frågor / PathologyResult_Breast / PathologyMacro

Spara

Ta bort AQL-fråga

Översikt | Aql | Parametrar

Select-sats

```
1
2  ial']/items[at0029,'Vävnadsprovtyper']/value/value as vavnadsprovtyp,
3  ial']/items[at0099]/value/magnitude as antalFragment,
4  ial']/items[openEHR-EHR-CLUSTER.specimen_measurements.v1,'Provmaterialsmätningar']/items[at0042,'Längd']/value as provmaterialLangd,
5  ial']/items[openEHR-EHR-CLUSTER.specimen_measurements.v1,'Provmaterialsmätningar']/items[at0042,'Bredd']/value as provmaterialBredd,
6  ial']/items[openEHR-EHR-CLUSTER.specimen_measurements.v1,'Provmaterialsmätningar']/items[at0042,'Tjocklek (djup)']/value as provmaterialDjup,
7  ial']/items[openEHR-EHR-CLUSTER.specimen_measurements.v1,'Provmaterialsmätningar']/items[at0020]/value as provmaterialVikt,
8  ial']/items[at0007,'Provtagningsmetoder']/value/value as provtagningsmetod,
9  ial']/items[at0042]/value as kvalitesproblem,
10
11
```

Contains-sats

```
1  CONTAINS OBSERVATION o [openEHR-EHR-OBSERVATION.laboratory_test_result.v1]
```

Where-sats

```
1  e/ehr_id/value = $ehr_id and o/name/value = 'Makroskopisk analys av bröstvävnad'
```

Fullständig AQL-fråga

```
1  SELECT c/uid/value as compositionId,
2  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
3  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
4  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
5  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
6  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
7  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
8  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
9  c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
10 c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/data[at0003]/it
11 c/content[openEHR-EHR-OBSERVATION.laboratory_test_result.v1,'Makroskopisk analys av bröstvävnad']/data[at0001]/events[at0002]/time/value as t
12
13 FROM EHR e CONTAINS COMPOSITION c CONTAINS OBSERVATION o [openEHR-EHR-OBSERVATION.laboratory_test_result.v1]
14 WHERE c/archetype_details/template_id/value matches { 'breast_pathology_result_report_inlined', 'breast_pathology_result_report_inlined.v1',
15 e/ehr_id/value = $ehr_id and o/name/value = 'Makroskopisk analys av bröstvävnad'
```

Micro

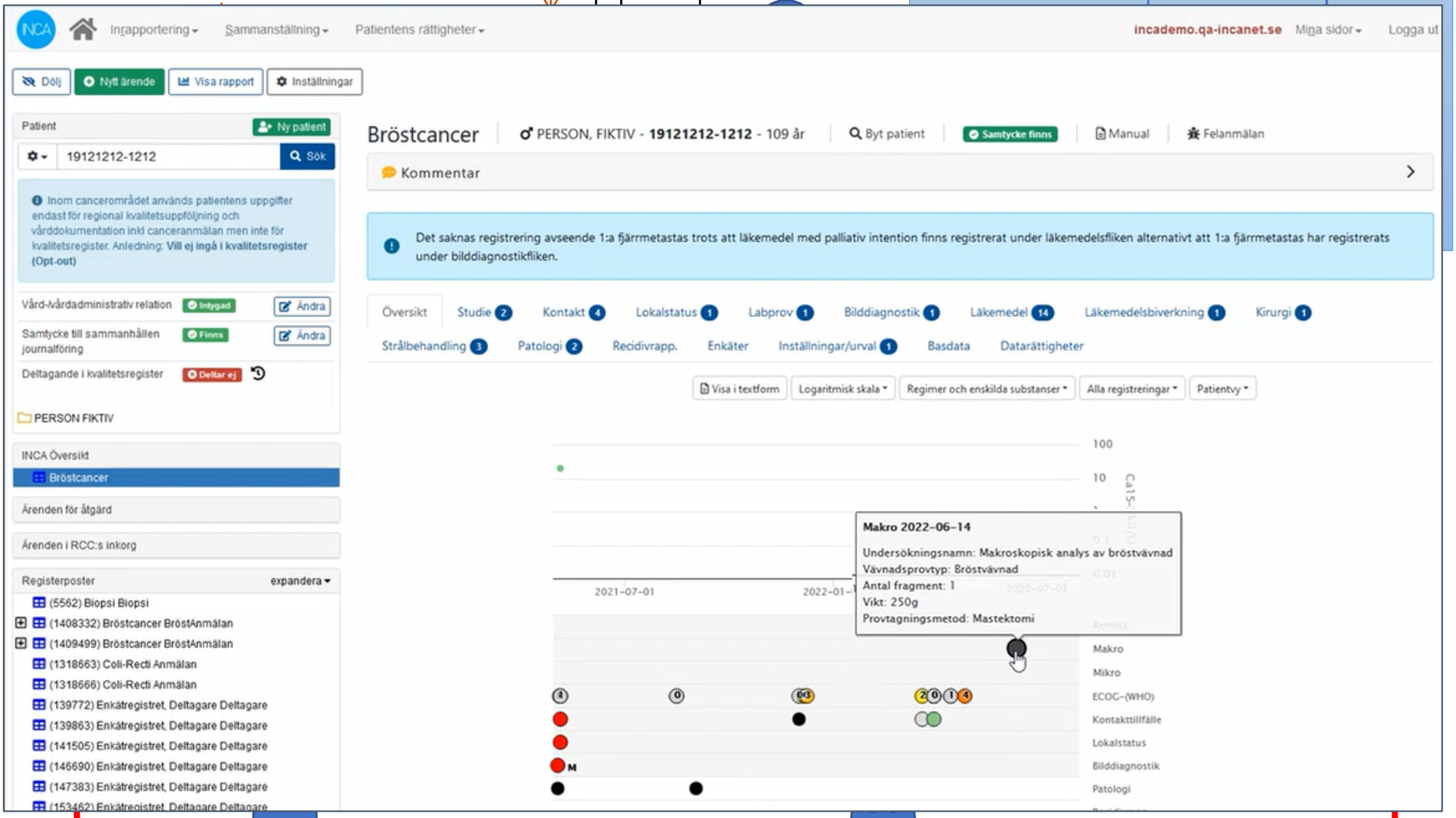
OpenEHR Templates for pathology

Users that want to continue working as they do today

Receiving system

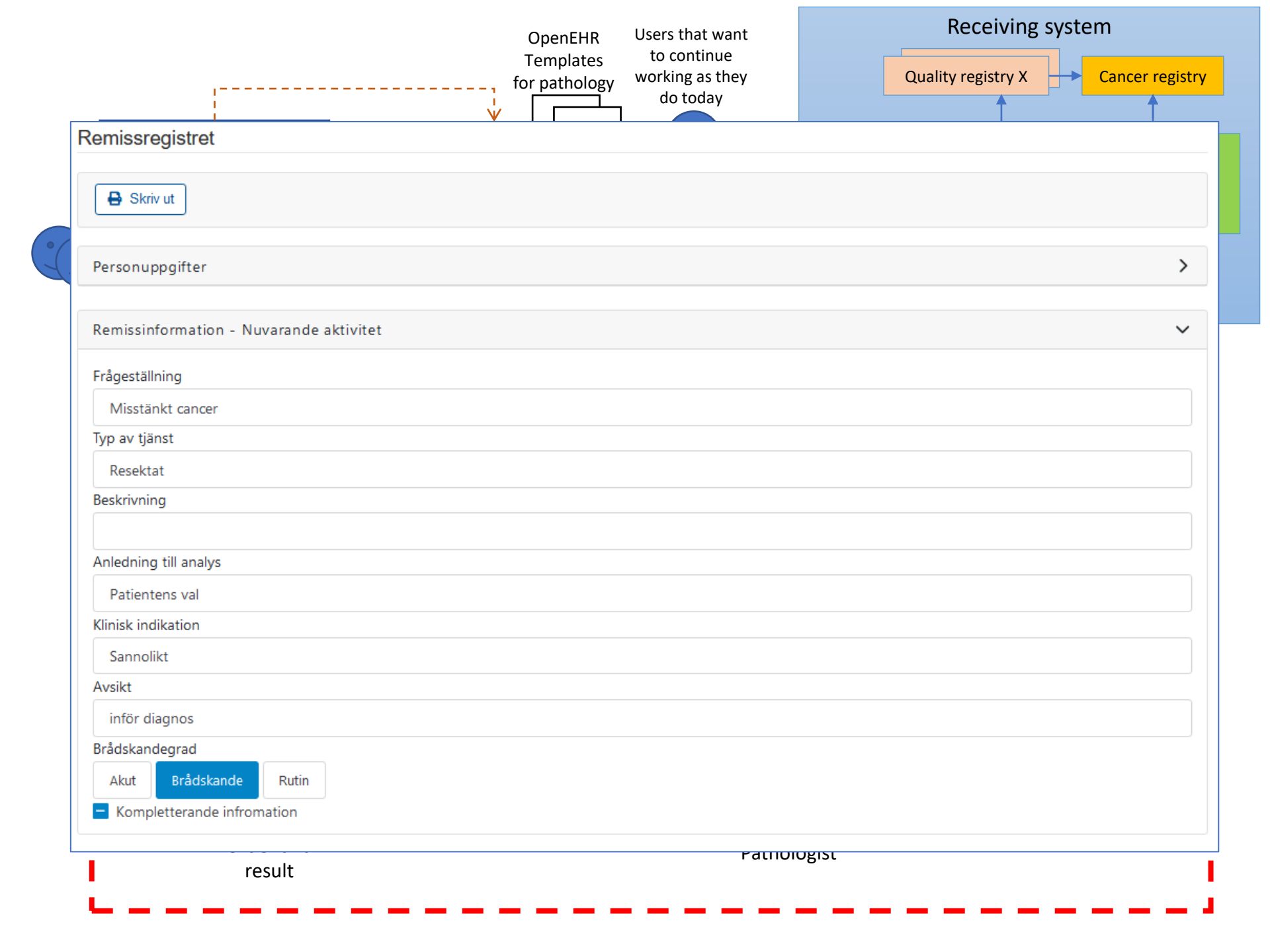
Quality registry X

Cancer registry



Order and result

Pathologist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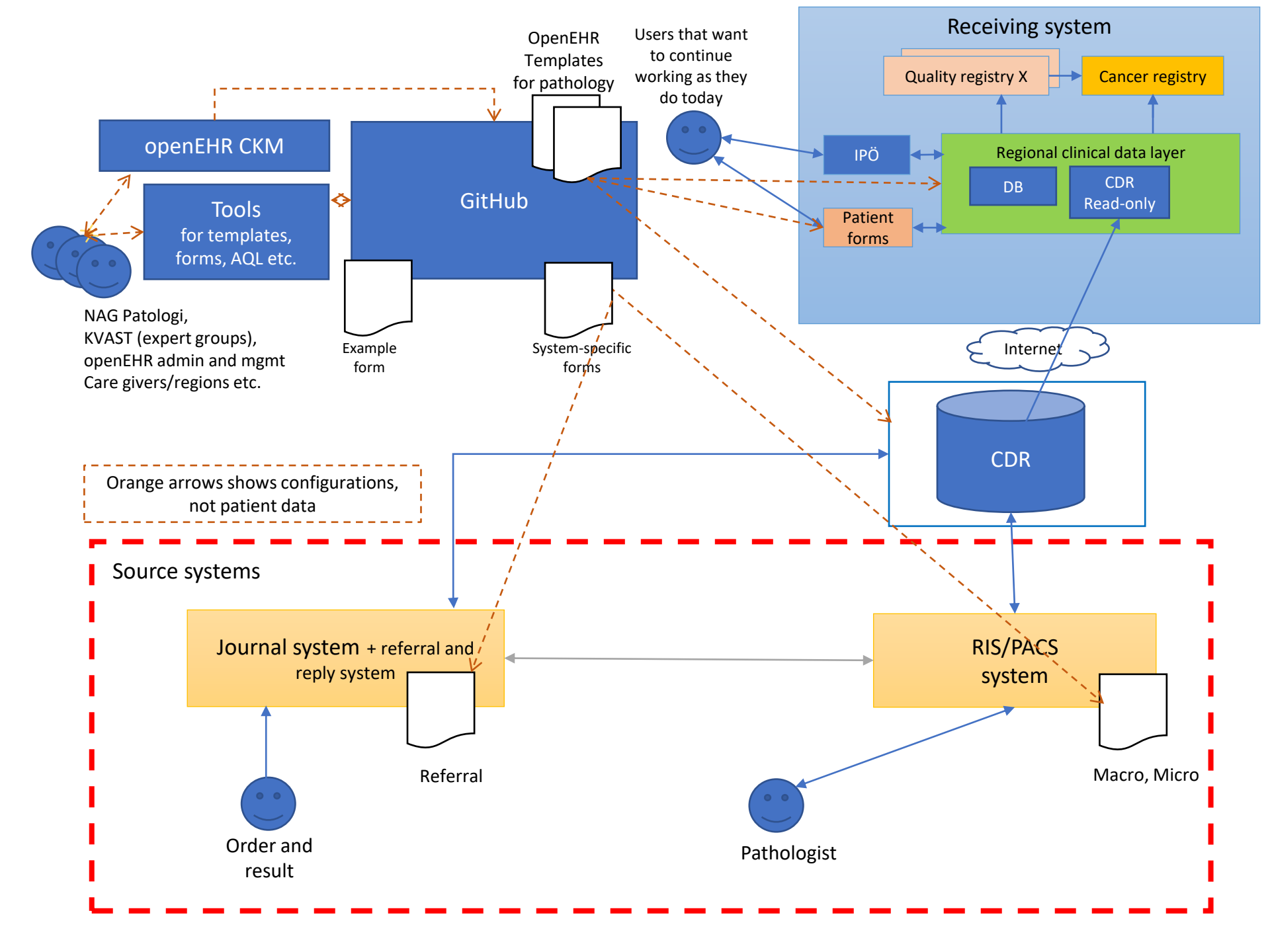
Remissregistret
Skriv ut
Personuppgifter
Remissinformation - Nuvarande aktivitet
Frågeställning
Misstänkt cancer
Typ av tjänst
Resektat
Beskrivning
Anledning till analys
Patientens val
Klinisk indikation
Sannolikt
Avsikt
inför diagnos
Brådskandegrad
Akut
Brådskande
Rutin
Kompletterande infromation
result
Pathologist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Results

Challenges:

- The open source CDR EHRbase did not support multiple datatypes for a single field and did not provide good error messages to signal this (another openEHR platform supported multiple fields). Quality assurance must be conducted at the source using the different system flora used within the consuming parties – at least until we have a good knowledge of what works where.
- Sectra has many functions surrounding form logic and data types, other systems available in care could have fewer possibilities
- Version handling of templates was problematic
- openEHR not widely in use yet, which makes it hard to find information to help with the development

Results

Sectra (data producing system):

- The informatics is well defined - however most work is spent on developing forms.
- Preferable if reference forms are created together with the templates on national level, until the logic has been standardised

INCA (data consuming system):

- It is easy to upload new templates and thereafter receive new compositions.
  - In the case of small updates in an updated template, no adjustment is needed
  - If the structure has major changes or when you need to collect new information, the AQL questions need to be updated
- Less work for the reporter (more automatic input). This will also improve the data quality.

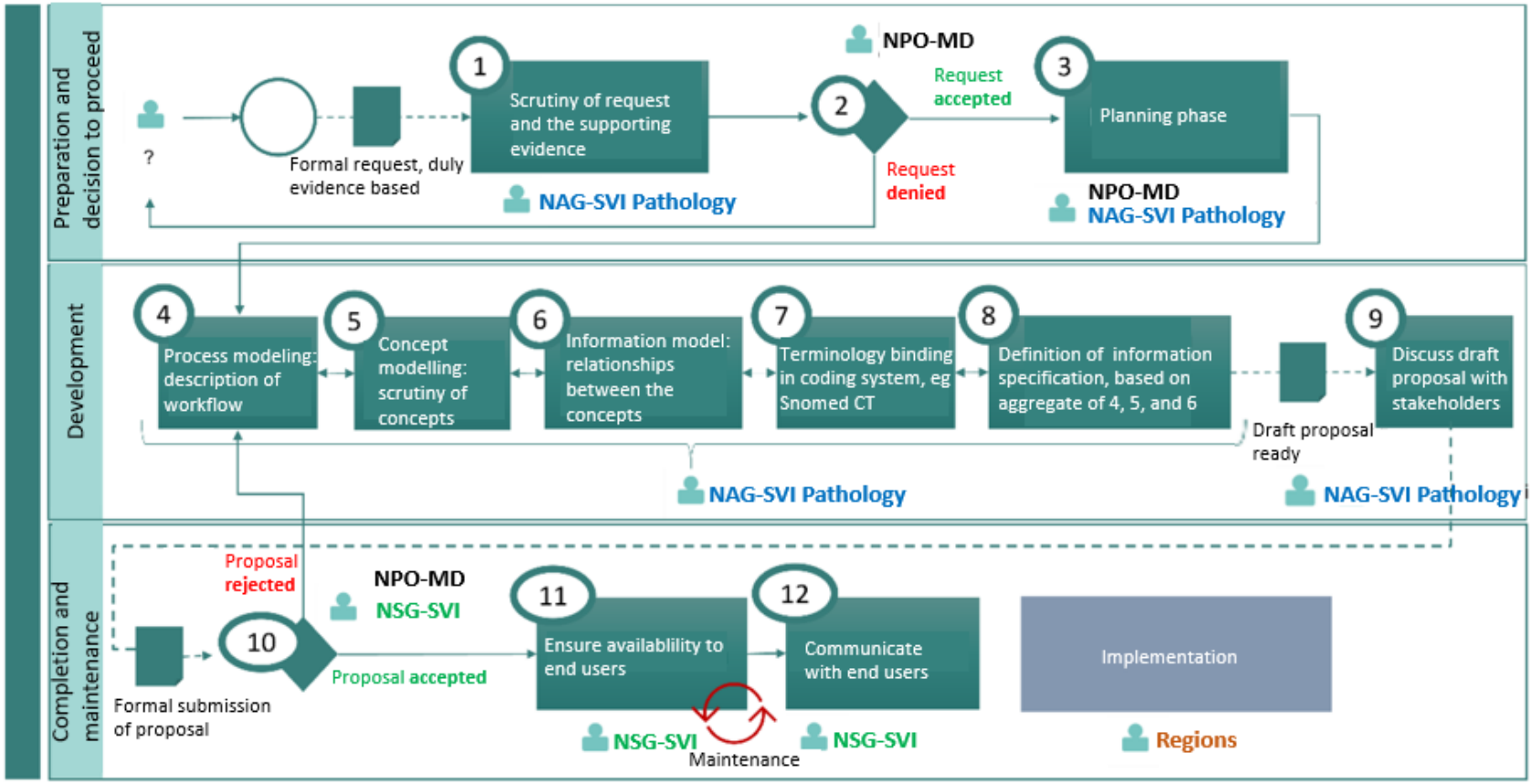
General:

- Centralising the development of templates, forms as well as AQL questions leads to higher quality with much less time spent on redoing work further down in the workflow
- Easy to get started with openEHR from a developer's standpoint.

Next step?

- Evaluate the Better platform
- Evaluate federation of nationally defined templates and forms to the regions and system providers
- Radiology protocol for colon cancer – setting up an openEHR template and form at Karolinska and transfer it from Sectra to INCA via the regional clinical data layer and integration platform
- Project in Jönköping together with CGM and RCC to set up openEHR templates for prostate cancer testing
- Implement a national group developing openEHR templates for radiology and pathology – in tight collaboration with the process for national standardised information specification (see next slide)

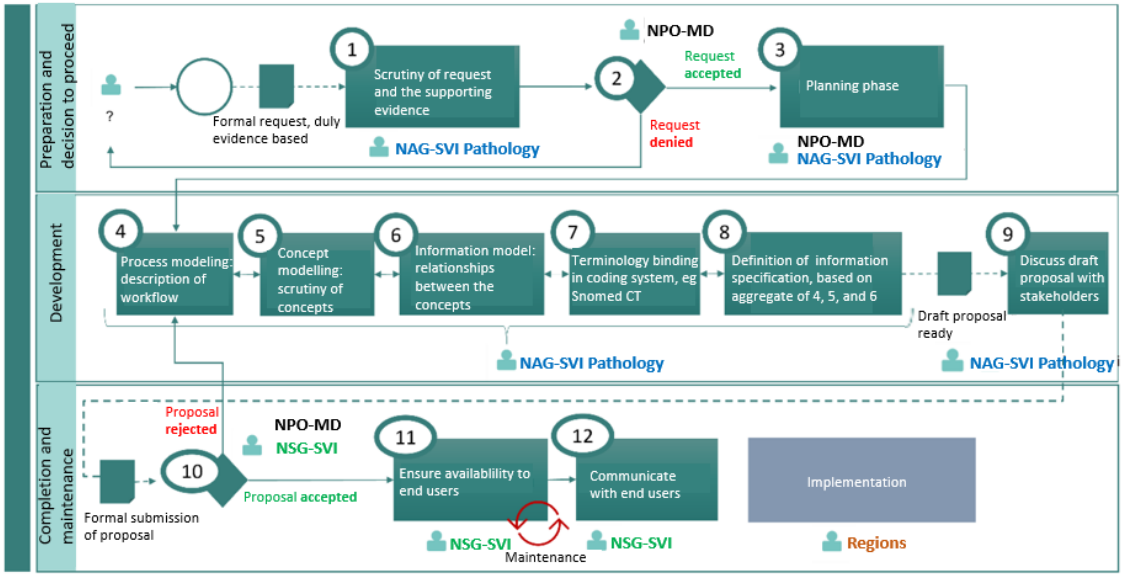
Process for standardising national protocols for pathology



- **NPO-MD**: National Program Division for Medical Diagnostics
- **NAG-SVI Pathology**: National Working Group for Standardised Healthcare Information in Pathology
- **NSG-SVI**: National Supervisory Collaborative Group for Standardised Healthcare Information
- **Regions**: Sweden's Regional Healthcare Boards

Discussion

- How can we create a national structure/process defining openEHR templates, AQL queries and forms for pathology and radiology protocols?
  - National openEHR group creating and maintaining templates?
  - NAG groups with an assigned openEHR specialist?
- How can this structure work together with the process “Systematiskt arbetssätt för nationellt standardiserade mallar för patologisvar”?
- Can we create a national budget for this work?
- How can we get started?



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