

OpenRIMS. Data visualization using Google Looker

(release 20240104)

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Motivation

The OpenRIMS database contains two sets of tables and views. One set is adapted to data input and management, second is a Data Warehouse for data visualization

The content of the Data Warehouse is a result of the daily ETL¹ process against tables adapted for data input.

This manual contains examples of the typical data visualization use cases. The examples were created using Google Looker Studio. All examples are built on fictive data.

Annexes contain references to the Data Warehouses tables and views, an explanation of the permit lifecycle, and provide a recommended roadmap of the data visualization

To use this manual, the Google Looker knowledge is required. Please, check, do you understand such terms:

- Data Source
- Filter
- Dimension
- Metric
- Blend

This document deprecates all previous reporting and data visualization manuals.

¹ Extract, Transform, Load

Permit Register

Report

<https://lookerstudio.google.com/u/0/reporting/745cf19d-2e72-4575-95d7-96e1cdb49557/page/VY3PD>

The OpenRIMS is a permit issuance management electronic tool. Thus, a register of issued permits should be published. This example demonstrates the usage of

- The Data Warehouse view “report_permits”
- Filters
- OpenRIMS publicly available permit data feature [\[Error! Reference source not found.\]](#)

Search

| | | | | |
|---------------------------|-------------------------|------------------------|-----------------------|------------------------|
| Province Enter a value | Permit Enter a value | Owner Enter a value | Name Enter a value | Reg # Enter a value |
|---------------------------|-------------------------|------------------------|-----------------------|------------------------|

Summary

| Province ▾ | Permits | Permit ▾ | Permits | Owner ▾ | Permits |
|------------|---------|--|---------|------------------|---------|
| BAGLUNG | 1 | New Retail Pharmacy - Individually Owned,Applications | 26 | swin03 | 1 |
| BANKE | 1 | Transition Retail Pharmacy - Individual Owned,Applications | 9 | steen den fjerde | 1 |
| BHAKTAPUR | 8 | | | steen andersen | 10 |
| CHITAWAN | 1 | | | new owner 06 | 1 |
| DAILEKH | 1 | | | bupi vac | 1 |

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1 - 2 / 2 < >

1 - 5 / 22 < >

Details

| Ref # | Name ▾ | Registered | Reg # | Valid Until | Details |
|--------|-----------------------------------|--------------|--------|--------------|----------------------|
| 116612 | Individual pharmacy | Apr 17, 2022 | 000160 | Apr 10, 2024 | open |
| 80288 | January 31 Pharmacy | Feb 21, 2022 | 000062 | Jan 28, 2024 | open |
| 104821 | March 10, 2022 Steen New Pharmacy | Mar 16, 2022 | 000287 | Mar 15, 2024 | open |
| 104821 | March 10, 2022 Steen New Pharmacy | Jun 24, 2022 | 000323 | Jun 24, 2024 | open |
| 105577 | March 10, steen pharmacy | Apr 21, 2022 | 000309 | Apr 19, 2024 | open |

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Figure 1 Permit Register

Filters

All these filters are for the whole report:

1. Language, to get all records in a particular language, e.g., EN_US:
 - 1.1. Lang='EN_US'
2. Classifiers, to get the district from an address of the premise:
 - 2.1. ClassifierUrl= dictionary.admin.units and ClassifierLevel=1
3. Links to get applicants:

- 3.1. LinkedURL contains own
- 4. Events to get incoming application registration numbers and dates:
 - 4.1. EventURL contains cert

Dimensions

| Dimension | Field from report_permits |
|-------------|---|
| Province | ClassifierValue |
| Permit | PermitModule |
| Owner | Linked |
| Ref # | PermitID |
| Name | PermitName |
| Registered | EventDate |
| Reg # | EventRegNo |
| Valid Until | EventNextDate |
| Details | HYPERLINK(concat("https://pharmadex.irka.in.ua/public?lang=",Lang,"#publicpermitdata/%7B%22permitDataID%22:",PermitID,"%7D"), 'open') |

Metrics

| Metric | Formula |
|---------|--------------------------|
| Permits | COUNT_DISTINCT(PermitID) |

NMRA Workload KPI

Report

<https://lookerstudio.google.com/u/0/reporting/f7809d67-d03c-40e8-a8c3-80fb2cef40df/page/29uND>

The workload KPI report provides workload data for NRA departments and performance data for employees.

This example demonstrates the usage of

- The Data Warehouse view “report_kpi”
- Min, max, average metrics

Search

Workflow
Enter a value

Activity
Enter a value

Department
Enter a value

Employee
Enter a value

Summary

| Year ^ | Workflows | Workflow ^ | Avg, days | Workflows | Activity ^ | Activities |
|--------|-----------|--|-----------|-----------|------------------------|------------|
| 2021 | 30 | Conducting pharmacy inspection | 25.25 | 9 | Approval | 12 |
| 2022 | 271 | De-register retail pharmacy owned by a person | 128.39 | 10 | Approve | 10 |
| 2023 | 136 | De-register retail pharmacy owned by the company | 162.42 | 7 | Approve the inspection | 4 |
| | | Deregister cooperative | 0 | 1 | Approve the report | 2 |
| | | Disciplinary Pharmacy Inspection | 0 | 1 | Assignment | 9 |

1 - 3 / 3 < >

1 - 5 / 27 < >

1 - 5 / 28 < >

| Department ^ | Activities | Employee ^ | min days | max days | Activities |
|-----------------------------------|------------|----------------------|----------|----------|------------|
| - | 122 | - | 1 | 654 | 122 |
| Biratnagar | 11 | Biratnagar all Roles | 1 | 599 | 11 |
| Birgunj | 12 | Birgunj all Roles | 1 | 602 | 12 |
| Department of Drug Administration | 914 | DDA Test Accountant | 1 | 565 | 10 |

1 - 5 / 8 < >

1 - 5 / 17 < >

Figure 2 KPIs

Filters

- Language, to get all records in a particular language, e.g., EN_US:
 - Lang='EN_US'

Dimensions

| Dimension | Data from report_permits |
|------------|--------------------------|
| Year | YEAR(WorkflowCome) |
| Workflow | Workflow |
| Activity | Activity |
| Department | ActivityDepartment |
| Employee | ActivityExecutorFullName |

Metrics

| Metric | Formula |
|------------|--|
| Workflows | COUNT_DISTINCT(WorkflowID) |
| Avg Days | AVG(DATE_DIFF(WorkflowGo, WorkflowCome)) |
| Activities | COUNT_DISTINCT(ActivityID) |
| Min Days | min(date_diff(date(ifnull(ActivityGo,TODAY()))),ActivityCome))+1 |
| Max Days | max(date_diff(date(ifnull(ActivityGo,TODAY()))),ActivityCome))+1 |

Outcomes KPI

Report

<https://lookerstudio.google.com/u/0/reporting/10412b6e-bbe7-4de8-92e2-3aa597ed1059/page/q9zVD>

Any incoming application should be processed by NRA. The result of the processing is the one of outcomes:

- Approve
- Approve Company
- Decline

The analysis of outcomes is vital to improve the quality of NRA processes.

This example demonstrates the usage of the Data Warehouse view “report_kpi” as well as illustrates the state-transition diagram [The content of tables is a result of the daily ETL process against the transactional data. The views are built upon the tables to cover the typical use cases.

The ETL process is implemented by the stored procedure dwh_update that runs daily. To ensure stability and continuity, the Data Warehouse tables contain data collected by two ETL runs or sessions.

The views contain data for the latest session. The starting set of views is in the database. In case additional views are needed, it is possible to place them into a separate database to avoid the original database structure changes.

Tables

This manual does not cover the fields of tables. To understand the fields for any given table, examine them using the various SQL queries to a table.

| # | Table | Purpose | Usage |
|----|----------------|--|--|
| 1. | dwhactivities | To report activities in the workflows. An activity is a job executed by one person that ends up with an outcome. | This table will be useful to calculate KPIs – performance and workflow outcomes. |
| 2. | dwhclassifiers | An electronic form may contain classifiers - dictionaries and drop lists. Examples are administrative units, types of business, etc. | To report classifier values. To calculate metrics based on the classifier values, e.g., quantity of premises in the province |
| 3. | dwhdepartments | NRA employees by the departments | To report full names of employees and names of departments. To calculate metrics like quantity of activities done by an employee or a department |
| 4. | dwhevents | A page in an electronic form may contain event definitions - registers and schedulers components. | To report event dates and numbers. To calculate metrics like “how many events...” |

| # | Table | Purpose | Usage |
|-----|---------------------|--|--|
| 5. | dwhlinks | Sometimes it is necessary to define a 1:M relation from a permit to other data records, i.e., owners of a pharmacy, manufacturers of medicinal products, etc. The “persons” and “links” components are allowing this | To report names of linked data. To calculate metrics like “average quantity of owners” or “how many medicinal products manufactured by ...” |
| 6. | dwhpages | Contains all data pages related to this permit. Each page is defined as an electronic form | In SQL queries to join all classifiers, events, and links with any given permit |
| 7. | dwhworkflowlist | All workflow configurations | To report names of workflows. To calculate metrics like “How many workflows of each type are defined” |
| 8. | dwhworkflows | All workflows are completed and running | To report workflow dates, names, and permit names. To calculate various metrics |
| 9. | reportclassifier | The deprecated version of dwhclassifiers | See dwhclassifiers |
| 10. | reportdatamodules | List of the main pages of all applications. This table is deprecated by dwhpages | See dwhpages |
| 11. | reportevent | The deprecated version of dwhevents | See dwhevents |
| 12. | reportfullpreflabel | Following the W3C recommendations, the main human-readable name of any object or subject should be defined in a named data structure. The name of it is “prefLabel”. | In SQL queries to join all prefLabel to an electronic form page. Then, prefLabel will be used for the report An example can be found in the definition of view “dwhapplications” and others |
| 13. | reportliteral | A typical application form is multi-page. A page may contain text fields (literals). A literal has a name. This table contains all literals on all application’s form pages | Get non-prefLabel literals from the application electronic form |
| 14. | reportpage | The deprecated version of dwhworkflows. See also pages | See dwhworkflows |
| 15. | reportpagelinks | The deprecated version of dwhlinks | See dwhlinks |

| # | Table | Purpose | Usage |
|-----|---------------|---|--|
| 16. | reportsession | To get access to the latest data warehouse | Only in SQL queries to ensure the right join to the other Data Warehouse tables. For example, to get the names of all applications: select distinct r.FullPrefLabel from history h join reportsession rs on rs.Actual join reportfullpreflabel r on r.conceptID=h.applDataID and r.reportsessionid=rs.ID |
| 17. | pagesall | The deprecated version of dwhworkflows. See also reportpage | See dwhworkflows |

Views

| # | View | Purpose | Usage |
|----|-------------------|---|---|
| 1. | dwhapplications | Essential data for all applications and workflows | To create applications-related reports. An example is the [Incoming Applications Logbook] |
| 2. | report_activities | The deprecated version of report_kpi | See report_kpi |
| 3. | report_kpi | To report activities and workflow dates, durations, NRA departments, executors | To calculate KPIs. An example is [NMRA Workload KPI] |
| 4. | report_permits | To report permits | Various permit registers. An example is [Permit Register] |
| 5. | report_users | To limit access to the application, permits, and workflows using Google Login of the current user | Reports with limited access to data. An example is [Incoming Applications Logbook] |

Annex 2 States and transitions].

Please note, that the workflow outcome and permit state are not the same.

Search

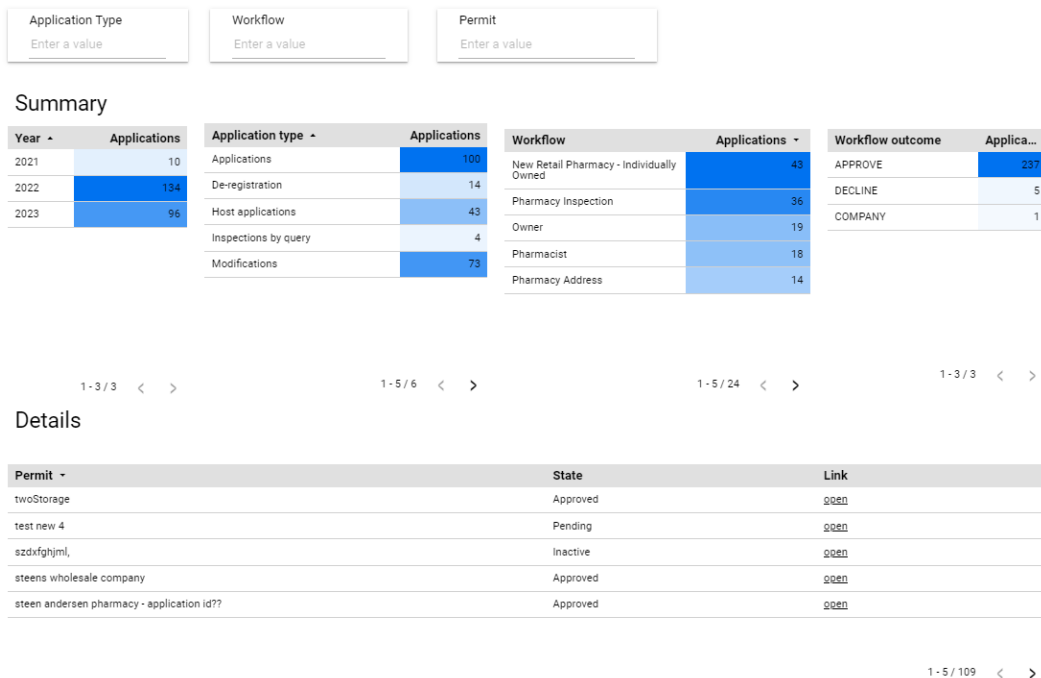


Figure 3 Outcome KPI

Filters

- Language, to get all records in a particular language, e.g., EN_US:
 - Lang='EN_US'
- ActivityOutcome to exclude non-terminal activities:
 - ActivityOutcome in {COMPANY, APPROVE, DECLINE}

Metrics

| Metric | Formula |
|--------------|----------------------------|
| Applications | COUNT_DISTINCT(WorkflowID) |

Dimensions

| Dimension | Data from report_permits |
|------------------|---|
| Year | YEAR(WorkflowGo) |
| Application Type | WorkflowDictName |
| Workflow | Workflow |
| Workflow outcome | ActivityOutcome |
| Permit | PermitName |
| State | case PermitState when 'ACTIVE' then 'Approved' when 'ONAPPROVAL' then 'Pending' when 'NOTSUBMITTED' then 'Not submitted' |

| | |
|------|---|
| | when 'DEREGISTERED' then 'Inactive' END |
| Link | <code>HYPERLINK(concat("https://pharmadex.irka.in.ua/public?lang=",Lang,"#publicp ermitdata/%7B%22permitDataID%22:",PermitID,"%7D"), 'open')</code> |

Incoming Applications Logbook

Report

<https://lookerstudio.google.com/u/0/reporting/1883d3bc-81ad-42c0-ba2e-2e0cdbbf7387/page/L7ScD>

The Incoming Application Logbook is an example of a digital incoming documents logbook

This example demonstrates the usage of:

- Data Warehouse view “dwhapplications” to get the application’s data
- Data Warehouse view “report_users”
- Access control using the Google login
- Google Looker Studio blends
- Registration numbers
- Registration, Deadline, or Expiration dates

Search

Select date range ▾

Applicant
Enter a value

Incoming #
Enter a value

Name
Enter a value

Summary

| Application ▾ | Applications | Applicant ▾ | Applications | Year ▾ | Applications |
|--|--------------|----------------|--------------|--------|--------------|
| Owner | 25 | दिवेर्ण दे | 1 | 2023 | 5 |
| New Retail Pharmacy - Individually Owned | 56 | validation | 1 | 2022 | 63 |
| | | swin03 | 1 | 2021 | 13 |
| | | steen andersen | 20 | | |
| | | siraj bara | 1 | | |

Details

| Ref # ⓘ ▾ | Incoming # | Incoming Date ⓘ ... | Deadline | Applicant | Application | Name | State |
|-----------|-----------------------------|---------------------|--------------|--------------------|--|--|------------------|
| 734368 | 000004 | Jun 12, 2023 | Sep 22, 2023 | Woodley Poindexter | Owner | 20230419 Pharmacy | Completed |
| 733733 | APPLICATION-PHARMACY/000004 | Jun 9, 2023 | Sep 22, 2023 | Louise Poindexter | New Retail Pharmacy - Individually Owned | Pharmacy 20230609 | Completed |
| 733591 | APPLICATION-PHARMACY/000004 | Jun 9, 2023 | Sep 22, 2023 | Louise Poindexter | New Retail Pharmacy - Individually Owned | Pharmacy 20230609 | Completed |
| 732286 | APPLICATION-PHARMACY/000003 | Apr 19, 2023 | Jun 12, 2023 | Woodley Poindexter | New Retail Pharmacy - Individually Owned | 20230419 Pharmacy | Completed |
| 732214 | APPLICATION-PHARMACY/000002 | Apr 3, 2023 | Jun 12, 2023 | Alexey Kurasoff | New Retail Pharmacy - Individually Owned | Test gis 20230403 Pharmacy | On consideration |

Figure 4 Incoming Application Logbook

Access Control

The Data Warehouse view “report_users” intends to use OpenRIMS application access rules in Google Looker reports.

| Column | Usage |
|------------|---|
| ApplDictID | Unique identifier of a kind of application, i.e., “Medicine Marketing Authorization”, “Pharmacy Business Allowance” |
| DictUrl | URL of the applications dictionary in OpenRIMS, i.e., dictionary.guest.applications, dictionary.guest.deregistration |
| Email | The Google email of the NRA employee for which this kind of application is accessible. This dimension is declared as “Filter by email” in the data source |

In Google Looker, this view should be defined as a data source that filters data by email

Filter by email

If your data contains email addresses, you can filter this data source to show only data matching the currently signed in user's email address. Report viewers must consent to letting this data source access their email address. [Learn more](#)

☒ Filter data by viewer email

ABC Email

This is the field that contains the addresses to filter by.

Figure 5 In the data source declare the Email field as “Filter data by viewer email”

Blend

The data source is the database view “dwhapplications”. To allow access control the data source should be joined with the data source report_users on dimension ApplDictID. In terms of Google Looker Studio, this construct is called “blend” To create the blend:

1. Add both data sources to the report
2. Create a blend with join as below
3. Extract to the blend all necessary dimensions from “dwhapplications”

Join configuration

Join operator

Tell us how rows from all the tables on the left and the table to the right are combined.



Join conditions

Tell us how these tables are related. Add one or more fields from the tables to the left that match the fields in the table to the right.



Figure 6 The join should be inner

Filters

All filters are defined in the blend.

1. Language, to get all records in a particular language, e.g., EN_US:
 - 1.1. Lang='EN_US'
2. EventURL, to get incoming application registration records from the application's events:
 - 2.1. EventURL in { register.new.pharmacy, register.amendments.pharmacy, register.pharmacy.deregistration }
3. LinkedPageURL, to get applicants:
 - 3.1. LinkedPageURL= site.owner.person

Dimensions

| Dimension | Data from dwhapplications |
|---------------|--|
| Application | ApplicationDictPref |
| Applicant | Linked |
| Year | Year(EventDate) |
| Ref # | ApplicationID |
| Incoming | EventNumber |
| Incoming Date | EventDate |
| Deadline | IFNULL(NextEventDate, TODAY()) |
| Applicant | Linked |
| Name | HYPERLINK(concat("https://pharmadex.irka.in.ua/public?lang='EN_US',"#publicpermitdata/%7B%22permitDataID%22:",PermitDataID,"%7D"), ApplicationPrefLabel) |
| State | if(Completed=1,'Completed','On consideration') |

Metrics

| Metric | Formula |
|--------------|-------------------------------|
| Applications | COUNT_DISTINCT(ApplicationID) |

Annex 1 The Data Warehouse

Overview

The Data Warehouse consists of database tables and views. The content of tables is a result of the daily ETL process against the transactional data. The views are built upon the tables to cover the typical use cases.

The ETL process is implemented by the stored procedure `dwh_update` that runs daily. To ensure stability and continuity, the Data Warehouse tables contain data collected by two ETL runs or sessions.

The views contain data for the latest session. The starting set of views is in the database. In case additional views are needed, it is possible to place them into a separate database to avoid the original database structure changes.

Tables

This manual does not cover the fields of tables. To understand the fields for any given table, examine them using the various SQL queries to a table.

| # | Table | Purpose | Usage |
|-----|----------------|--|--|
| 18. | dwhactivities | To report activities in the workflows. An activity is a job executed by one person that ends up with an outcome. | This table will be useful to calculate KPIs – performance and workflow outcomes. |
| 19. | dwhclassifiers | An electronic form may contain classifiers - dictionaries and drop lists. Examples are administrative units, types of business, etc. | To report classifier values. To calculate metrics based on the classifier values, e.g., quantity of premises in the province |
| 20. | dwhdepartments | NRA employees by the departments | To report full names of employees and names of departments. To calculate metrics like quantity of activities done by an employee or a department |
| 21. | dwhevents | A page in an electronic form may contain event definitions - registers and schedulers components. | To report event dates and numbers. To calculate metrics like “how many events...” |
| 22. | dwhlinks | Sometimes it is necessary to define a 1:M relation from a permit to other data records, i.e., owners of a pharmacy, manufacturers of medicinal products, etc. The “persons” and “links” components are allowing this | To report names of linked data. To calculate metrics like “average quantity of owners” or “how many medicinal products manufactured by ...” |

| # | Table | Purpose | Usage |
|-----|---------------------|---|--|
| 23. | dwhpages | Contains all data pages related to this permit. Each page is defined as an electronic form | In SQL queries to join all classifiers, events, and links with any given permit |
| 24. | dwhworkflowlist | All workflow configurations | To report names of workflows. To calculate metrics like “How many workflows of each type are defined” |
| 25. | dwhworkflows | All workflows are completed and running | To report workflow dates, names, and permit names. To calculate various metrics |
| 26. | reportclassifier | The deprecated version of dwhclassifiers | See dwhclassifiers |
| 27. | reportdatamodules | List of the main pages of all applications. This table is deprecated by dwhpages | See dwhpages |
| 28. | reportevent | The deprecated version of dwevents | See dwevents |
| 29. | reportfullpreflabel | Following the W3C recommendations, the main human-readable name of any object or subject should be defined in a named data structure. The name of it is “prefLabel”. | In SQL queries to join all prefLabel to an electronic form page. Then, prefLabel will be used for the report An example can be found in the definition of view “dwhapplications” and others |
| 30. | reportliteral | A typical application form is multi-page. A page may contain text fields (literals). A literal has a name. This table contains all literals on all application’s form pages | Get non-prefLabel literals from the application electronic form |
| 31. | reportpage | The deprecated version of dwhworkflows. See also pages | See dwhworkflows |
| 32. | reportpagelinks | The deprecated version of dwhlinks | See dwhlinks |
| 33. | reportsession | To get access to the latest data warehouse | Only in SQL queries to ensure the right join to the other Data Warehouse tables. For example, to get the names of all applications: select distinct r.FullPrefLabel from history h join reportsession rs on rs.Actual join reportfullpreflabel r on r.conceptID=h.applDataID and r.reportsessionid=rs.ID |

| # | Table | Purpose | Usage |
|-----|----------|---|------------------|
| 34. | pagesall | The deprecated version of dwhworkflows. See also reportpage | See dwhworkflows |

Views

| # | View | Purpose | Usage |
|-----|-------------------|---|--|
| 6. | dwhapplications | Essential data for all applications and workflows | To create applications-related reports. An example is the [Incoming Applications Logbook] ² |
| 7. | report_activities | The deprecated version of report_kpi | See report_kpi |
| 8. | report_kpi | To report activities and workflow dates, durations, NRA departments, executors | To calculate KPIs. An example is [NMRA Workload KPI] ³ |
| 9. | report_permits | To report permits | Various permit registers. An example is [Permit Register] ⁴ |
| 10. | report_users | To limit access to the application, permits, and workflows using Google Login of the current user | Reports with limited access to data. An example is [Incoming Applications Logbook] ⁵ |

² <https://lookerstudio.google.com/u/0/reporting/1883d3bc-81ad-42c0-ba2e-2e0cdbbf7387/page/L7ScD>

³ <https://lookerstudio.google.com/u/0/reporting/f7809d67-d03c-40e8-a8c3-80fb2cef40df/page/29uND>

⁴ <https://lookerstudio.google.com/u/0/reporting/745cf19d-2e72-4575-95d7-96e1cdb49557/page/VY3PD>

⁵ <https://lookerstudio.google.com/u/0/reporting/1883d3bc-81ad-42c0-ba2e-2e0cdbbf7387/page/L7ScD>

Annex 2 States and transitions

To make proper data visualization it will be necessary to understand the lifecycle of a permit.

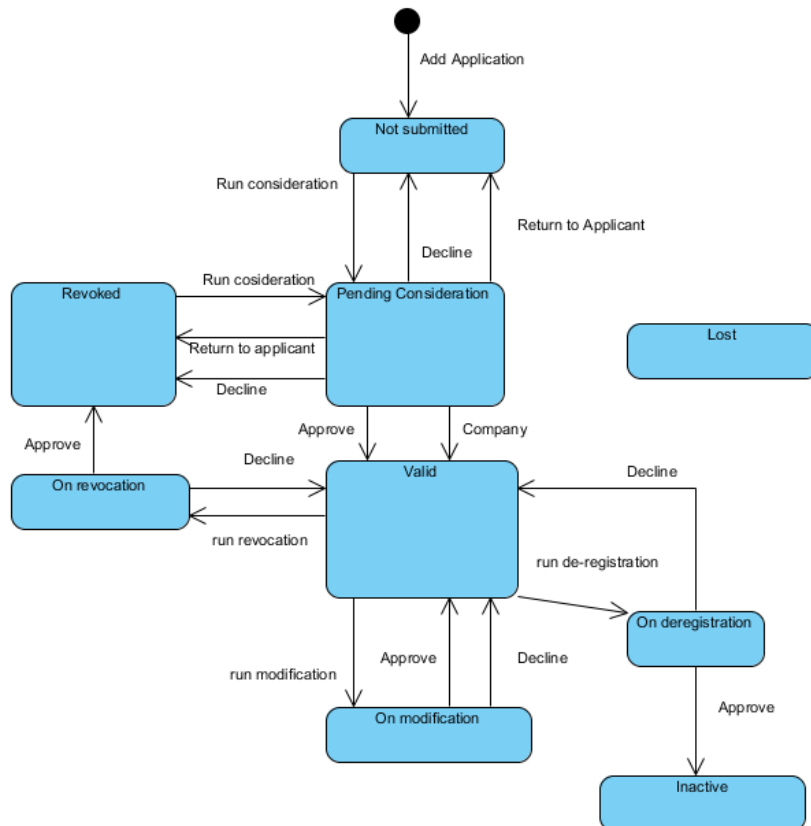


Figure 7 Permit life cycle. States and transitions

- The main path of states is “Not Submitted” -> “Pending Considerations” -> “Active” -> “Inactive”.
- States “On Modification”, “On revocation”, and “On deregistration” are sub-states of the “Valid” state. Currently, there is no way to distinguish them in reports.
- To follow the main path in the forward direction the respective workflows should be started
- Any given workflow has two possible outcomes – Approve and Decline. In case the outcome is “Approved” the permit will go into the next state. In case of the outcome “Decline,” the permit will go into the previous state.
- The “Pending Consideration” state allows two additional outcomes:
 - Return To Applicant – return the application to the applicant to fix minor mistakes
 - Company – to approve the company registration application
- The “Lost” state is reserved for permits that do not fit any other state, because of software errors.

Annex 3 Data Visualization Roadmap

Create the wireframe

The wireframe should be created to roughly determine dimensions and metrics, thus data sources.

Incoming Applications Logbook

Search

Applicant Incoming # Name

Summary

| Applicant | Applications |
|----------------|--------------|
| ACME Inc | 12 |
| Sosulka Ltd | 23 |
| Maurice Gerald | 1 |

| Application | Applications |
|----------------------------|--------------|
| Vaccines | 12 |
| Over the counter medicines | 345 |
| Import permit | 120 |
| Retailing pharmacies | 12456 |

| Year | Applications |
|------|--------------|
| 2021 | 13765 |
| 2022 | 11897 |
| 2023 | 22439 |

Details

| Ref # | Incoming # | Incoming Date | Deadline | Applicant | Application | Name | State |
|--------|------------|---------------|-------------|-----------|----------------------------|-----------------------------------|------------------|
| 736858 | 100N-23 | Jun 12 2023 | Jul 12 2023 | ACME Inc | Import Permit | Paracetamol Theta | Completed |
| 739858 | 113N-23 | Jun 23 2023 | Jul 23 2023 | ACME Inc | Over the counter medicines | Aqva Kizlyarius | On Consideration |
| | | | | | | | |
| | | | | | | | |

Figure 8 An example of the wireframe

Select or create a Report Data Source

It is presumed, that the dimensions and metrics have been determined by the wireframe

First, inspect the Data Warehouse views for necessary dimensions.

If there aren't appropriate views, create an SQL query for the data source. Make the query as common as possible. To limit data, report filters are preferable to the phrase "were" in the SQL query.

Decide access limitation

If the report is not publicly available, decide on two access control options:

- Limit access to the whole report using the Share feature of the Google Looker Studio
- Limit access to reporting data using the report_users view

In the case of the usage of report_users, it will be necessary to create a data blend similar to [Blend]

Create data filters

It will be a good idea to place data filters to report and/or data blend levels. Use the filters on a chart only if necessary.

Create data visualization

To create a good data visualization, please refer to appropriate books. We like a book by Claus Wilke "Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures"⁶

Place additional controls and decors

The most used additional controls are search boxes. The implementation in the Google Looker Studio is the Input box Control. This control allows exact and partial search by any dimension.

Other controls also can be very helpful. Please, refer to the Google Documentation.

The report may be decorated with a header and footer that allows imitation of OpenRIMS UI.

⁶ <https://www.amazon.com/Fundamentals-Data-Visualization-Informative-Compelling/dp/1492031089>