SIBD Project – Part III

Group 7:

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34% contribution - 7 hours

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33% contribution - 7 hours

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33% contribution - 7 hours

Shift: Monday 9.30 to 11.00

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1. Database Loading

populate.sql

2. Integrity Constraints

RI.sql

3. View

queries.sql

4. SQL

queries.sql

The first query, in order not to return empty, requires us to put element B-789 being analyzed by only one analyst, because this is the only way we have to guarantee that he/she analyses every incident of this element.

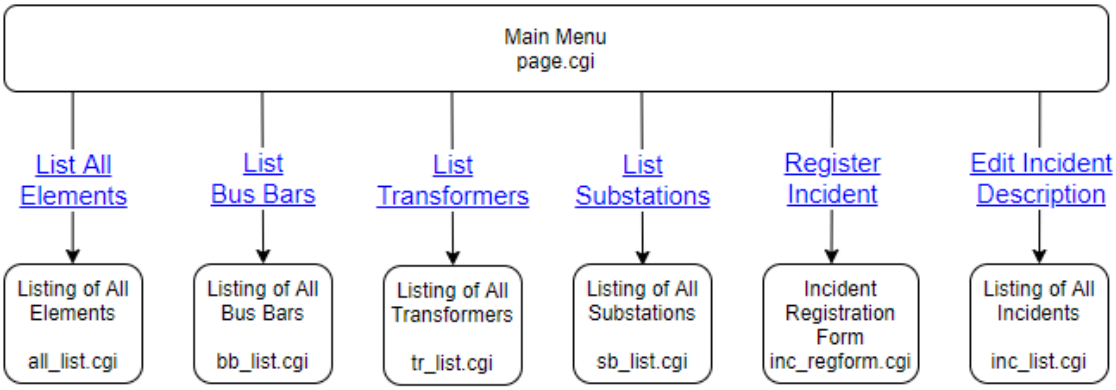
In the second query, we assume that the supervisors who do not supervise substations south of Rio Maior include the supervisors that do not supervise anything.

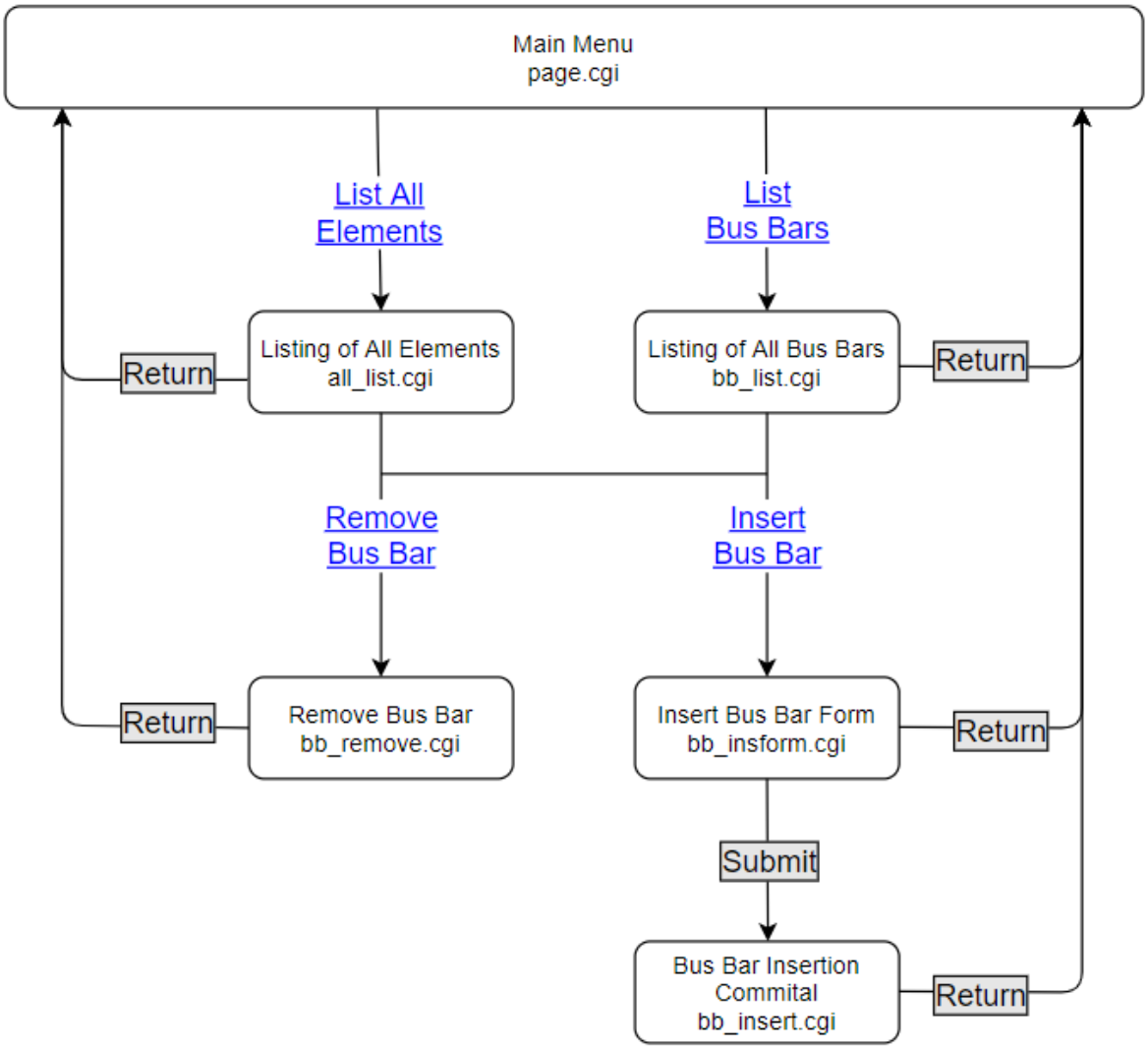
In the third query, we consider that elements with zero incidents are the ones with the lower number of incidents. However, our query is robust enough to return the elements with the lower number of elements, even if there are no elements with zero incidents.

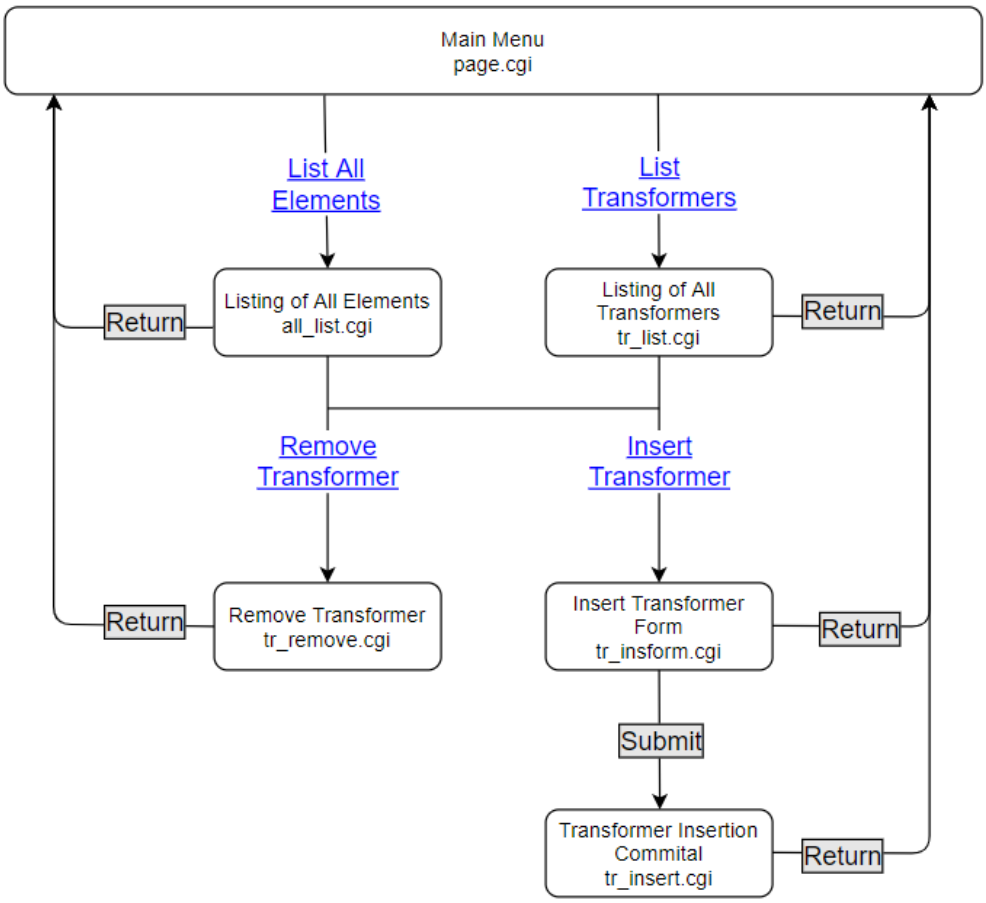
In the fourth query, we made two queries, one using the created view and other without using the view.

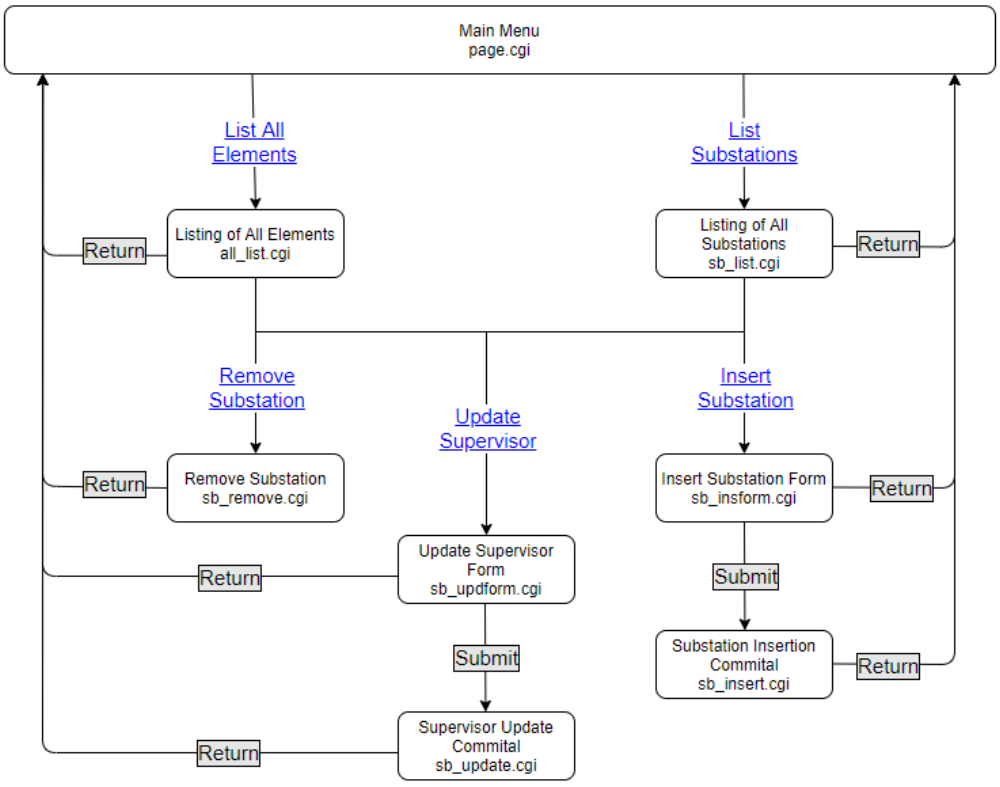
5. Application Development

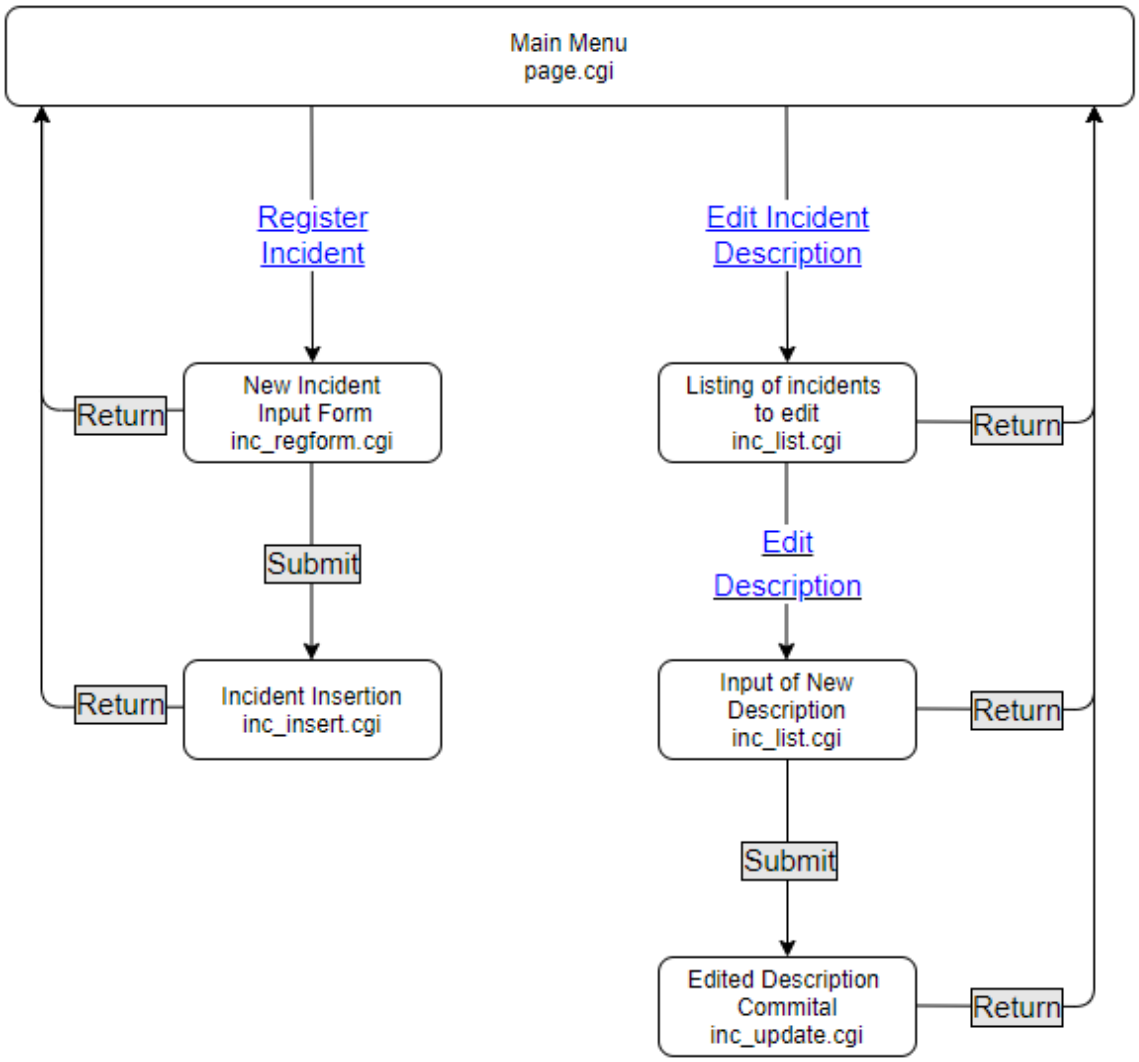
http://web2.tecnico.ulisboa.pt/ist187734/page.cgi?


Main Menu
page.cgi
List All Elements
List Bus Bars
List Transformers
List Substations
Register Incident
Edit Incident Description
Listing of All Elements
all_list.cgi
Listing of All Bus Bars
bb_list.cgi
Listing of All Transformers
tr_list.cgi
Listing of All Substations
sb_list.cgi
Incident Registration Form
inc_regform.cgi
Listing of All Incidents
inc_list.cgi


Main Menu
page.cgi
List All Elements
List Bus Bars
Listing of All Elements
all_list.cgi
Listing of All Bus Bars
bb_list.cgi
Return
Return
Remove Bus Bar
Insert Bus Bar
Remove Bus Bar
bb_remove.cgi
Insert Bus Bar Form
bb_insform.cgi
Return
Return
Submit
Bus Bar Insertion Commital
bb_insert.cgi
Return


Main Menu
page.cgi
List All Elements
List Transformers
Listing of All Elements
all_list.cgi
Return
Listing of All Transformers
tr_list.cgi
Return
Remove Transformer
Insert Transformer
Return
Remove Transformer
tr_remove.cgi
Insert Transformer Form
tr_insform.cgi
Return
Submit
Transformer Insertion Commital
tr_insert.cgi
Return


Main Menu
page.cgi
List All Elements
List Substations
Return
Listing of All Elements
all_list.cgi
Listing of All Substations
sb_list.cgi
Return
Remove Substation
Update Supervisor
Insert Substation
Return
Remove Substation
sb_remove.cgi
Insert Substation Form
sb_insform.cgi
Return
Return
Update Supervisor Form
sb_updform.cgi
Submit
Submit
Substation Insertion Commital
sb_insert.cgi
Return
Return
Supervisor Update Commital
sb_update.cgi



6. Indexes

6.1:

- **Hash index on transformer(pv)** because it is a point-based query. Usefulness of this index would depend on the number of existing primary voltages. Many different primary voltages are expected to exist, qualifying few records each, so this index would substantially improve the performance.
- If the table is ordered by item_id, then we can evaluate the aggregation using only a table scan. If not, then we would make a **B+tree index on item_id**, using an index scan.
- **Composite index on transformer(gpslat,gpslong)**. This inner index scan would return a row if the condition is fulfilled.

6.2:

- **B+tree composite index on (description, instant)**, because we want to first see if it is a line incident, and only then we will look for the instants between the two points in time. We know that this condition qualifies only one record, because instant is the primary key of the incident table, so the performance of this query would increase.

7. Multidimensional Model

star_schema.sql

8. ETL + Data Analytics Queries

etl.sql

olap.sql