

Bahmni-OpenIMIS Integration Using FHIR



Nyaya Health Nepal
Laxman Manandhar

 OpenMRS

 OpenELIS

Open ERP
OPEN SOURCE MANAGEMENT SOLUTION

dcm4che.org

Registration

Clinical Services

Lab Services

Inpatient Management

Stock Management

Reporting

PACS Integration

Dhis2 Integration

IPD Module

Insurance Integration(IMIS)

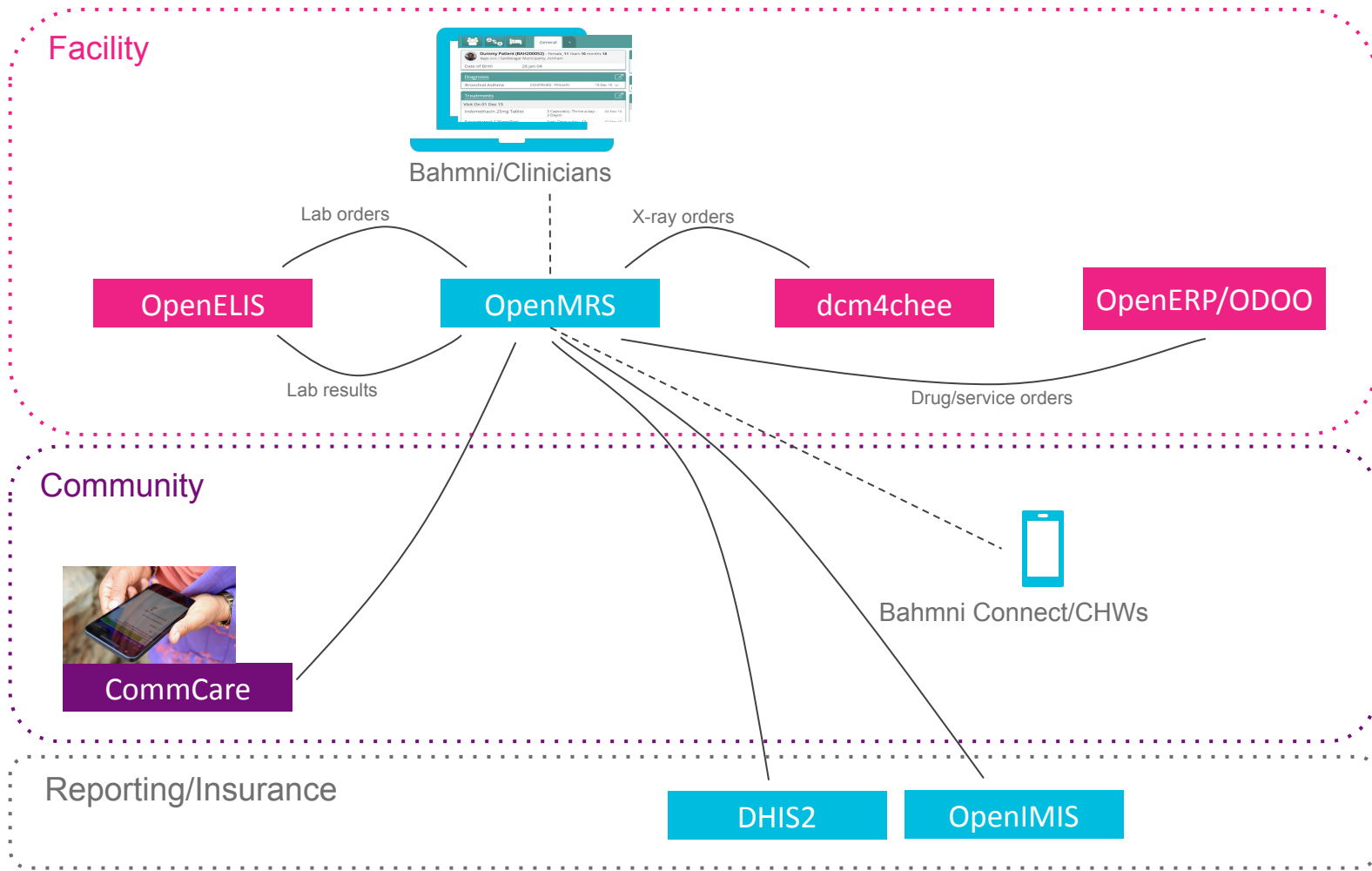
Billing and Accounting



- Distribution on top of Bahmni (Openmrs,Openelis,OpenERP/ODOO)
- Customizations for Nepal Specific Features : Nepali Calendars, Observation Templates, Configurations etc.
- Dhis2 Integration : HMIS Reporting
- OpenIMIS Integration

We aim to create an efficient and accountable digital healthcare system that is affordable to the government.

Integrated EHR ecosystem



Bayalpata Hospital, Achham in far-west Nepal

Public-private partnership

50 Beds

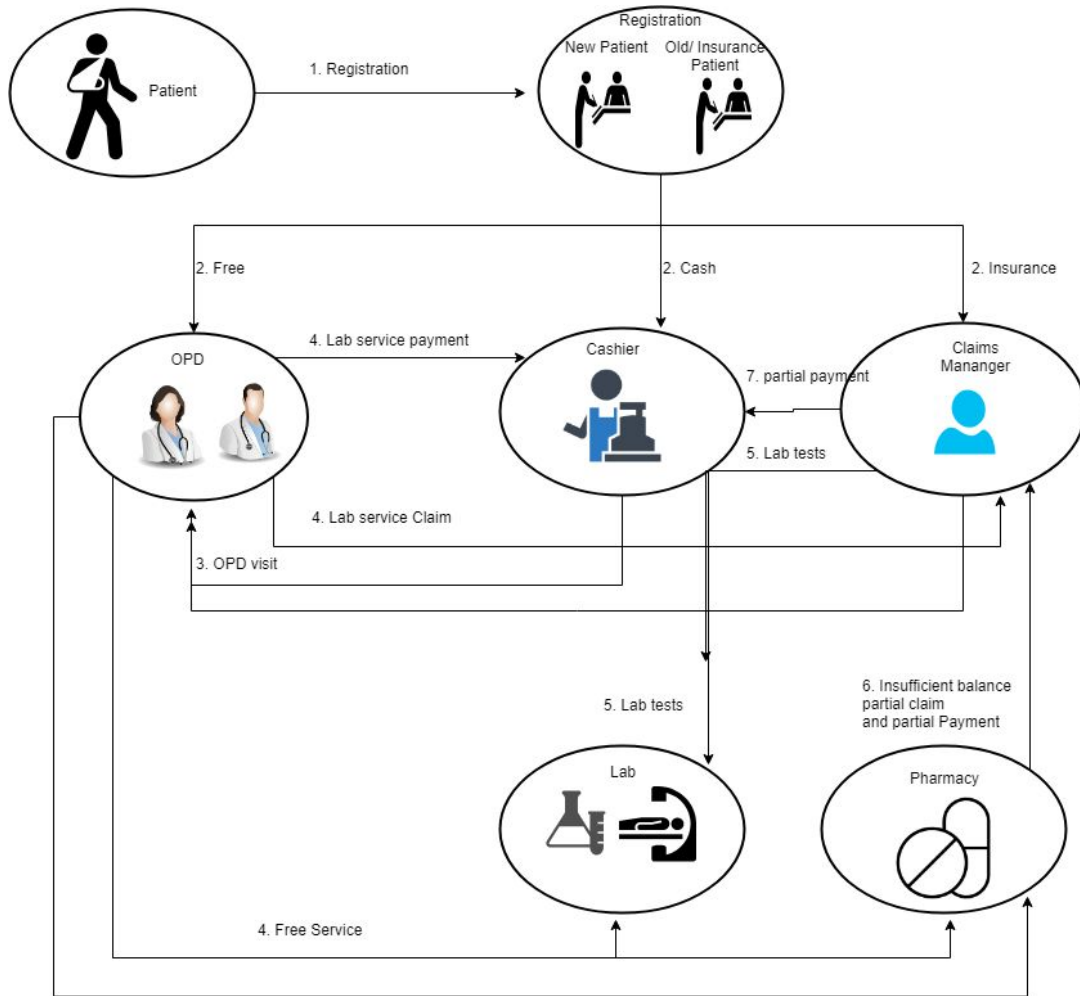
2K inpatients per year

70K patients treated per year

200 – 500 patients per day

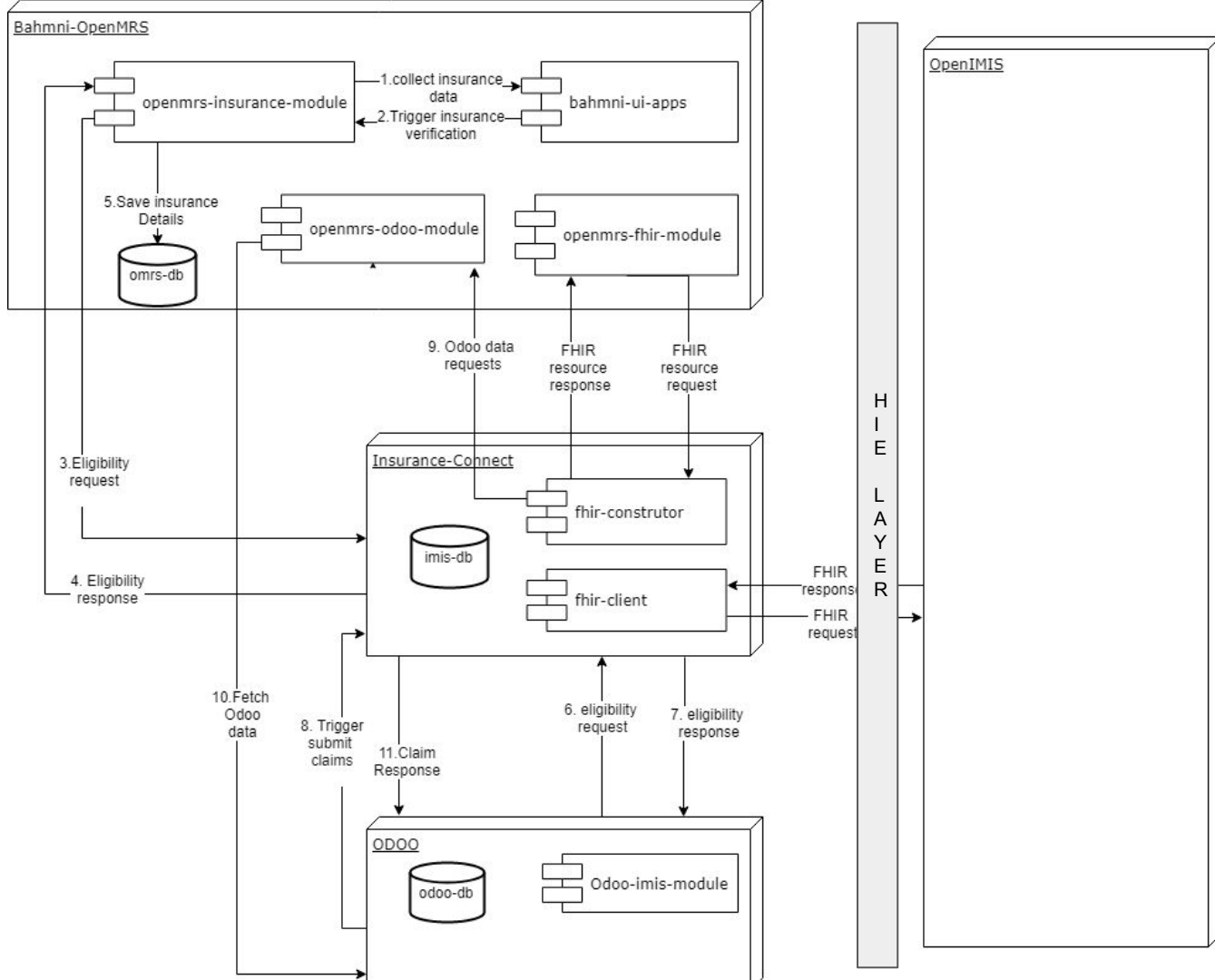


Insurance-Integration Workflow



4. Pharmacy claims/Payment

OpenMIS-Bahmni Integration architecture



Insurance Integration Demo

Patent Identifier: CHM205616

Registration Date 14 Jul 19

Patient Name * Dummy Middle Name User

Gender * Male

Age * Years 32 Months 1 Days 26

Date of Birth 07/14/1987 Estimated Birth Time --:-- --



Address Information

Ward * 1

District * Achham

Country * Nepal

VDC/Municipality * Chaurpati Rural Municipalit

Province * Province No. 7

Additional Identifiers

National ID

Other Information

Is NHIS member

NHIS Number * 12345678

Is NHIS primary contact point

Caste Details * 6 - Others

Primary Contact

Phone Number



Search

+ Create New

Print Label



Summary

: CHM211729

Patient Name : **First Patient**

Visit Details

Department Sent to

OPD

ER



IPD

ART/TB/Leprosy

ANC ward

Insurance Detail

NHIS Number: **55555**

Balance: **405**

Category:

Close Visit

Back

Save

Edit

Create

Print ▾

Action ▾



QA Patient

 Active

 181.00₹
Invoiced

 9
Sales

Internal Reference | CHM205630

NHIS Number | 55555

Address | 1
Dhanusa
Province No. 2

Website
Tags

Job Position

Phone

Mobile

Fax

Email

Title

Language

English

Contacts & Addresses

Internal Notes

Sales & Purchases

Accounting

Additional Info



- Dashboard
- Sales
- Customers
- Quotations**
- Sales Orders
- Products
- Invoicing
 - Sales to Invoice
 - Orders to Upsell
- Reports
 - Sales
- Configuration

Quotations

Search...

Create

1-3 / 3 < > [List Icon] [Grid Icon] [Calendar Icon] [Table Icon] [Bar Chart Icon]

<input type="checkbox"/>	Quotation Number	Order Date	Customer	Payment Type	Shop	Partner Village	Salesperson	Total	Total Outstanding Balance	Provider Name	Discount Account Head	Care Setting	Status
<input type="checkbox"/>	SO266	09/02/2019 13:46:30	QA Patient [CHM205630]	CASH	IPD Billing		Administrator	1.00 ₹	1.00 ₹	Super Man		OPD	Quotation
<input type="checkbox"/>	SO264	09/02/2019 13:46:30	QA Patient [CHM205630]	CASH	OPD Billing		Administrator	0.00 ₹	0.00 ₹	Super Man		OPD	Quotation
<input type="checkbox"/>	SO261	09/02/2019 13:41:30	QASecond Patient [CHM205631]	CASH	OPD Billing		Administrator	0.00 ₹	0.00 ₹	Deepak Prasad Neupane		OPD	Quotation
								1.00					

Save

Discard

Send by Email

Print

Confirm Sale

Cancel

Print Consent Form

Latest Prescription

Quotation

Quotation 5

SO321

Customer

QA Patient [CHM205630]

Order Date

09/04/2019 15:18:30

NHIS Number

55555

Expiration Date

Payment Type

CASH

Pricelist

NHNN (NP)

Partner Village

INSURANCE

Payment Terms

30 Net Days

Care Setting

CASH

Shop

OPD Billing

Provider Name

Super Man

Order Lines

Other Information

Product	Description	Payment Type	Ordered Qty	Batch No	Expiry date	Unit Price	Taxes	Subtotal
+ Diclofenac 1% gel,30gm Tube (Gel)	Diclofenac 1% gel,30gm Tube	CASH	6.000			30.00		180.00 ₹

Edit

Create

Print ▾

Action ▾

Send by Email

Print

Confirm Sale

Cancel

Check Eligibility

Print Consent Form

Latest Prescription

Quotation

Quotation Sent

SO322

Customer	Bhaga Saud [CHM203162] 1 PN7	Order Date	09/06/2019 11:13:53
NHIS Number	044352501	Expiration Date	
Payment Type	INSURANCE	Pricelist	NHNN (NP)
Partner Village		Payment Terms	30 Net Days
Care Setting	OPD	Shop	OPD Billing
Provider Name			

Order Lines

Other Information

Product	Description	Payment Type	Ordered Qty	Batch No	Expiry date	Unit Price	Taxes	Subtotal
Aceclofenac 100mg (Tablet)	Aceclofenac 100mg (Tablet)	INSURANCE	50.000	Nabin [Jun 30,2019]	06/30/2019 05:45:00	0.00		0.00 ₹
Ibuprofen and Paracetamol 400/500mg Tablet (Tablet)	Ibuprofen and Paracetamol 400/500mg Tablet (Tablet)	INSURANCE	10.000			50.00		500.00 ₹

Insurance Detail



Insuree Name

Salman Khan

NHIS Number

039061175

Detail

Valid Till	Category	Available Balance
02/12/2021 05:45:00	medical	100,000.00

Close



Insurance Claims / insurance.claim,21

Edit

Create

Action ▾

Confirm Claim

Print

7

Insuree | QA Patient [CHM205630] | **Creation Date** | 09/02/2019 16:51:30
NHIS Number | 55555 | **Claims Manager** | Administrator
Claim Status | Draft | **Processed Date**

3

4

5

6

Claim Items

Sale Orders

Eligibility Details

Claim History

Product	Quantity	Unit Price	Total	Approved amount	Claim Status	Rejection Reason
OPD Hospital (All)	1.00	200.00	200.00 ₹	0.00 ₹		
Diclofenac 1% gel,30gm Tube (Gel)	14.00	96.00	1,344.00 ₹	0.00 ₹		

Total Claimed Amount : 1,544.00

Claims

Claim 2

Submitted Claims

Configuration

Insurance Settings

Insurance - Odoo Product ...



Insuree

New Patient [CHM205641]

Creation Date

09/04/2019 14:34:12

NHIS Number

55555

Claims Manager

Administrator

Claim Status

Checked

Processed Date

Claim Items


Sale Orders

Eligibility Details

Claim History

Product	Quantity	Unit Price	Total	Approved amount	Claim Status	Rejection Reason
OPD Hospital (All)	1.00	200.00	200.00 ₹	0.00 ₹	Passed	
Diclofenac 1% gel,30gm Tube (Gel)	4.00	96.00	384.00 ₹	0.00 ₹	Rejected	2

Total Claimed Amount : 584.00



Claims
 Claims
Submitted Claims
 Configuration
 Insurance Settings
 Insurance - Odoo Product ...

Powered by Odoo

Submitted Claims / insurance.claim,30

Action ▾
1 / 6 < >

951

Insuree	Insurance Claim [CHM205639]	Creation Date	09/03/2019 16:43:15
NHIS Number	55555	Claims Manager	Administrator
Claim Status	Checked	Processed Date	

Product	Quantity	Unit Price	Total	Claim Status	Rejection Reason
Diclofenac 1% gel,30gm Tube (Gel)	1.00	96.00	96.00 ₹	Passed	

Total Claimed Amount : 96.00

Insurance Fhir

Claim Code: 951

Claim FHIR Request

```
{
  "billablePeriod": {
    "end": "2019-09-03T16:15:51+05:45",
    "start": "2019-09-03T16:09:59+05:45"
  },
  "created": "2019-09-03T16:43:15+05:45",
  "diagnosis": [
    {
      "diagnosisCodeableConcept": {
        "coding": [
          {
            "code": "A00.9"
          }
        ]
      },
      "sequence": 1,
      "type": [
        {
          "text": "icd_0"
        }
      ]
    }
  ]
}
```

Buttons: Close, Resubmit

Validate

Import

Cancel

Select a CSV or Excel file to import.

[Help](#)

tblItems_Nepal_.csv

Load File

Reload File

+ Options...

Encoding: utf-8

Date Format:

Separator: Semicolon

Datetime Format:

Text Delimiter: "

Thousands Separator: Comma

Decimal Separator: Dot

Map your columns to import

 Track history during import The first row contains the label of the column Show fields of relation fields (advanced)

ItemID	ItemCode	ItemName	ItemType	ItemPackage	ItemPrice	ItemCareType	ItemFrequency
Don't import	Item Code	Insurance Pro...	Don't import	Don't import	Insurance Pro...	Don't import	Don't import
1009	A01C1R	Amphotericin B 50mg	D	SOLUTION	450.00	B	0
1010	A02B1W	Bisacodyl suppository 5mg	D	TABLET	2.00	B	0
1011	A03B2V	Bisacodyl suppository 5mg	D	Suppository	20.00	B	0
1012	A04B4V	Bisacodyl suppository 10mg	D	Suppository	22.00	B	0
1013	V05E2W	Calcium Acetate 667ma	D	TABLET	7.00	B	0

Insurance - Odoo Product mapping / 002 - Aspirin 75mg

Save

Discard



Item Code	002
Insurance Product Name	Aspirin 75mg
Insurance Product Price	10.00
Odoo Product	Aspirin 75mg Tablet (Tablet) 
Valid From	
Valid Till	
Is active	<input checked="" type="checkbox"/>
ICD Code	



FHIR Resources

Eligibility Request <http://hl7.org/fhir/STU3/eligibilityrequest.html>

Eligibility Response-<http://hl7.org/fhir/STU3/eligibilityresponse.html>

Claim Request-<http://hl7.org/fhir/STU3/claim.html>

Claim Response-<http://hl7.org/fhir/STU3/claimresponse.html>

Future works

- Fhir4 update : attachments
- Insurance packages claims: which have already listed items/services.

Challenges :

- Real time claim response
- Bulk processing of claims

User guides and Documentations

User Guide

https://docs.google.com/document/d/13EqhG3d1X9lpBzdAbn_mmh-BLAIERy-cjNGetqVN-nY/edit

Other Technical Documentations

<https://openimis.atlassian.net/wiki/spaces/OP/pages/906592266/Bahmni-OpenIMIS+Integration>

Thank you