OpenRIMS Data Visualization

Draft 2024-11-01

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Motivation

The OpenRIMS database provides views to use by an external software tool for querying OpenRIMS data using SQL.

The reason to introduce special views instead of direct access to the data entered by users is querying performance and uniformity. The content of the views is a result of the ETL[1] process runs. The process runs daily by schedule and can be run by demand.

To simplify data querying, OpenRIMS provides the Data Sources Configurator feature that assists SQL statement creation. Moreover, it allows SQL statement creation for Supervisor users, that are typically do not have SQL knowledge.

Disclaimer

1. This feature is experimental. Use it for your consideration.
2. The current version of the Configurator:
   2.1. Does not allow querying detailed pages yet.
   2.2. Allows only registration applications yet.
3. The current version of the OpenRIMS does not use the data sources for GraphQL. It is scheduled for the following releases.

[1] Extract, Transform, Load

Data Sources Configurator

The Data Source Configurator is an OpenRIMS tool that allows the creation of SQL queries to OpenRIMS data without SQL knowledge. Only OpenRIMS electronic form configuration ability is required. The Configurator assists in selecting filters and fields from the database views that are dedicated to data querying:

- pv_applications is the main view to access applications and their states
- pv_activities to access the NRA workflow`s data, such are kind of workflow, entering and finishing dates, steps, executors, etc.
- pv_addresses provides access to the administrative unit part of addresses
- pv_classifiers provides access to predefined choices that are used in electronic forms, such as addresses, types of facilities, payment tiers, etc.
- pv_links provides access to common detailed data, such are active ingredients, applicant's facilities, etc.
- pv_literals provides access to text, data, logical and numeric fields in the electronic forms
- pv_events provides access to office registers, application renewals, etc.

The SQL query can be tested, downloaded, and stored in the database for future use.

Below are simplified data source examples built using the Data Source Configurator. These data sources use data from the retail pharmacy registration process. The fill-out process of a Data Source Configuration electronic form is grounded on the OpenRIMS User Experience:

- Any data source is addressed using a unique URL
- Filters and Fields should be selected from on-screen tables. Multiply selection is allowed.

Pharmacies by provinces (pv_applications, pv_addresses)

For each pharmacy, only one premise should be registered. Each premise has an address. Province is the second level of the address. For each province, the quantity of pharmacies should be reported.

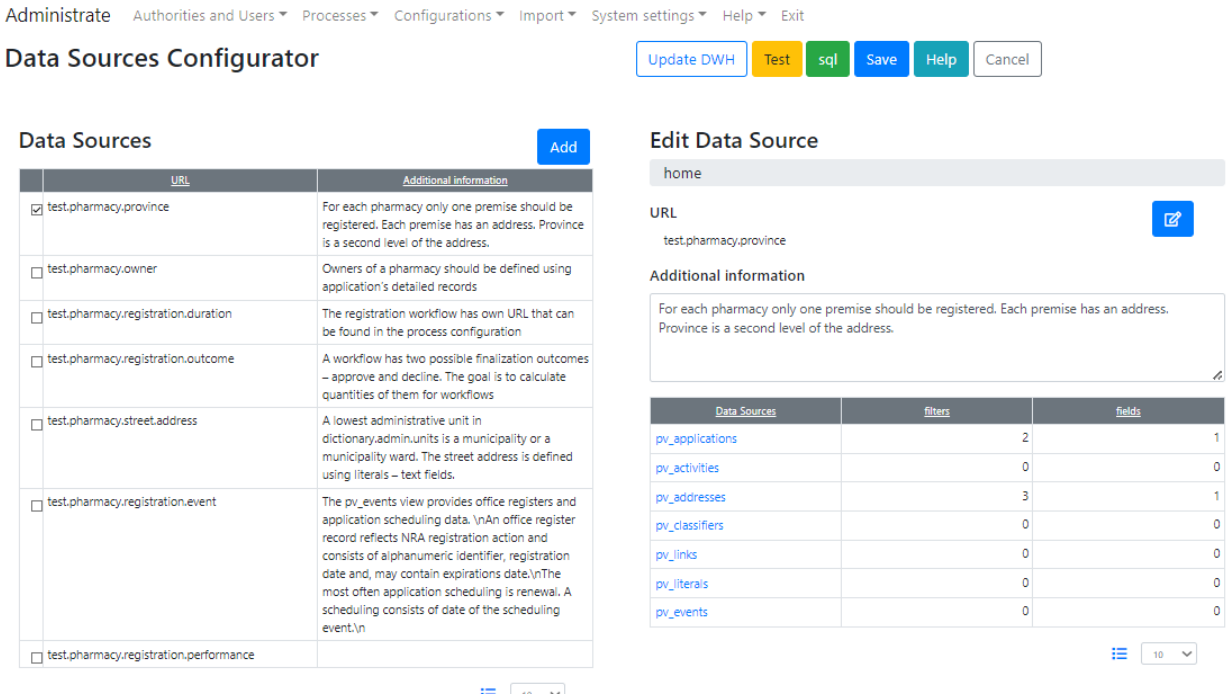

Figure 1 Data Source definition

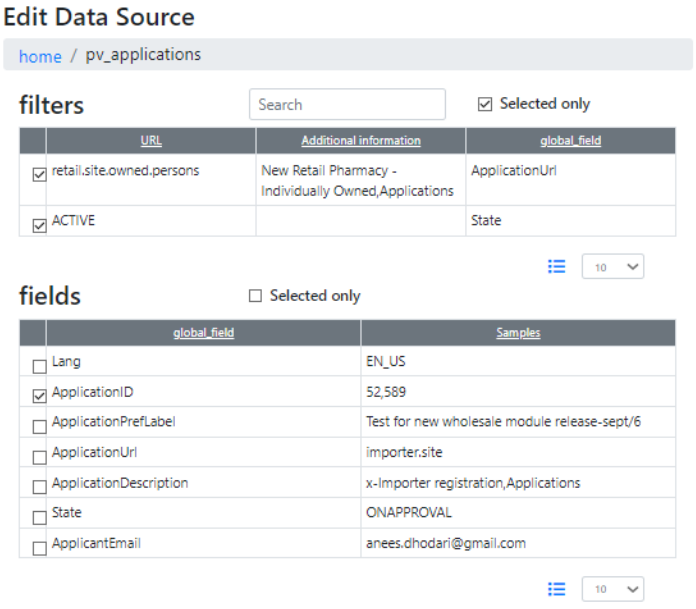

Figure 2 pv_applications. Select only approved applications created using the application form "retail.site.owned.persons" Put to the result set unique IDs of applications to calculate the quantity

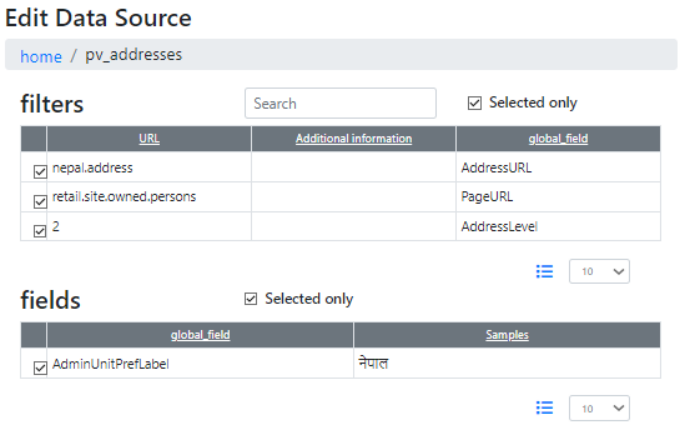

Figure 3 pv_addresses. An address of the premise is defined by the 'addresses" component with URL nepal.address that is defined in retail.site.owned.persons page. The second level of administrative units is a province. The AdminUnitPrefLabel field contains the name of a province

The query is:

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationID`,
`pv_addresses`.`AdminUnitPrefLabel`

FROM `pv_applications` pv_applications

join pv_addresses`pv_addresses`
ON `pv_addresses`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_addresses`.`PageURL` IN ('retail.site.owned.persons')
AND `pv_addresses`.`AddressLevel` IN ('2')
AND `pv_addresses`.`AddressURL` IN ('nepal.address')
AND `pv_applications`.`Lang`=`pv_addresses`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
AND `pv_applications`.`State` IN ('ACTIVE')
```

Lang	ApplicationID	AdminUnitPrefLabel
pt_PT	80,288	सुदुरपश्चिम प्रदेश
pt_PT	83,291	बागमती प्रदेश
pt_PT	83,001	बागमती प्रदेश
pt_PT	79,922	बागमती प्रदेश
pt_PT	77,078	गण्डकी प्रदेश
pt_PT	74,451	प्रदेश १
pt_PT	73,748	बागमती प्रदेश
pt_PT	71,916	बागमती प्रदेश
pt_PT	70,004	प्रदेश १
pt_PT	68,936	बागमती प्रदेश
EN_US	739,274	Bagmati Province
EN_US	722,105	Gandaki Province
EN_US	732,262	Bagmati Province
EN_US	89,984	Bagmati Province
EN_US	105,577	Sudurpaschim Province
EN_US	120,093	Sudurpaschim Province
EN_US	119,274	Sudurpaschim Province
EN_US	95,660	Sudurpaschim Province
EN_US	116,612	Karnali Province
EN_US	115,122	Karnali Province

Figure 4 The test of the query. ApplicationID is for the metric. AdminUnitPrefLabel is for the dimension.

Street address of a pharmacy (pv_applications, pv_addresses, pv_literals)

The lowest administrative unit in the “dictionary.admin.units” is a municipality or a municipality ward. The street address is defined using “literals” – text fields.

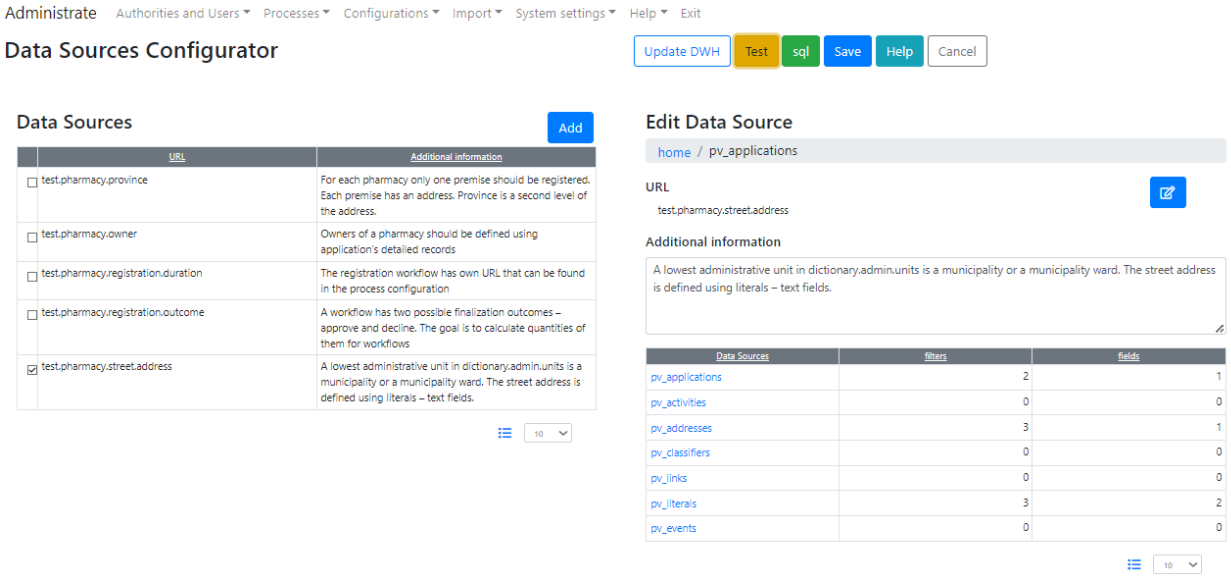

Figure 5 A configuration of the Street Address data source

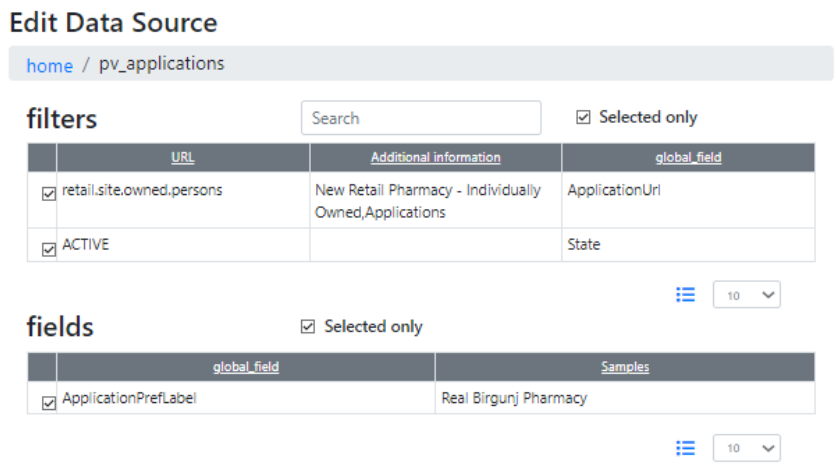

Figure 6 Select approved applications created using the application form “retail.site.owned.persons”. Put into the result set pharmacy names (ApplicationPrefLabel)

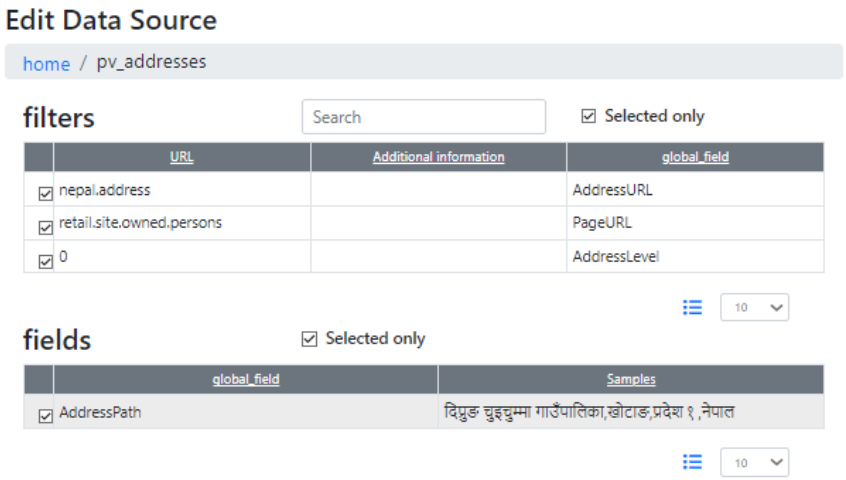

Figure 7 Select the lowest administrative unit part of an address from pv_addresses

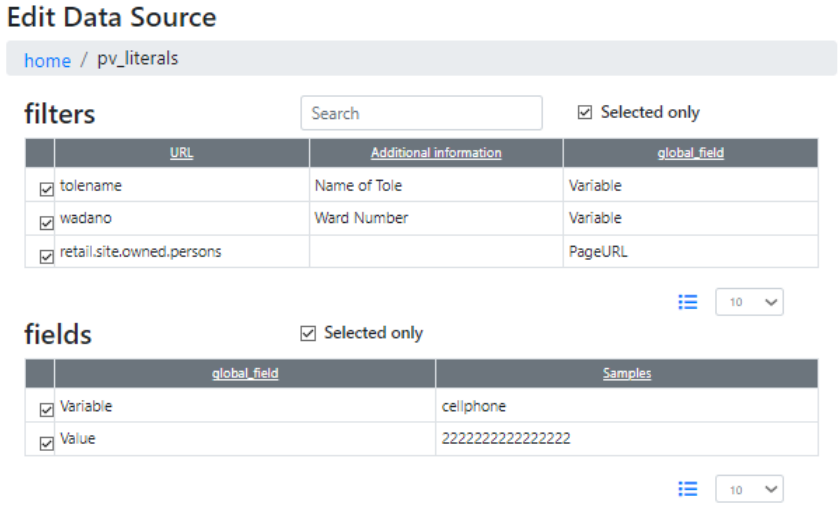

Figure 8 The street address is defined using fields tolename and wadano that are in the page retail.site.owned.persons. The tolename is similar to the street name, the wadano is similar to the block number

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The SQL:

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationPrefLabel`,
`pv_addresses`.`AddressPath`,
`pv_literals`.`Variable`,
`pv_literals`.`Value`

FROM `pv_applications` pv_applications

join pv_addresses`pv_addresses`
ON `pv_addresses`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_addresses`.`PageURL` IN ('retail.site.owned.persons')
AND `pv_addresses`.`AddressLevel` IN ('0')
AND `pv_addresses`.`AddressURL` IN ('nepal.address')
AND `pv_applications`.`Lang`=`pv_addresses`.`Lang`

join pv_literals`pv_literals`
ON `pv_literals`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_literals`.`Variable` IN ('tolename','wadano')
AND `pv_literals`.`PageURL` IN ('retail.site.owned.persons')
AND `pv_applications`.`Lang`=`pv_literals`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
AND `pv_applications`.`State` IN ('ACTIVE')
```

Lang	ApplicationPrefLabel	AddressPath	Variable	Value
EN_US	April 13 Pharmacy new name	Shuklaphanta Municipality,KANCHANPUR,Sudurpaschim Province,Nepal	wadano	12
EN_US	Individual pharmacy	Dungeshwor Gaunpalika,DAILEKH,Karnali Province,Nepal	tolename	individual
EN_US	Individual pharmacy	Dungeshwor Gaunpalika,DAILEKH,Karnali Province,Nepal	wadano	12
EN_US	angreji name pharmacy	Raskot Municipality,KALIKOT,Karnali Province,Nepal	tolename	बिहिबार टोल
EN_US	angreji name pharmacy	Raskot Municipality,KALIKOT,Karnali Province,Nepal	wadano	4
EN_US	New Pharmacy	Kanepokhari Gaunpalika,MORANG,Province 1,Nepal	tolename	name of tole
EN_US	New Pharmacy	Kanepokhari Gaunpalika,MORANG,Province 1,Nepal	wadano	16
EN_US	steen andersen pharmacy - application id??	Krishnapur Municipality,KANCHANPUR,Sudurpaschim Province,Nepal	tolename	steen andersen
EN_US	steen andersen pharmacy - application id??	Krishnapur Municipality,KANCHANPUR,Sudurpaschim Province,Nepal	wadano	12
EN_US	March 10, 2022 Steen New Pharmacy	Bhimdatta Municipality,KANCHANPUR,Sudurpaschim Province,Nepal	tolename	Tole
EN_US	March 10, 2022 Steen New Pharmacy	Bhimdatta Municipality,KANCHANPUR,Sudurpaschim Province,Nepal	wadano	12
EN_US	Test for checklist - Pharmacy	Ichchha Kamana Gaunpalika,CHITAWAN,Bagmati Province,Nepal	tolename	min thura
EN_US	Test for checklist - Pharmacy	Ichchha Kamana Gaunpalika,CHITAWAN,Bagmati Province,Nepal	wadano	3
EN_US	Pharmacist Image In certificate Pharmacy	Bhaktapur Municipality,BHAKTAPUR,Bagmati Province,Nepal	tolename	nnn
EN_US	Pharmacist Image In certificate Pharmacy	Bhaktapur Municipality,BHAKTAPUR,Bagmati Province,Nepal	wadano	4
EN_US	2022-01-27 Biratnagar Pharmacy	Duduwa,BANKE,Lumbini Province,Nepal	tolename	modification tole

Figure 9 A dataset for street addresses. Please, pay attention that the literals are in separate rows. It should be processed using the pivoting capabilities of the Business intelligence tool.

Registration terms (pv_applications, pv_events)

The pv_events view provides office registers and application scheduling data. An office register record is created for NRA registration action and consists of an alphanumeric identifier, the registration date, and the expiration date. The most often application scheduling is renewal. A scheduling consists of the date of the scheduled event.

In this example, we use NRA certificate registration office records to extract the registration terms of pharmacies.

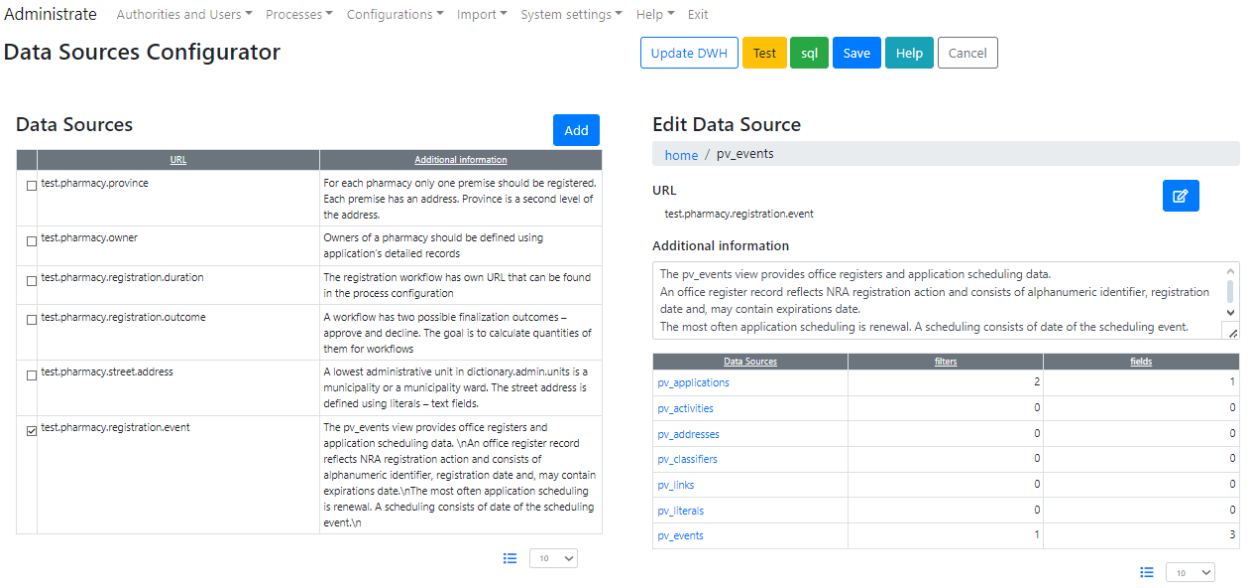

Figure 10 The Registration Terms data source

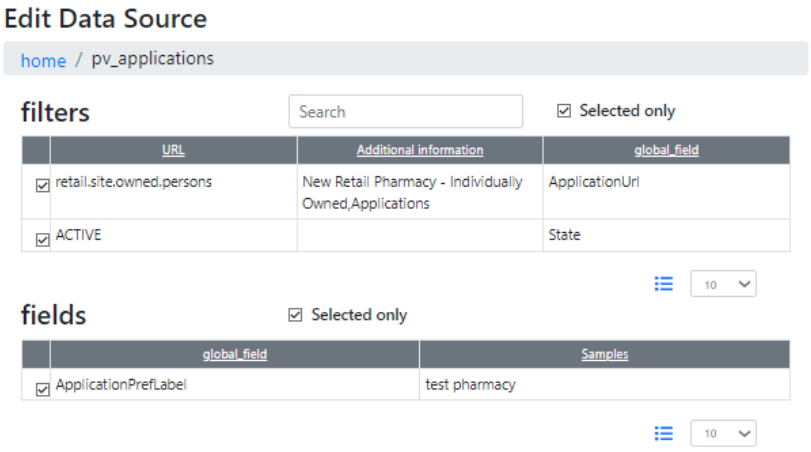

Figure 11 Select only approved applications created using the application form "retail.site.owned.persons". Put into the result set pharmacy names (ApplicationPrefLabel)

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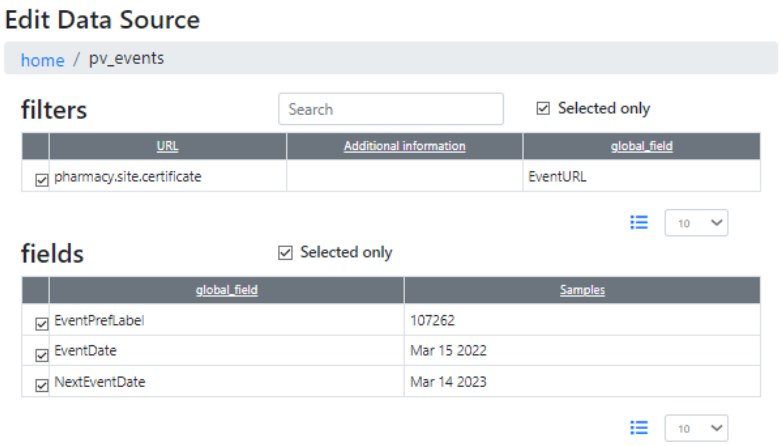

Figure 12 Select registration certificate office records by the office register URL. Put the registration number, registration date, and expiration date in the data set

The SQL

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationPrefLabel`,
`pv_events`.`EventPrefLabel`,
`pv_events`.`EventDate`,
`pv_events`.`NextEventDate`

FROM `pv_applications` pv_applications

join pv_events`pv_events`
ON `pv_events`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_events`.`EventURL` IN ('pharmacy.site.certificate')
AND `pv_applications`.`Lang`=`pv_events`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
AND `pv_applications`.`State` IN ('ACTIVE')
```

Test SQL - test.pharmacy.registration.event

Lang	ApplicationPrefLabel	EventPrefLabel	EventDate	NextEventDate
EN_US	Thursday 28 Oct Retail	1000002	Oct 28 2021	Oct 28 2025
EN_US	sbs pharmacy	00004	Dec 01 2021	Nov 30 2025
EN_US	Aago Pharmacy	000004	Dec 14 2021	Dec 13 2025
EN_US	Humbuja Pharmacy	000007	Dec 15 2021	Dec 13 2025
EN_US	2022-01-30 Smartphone Pharmacy	000091	Feb 11 2022	Feb 09 2024
EN_US	New pharmacy	000147	Feb 14 2022	Feb 13 2024
EN_US	Test for checklist - Pharmacy	000157	Feb 17 2022	Feb 15 2024
EN_US	April 13 Pharmacy new name	000231	Feb 26 2022	Feb 25 2024
EN_US	Pharmacy 20210924	000142	Mar 04 2022	Feb 11 2024
EN_US	Pharmacist Image In certificate Pharmacy	000195	Mar 04 2022	Feb 19 2024
EN_US	steen andersen pharmacy - application id??	000286	Mar 11 2022	Mar 10 2024
EN_US	March 10, 2022 Steen New Pharmacy	000287	Mar 16 2022	Mar 15 2024
pt_PT	Thursday 28 Oct Retail	1000002	Oct 28 2021	Oct 28 2025
pt_PT	sbs pharmacy	00004	Dec 01 2021	Nov 30 2025
pt_PT	Aago Pharmacy	000004	Dec 14 2021	Dec 13 2025
pt_PT	Humbuja Pharmacy	000007	Dec 15 2021	Dec 13 2025
pt_PT	2022-01-30 Smartphone Pharmacy	000091	Feb 11 2022	Feb 09 2024

Figure 13 The data set. Pharmacy name, registration number, registration date, expiration date

Owners and product system of pharmacies (pv_applications, pv_classifiers, pv_links)

There are two implementations of the detailed records – using component “persons” or using component “links”. Both implementations are available in the pv_links view.

The “persons” component allows adding new detailed records in the application form. Examples are:

- Owners of a pharmacy
- Warehouses of a wholesaler
- Products in an import permit

The “links” component allows adding existing detailed records in the application form. Examples are:

- Active ingredients
- Certified manufacturers
- Certified pharmacists

Owners of pharmacies are defined using the “persons” component. Up to five persons may be owners of a pharmacy.

Products of a pharmacy may belong to Allopathy or traditional Ayurvedic medicine systems of both. The product system is defined in the “dictionary.product.system.category.h” classifier in an application form.

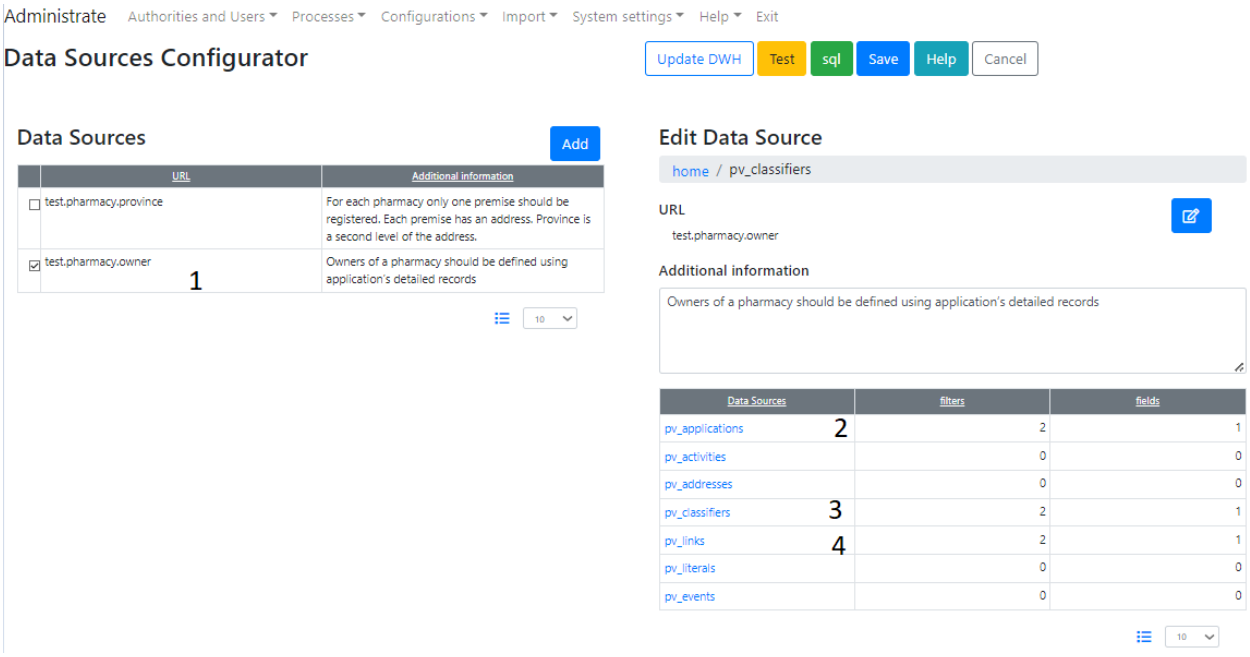

Figure 14 Data Source Definition

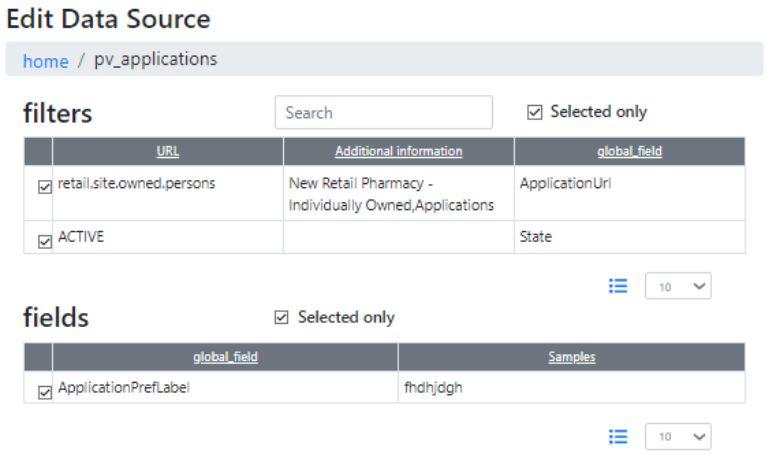

Figure 15 pv_applications. Select approved applications created using retail.site.owned.persons. Get the prefLabel (pharmacy name) column for each

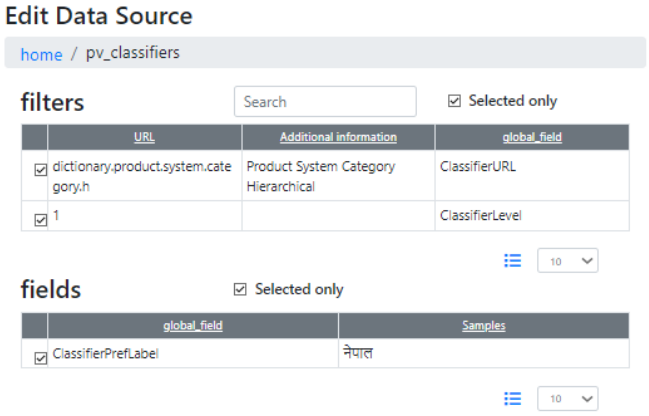

Figure 16 pv_classifiers. The product system is at 1 level of the dictionary. Put to the data set the name of the system.

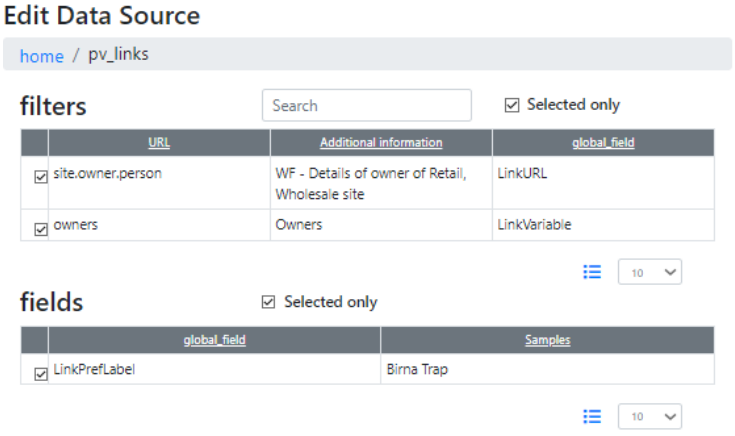

Figure 17 pv_links. Select owners defined in the application form in site.owner.person page. The name of the configuration variable is "owners". Put to the result set only prefLabel - the names of an owner

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The SQL query is

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationPrefLabel`,
`pv_classifiers`.`ClassifierPrefLabel`,
`pv_links`.`LinkPrefLabel`

FROM `pv_applications` pv_applications

join pv_classifiers`pv_classifiers`
ON `pv_classifiers`.`JoinID`=`pv_applications`.`ApplicationID`
AND `pv_classifiers`.`ClassifierURL` IN ('dictionary.product.system.category.h')
AND `pv_classifiers`.`ClassifierLevel` IN ('1')
AND `pv_applications`.`Lang`=`pv_classifiers`.`Lang`

join pv_links`pv_links`
ON `pv_links`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_links`.`LinkURL` IN ('site.owner.person')
AND `pv_links`.`LinkVariable` IN ('owners')
AND `pv_applications`.`Lang`=`pv_links`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
AND `pv_applications`.`State` IN ('ACTIVE')
```

Test SQL - test.pharmacy.owner

Lang	ApplicationPrefLabel	ClassifierPrefLabel	LinkPrefLabel
EN_US	20230419 Gold Pharmacy	Product System Category Hierarchical	Woodley Poindexter
pt_PT	20230419 Gold Pharmacy	प्रणाली	Woodley Poindexter
EN_US	2022-11-08 pharmacy	Allopathy	swin03
pt_PT	2022-11-08 pharmacy	एलोपैथिक	swin03
EN_US	Pharmacy 20210924	Allopathy	Cassius Calhoun
pt_PT	Pharmacy 20210924	एलोपैथिक	Cassius Calhoun
EN_US	Register check pharmacy	Allopathy	Woodley Poindexter
PT_PT	Register check pharmacy	एलोपैथिक	Woodley Poindexter

‹ 1 2 3 4 5 6 7 8 ›

10

Figure 18 The test result of the query. The data set contains the names of pharmacies, product systems, and owners.

Duration of pharmacy registration (pv_applications, pv_activities)

The duration of pharmacy registration is the period between the starting and ending workflow processing dates

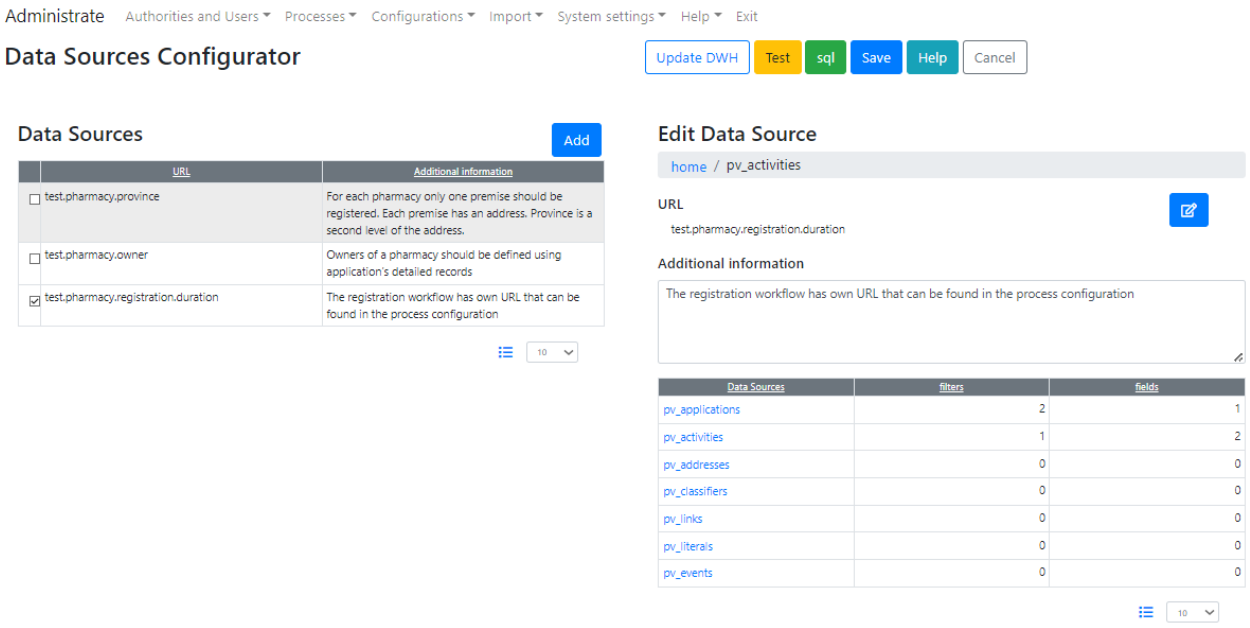

Figure 19 The data source for the duration of pharmacy registration

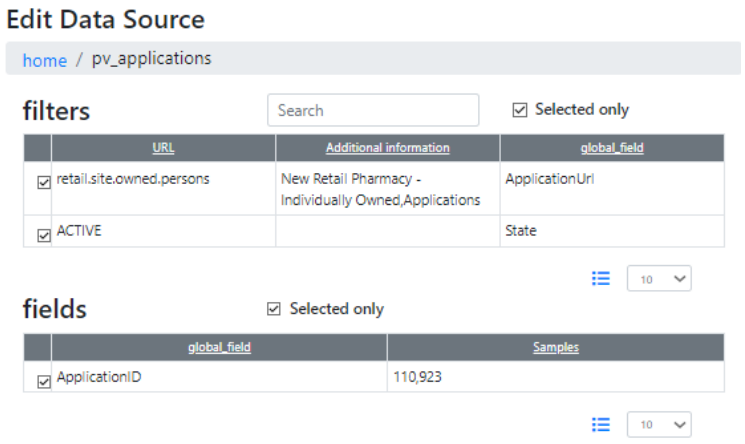

Figure 20 pv_applications. Only approved applications

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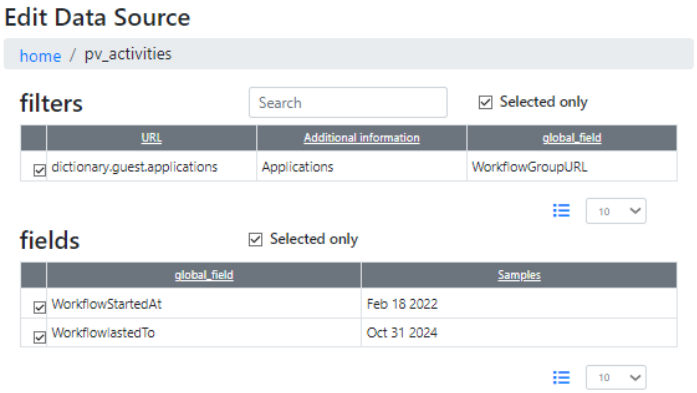

Figure 21 pv_activities. Select only registration workflows. Put in the result set only the dates of them

The SQL query is

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationID`,
`pv_activities`.`WorkflowStartedAt`,
`pv_activities`.`WorkflowlastedTo`

FROM `pv_applications` pv_applications

join pv_activities`pv_activities`
ON `pv_activities`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_activities`.`WorkflowGroupURL` IN ('dictionary.guest.applications')
AND `pv_applications`.`Lang`=`pv_activities`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
AND `pv_applications`.`State` IN ('ACTIVE')
```

Test SQL - test.pharmacy.registration.duration

Lang	ApplicationID	WorkflowStartedAt	WorkflowlastedTo
EN_US	68,936	Oct 24 2021	Mar 04 2022
pt_PT	68,936	Oct 24 2021	Mar 04 2022
EN_US	70,004	Oct 28 2021	Oct 28 2021
pt_PT	70,004	Oct 28 2021	Oct 28 2021
EN_US	71,916	Nov 08 2021	Jan 30 2022
pt_PT	71,916	Nov 08 2021	Jan 30 2022
EN_US	73,748	Dec 01 2021	Dec 07 2021
pt_PT	73,748	Dec 01 2021	Dec 07 2021
EN_US	74,451	Dec 15 2021	Dec 15 2021
pt_PT	74,451	Dec 15 2021	Dec 15 2021
EN_US	75,230	Dec 13 2021	Dec 14 2021
pt_PT	75,230	Dec 13 2021	Dec 14 2021
EN_US	77,078	Dec 23 2021	Jan 19 2022
pt_PT	77,078	Dec 23 2021	Jan 19 2022
EN_US	79,171	Jan 28 2022	Jan 30 2022
pt_PT	79,171	Jan 28 2022	Jan 30 2022
EN_US	79,922	Jan 30 2022	Feb 11 2022
pt_PT	79,922	Jan 30 2022	Feb 11 2022
EN_US	80,288	Jan 31 2022	Feb 01 2022

Figure 22 The result. Typically, an application passes a workflow once. However, an NRA officer can return an application to fix tiny inconsistencies. In this case, the application passes a workflow twice or more times.

Approved and declined applications (pv_applications, pv_activities)

An activity should have an outcome. There are four possible outcomes – NO, APPROVE, COMPANY, and DECLINE.

- NO means that this activity is not a workflow finalization activity
- APPROVE means that this activity finalizes the workflow and the application becomes approved
- COMPANY is the same as APPROVE but for Applicant's Company registration applications
- DECLINE means that this activity finalizes the workflow and the application becomes declined

The result of the registration workflow is the outcome of the completed finalization activity.

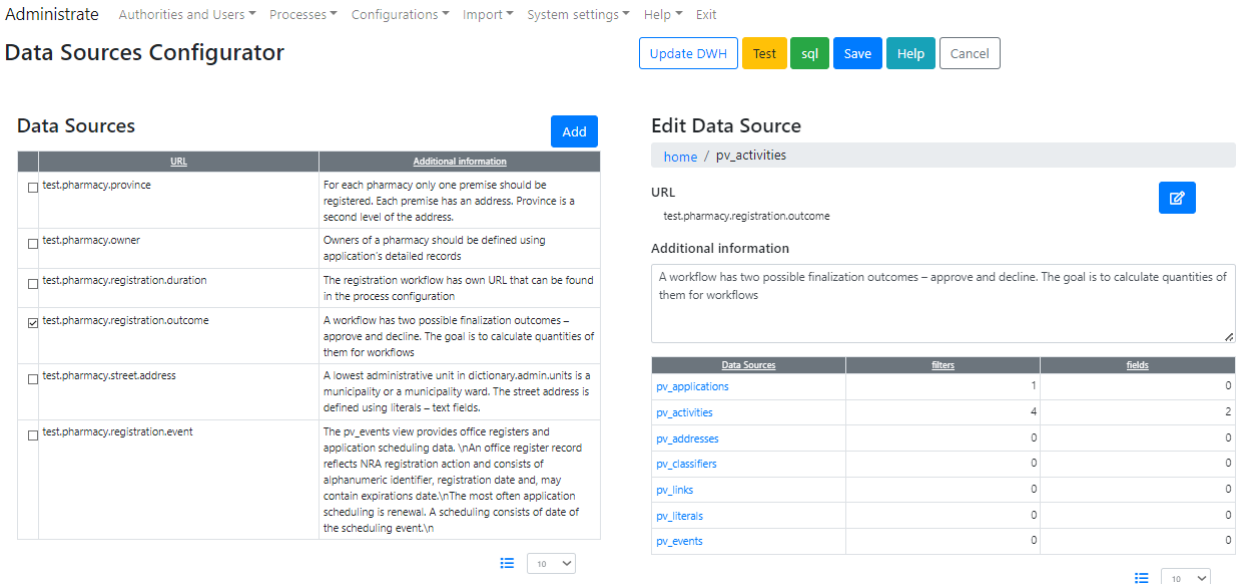

Figure 23 The data source for approved and declined applications

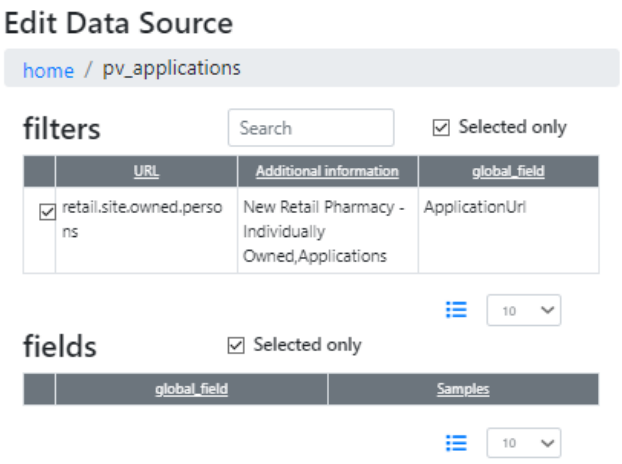

Figure 24 Limit applications to the retail pharmacy registration.

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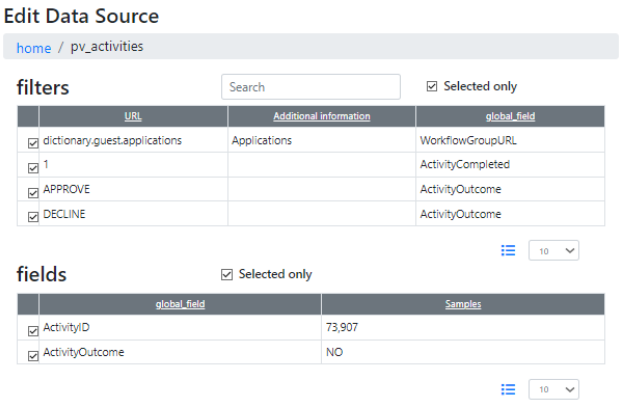

Figure 25 Limit workflows by the registration workflows. Include in the result set only completed activities with outcomes APPROVE or DECLINE. Select ActivityID as the metric and ActivityOutcome as the dimension

The SQL

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_activities`.`ActivityID`,
`pv_activities`.`ActivityOutcome`

FROM `pv_applications` pv_applications

join pv_activities`pv_activities`
ON `pv_activities`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_activities`.`ActivityCompleted` IN ('1')
AND `pv_activities`.`ActivityOutcome` IN ('APPROVE','DECLINE')
AND `pv_activities`.`WorkflowGroupURL` IN ('dictionary.guest.applications')
AND `pv_applications`.`Lang`=`pv_activities`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
```

Lang	ActivityID	ActivityOutcome
pt_PT	77,536	APPROVE
EN_US	89,095	APPROVE
pt_PT	89,095	APPROVE
EN_US	742,977	DECLINE
pt_PT	742,977	DECLINE
EN_US	78,191	APPROVE
pt_PT	78,191	APPROVE
EN_US	79,828	APPROVE
pt_PT	79,828	APPROVE
EN_US	86,474	APPROVE
pt_PT	86,474	APPROVE
EN_US	86,075	APPROVE
pt_PT	86,075	APPROVE
EN_US	80,546	APPROVE
pt_PT	80,546	APPROVE
EN_US	86,870	APPROVE
pt_PT	86,870	APPROVE
EN_US	208,646	APPROVE
pt_PT	208,646	APPROVE
EN_US	89,194	APPROVE

Figure 26 Result allows counting distinct Activities for APPROVE and DECLINE outcomes.

Performance of NRA employees and departments (pv_applications, pv_activities)

The performance can be measured using minimal, maximal, and average time to process workflow activities. It can be calculated using the activity execution period for completed activities.

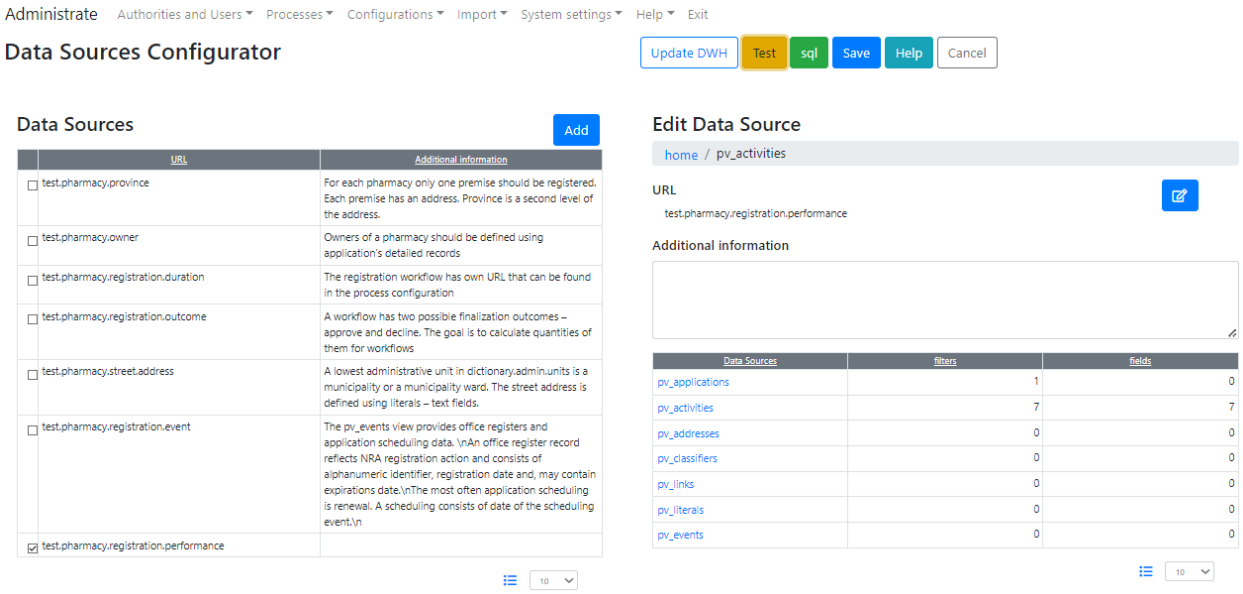

Figure 27 Performance of NRA Employee data set

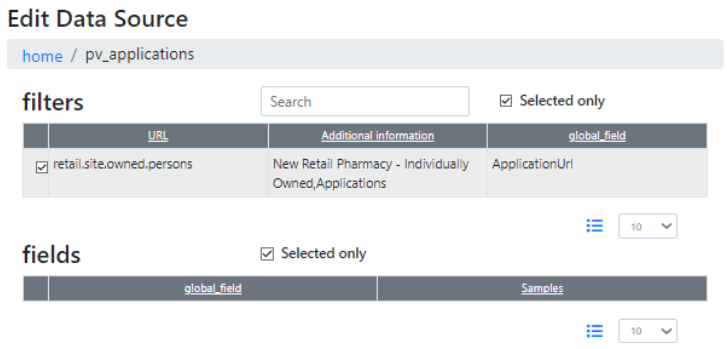

Figure 28 Select activities only for one application form

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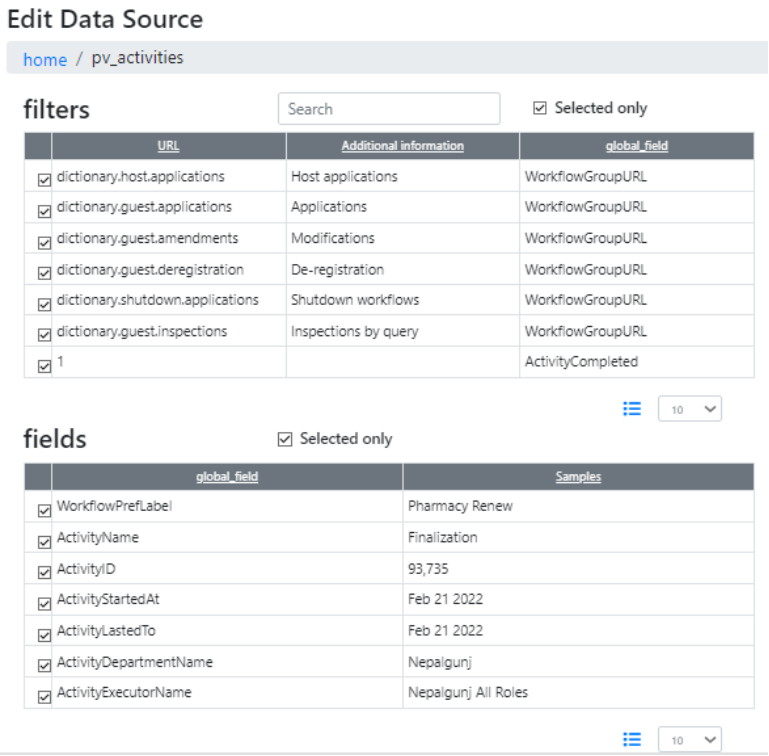

Figure 29 Select completed activities in all workflows. Put in the data set essential workflow and activity information including start and finish dates

The SQL is

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_activities`.`WorkflowPrefLabel`,
`pv_activities`.`ActivityName`,
`pv_activities`.`ActivityID`,
`pv_activities`.`ActivityStartedAt`,
`pv_activities`.`ActivityLastedTo`,
`pv_activities`.`ActivityDepartmentName`,
`pv_activities`.`ActivityExecutorName`

FROM `pv_applications` pv_applications

join pv_activities`pv_activities`
ON `pv_activities`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND `pv_activities`.`ActivityCompleted` IN ('1')
AND `pv_activities`.`WorkflowGroupURL` IN
('dictionary.host.applications','dictionary.guest.applications','dictionary.guest.amendments'
,'dictionary.guest.deregistration','dictionary.shutdown.applications','dictionary.guest.inspections')
AND `pv_applications`.`Lang`=`pv_activities`.`Lang`

WHERE `pv_applications`.`ApplicationUrl` IN ('retail.site.owned.persons')
```

Test SQL - test.pharmacy.registration.performance

Lang	WorkflowPrefLabel	ActivityName	ActivityID	ActivityStartedAt	ActivityLastedTo	ActivityDepartmentName	ActivityExecutorName
EN_US	New Retail Pharmacy - Individually Owned	Screening1	68,595	Oct 23 2021	Oct 23 2021	Department of Drug Administration	Supervisor S Supervisor
pt_PT	फार्मेसी दर्ता (व्यक्तिगत खुद्रा)	Screening	68,595	Oct 23 2021	Oct 23 2021	Department of Drug Administration pt	Supervisor S Supervisor
EN_US	New Retail Pharmacy - Individually Owned	Check payment	68,596	Oct 23 2021	Oct 23 2021	Department of Drug Administration	Supervisor S Supervisor
pt_PT	फार्मेसी दर्ता (व्यक्तिगत खुद्रा)	Check payment	68,596	Oct 23 2021	Oct 23 2021	Department of Drug Administration pt	Supervisor S Supervisor
EN_US	New Retail Pharmacy - Individually Owned	Inspection	68,597	Oct 23 2021	Oct 23 2021	Department of Drug Administration	Supervisor S Supervisor
pt_PT	फार्मेसी दर्ता (व्यक्तिगत खुद्रा)	Inspection	68,597	Oct 23 2021	Oct 23 2021	Department of Drug Administration pt	Supervisor S Supervisor
EN_US	New Retail Pharmacy - Individually Owned	Review	68,604	Oct 23 2021	Oct 23 2021	Department of Drug Administration	Supervisor S Supervisor
pt_PT	फार्मेसी दर्ता (व्यक्तिगत खुद्रा)	Review	68,604	Oct 23 2021	Oct 23 2021	Department of Drug Administration pt	Supervisor S Supervisor
EN_US	New Retail Pharmacy - Individually Owned	Verification	68,605	Oct 23 2021	Oct 23 2021	Department of Drug Administration	Supervisor S Supervisor
pt_PT	फार्मेसी दर्ता (व्यक्तिगत खुद्रा)	Verification	68,605	Oct 23 2021	Oct 23 2021	Department of Drug Administration pt	Supervisor S Supervisor

Figure 30 This result allows calculation performance for departments and employees.

References

OpenRIMS Data

An applicant should submit the application to the National Regulatory Authority (NRA) using OpenRIMS software. The NRA uses OpenRIMS software to review the application. During the review, an application may be approved or declined.

An approved application may be renewed, inspected, revoked, modified, and de-registered.

The OpenRIMS database consists of two parts:

- Data Collecting tables that are efficient for data input, however inefficient for data publishing
- Data Publishing tables that are efficient for data publishing, however, can't be used for data input

The content of the Data Publishing tables is a result of the ETL[2] process built-in OpenRIMS software. However, the direct usage of the Data Publishing tables by the external software is discouraged because of cumbersome SQL queries

The OpenRIMS database provides views built on the Data Publishing tables to simplify data querying.

- pv_applications is the main view to access applications and their states
- pv_activities to access the NRA workflow`s data, such are kind of workflow, entering and finishing dates, steps, executors, etc.
- pv_addresses provides access to the administrative unit part of addresses
- pv_classifiers provides access to predefined choices that are used in electronic forms, such as addresses, types of facilities, payment tiers, etc.
- pv_links provides access to common detailed data, such are active ingredients, applicant's facilities, etc.
- pv_literals provides access to text, data, logical and numeric fields in the electronic forms
- pv_events provides access to office registers, application renewals, etc.

pv_applications

This view publishes basic application data.

Column	Purpose	Example
Lang	1. Filtering by language 2. Key to joining other views	EN_US
ApplicationID	1. Calculating metrics, e.g. quantity of applications 2. Publishing a link to the application data 3. Key to joining other application views	734904
AplicationPrefLabel	Publishing in reports. Can't be used for metric calculations	Aspirin

[2] Extracting, Transforming, Loading

Column	Purpose	Example
ApplicationURL	Filtering and grouping by application type	medicinal.product.marketing
ApplicationDescription	To publish a detailed description of the application type	A Marketing Authorization Application is an application submitted by a drug manufacturer seeking marketing authorization, which is permission to bring a medicinal product to market.
State	Filtering and grouping by application state. Possible values are: **DEREGISTERED** – no longer valid, **REVOKED** – temporary or permanently suspended by NRA, **NOTSUBMITTED** – prepared by an applicant, but not submitted yet, **ONAPPROVAL** – NRA is reviewing this application, **ACTIVE** – the application subject is permitted, **LOST** – something wrong with this application because of software error	ACTIVE
ApplicantEmail	1. Access control 2. Filtering and grouping by applicants 3. Calculating metrics, e.g. count applications by an applicant	nobody@neverland.com

pv_activities

An activity is an atomic job that is completed or completed by an executor. An executor may be an NRA employee or an applicant. The outcome of an activity execution may be one of:

- Canceling the activity
- Running the next activity
- Returning application to the applicant for correction
- Approve the application
- Decline the application

The pv_activities view allows:

- Calculate the workload and performance of employees and NRA departments
- Calculate the statistic of successful/unsuccessful application processing

Dimension	Purpose	Example
Lang	Language for filtering and joining	EN_US
WorkflowGroupURL	The URL of the dictionary contains workflows of the same group. It can be used for filtering	dictionary.guest.applications
WorkflowGroupName	The name of the dictionary contains workflows of the same group. It can be used for publishing.	Initial Applications
WorkflowURL	URL of the Workflow Configuration. It can be used for filtering. Unlike Workflow Group, there is no human-readable name for a Workflow Configuration. Also, the Workflow Configuration can be shared for many similar workflows	application.ws.site
WorkflowPrefLabel	Human readable name of a Workflow Application. For publishing	Domestic Wholesaler Authorization
WorkflowStartedAt	Date a workflow has been started. It can be used mainly for filtering	2022-04-13
WorkflowLastedTo	Date to which workflow is lasted. For not finished workflows – today, for finished – the date when the last activity has been completed or canceled	2022-04-16
ActivityURL	URL of the activity. It can be used for filtering.	
ActivityName	Human readable name of the activity. For publishing	Screening
ActivityWorkflowID	Unique ID of a workflow ran. It can be used for calculating metrics, such as are quantity of workflows as well as a link to workflows in pv_workflows	86891
ApplicationID	Unique ID of an application served by this activity. It can be used for linking to the ApplicationID field in other views or for various counters	34136
ActivityID	Unique ID of the activity. It can be used for various counters	86898
ActivityHistoryID	Unique ID of the record in the history table. This table manages activities in the OpenRIMS. It can be used only to build hyperlinks to the OpenRIMS User Interface in the external software	477

Dimension	Purpose	Example
ActivityStartedAt	Date an activity has been started. It can be used mainly for filtering.	
ActivityLastedTo	Date to which an activity is lasted. For not finished workflows – today, for finished – real date and time when the last activity has been completed or canceled	2022-03-03
ActivityCompleted	Is this activity completed? It can be used mainly for filtering	2022-03-03
ActivityOutcome	Outcome code of this activity. Possible values are NO, APPROVE, and DECLINE. It can be used for filtering and publishing.	DECLINE
ActivityDepartmentID	Unique ID of an NRA department of the NRA executor. Can be used for various department-related counters For activities that are assigned to an applicant; this parameter is zero	2184
ActivityDepartmentName	The human-readable name of the department is identified by the ActivityDepartmentID. For activities that are assigned to an applicant; this parameter is – (dash)	Department of Drug Administration
ActivityExecutorEmail	The email of the executor. It can be used for access control, filtering, etc.	el-coyote@headless.horseman.mr
ActivityExecutorName	The name of an executor. For applicants, this parameter is – (dash)	Miguel Diaz
historyID	Same as ActivityHistoryID for backward compatibility	477

pv_addresses

This view publishes the user`s selections in the “addresses” component as well as direct selections in “dictionary.admin.units” in electronic forms of application and application review activities.

Allows access to administrative unit’s part of addresses.

Dimension	Purpose	Example
Lang	Language for filtering and joining	EN_US
ApplicationID	Unique ID of an application served by this activity. It can be used for linking to the ApplicationID field in other views or for various counters	41747
AdminUnitID	Unique ID of the administrative unit value on the current level of hierarchy. Can be used to calculate metrics related to province, district, etc.	24395
AddressID	Unique ID of the administrative unit value on the zero level of hierarchy. Can be used to calculate metrics related to the smallest administrative unit, e.g. municipality or municipal ward	24451
AdminUnitPrefLabel	A name of the administrative unit on the current level of hierarchy. Do not use for metric.	Karnali Province
AddressPrefLabel	A name of the administrative unit value on the zero level of hierarchy. e.g. municipality or municipal ward. Do not use for metric.	Kanaka Sundari Gaun Palika
AdminUnitGIS	GIS coordinates of the administrative unit value on the current level of hierarchy. Usually, the same as AddressGIS	29.389746973335725; 81.9883192210274
AddressGIS	GIS coordinates of the administrative unit value on the zero level of hierarchy. e.g. municipality or municipal ward. Do not use for metric	29.389746973335725; 81.9883192210274
AdminUnitPath	A full address of the administrative unit on the current level of hierarchy. Do not use for metric.	Karnali Province,Nepal
AddressPath	A full address of the administrative unit on the zero level of hierarchy. e.g. municipality or municipal ward. Do not use for metric.	Kanaka Sundari Gaun Palika,JUMLA,Karnali Province,Nepal

Dimension	Purpose	Example
AddressLevel	Aa address is hierarchical. The level is a number in a hierarchy. 0 is the smallest administrative unit, e.g. municipality or municipal ward. 1 is the previous hierarchy level, etc. Only for filtering	2
AddressURL	URL of the address component on the page of the form. Only for filtering	ws.site.address
PageURL	URL of the page in the form. Only for filtering	ws.site
Variable	The name of the address component on the electronic form page. It is only for filtering	address

pv_classifiers

This view publishes the user`s selections in the “dictionaries” or “droplist” input components in electronic forms of application and application review activities.

Dimension	Purpose	Example
Lang	Language for filtering and joining	EN_US
JoinID	Join to pv_applications, or pv_links	734904
ClassifierID	Unique ID of the classifier value on the current level of hierarchy. Can be used to calculate metrics related to the current level of the classifier hierarchy, e.g. number of provinces in the address hierarchy	34982
ClassifierSelectionID	Unique ID of the selected classifier value(zero level of the hierarchy). Can be used to calculate metrics related to the classifier, e.g. count of “Ove The Counter” products	10509
ClassifierPrefLabel	Publish a value of the current level of the classifier hierarchy. Do not use for metric.	Over The Counter
ClassifierSelectonPrefLabel	Publish a value of the selected classifier value(zero level of the hierarchy). Do not use for metric	b) Bachelor's in Pharmacy
ClassifierAltLabel	Publish GIS coordinates related to the current level of the classifier hierarchy, if one	30.060622428474737; 81.61995133464052
ClassifierSelectionAltLabel	Publish GIS coordinates related to the selected classifier value(zero level of the hierarchy), if one	30.06055300285923; 81.62178736957549
ClassifierPath	The comma-separated list of strings represents the full value of the classifier. The classifier name is included. For publishing only	Over The Counter, Product Category
ClassifierURL	The URL of the classifier. 1. Filtering and grouping by a classifier 2. Counting metrics, e.g. count of classifier usage	dictionary.product.category

Dimension	Purpose	Example
ClassifierLevel	A dictionary that implements a classifier may be hierarchical. The level is a number in a hierarchy backward. 0 is the latest selected, 1 is the previous hierarchy level, etc. The latest level is the name of the classifier. Only for filtering	Level 0 – Over The Counter Level 1 – Product Category Or for address: Level 0 – Donaldsonville Level 2 - Ascension Parish Level 3 – Louisiana Level 4 - USA
ClassifierPageURL	The page in the electronic form on which the classifier is available. It can be used for filtering	medicinal.product.marketing.classifiers
ClassifierVar	The name of the classifier field on the electronic form page. It can be used for filtering	product_category

pv_links

There are two implementations of the detailed records – using component “persons” or using component “links”. Both implementations are available in the pv_links view.

The “persons” component allows adding new detailed records in the application form. Examples are:

- Owners of a pharmacy
- Warehouses of a wholesaler
- Products in an import permit

The “links” component allows adding existing detailed records in the application form. Examples are:

- Active ingredients
- Certified manufacturers
- Certified pharmacists

Dimension	Purpose	Example
Lang	Language for filtering and joining	EN_US
ApplicationID	Join to pv_applications	39769
LinkURL	To filter links by link URL. A link URL is a unique identifier of the “persons” or “links” component defined in the Data Configuration	pharmacy.site.owner.person
LinkPrefLabel	To publish a preferred label for the link	Owner 1
LinkApplicationPageURL	The page in the electronic form on which links are available. It can be used for filtering	ws.site.owners
LinkVariable	The name of the “links” field on the page. It can be used for filtering	manufacturers.
LinkIdentifierURL	A detailed record in the “links” component may be identified, using a classifier. For example, the kind of manufacturer may be the final product or bulk packager. It can be used for filtering	dictionary.manufacturer.type
LinkIdentifier	A string value of the identifier. For publishing only	Active Ingredient, Manufacturer

pv_events

The pv_events view provides office registers and application scheduling data. An office register record is created in an NRA registration action and consists of an alphanumeric identifier, the registration date, and the expiration date. The most often application scheduling is renewal. A scheduling consists of the date of the scheduled event.

Dimension	Purpose	Example
Lang	Join to pv_applications	EN_US
ApplicationID	Join to pv_applications	39769
EventURL	To filter links by Event URL. An Event URL is a unique identifier of a register or a scheduler	ws.site.renewal or ws.site.certificate
EventPrefLabel	Register number for publishing	12/24-U
EventDate	Registration date or Routine Event assigning date. It may be used for publishing or filtering. The format is ISO date string	2024-02-10
NextEventDate	Next routine Event date or certificate expiration date. It may be used for publishing or filtering. The format is ISO date string	2026-03-12
EventPageURL	The page on which “schedulers” or “registers” are available. It may be the application`s form page or workflow activity data page. The preferred usage is filtering	pharmacy.certificate.register
EventVariable	The name of the “schedulers” or “registers” field on the page. It can be used for filtering	certificate

pv_literals

Application electronic form and application review activity electronic form may contain text, date, number, and logical fields. An example is street address literal which consists of street name and block number. These fields are available using the pv_literals view.

Dimension	Purpose	Example
Lang	Join to pv_applications	EN_US
ApplicationID	Join to pv_applications	39769
PageURL	URL of an application form or application review activity form. It can be used for filtering.	retail.site.owned.pvt
Variable	The name of a field. It can be used for filtering.	streetname
Value	The value of a field. It can be used for publishing or filtering	Marble Str 12

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Tips and tricks

Application data publishing

Sometimes it will be necessary to publish full application data. For example, the approved medicinal product details should be publicly available.

The OpenRIMS software provides the “PublicPermitData” electronic form. This form is accessible by the link that looks like

https://pharmadex.irka.in.ua/public#publicpermitdata/%7B%22permitDataID%22:732262%7D

Where:

- pharmadex.irka.in.ua is the address of the OpenRIMS server
- 732262 is the content of the ApplicationID field

This link will publish only publicity available data, in case there is no applicant or NRA employee login in the current browser.

Customizing Todo lists

Sometimes it will be necessary to publish the Todo list of OpenRIMS to the uniform Todo list that is in use by NRA employees. To do this OpenRIMS provides:

- SQL query to determine the context of NRA user in OpenRIMS
- The Data Source Configurator to pre-build SQL query to get data for custom visualization
- GET HTTP(s) query to run Activity Management form and an example in Java Script

User’s context in OpenRIMS HTTP(S) URL

When the user’s login Gmail is known, the following SQL helps get the user’s role context:

```
SELECT distinct
email,
CASE
WHEN `role`='ROLE_SECRETARY' THEN 'secretary'
WHEN `role`='ROLE_ACCOUNTANT' THEN 'accountant'
WHEN `role`='ROLE_INSPECTOR' THEN 'inspector'
WHEN `role`='ROLE_MODERATOR' THEN 'moderator'
WHEN `role`='ROLE_REVIEWER' THEN 'reviewer'
WHEN `role`='ROLE_SCREENER' THEN 'screener'
WHEN `role`='ROLE_ADMIN' THEN 'admin'
WHEN `role`='APPLICANT' THEN 'guest'
END users_context
FROM pdx2.user_access;
```

The user`s context is a “path” part of uniform OpenRIMS HTTP(S) URL structure. For example:

https://pharmadex.irka.in.ua/admin#todolist/activitymanager/%7B"historyId"%3A9246%7D

- https: is a protocol
- pharmadex is a host
- irka.in.ua is a domain
- **admin is a path**
- todolist/activitymanager/%7B"historyId"%3A9246%7D is a fragment that will be explained below.

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SQL query to get the Todo list

The SQL for the Todo list may be created using the Data Sources Configurator, and, then, manually tuned by the additional selection criteria to restrict the result to a particular NRA user. Please, consider a simplified example:

The SQL query created by the Configurator is

```
SELECT DISTINCT
`pv_applications`.`Lang`,
`pv_applications`.`ApplicationPrefLabel`,
`pv_applications`.`ApplicantEmail`,
`pv_activities`.`WorkflowPrefLabel`,
`pv_activities`.`WorkflowStartedAt`,
`pv_activities`.`ActivityName`,
`pv_activities`.`ActivityHistoryID`,
`pv_activities`.`ActivityStartedAt`,
`pv_activities`.`ActivityDepartmentName`,
`pv_activities`.`ActivityExecutorEmail`, -- allows get the context
`pv_activities`.`ActivityExecutorName`

FROM `pv_applications` pv_applications

join pv_activities`pv_activities`
ON `pv_activities`.`ApplicationID`=`pv_applications`.`ApplicationID`
AND ActivityCompleted IN ('0')
 and WorkflowGroupURL IN ('dictionary.guest.applications')
AND `pv_applications`.`Lang`=`pv_activities`.`Lang`

WHERE ApplicationUrl IN ('retail.site.owned.persons')
 and State IN ('ONAPPROVAL')
```

HTTP(S) GET URL – the fragment

The structure of the HTTP(S) GET URL in OpenRIMS is uniform. For example:

https://pharmadex.irka.in.ua/admin#todolist/activitymanager/%7B"historyId"%3A9246%7D

- https: is a protocol
- pharmadex is a host
- irka.in.ua is a domain
- admin is a path
- **todolist/activitymanager/%7B"historyId"%3A9246%7D** is a fragment

The fragment contains:

- todolist/activitymanager – means electronic form activitymanager in the context of Todo list
- %7B"historyId"%3A9246%7D is an URL encoded string that represents a JSON object, where 9246 is a `pv_activities`.`ActivityHistoryID`

For better understanding, please consider the following fragment of Java Scrip code that is used internally by the OpenRIMS

```
let dataParams={
      historyId: 9246,
 }
 let param = JSON.stringify(dataParams)
let hash='todolist/activitymanager'
hash=hash+"/"+encodeURIComponent(parameter)
 window.location.hash = hash
```

Creation of the report in Google Looker Studio

The static report

The vendor's manual on creation report in the Google Looker is here https://cloud.google.com/looker/docs/intro. Additionally, there are many tutorials available.

Key points for this example are:

The data source name is "To Do Example". We are using the SQL described above to create it.

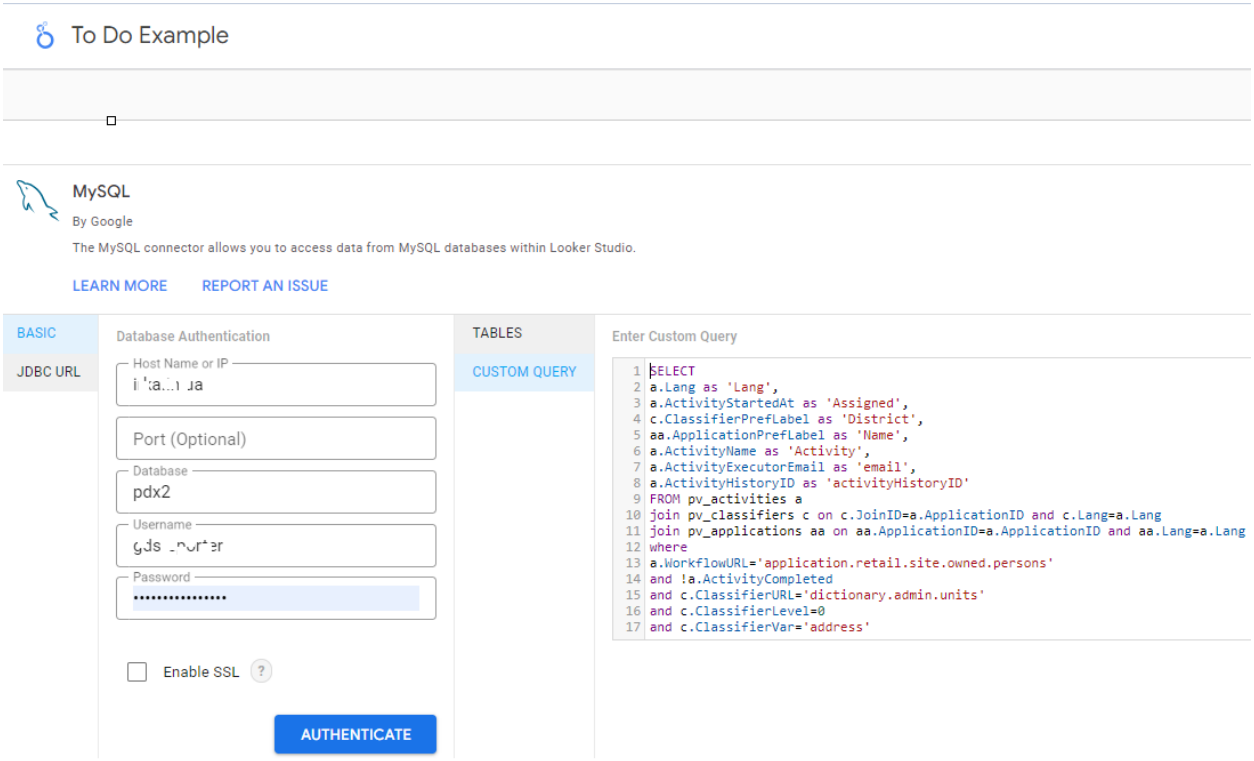

Figure 31 The Data Source Connection

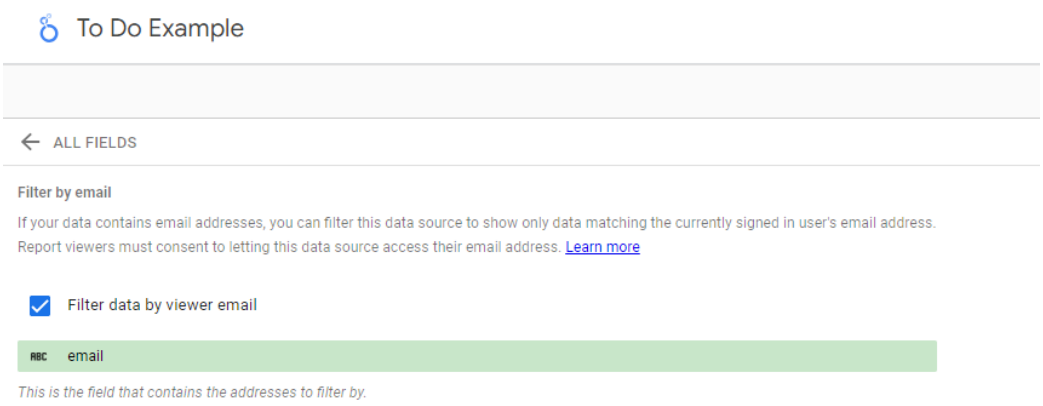

Figure 32 Filter the data source by email to ensure access control.

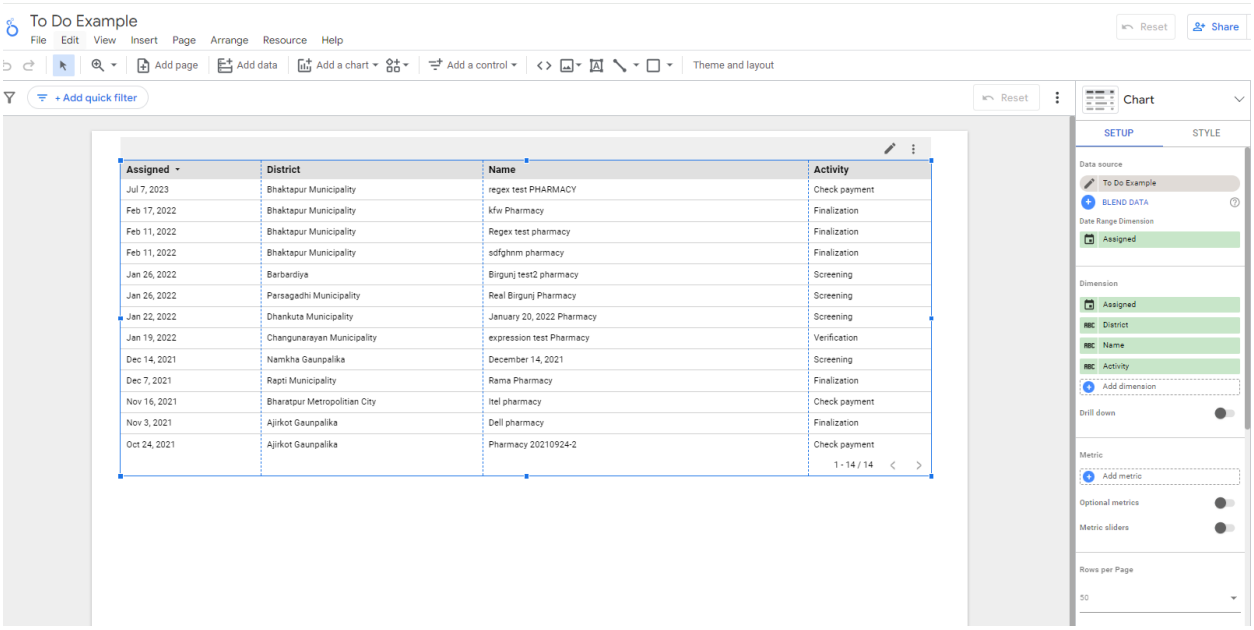

Figure 33 The static report

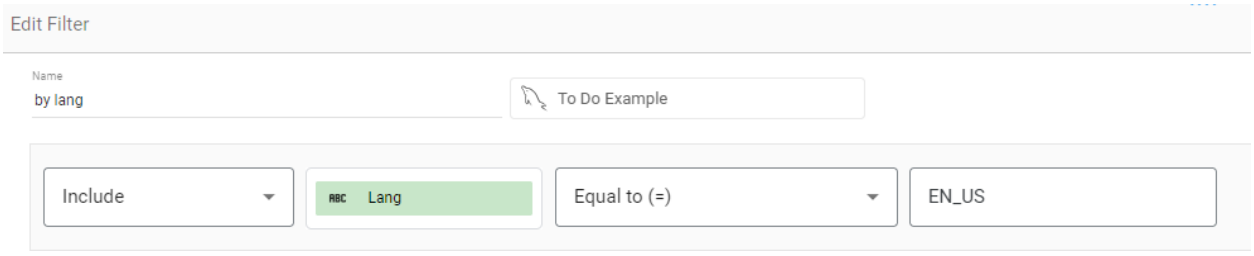

Figure 34 Report filter by language - EN_US only

Add interactivity

This report publishes To Do data. It will be nice to add a possibility to complete activities using the OpenRIMS User Interface.

The Google Looker provides a link feature, that allows placing a link into a report data cell.

First, determine the link URL using the To-Do List in OpenRIMS. An example is in the browser's URL line

https://pharmadex.irka.in.ua/admin#todolist/activitymanager/%7B"historyId"%3A9059%7D

The ActivityHistoryID is in our data set. Thus, it is possible to assign a link to cells in the "Activity" column.

Second, replace the Activity text with the Activity hyperlink field.[3]

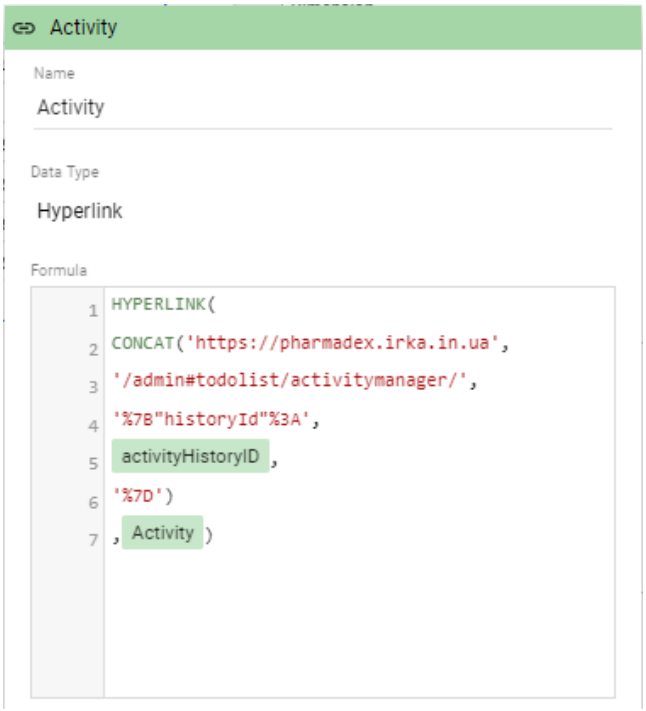

Figure 35 The link to the OpenRIMS activity processing form

[3] The details are here https://support.google.com/looker-studio/answer/7431836?hl=en#zippy=%2Cin-this-article

Share the report

Access to this report is limited. Thus, add only authorized users to the access control.

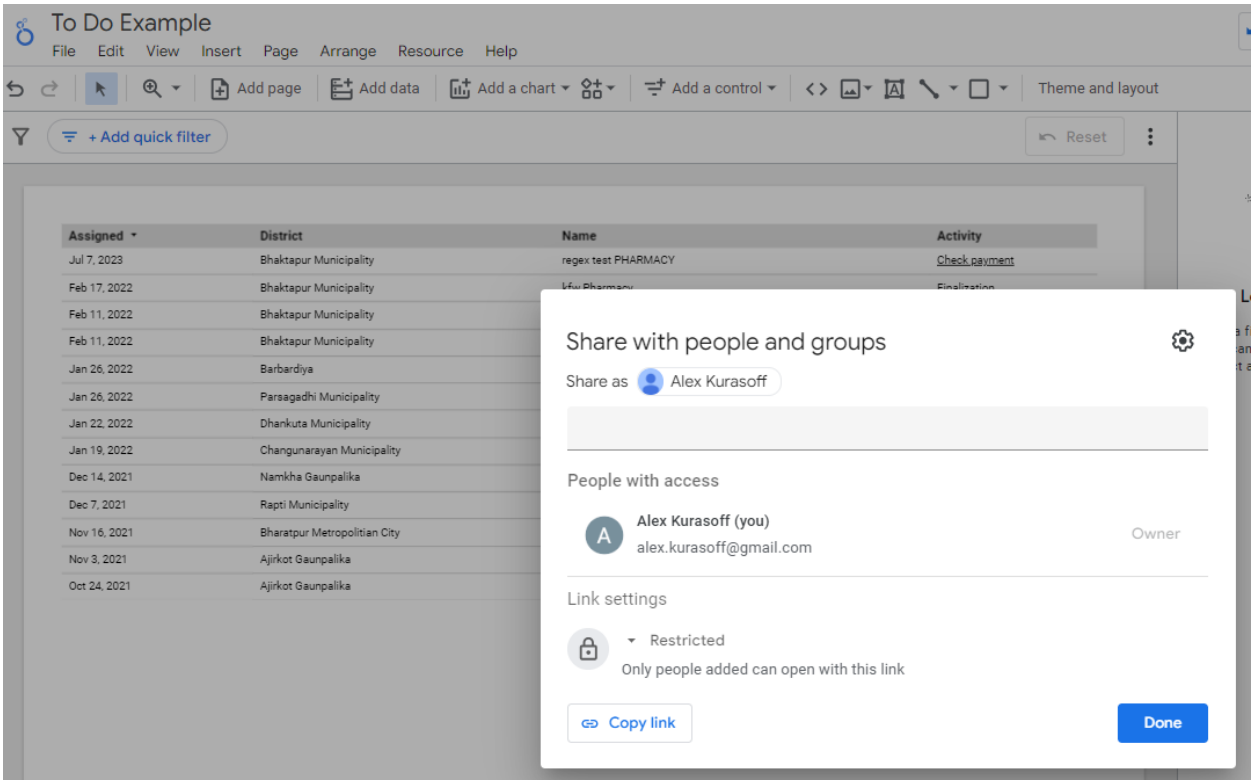

Figure 36 Add authorized users.