



DATA QUALITY MANAGEMENT - SOFTWARE APPLICATION

User Manual



Bhaskaracharya National Institute for Space
Applications and Geo-informatics

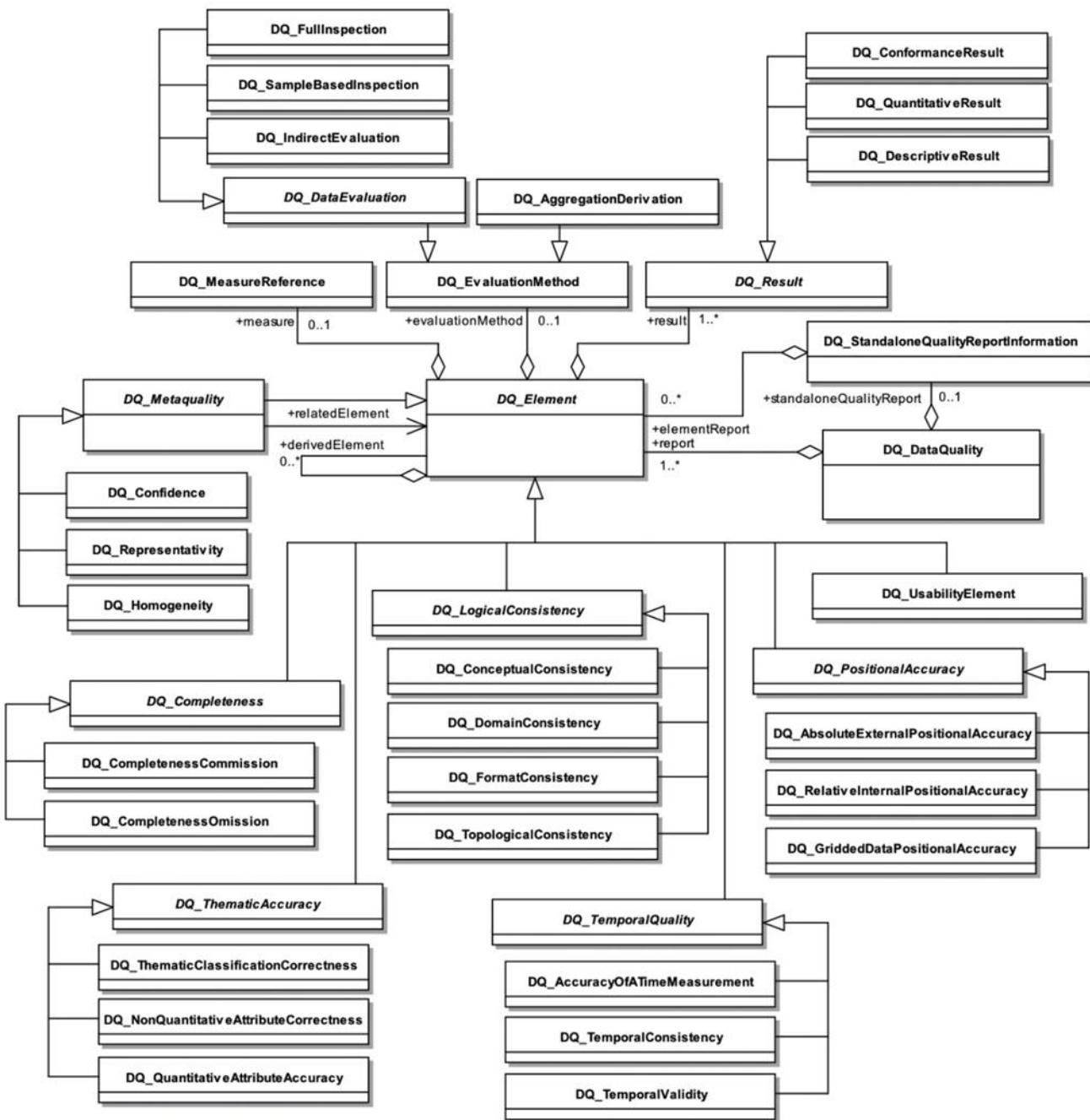
Data Quality Management

Data Quality Management (DQM) is a comprehensive framework that ensures organizational data meets defined standards of quality, making it fit for its intended use. High-quality data is crucial for effective decision-making, operational efficiency, and maintaining organizational trust. DQM focuses on maintaining and improving data accuracy, consistency, completeness, timeliness, and reliability throughout its lifecycle. This process involves data profiling, monitoring, validation, and cleansing to identify and correct errors, inconsistencies, and inaccuracies. By implementing DQM practices, organizations can mitigate risks associated with poor-quality data, such as faulty decision-making, compliance violations, and customer dissatisfaction.

Included Modules:

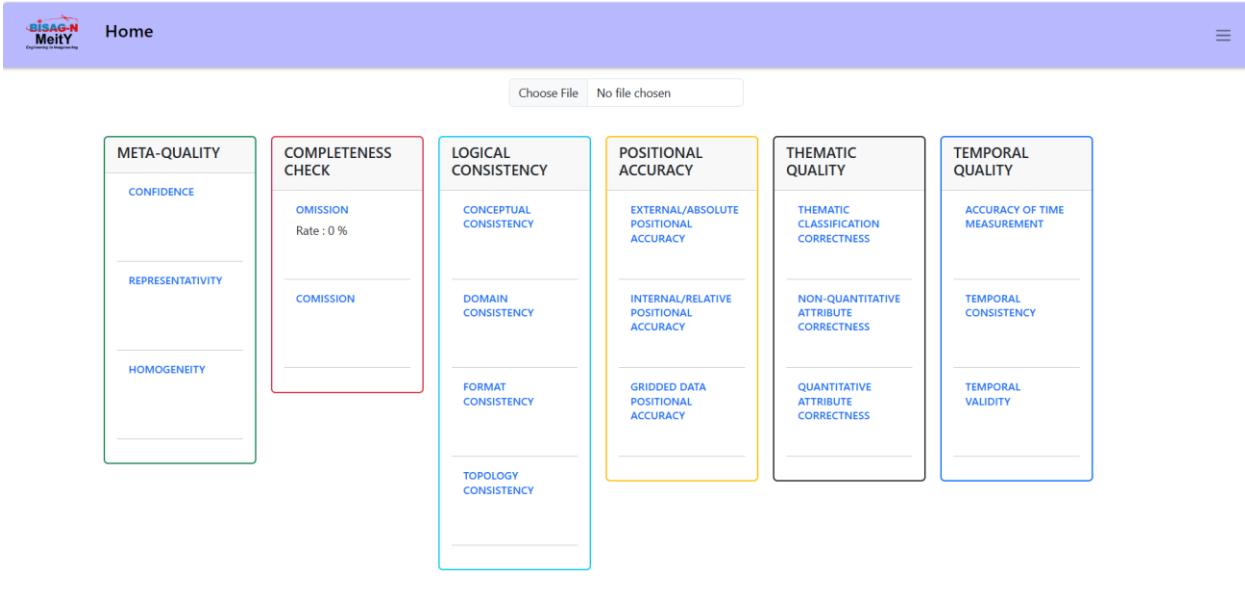
- A. Meta Quality
- B. Completeness Check
- C. Logical Consistency
- D. Positional Accuracy
- E. Thematic Quality
- F. Temporal Quality

The diagram shown below illustrates the framework defined by ISO 19157 for geospatial data quality assessment, detailing various quality elements such as positional accuracy, logical consistency, and completeness, along with their relationships and evaluation methods.



For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Dashboard:



The dashboard interface includes a top navigation bar with the BISAG-N MeitY logo and a "Home" link. Below the navigation is a file upload section with a "Choose File" button and a "No file chosen" message. The main content area is divided into six colored boxes representing different quality categories:

- META-QUALITY** (Green border):
 - CONFIDENCE
 - REPRESENTATIVITY
 - HOMOGENEITY
- COMPLETENESS CHECK** (Red border):
 - OMISSION Rate : 0 %
 - COMMISSION
- LOGICAL CONSISTENCY** (Blue border):
 - CONCEPTUAL CONSISTENCY
 - DOMAIN CONSISTENCY
 - FORMAT CONSISTENCY
 - TOPOLOGY CONSISTENCY
- POSITIONAL ACCURACY** (Yellow border):
 - EXTERNAL/ABSOLUTE POSITIONAL ACCURACY
 - INTERNAL/RELATIVE POSITIONAL ACCURACY
 - GRIDDED DATA POSITIONAL ACCURACY
- THEMATIC QUALITY** (Black border):
 - THEMATIC CLASSIFICATION CORRECTNESS
 - NON-QUANTITATIVE ATTRIBUTE CORRECTNESS
 - QUANTITATIVE ATTRIBUTE CORRECTNESS
- TEMPORAL QUALITY** (Blue border):
 - ACCURACY OF TIME MEASUREMENT
 - TEMPORAL CONSISTENCY
 - TEMPORAL VALIDITY

Figure_01: Dashboard

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

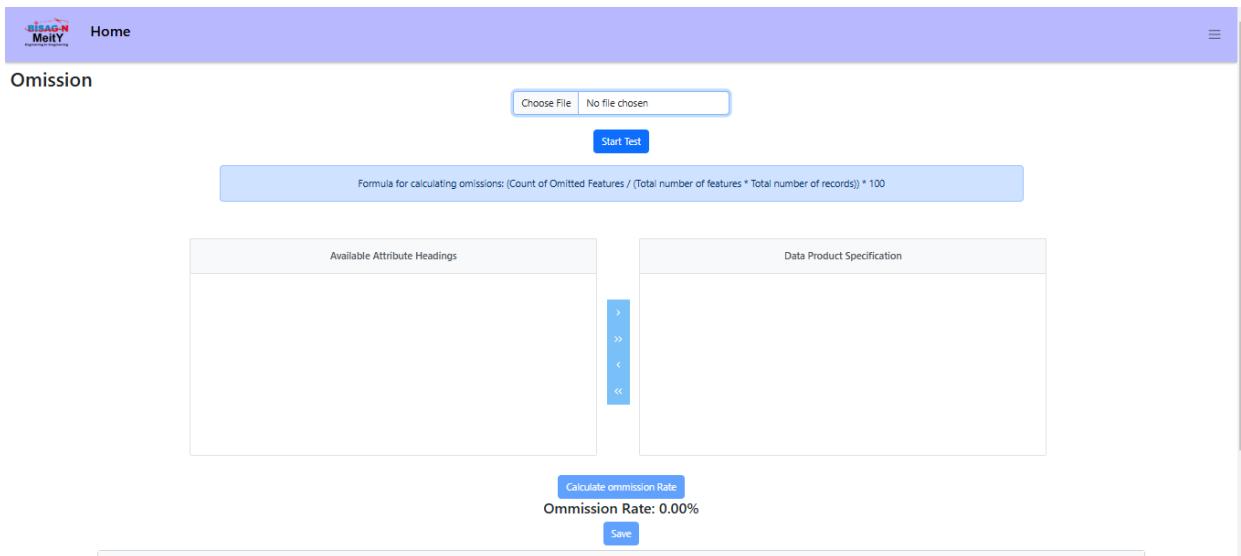
Completeness Check

Ensures that the dataset contains all necessary data without missing (omission) or extra (commission) entries. It helps identify gaps or redundant information.

Types of Completeness Check:

- **Omission:** Missing data that should be present.
- **Commission:** Extra data that should not be present.

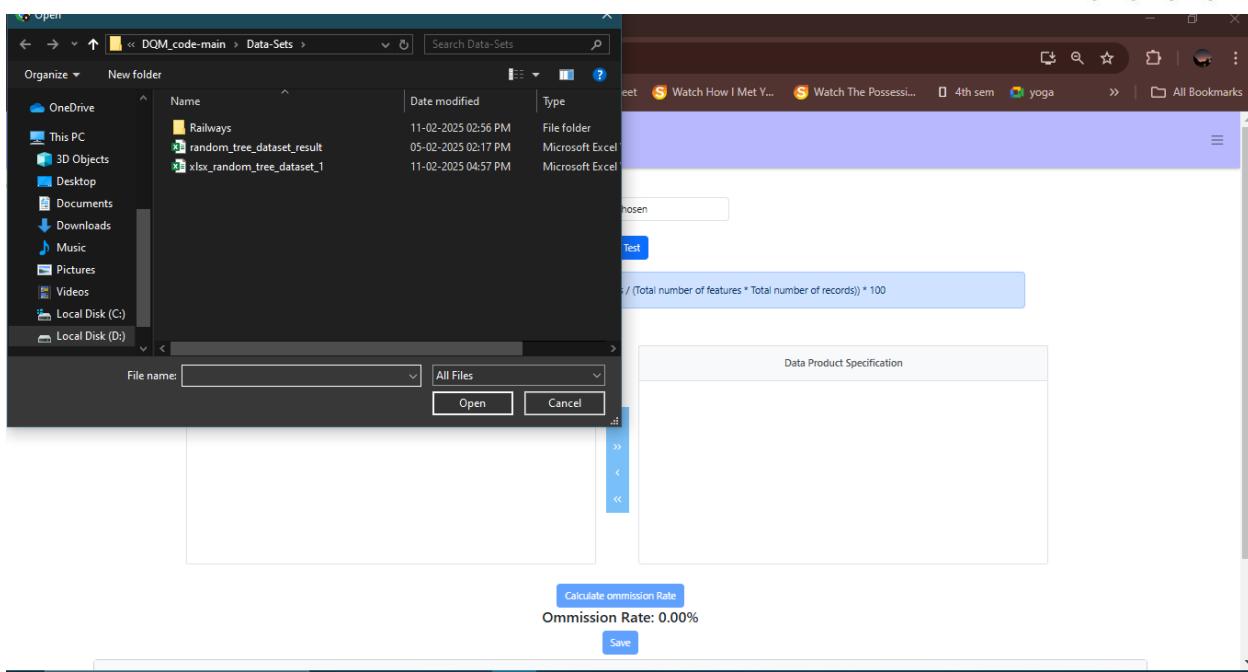
A. Omission:



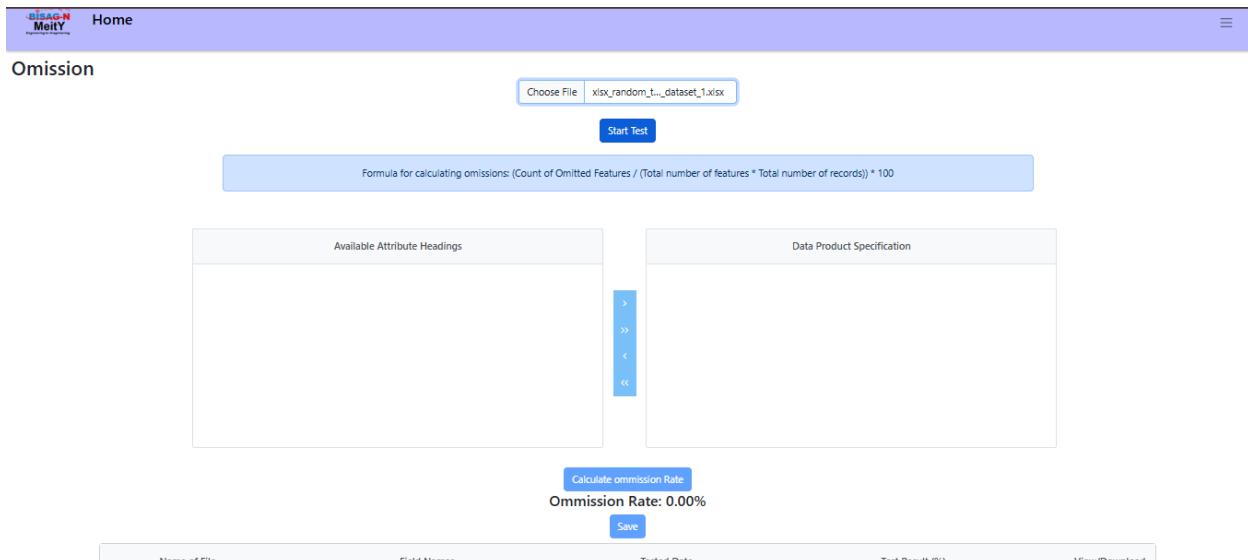
Figure_02: Omission test page

- **Step-1: Upload an Excel File**
 - Click on the Choose File button.
 - Select the desired Excel file(Omission and Commision.xlsx)¹ from your system.
 - Ensure that the file contains the necessary attribute headings.

¹ Refer the file (Omission and Commision.xlsx) path: *DataSheets\Omission and Commission.xlsx*



Figure_03: Select file

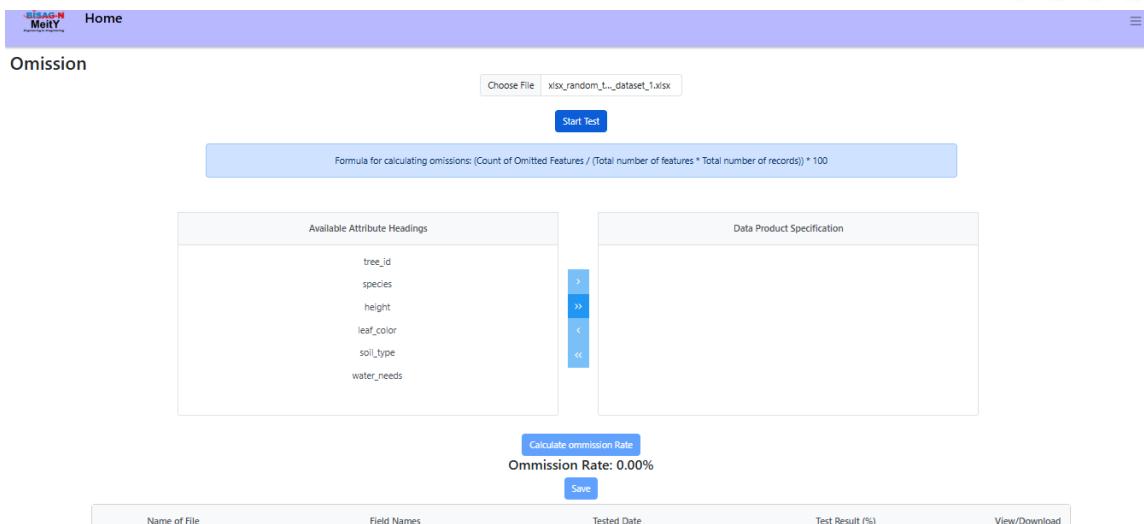


Figure_04: Upload file

- **Step-2: Start the Test**

- Click on the Start Test button.
- The system will fetch all attribute headings from the uploaded Excel file.
- The fetched attribute headings will be displayed in the Available Attribute Headings section.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Home

Omission

Choose File: xslx_random_features_dataset_1.xlsx

Start Test

Formula for calculating omissions: (Count of Omitted Features / (Total number of features * Total number of records)) * 100

Available Attribute Headings	Data Product Specification
tree_id	
species	
height	
leaf_color	
soil_type	
water_needs	

> >> < <<

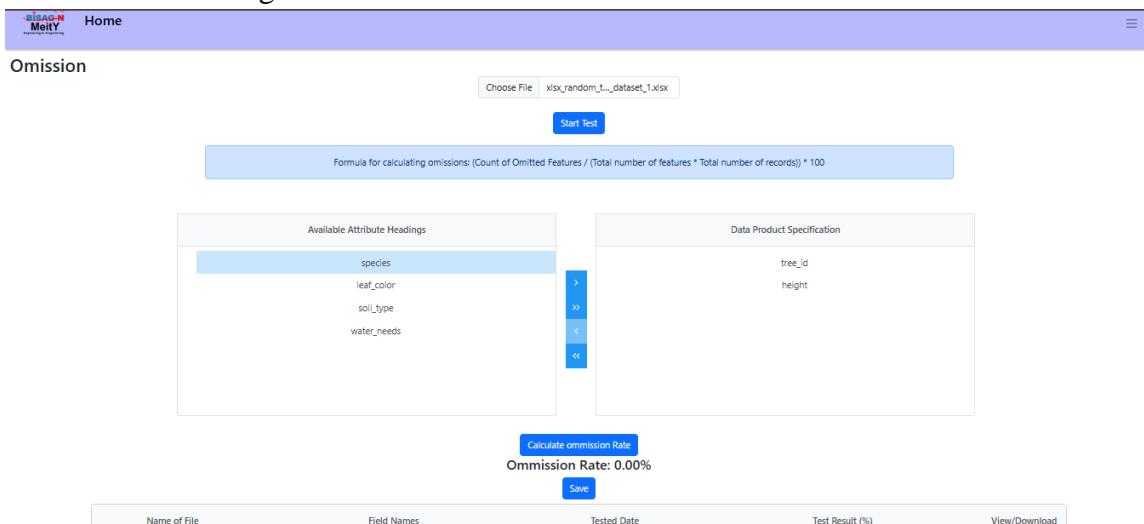
Calculate omission Rate
Ommission Rate: 0.00%
Save

Name of File	Field Names	Tested Date	Test Result (%)	View/Download
--------------	-------------	-------------	-----------------	---------------

Figure_05: Start test

- **Step-3: Select Attribute Headings**

- In the Available Attribute Headings section, select one or multiple attributes.
- Use the right arrow button (> or >>) to move the selected attributes to the Data Product Specification section.
- If needed, use the left arrow button (< or <<) to move attributes back to the Available Attribute Headings section.



Home

Omission

Choose File: xslx_random_features_dataset_1.xlsx

Start Test

Formula for calculating omissions: (Count of Omitted Features / (Total number of features * Total number of records)) * 100

Available Attribute Headings	Data Product Specification
species	tree_id
leaf_color	height
soil_type	
water_needs	

> >> < <<

Calculate omission Rate
Ommission Rate: 0.00%
Save

Name of File	Field Names	Tested Date	Test Result (%)	View/Download
--------------	-------------	-------------	-----------------	---------------

Figure_06: Select Attribute

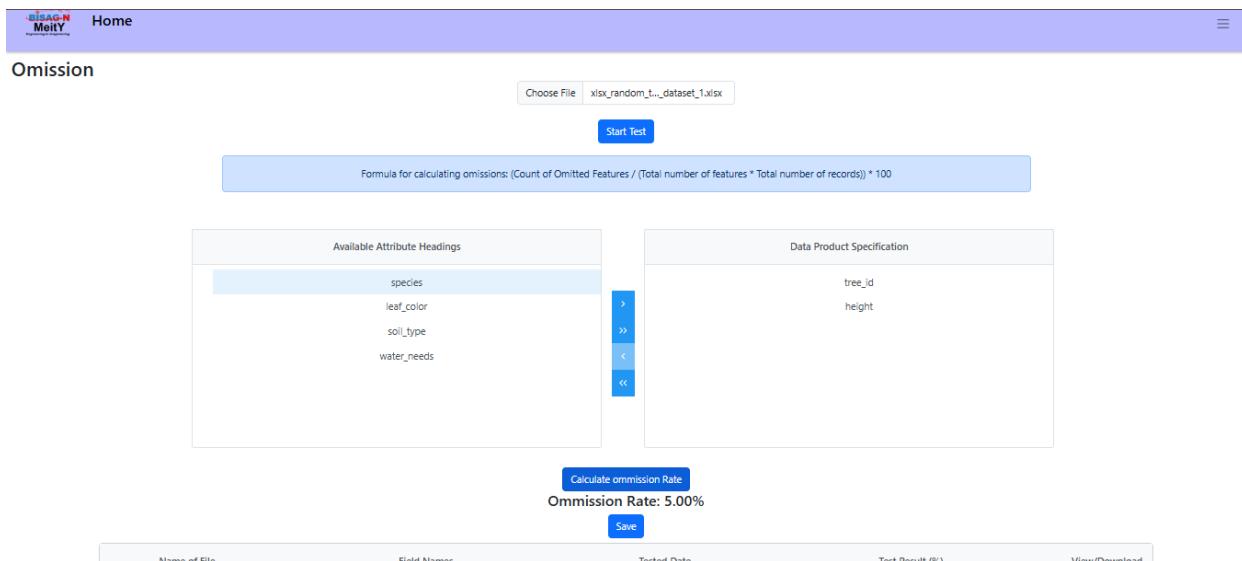
- **Step-4: Calculate omission Rate**

- Once the required attributes are added to the Data Product Specification section, click on the Calculate omission Rate button.
- The system will compute the omission rate using the formula:

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Omissions Rate= (Count of Omitted Features / (Total number of features * Total number of records)) * 100

- The calculated omission rate will be displayed below the Calculate Omission Rate button in the format: 0.00%.



Home

Omission

Choose File xlsx_random_t..._dataset_1.xlsx

Start Test

Formula for calculating omissions: (Count of Omitted Features / (Total number of features * Total number of records)) * 100

Available Attribute Headings	Data Product Specification
species	tree_id
leaf_color	height
soil_type	
water_needs	

Calculate omission Rate
Omission Rate: 5.00%

Name of File Field Names Tested Date Test Result (%) View/Download

Figure_07: Calculate omission

- Step-5: Save Results**

- Click on the Save button to store the results.
- The saved results will be displayed in the table at the bottom, including:
 - Name of the file
 - Field names
 - Tested date
 - Test result (%)
 - View/Download option for the file

Start Test

Formula for calculating omissions: (Count of Omitted Features / (Total number of features * Total number of records)) * 100

Available Attribute Headings

Data Product Specification

>
>>
<
<<

Calculate omission Rate

 Omission Rate: 0.00%

Save

Name of File	Field Names	Tested Date	Test Result (%)	View/Download
20250214T100039_xlsx_random_tree_dataset_1.json	[{"tree_id": "height"}]	2025-02-14T10:02:37.298Z	5	

Delete

Figure_08: Save result

- **Step-6: View Result**

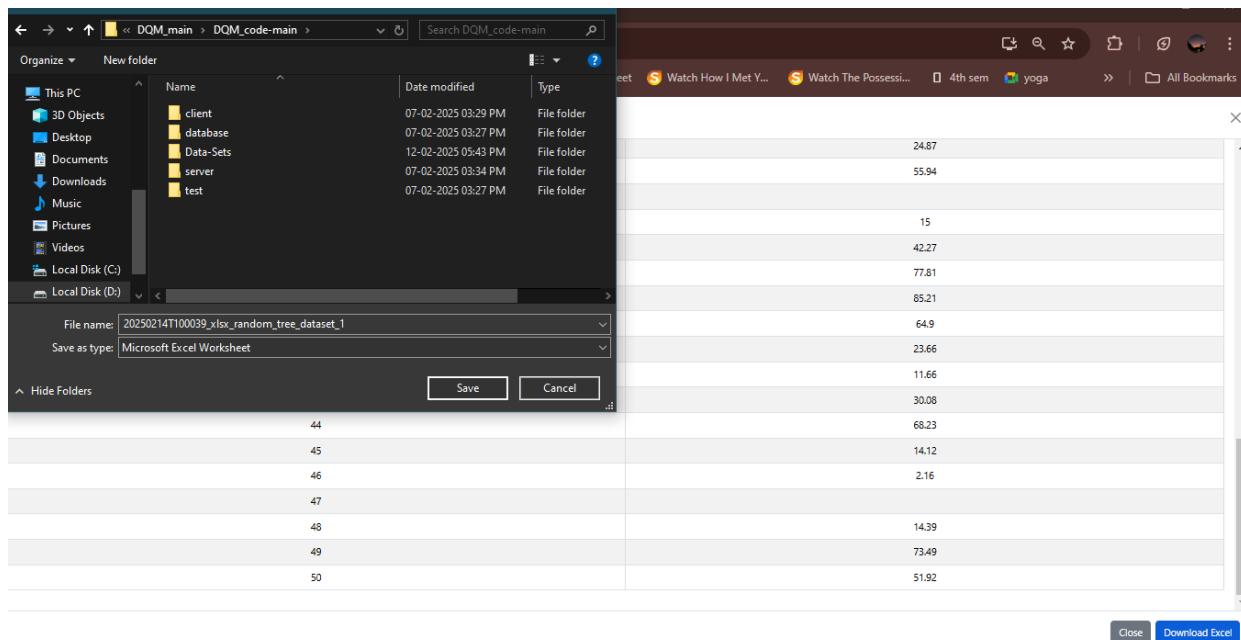
- Click on the eye symbol to view/download the saved result.
- You can view the result in table.

View Data		X
tree_id	height	
1	8.86	
2	91.42	
3	54.71	
4	17.97	
5	2.27	
6	62.51	
7	27.09	
8	41.63	
9	97.47	
10	38.03	
11		
12	85.2	
13	48.57	
14	38.22	
15	88.86	
16		
17	53.1	

Figure_09: View Result

- **Step-7: Download Result**

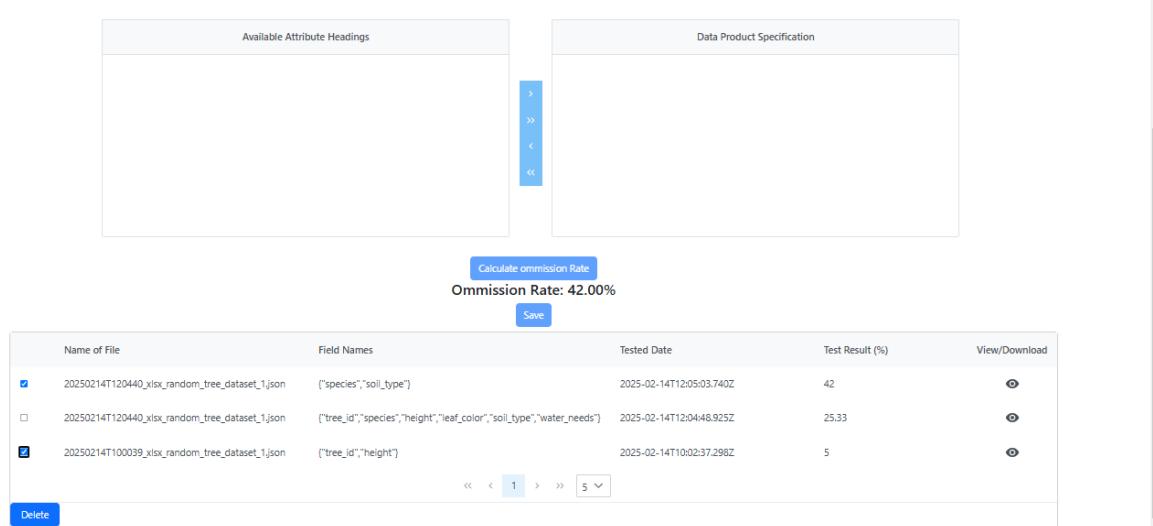
- After viewing the result you can download it using download Excel button.
- It will be saved in your system.
- On clicking close button you will be back to your omission page.



Figure_10: Download Result

- **Step-8: Delete Results**

- Select one or more results and then click delete button to delete the result from the table.

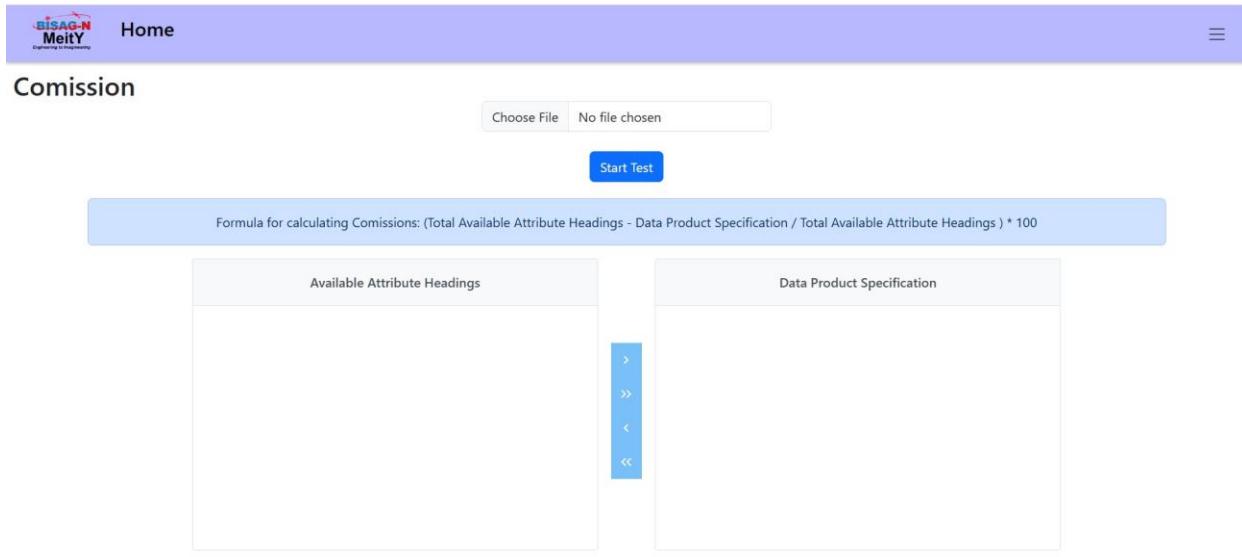


Name of File	Field Names	Tested Date	Test Result (%)	View/Download
<input checked="" type="checkbox"/> 20250214T120440_xlsx_random_tree_dataset_1.json	(“species”, “soil_type”)	2025-02-14T12:05:03.740Z	42	
<input type="checkbox"/> 20250214T120440_xlsx_random_tree_dataset_1.json	(“tree_id”, “species”, “height”, “leaf_color”, “soil_type”, “water_needs”)	2025-02-14T12:04:48.925Z	25.33	
<input checked="" type="checkbox"/> 20250214T100039_xlsx_random_tree_dataset_1.json	(“tree_id”, “height”)	2025-02-14T10:02:37.298Z	5	

Figure_11: Delete Result

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

B. Commission:

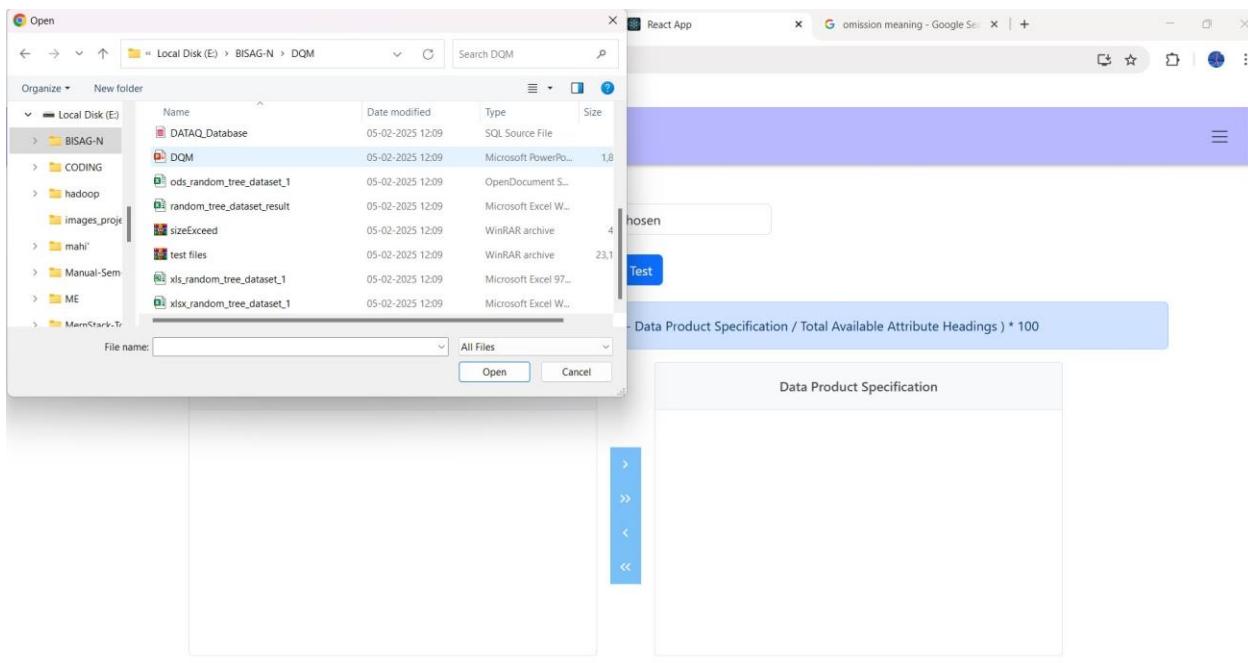


Figure_12: Comision test page

- **Step-1: Upload an Excel File**

- Click on the Choose File button.
- Select the desired Excel file(Omission and Commision.xlsx)² from your system.
- Ensure that the file contains the necessary attribute heading

² Refer the file (Omission and Commision.xlsx) path: *DataSheets\Omission and Commission.xlsx*



Figure_13: Select file

- **Step-2: Start the Test**

- Click on the Start Test button.
- The system will fetch all attribute headings from the uploaded Excel file.
- The fetched attribute headings will be displayed in the Available Attribute Headings section.

Comission

Choose File

Start Test

Formula for calculating Comissions: (Total Available Attribute Headings - Data Product Specification / Total Available Attribute Headings) * 100

Available Attribute Headings	Data Product Specification
tree_id	
species	
height	
leaf_color	
soil_type	
water_needs	

Figure_14: Start test

- **Step-3: Select Attribute Headings**

- In the Available Attribute Headings section, select one or multiple attributes.
- Use the right arrow button (> or >>) to move the selected attributes to the Data Product Specification section.
- If needed, use the left arrow button (< or <<) to move attributes back to the Available Attribute Headings section.

Commission

Choose File

Start Test

Formula for calculating Commissions: (Total Available Attribute Headings - Data Product Specification / Total Available Attribute Headings) * 100

Available Attribute Headings	Data Product Specification
species leaf_color soil_type water_needs	tree_id height
> >> < <<	

[Calculate Commission Rate](#)
 Commission Rate: 0.00%

Figure_15: Select Attribute

- **Step-4: Calculate Commission Rate**

- Once the required attributes are added to the Data Product Specification section, click on the Calculate Commission Rate button.
- The system will compute the commission rate using the formula:

$$\text{Commission Rate} = (\text{Total Available Attribute Headings} - \text{Data Product Specification}) / \text{Total Available Attribute Headings} * 100$$

- The calculated commission rate will be displayed below the Calculate Commission Rate button in the format: 0.00%.

Choose File xlsx_random_tree_dataset_1.xlsx

Start Test

Formula for calculating Commissions: (Total Available Attribute Headings - Data Product Specification / Total Available Attribute Headings) * 100

Available Attribute Headings	Data Product Specification
species	tree_id
leaf_color	height
soil_type	
water_needs	

Calculate Commission Rate
Commission Rate: 66.67%
Save

Figure_16: Calculate Commission

- **Step-5: Save Results**

- Click on the Save button to store the results.
- The saved results will be displayed on the table at the bottom, including:
 - Name of the file
 - Field names
 - Tested date
 - Test result (%)
 - View/Download option for the file

Calculate Commission Rate
Commission Rate: 66.67%
Save

Name of File	Field Names	Tested Date	Test Result (%)	View/Download
<input type="checkbox"/> 20250214T113445_xlsx_random_tree_dataset_1.json	{"tree_id", "height"}	2025-02-14T11:44:43.878Z	66.67	
<input type="checkbox"/> 20250214T113445_xlsx_random_tree_dataset_1.json	{"tree_id", "height"}	2025-02-14T11:44:42.658Z	66.67	
<input type="checkbox"/> 20240506T064542_xls_random_tree_dataset_1.json	{"tree_id", "species", "height"}	2024-05-06T06:45:58.561Z	50.00	
<input type="checkbox"/> 20240406T055543_xls_random_tree_dataset_1.json	{"tree_id", "height", "leaf_color", "soil_type"}	2024-04-06T05:57:19.844Z	33.33	

<< < 1 > >> 5 ▼

Delete

Figure_17: Save result

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- **Step-6: View Results**

- Clicking on the eye icon will display the Result.

View Data



The table displays the following data:

tree_id	height
1	8.86
2	91.42
3	54.71
4	17.97
5	2.27
6	62.51
7	27.09
8	41.63
9	97.47
10	38.03
11	
12	85.2

Close

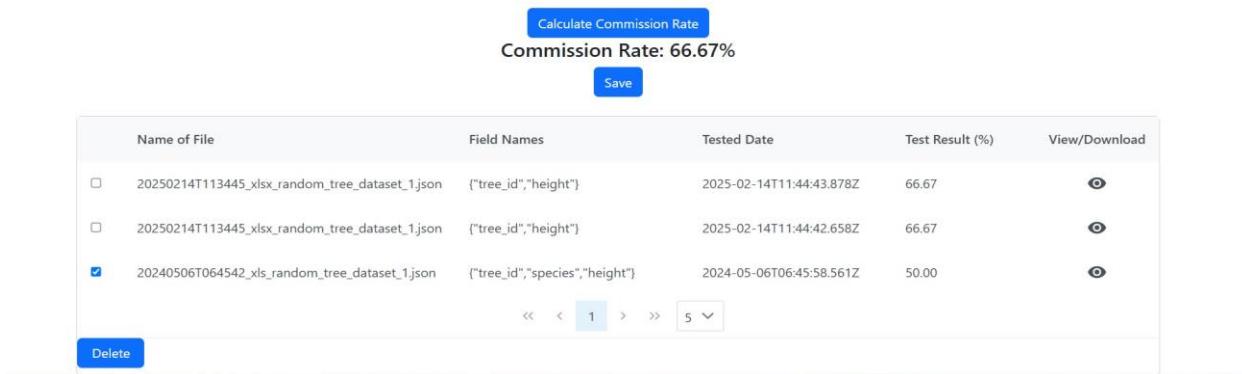
Figure_18: View Result

- **Step-7: Download Result**

- On top right corner we have download icon on clicking the download icon user can download Result in Excel format.

- **Step-8: Delete Result**

- As show in fig, you can check the check box of the file you want to delete from saved data. After checking the checkbox click on the delete button and the Result file will be deleted.



The interface includes the following buttons:

- Calculate Commission Rate
- Commission Rate: 66.67%
- Save

The table lists three files:

Name of File	Field Names	Tested Date	Test Result (%)	View/Download
<input type="checkbox"/> 20250214T113445_xlsx_random_tree_dataset_1.json	{"tree_id","height"}	2025-02-14T11:44:43.878Z	66.67	
<input type="checkbox"/> 20250214T113445_xlsx_random_tree_dataset_1.json	{"tree_id","height"}	2025-02-14T11:44:42.658Z	66.67	
<input checked="" type="checkbox"/> 20240506T064542_xls_random_tree_dataset_1.json	{"tree_id","species","height"}	2024-05-06T06:45:58.561Z	50.00	

Navigation buttons: << < 1 > >> 5 <

Delete

Figure_19: Delete Result

Logical Consistency

Validates the adherence of data to predefined rules and structures. It includes conceptual, domain, format, and topology consistency to maintain logical correctness.

Types of Logical Consistency:

1. **Conceptual Consistency:** Data aligns with the conceptual model.
2. **Domain Consistency:** Values fall within the defined range.
3. **Format Consistency:** Data follows a specified format.
4. **Topology Consistency:** Spatial relationships are correctly maintained.

A. Domain Consistency:

Domain consistency main page will appear, and you can click on ‘choose file’ option to select file.

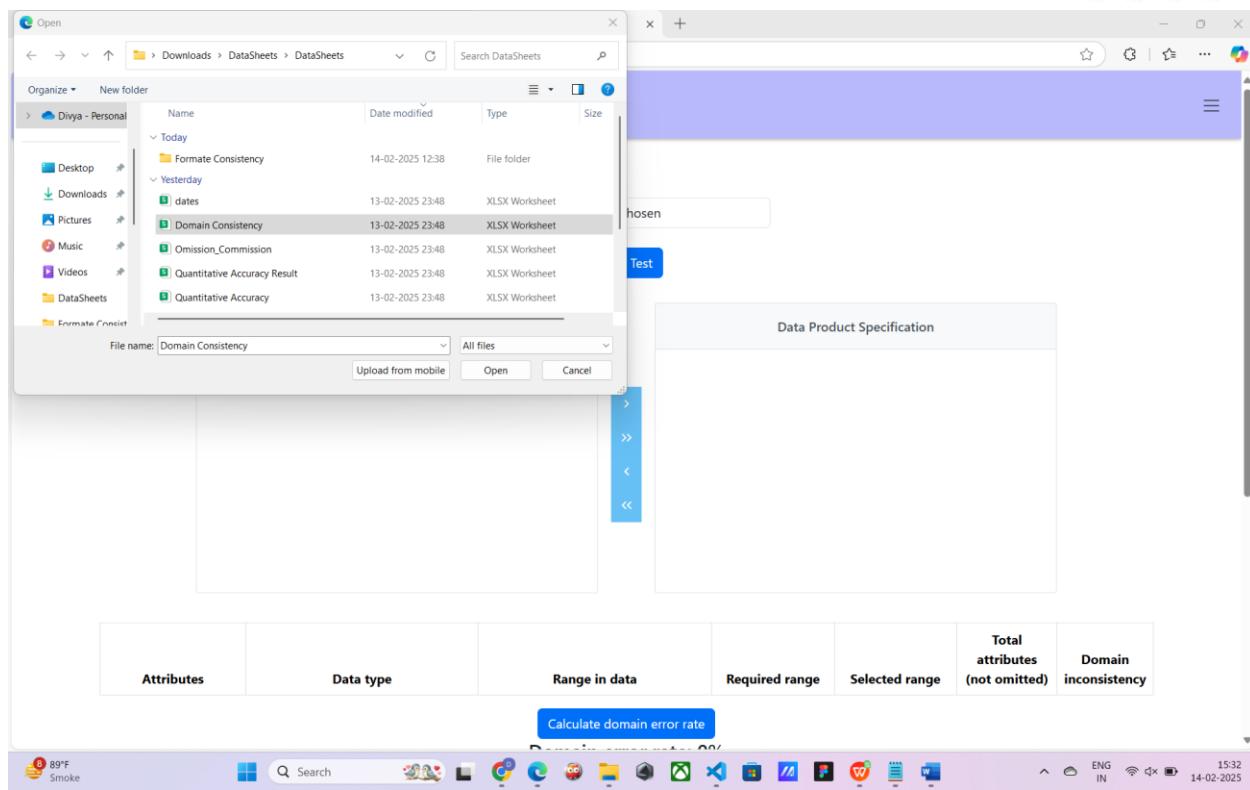
>, >>, <, <<). Below these is a table with columns: Attributes, Data type, Range in data, Required range, Selected range, Total attributes (not omitted), and Domain inconsistency. A 'Calculate domain error rate' button is located at the bottom of the table area. The status bar at the bottom shows system information like battery level, network, and date/time." data-bbox="111 364 880 734"/>

Attributes	Data type	Range in data	Required range	Selected range	Total attributes (not omitted)	Domain inconsistency

Figure_20: Main Dashboard of DQM Application

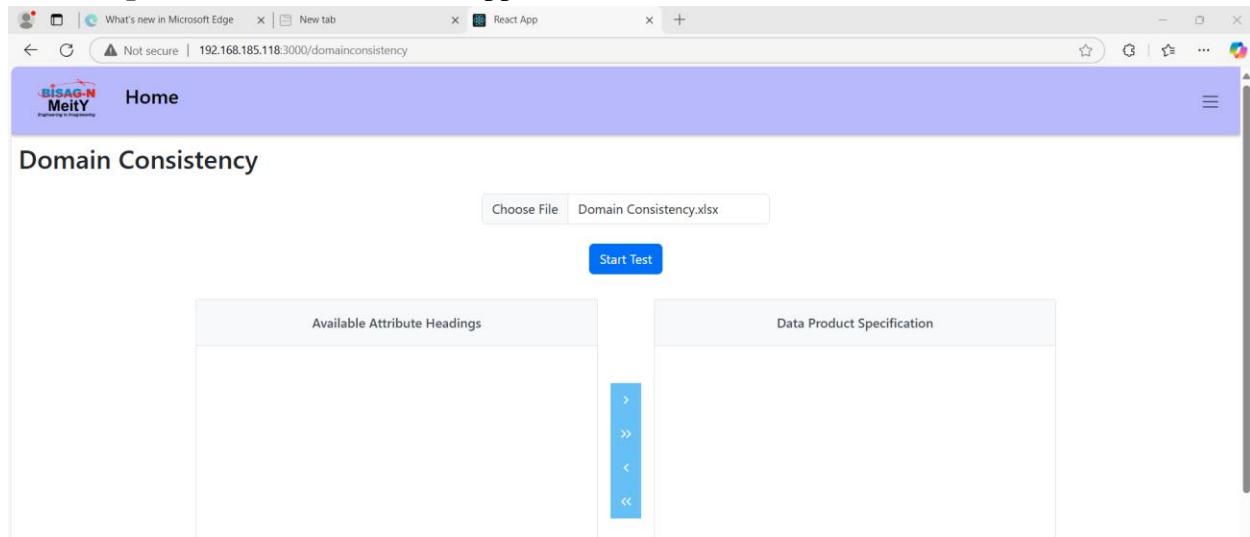
- **Step 1:** Now choose the file and click on ‘open’ having filename(Domain Consistency.xlsx)³

³ Refer the file (Domain Consistency.xlsx) path: *DataSheets\Domain Consistency.xlsx*



Figure_21: Domain Consistency main page.

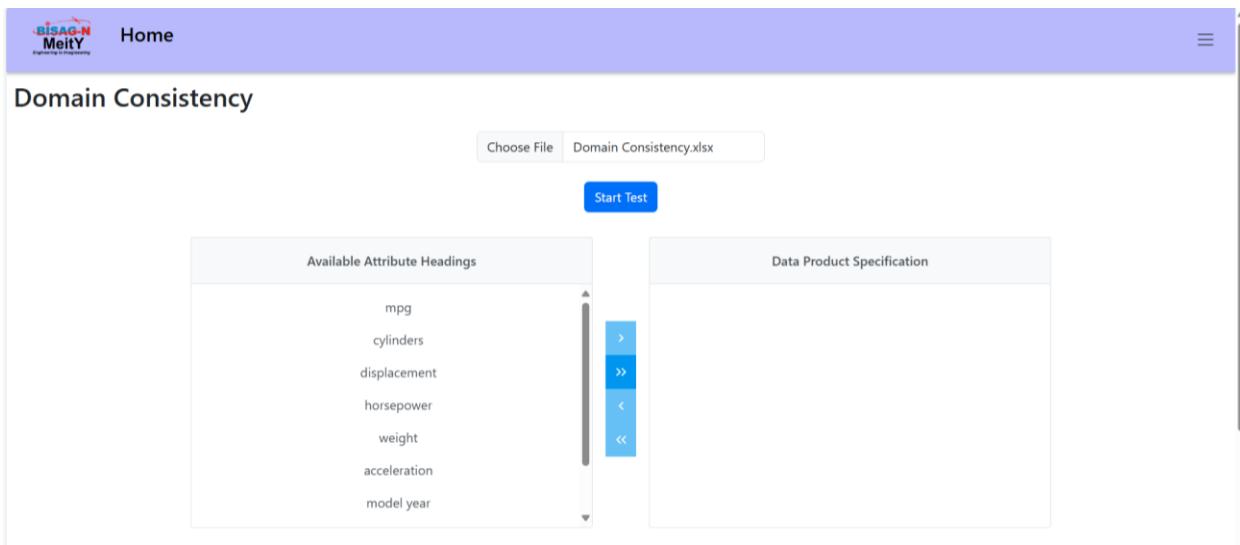
- **Step 2:** The selected file will appear in the chosen file.



Figure_22: Selection of file for Domain Consistency

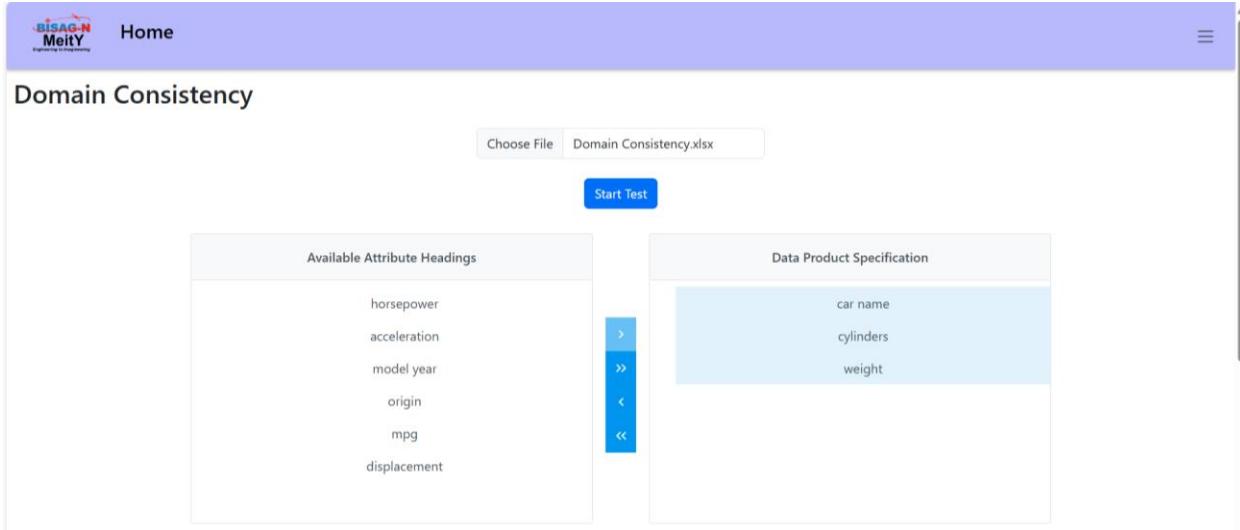
- **Step 3:** You need to click on 'start test' and then the attributes will appear in available attribute headings. Choose whichever attributes you want to use for evaluation then they will appear in data product specification.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



The screenshot shows the 'Domain Consistency' tool interface. At the top, there is a header with the BISAG-N MeitY logo and a 'Home' button. Below the header, the title 'Domain Consistency' is displayed. A 'Choose File' button is followed by the text 'Domain Consistency.xlsx'. A blue 'Start Test' button is located below these controls. The main area contains two sections: 'Available Attribute Headings' on the left and 'Data Product Specification' on the right. In the 'Available Attribute Headings' section, the following attributes are listed: mpg, cylinders, displacement, horsepower, weight, acceleration, and model year. To the right of this list are four blue navigation arrows: a single arrow pointing right (>), a double arrow pointing right (»), a single arrow pointing left (<), and a double arrow pointing left («). The 'Data Product Specification' section is currently empty.

Figure_23: Domain Consistency file chosen



This screenshot shows the same 'Domain Consistency' tool interface after a file has been chosen. The 'Available Attribute Headings' section now lists different attributes: horsepower, acceleration, model year, origin, mpg, and displacement. The four blue navigation arrows remain to the right of this list. The 'Data Product Specification' section now contains three items: 'car name', 'cylinders', and 'weight', each preceded by a small blue arrow pointing right (>).

Figure_24: Parameters of Domain Consistency

- **Step 4:** You can adjust the data type and choose range of values for the chosen attributes. Then click on ‘calculate domain error rate’.

Attributes	Data type	Range in data	Required range	Selected range	Total attributes (not omitted)	Domain inconsistency
cylinders	<input type="button" value="Integer"/> <input type="button" value="Select"/> <input style="background-color: #cccccc; color: black; font-weight: bold; border: 1px solid black; padding: 2px; margin-bottom: 5px;" type="button" value="Integer"/> <input type="button" value="Decimal"/> <input type="button" value="List"/> <input type="button" value="String"/>	Min : 0 Max : 8	<input type="text" value="Min : 0"/> <input type="text" value="Max : 8"/>	Min: 0, Max: 8		
weight	<input type="button" value="Integer"/> <input type="button" value="Decimal"/> <input type="button" value="List"/> <input type="button" value="String"/>	Min : *** Max : ***	<input type="text" value="Min : 2000"/> <input type="text" value="Max : 4000"/>	Min: 2000, Max: 4000		
car name	<input type="button" value="String"/>	Min : 6 Max : 36	<input type="text" value="Min : 6"/> <input type="text" value="Max : 36"/>	Min: 6, Max: 36		

Figure_25: Selection of range and data type for each chosen attributes

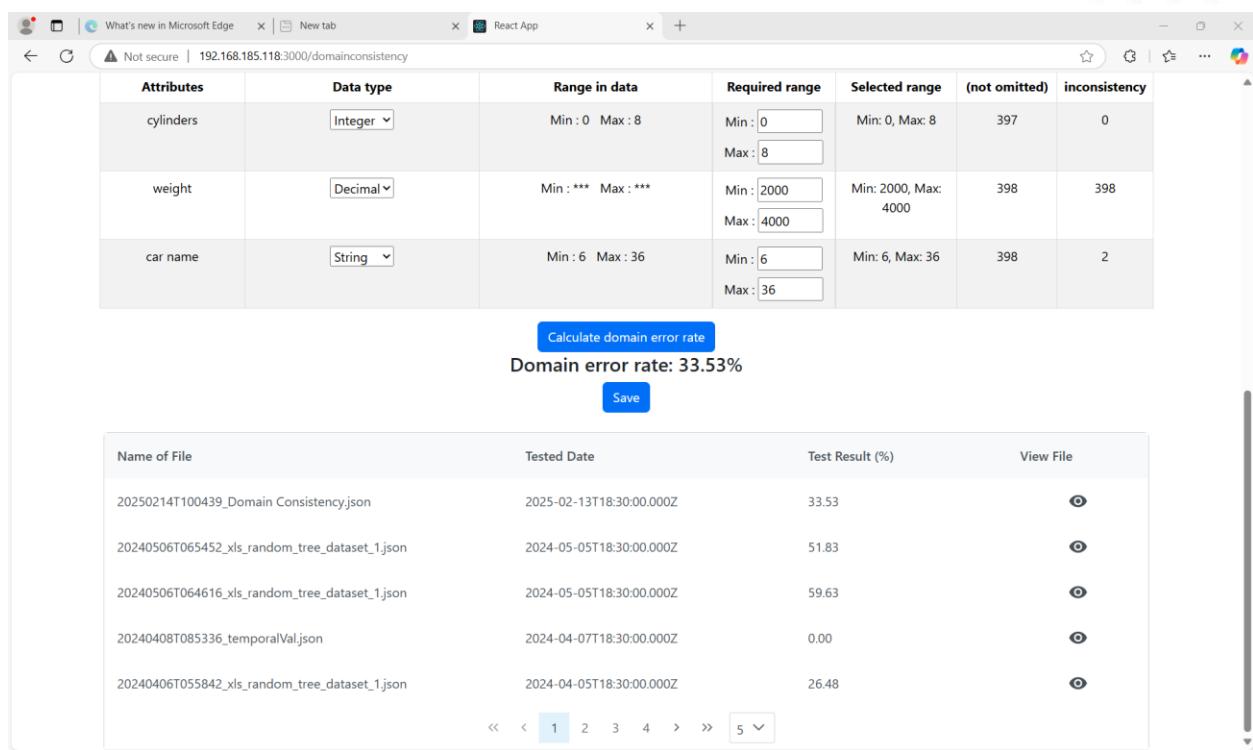
- **Step 5:** You can save this result for future reference by clicking on save option.

Attributes	Data type	Range in data	Required range	Selected range	Total attributes (not omitted)	Domain inconsistency
cylinders	<input type="button" value="Integer"/>	Min : 0 Max : 8	<input type="text" value="Min : 0"/> <input type="text" value="Max : 8"/>	Min: 0, Max: 8	397	0
weight	<input type="button" value="Decimal"/>	Min : *** Max : ***	<input type="text" value="Min : 2000"/> <input type="text" value="Max : 4000"/>	Min: 2000, Max: 4000	398	398
car name	<input type="button" value="String"/>	Min : 6 Max : 36	<input type="text" value="Min : 6"/> <input type="text" value="Max : 36"/>	Min: 6, Max: 36	398	2

Domain error rate: 33.53%

Figure_26: Result of Domain Error Rate

- **Step 6:** After saving you can view or download data.



Figure_27: Saving Domain Error Rate

- **Step 7:** This will be shown in the data file. **The highlighted part of the data is erroneous according to this metric:**



File Data

mpg	cylinders	displacement	horsepower	weight	acceleration	model year	origin	car name
18	8	307	130	3504	12	70	1	chevrolet chevelle malibu
15	8	350	165	3693	11.5	70	1	buick skylark 320
18	8	318	150	3436	11	70	1	plymouth satellite
16	8	304	150	3433	12	70	1	amc rebel sst
17	8	302	140	3449	10.5	70	1	ford torino
15	8	429	198	4341	10	70	1	ford galaxie 500
14	8	454	220	4354	9	70	1	chevrolet impala
14	8	440	215	4312	8.5	70	1	plymouth fury iii
14	8	455	225	4425	10	70	1	pontiac catalina
15	8	390	190	3850	8.5	70	1	amc ambassador dpl
15	8	383	170	3563	10	70	1	dodge challenger se
14	8	340	160	3609	8	70	1	plymouth 'cuda 340
15	8	400	150	3761	9.5	70	1	chevrolet monte carlo
14	8	455	225	3086	10	70	1	buick estate wagon (sw)
24	4	113	95	2372	15	70	3	toyota corona mark ii
22	6	198	95	2833	15.5	70	1	plymouth duster

Close Download Excel



Figure_28: Data of chosen attributes for domain consistency

B. Format Consistency:

The below page will load after choosing format consistency from main page.



Home

File Format

File format Consistency
Primary Key Constraint

Choose File No file chosen

Start Test

Available Attribute Headings

Data Product Specification

>
>>
<
<<

Check Validity

Figure_29: Main page of File Format Consistency

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- **Step 1:** Select an appropriate format from the options mentioned in drop down menu and select the file accordingly.

Files to be chosen:

- **File Format:**
 - File Formate-1.xls⁴
 - File Formate-2.xlsx⁵
- **Date Format:**
 - Date Formate.xlsx⁶
 - Date Formate2.xlsx⁷
- **Station code Format:** Stationcode Formate.xlsx⁸
- **Lat-Long Format:** Lat_lon Formate.xlsx⁹
- **Railway code Format:** Railway Zone Formate.xlsx¹⁰
- **Pincode Format:** PinCode Formate.xlsx¹¹
- **State Format:** State_District_Union Formate.xlsx¹²
- **District Format:** State_District_Union Formate.xlsx¹³
- **Union Territory Format:** State_District_Union Formate.xlsx¹⁴
- **RailwayZones Frmat:** Railway Zone Formate.xlsx¹⁵

⁴ Refer the file (File Formate-1.xls) path: *DataSheets\Formate Consistency\File Formate-1.xls*

⁵ Refer the file (File Formate-2.xlsx) path: *DataSheets\Formate Consistency\File Formate-2.xlsx*

⁶ Refer the file (Date Formate.xlsx) path: *DataSheets\Formate Consistency\Date Formate.xlsx*

⁷ Refer the file (Date Formate2.xlsx) path: *DataSheets\Formate Consistency\Date Formate2.xlsx*

⁸ Refer the file (Stationcode Formate.xlsx) path: *DataSheets\Formate Consistency\Stationcode Formate.xlsx*

⁹ Refer the file (Lat_lon Formate.xlsx) path: *DataSheets\Formate Consistency\Lat_lon Formate.xlsx*

¹⁰ Refer the file (Railway Zone Formate.xlsx) path: *DataSheets\Formate Consistency\Railway Zone Formate.xlsx*

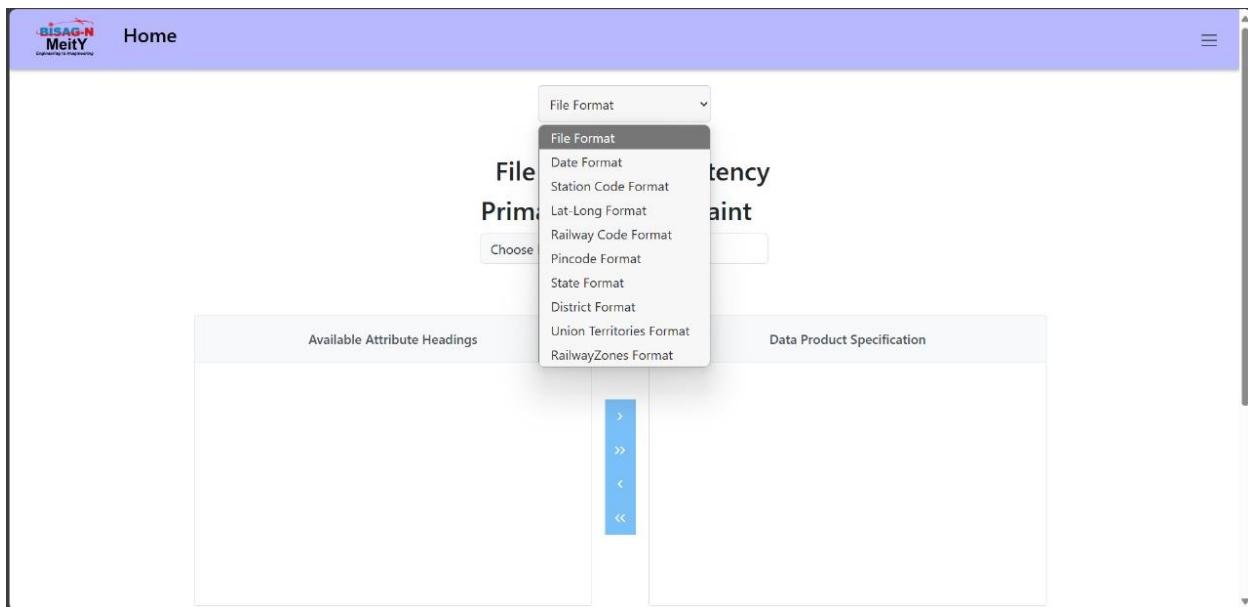
¹¹ Refer the file (PinCode Formate.xlsx) path: *DataSheets\Formate Consistency\ PinCode Formate.xlsx*

¹² Refer the file (State_District_Union Formate.xlsx) path: *DataSheets\Formate Consistency\ State_District_Union Formate.xlsx*

¹³ Refer the file (State_District_Union Formate.xlsx) path: *DataSheets\Formate Consistency\ State_District_Union Formate.xlsx*

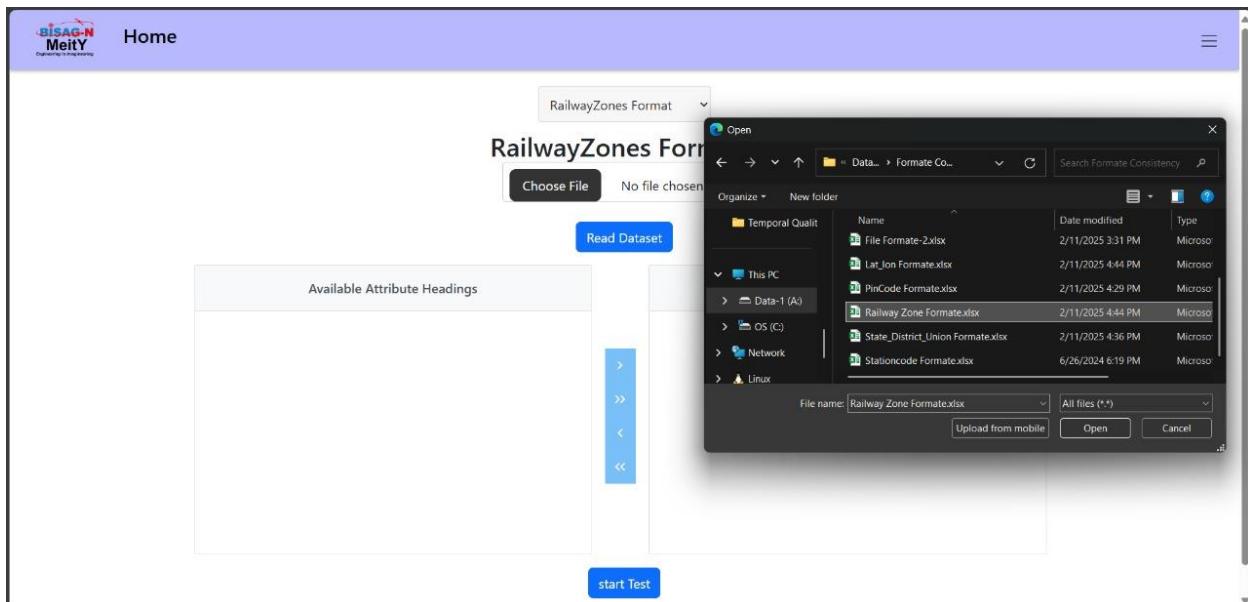
¹⁴ Refer the file (State_District_Union Formate.xlsx) path: *DataSheets\Formate Consistency\ State_District_Union Formate.xlsx*

¹⁵ Refer the file (Railway Zone Formate.xlsx) path: *DataSheets\Formate Consistency\ Railway Zone Formate.xlsx*



Figure_30: Dropdown for format options

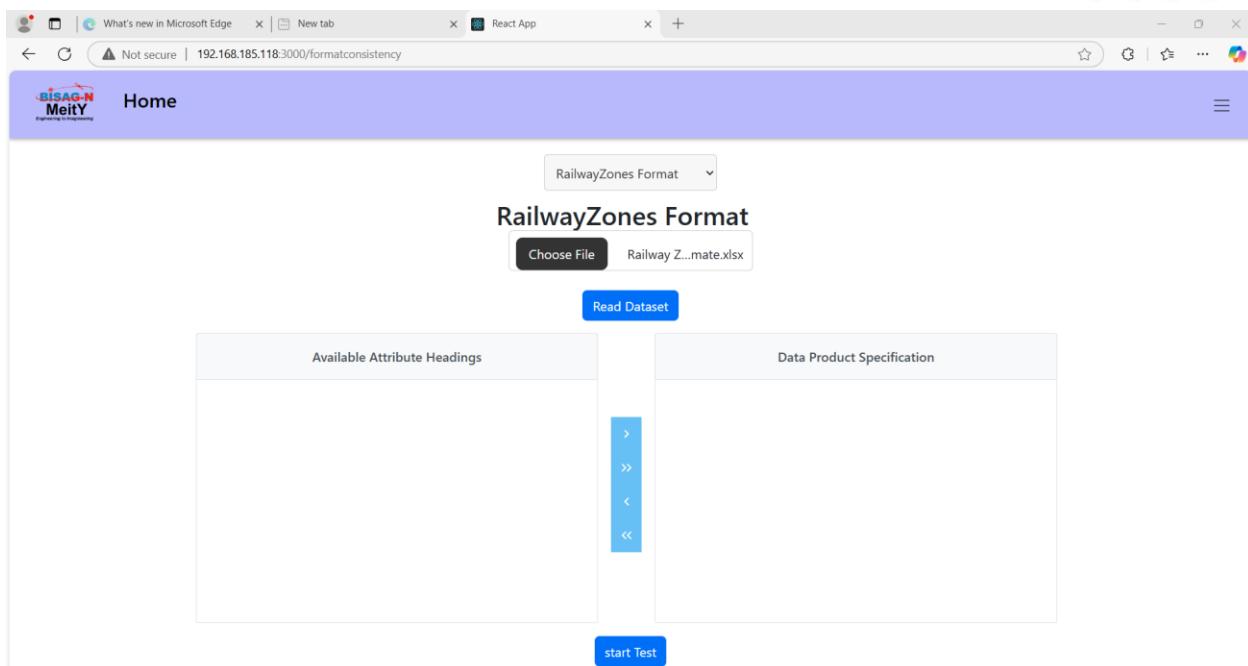
Here we have selected the RailwayZones format and for that the file(Railway Zone Formate.xlsx) should be uploaded.



Figure_31: File selection

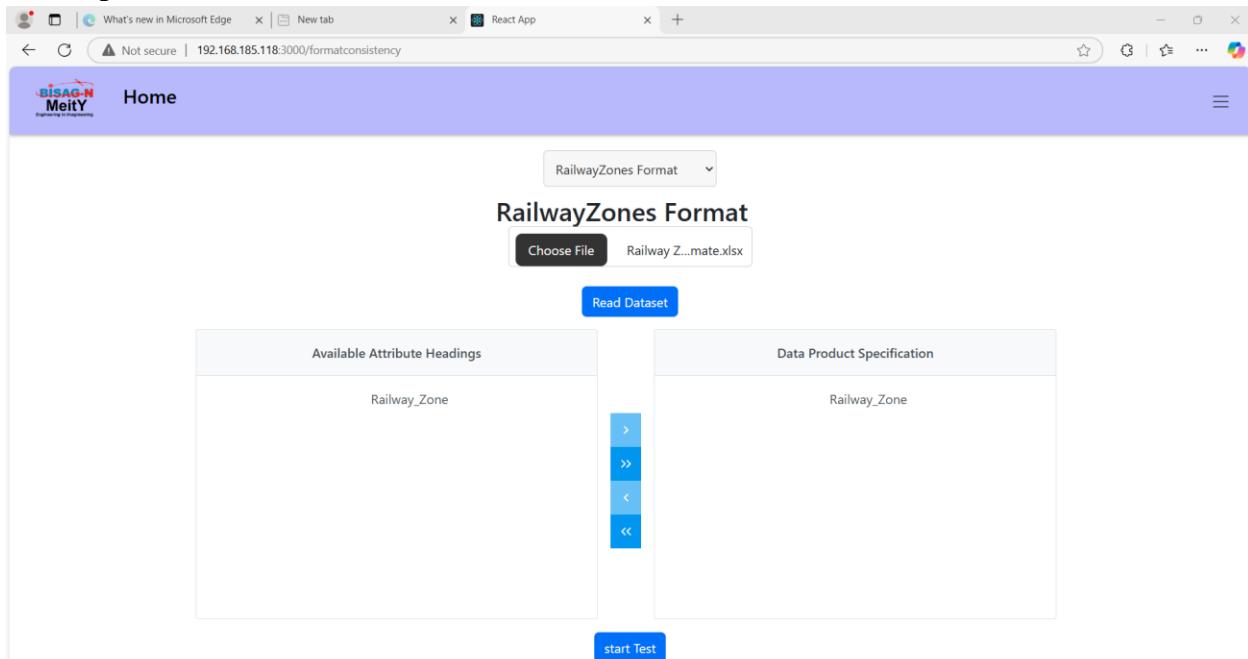
- Choose ‘**Read Dataset**’ option .

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Figure_32: Display of drop-down list of file format

- **Step 2:** Select attribute and then it will be shown on other side ‘**Data Product Specification**’. Then click on ‘**start Test**’.



Figure_33: Main page of RailwayZones Format

- **Step 3:** You can scroll down and get the resultant **Filter Table** in which the erroneous data is mentioned as ‘invalid/False’. (Some format’s output are shown below.)

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

start Test

Filter Table

Error Percentage: 3.158%

id	ECOR	value
11	ECOR	valid
12	ECOR	valid
13	N/A	Invalid
14	ECOR	valid
15	ECOR	valid
16	ECR+A17	Invalid
17	ECR	valid
18	ECR	valid
19	ECR	valid
20	ECR	valid

Figure_34: Filter Table of RailwayZones Format

start Test

Filter Table

Error Percentage: 9.322%

16	28°3'29.29"N	75°17'7.85"E	Valid
17	19°9'36.9678"N	77°18'33.8532"E	Valid
18	24°40'48.1854"N	76°51'6.3708"E	Valid
19	24°35'53.6376"N	77°5'37.0782"E	Valid
20	27.48°5.4678"N	78.38°43.9218"E	Not Valid
21	28°23'19.590"N	079°25'17.022"E	Valid
22	28°42'50.388"N	079°29'17.922"E	Valid
23	28°33'51.294"N	079°27'49.134"E	Valid
24	28°29'39.960"N	079°26'51.852"E	Valid
25	28°21'26.484"N	079°24'05.994"E	Valid

Figure_35: Filter Table of Lat-Long Format.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Pincode	IsValid	Save
603405	true	
59595	false	
4445454888	false	

<< < 29 30 31 32 33 > >> 5 ▾

Figure_36: Filter Table of Pincode Format

Filter Table

Error Percentage: 100.000%

Sr No.	UnionTerritories	Valid/Invalid
1	HG2	Invalid
2	HG2	Invalid
3	HG3	Invalid
4	HG3	Invalid
5	HG3	Invalid
6	HG3	Invalid
7	HG3	Invalid
8	HG3	Invalid
9	HG3	Invalid

Figure_37: Filter Table of UnionTerritories Format.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Positional Accuracy

Assesses the accuracy of spatial data in terms of location. That is, it evaluates the spatial correctness of data in terms of location. It includes absolute accuracy (relative to reference points), relative accuracy (within the dataset), and gridded data accuracy.

Types of Position Accuracy:

- **External / Absolute Position Accuracy:** Accuracy concerning a known reference point.
- **Internal / Relative Position Accuracy:** Accuracy of data relative to itself.
- **Gridded Data Positional Accuracy:** Accuracy in structured grid datasets.

A. External / Absolute Position Accuracy

Formula used:

Absolute horizontal accuracy of the data's coordinates, expressed in terms of circular error at 90% probability, given that a bias is present.

A comparison of the data (source) and the control (reference) is calculated in the following manner:

1. Calculate the absolute error in the horizontal dimension at each point:

$$\Delta H_i = \sqrt{(sourceX_i - referenceX_i)^2 + (sourceY_i - referenceY_i)^2}, \quad \text{for } i = 1\dots N$$

2. Calculate the mean horizontal error:

$$\mu_H = \frac{\sum \Delta H_i}{N}$$

3. Calculate the standard deviation of the horizontal errors:

$$\sigma_H = \sqrt{\frac{\sum (\Delta H_i - \mu_H)^2}{N - 1}}$$

4. Calculate the ratio of the absolute value of the mean error to the standard deviation:

$$\text{ratio} = \frac{|\mu_H|}{\sigma_H}$$

5. Determine k :

- If ratio > 1.4, then $k = 1.2815$.
- If ratio ≤ 1.4 , calculate k using the formula:

$$k = 1.6435 - (0.999556 \times \text{ratio}) + (0.923237 \times \text{ratio}^2) - (0.282533 \times \text{ratio}^3)$$

6. Compute CE90 for the source:

$$CE90_{\text{source}} = |\mu_H| + (k \times \sigma_H)$$

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

7. Compute absolute CE90:

$$CE90_{\text{abs}} = \sqrt{CE90_{\text{reference}}^2 + CE90_{\text{source}}^2}$$

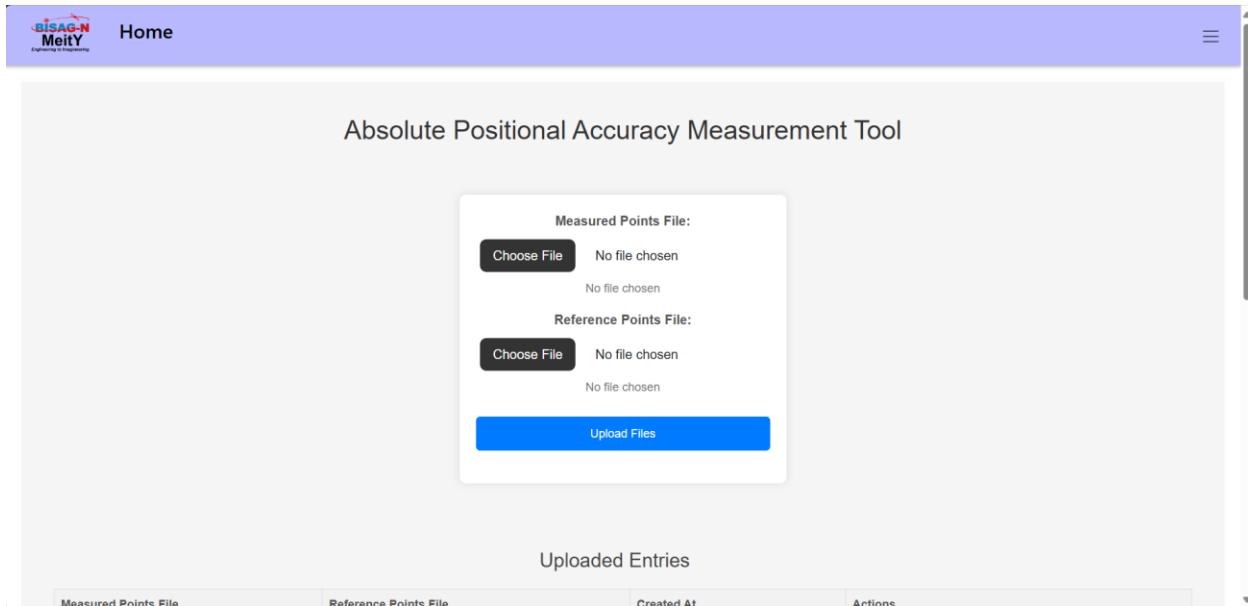
Haversine's formula: The Haversine formula **determines the great-circle distance between two points on a sphere** given their longitudes and latitudes.

$$D = 2 \cdot \sin^{-1} \left(\sqrt{\sin\left(\frac{\text{lat2} - \text{lat1}}{2}\right)^2 + \sin\left(\frac{\text{lon2} - \text{lon1}}{2}\right)^2 \cdot \cos(\text{lat1}) \cdot \cos(\text{lat2})} \right) \cdot \mu_E$$

where:

- D = Great Circle Arc Length (distance)
- lat 1 = latitude of first point
- lon 1 = longitude of first point
- lat 2 = latitude of second point
- lon 2 = longitude of second point
- μ_E = Mean Radius of the Earth (6371.009 km)

- **Step 1:** Click on External / Absolute Position Accuracy, it will Navigate to the main page for calculating absolute position accuracy.
- **Step 2:** Uploading the file.

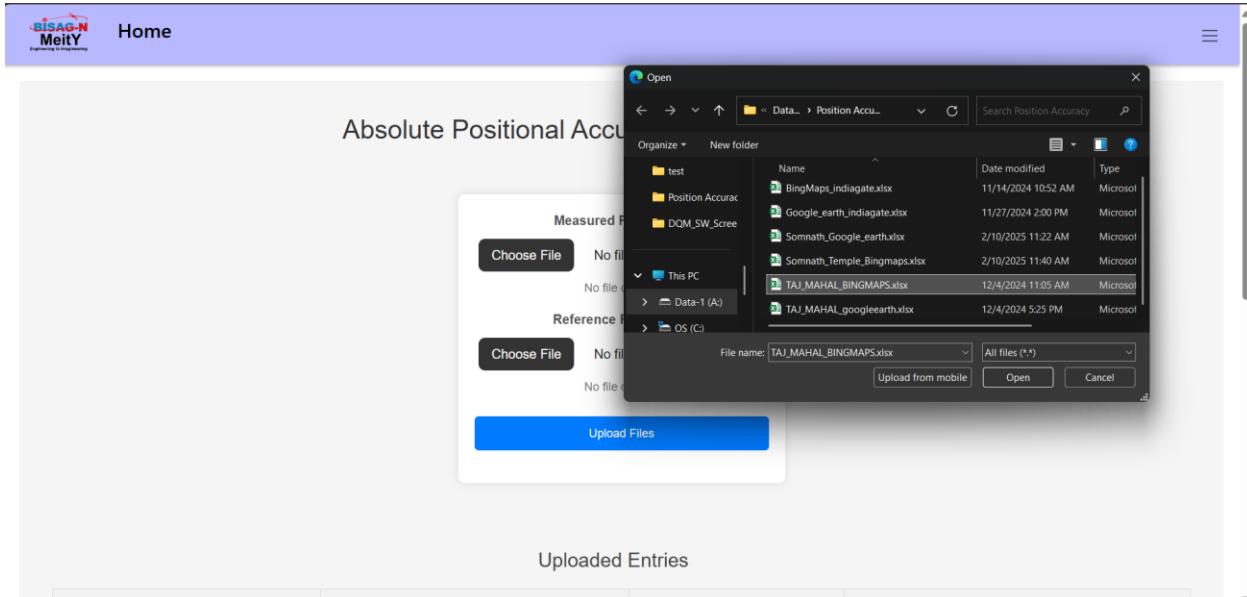


Figure_38: Absolute Positional Accuracy

- By clicking “choose file”, choose both files.

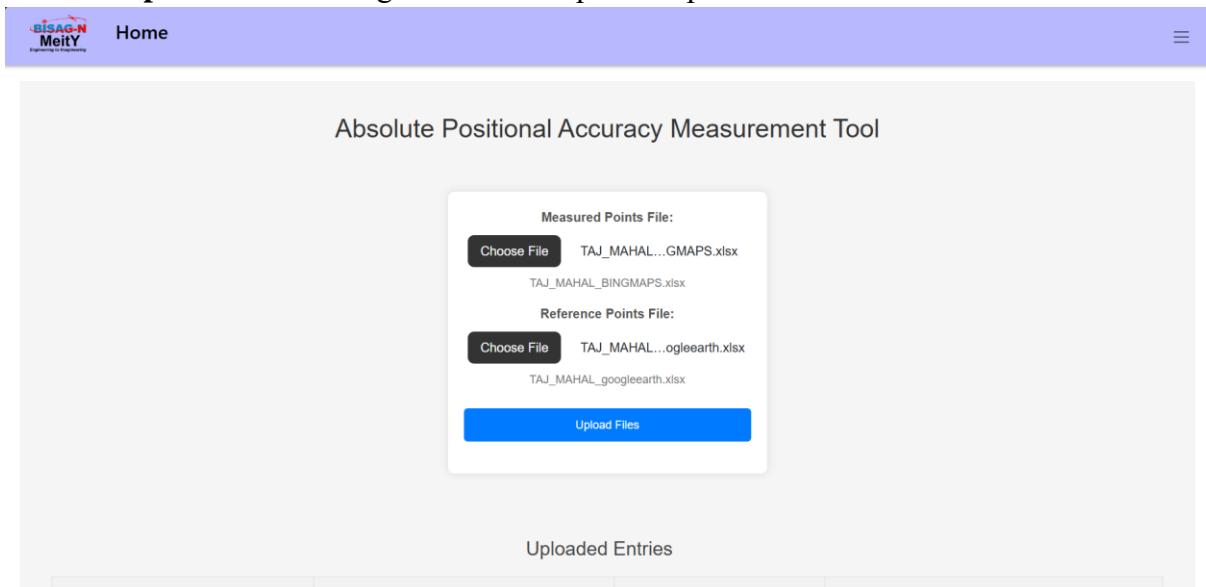
For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- Measure Point File (TAJ_MAHAL_BINGMAPS.xlsx)¹⁶ and Reference Point File (TAJ_MAHAL_googleearth.xlsx)¹⁷ from the directory.
- Which consists of Longitude and Latitude of points of the respective position.
- This data set should contain multiple points for the respective position.



Figure_39: Selecting the File

- **Step 3:** After selecting both the files press “Upload Files”

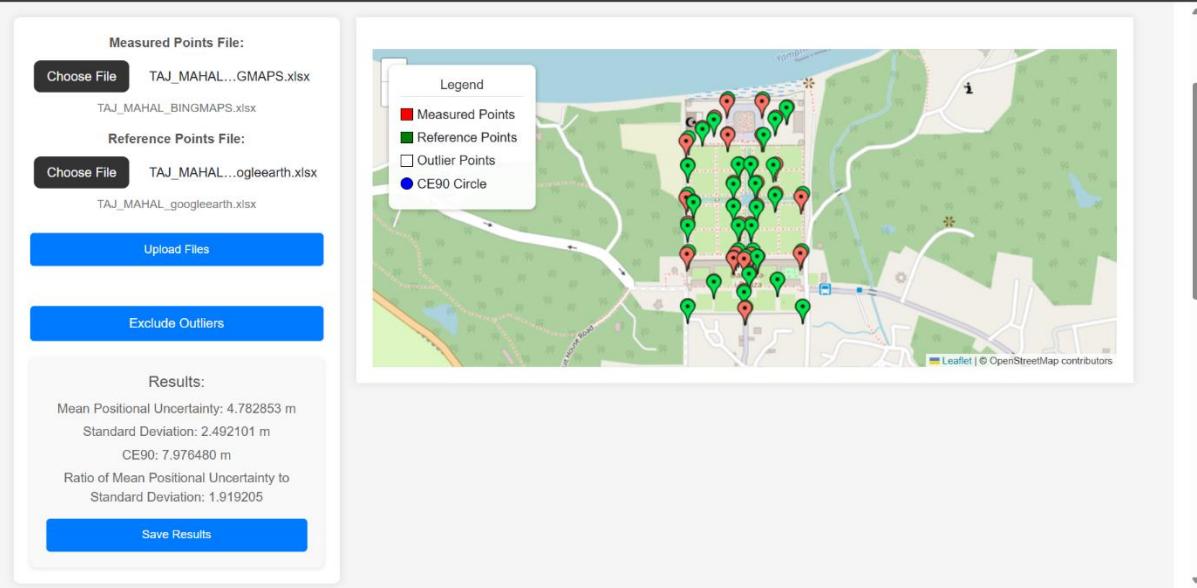


Figure_40: Selected files

¹⁶ Refer the file (TAJ_MAHAL_BINGMAPS.xlsx) path: *DataSheets\Position Accuracy\TAJ_MAHAL_BINGMAPS.xlsx*

¹⁷ Refer the file (TAJ_MAHAL_googleearth.xlsx) path: *DataSheets\Position Accuracy\TAJ_MAHAL_googleearth.xlsx*

- **Step 4:** Here you can see a map orientated result for positional accuracy.
 - Here the measured point file long/late is compared with the reference point file lon/lat.
 - And there is determination of **Mean Positional Uncertainty, Standard Deviation, CE90 error and ratio of Mean Positional Uncertainty to Standard Deviation.**
 - Here you got the option to visualize the outlier's differentiation by clicking on “**Exclude Outliers**”



Figure_41: Result Absolute Positional Accuracy

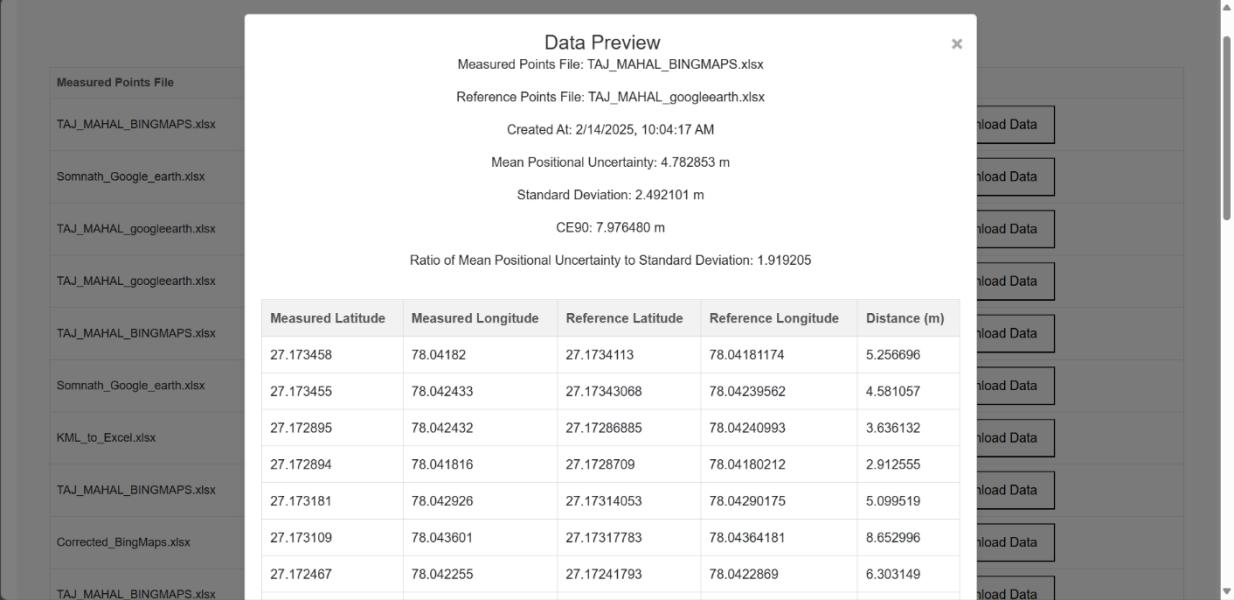
- **Step 5:** To Save the results in the database click “Save Results”.
 - Here you can save the result to the database and can view and download it later in future.

Uploaded Entries			
Measured Points File	Reference Points File	Created At	Actions
TAJ_MAHAL_BINGMAPS.xlsx	TAJ_MAHAL_googleearth.xlsx	2/14/2025, 10:04:17 AM	View Download Data
Somnath_Google_earth.xlsx	Somnath_Temple_Bingmaps.xlsx	2/14/2025, 7:30:24 AM	View Download Data
TAJ_MAHAL_googleearth.xlsx	TAJ_MAHAL_BINGMAPS.xlsx	2/14/2025, 7:12:06 AM	View Download Data
TAJ_MAHAL_googleearth.xlsx	TAJ_MAHAL_BINGMAPS.xlsx	2/14/2025, 5:59:04 AM	View Download Data
TAJ_MAHAL_BINGMAPS.xlsx	TAJ_MAHAL_googleearth.xlsx	2/12/2025, 12:12:57 PM	View Download Data
Somnath_Google_earth.xlsx	Somnath_Temple_Bingmaps.xlsx	2/12/2025, 12:11:19 PM	View Download Data
KML_to_Excel.xlsx	Somnath_Temple_Coordinates.xlsx	2/10/2025, 6:12:08 AM	View Download Data
TAJ_MAHAL_BINGMAPS.xlsx	TAJ_MAHAL_googleearth.xlsx	2/7/2025, 5:59:07 AM	View Download Data
Corrected_BingMaps.xlsx	Adjusted_GoogleEarth.xlsx	12/12/2024, 9:38:25 AM	View Download Data
TAJ MAHAL BINGMAPS.xlsx	KML TAJ MAHAL NEW.xlsx	12/12/2024, 5:40:46 AM	View Download Data

Figure_42: Past Results

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- To view and download the result later



The screenshot shows a software window titled "Data Preview". On the left, there is a list of "Measured Points File"s:

- TAJ_MAHAL_BINGMAPS.xlsx
- Somnath_Google_earth.xlsx
- TAJ_MAHAL_googleearth.xlsx
- TAJ_MAHAL_googleearth.xlsx
- TAJ_MAHAL_BINGMAPS.xlsx
- Somnath_Google_earth.xlsx
- KML_to_Excel.xlsx
- TAJ_MAHAL_BINGMAPS.xlsx
- Corrected_BingMaps.xlsx
- TAJ_MAHAL_BINGMAPS.xlsx

The main area displays the contents of the selected file, "TAJ_MAHAL_BINGMAPS.xlsx". It includes the following details:

- Measured Points File: TAJ_MAHAL_BINGMAPS.xlsx
- Reference Points File: TAJ_MAHAL_googleearth.xlsx
- Created At: 2/14/2025, 10:04:17 AM
- Mean Positional Uncertainty: 4.782853 m
- Standard Deviation: 2.492101 m
- CE90: 7.976480 m
- Ratio of Mean Positional Uncertainty to Standard Deviation: 1.919205

A table follows, showing data for each point:

Measured Latitude	Measured Longitude	Reference Latitude	Reference Longitude	Distance (m)
27.173458	78.04182	27.1734113	78.04181174	5.256696
27.173455	78.042433	27.17343068	78.04239562	4.581057
27.172895	78.042432	27.17286885	78.04240993	3.636132
27.172894	78.041816	27.1728709	78.04180212	2.912555
27.173181	78.042926	27.17314053	78.04290175	5.099519
27.173109	78.043601	27.17317783	78.04364181	8.652996
27.172467	78.042255	27.17241793	78.0422869	6.303149

Figure_43: Preview and Download Past Results

B. Internal / Relative Position Accuracy

Formula used:

Evaluation of the random errors in the horizontal position of one feature to another in the same dataset or on the same map/chart.

A comparison of the data (measured) and the control (true) is calculated in the following manner:

1. Determine all possible point pair combinations:

$$\text{Point Pair Combinations} = m = n(n - 1)/2$$

2. Calculate the absolute error in the X and Y dimensions at each point:

$$\Delta X_i = \text{Measured } X_i - \text{True } X_i, \quad \text{for } i = 1 \dots n$$

$$\Delta Y_i = \text{Measured } Y_i - \text{True } Y_i, \quad \text{for } i = 1 \dots n$$

3. Calculate the relative error in X and Y for all point pair combinations:

$$\Delta X_{rel} = \Delta X_j - \Delta X_k, \quad \text{for } k = 1 \dots m, j = 1 \dots (m - 1), j \neq k$$

$$\Delta Y_{rel} = \Delta Y_j - \Delta Y_k, \quad \text{for } k = 1 \dots m, j = 1 \dots (m - 1), j \neq k$$

4. Calculate the relative standard deviations in each axis:

$$\sigma_{X,rel} = \sqrt{\frac{\sum \Delta X_{rel}^2}{m - 1}}$$

$$\sigma_{Y,rel} = \sqrt{\frac{\sum \Delta Y_{rel}^2}{m - 1}}$$

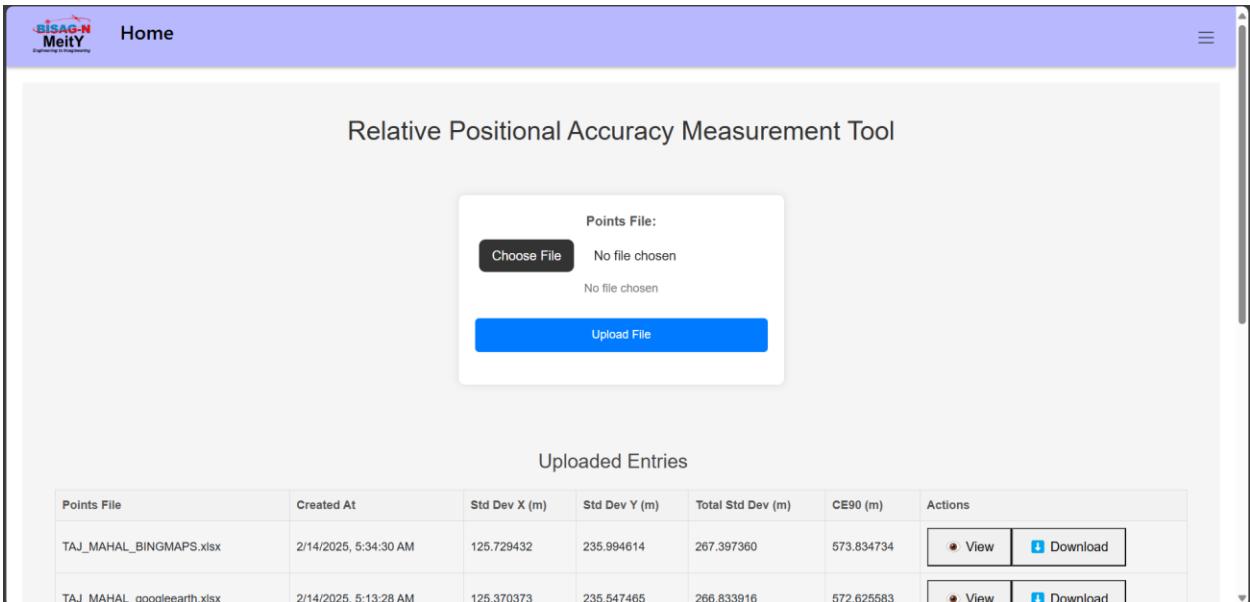
5. Calculate the relative horizontal standard deviation:

$$\sigma_{H,rel} = \sqrt{\frac{\sigma_{X,rel}^2 + \sigma_{Y,rel}^2}{2}}$$

6. Calculate the Relative CE by converting the sigma to a 90% significance level:

$$\text{Rel CE90} = 2.146 \cdot \sigma_{H,rel}$$

- **Step 1:** Click on Internal / Relative Position Accuracy.
- **Step 2:** Uploading the file.

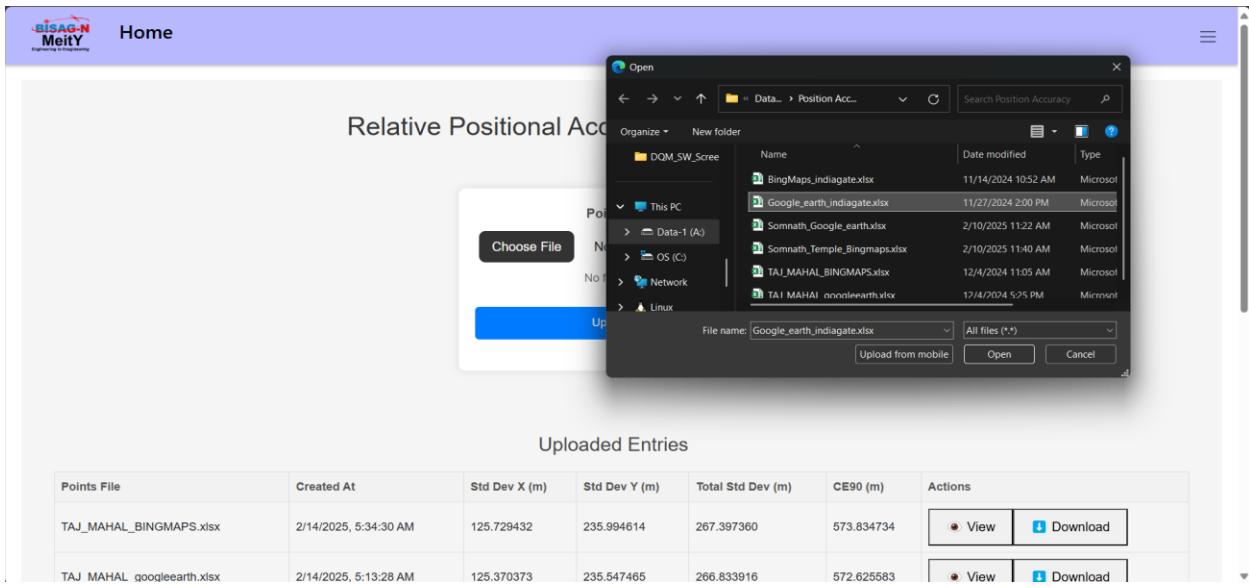


Points File	Created At	Std Dev X (m)	Std Dev Y (m)	Total Std Dev (m)	CE90 (m)	Actions
TAJ_MAHAL_BINGMAPS.xlsx	2/14/2025, 5:34:30 AM	125.729432	235.994614	267.397360	573.834734	View Download
TAJ_MAHAL_googleearth.xlsx	2/14/2025, 5:13:28 AM	125.370373	235.547465	266.833916	572.625583	View Download

Figure_44: Relative Positional Accuracy

- By clicking “choose file”, choose Point File(Google_earth_indiagate.xlsx)¹⁸ from the directory which contains Longitude and Latitude of the position.

¹⁸ Refer the file (Google_earth_indiagate.xlsx) path: DataSheets\Position Accuracy\ Google_earth_indiagate.xlsx

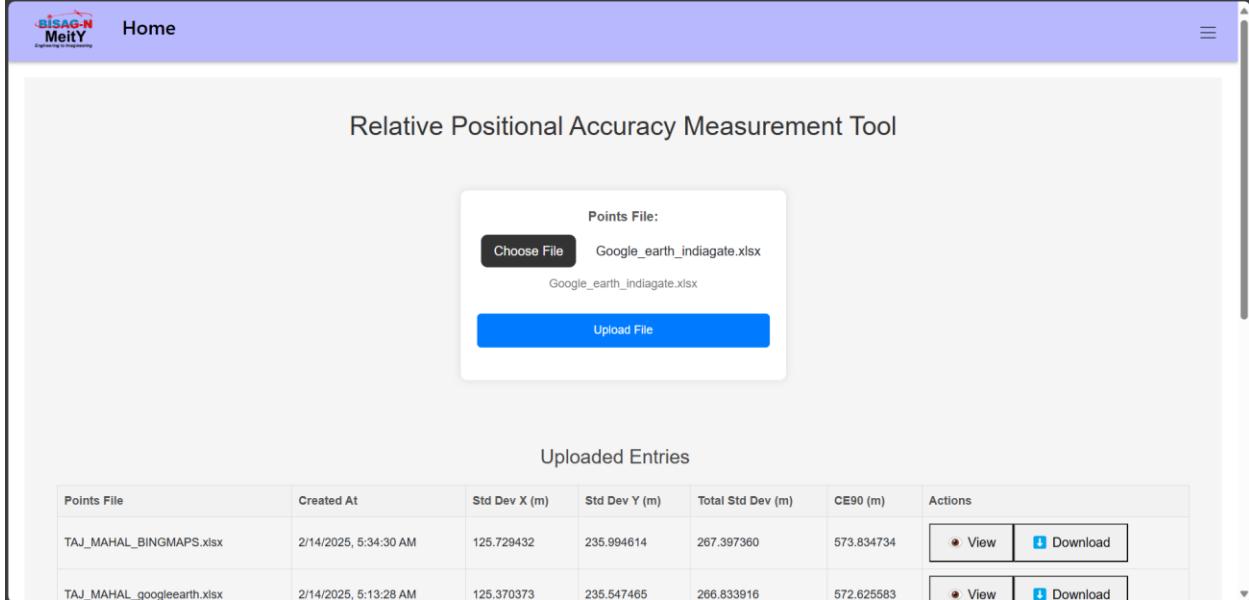


The screenshot shows a web-based application interface. At the top, there's a header with the BISAG-N MeitY logo and a "Home" button. Below the header, the title "Relative Positional Accuracy Measurement Tool" is displayed. A modal window titled "Choose File" is open, showing a list of files from a local drive. The table below lists "Uploaded Entries" with columns: Points File, Created At, Std Dev X (m), Std Dev Y (m), Total Std Dev (m), CE90 (m), and Actions (View, Download). Two entries are shown:

Points File	Created At	Std Dev X (m)	Std Dev Y (m)	Total Std Dev (m)	CE90 (m)	Actions
TAJ_MAHAL_BINGMAPS.xlsx	2/14/2025, 5:34:30 AM	125.729432	235.994614	267.397360	573.834734	View Download
TAJ_MAHAL_googleearth.xlsx	2/14/2025, 5:13:28 AM	125.370373	235.547465	266.833916	572.625583	View Download

Figure_45: Selecting The file

- **Step 3:** Click “Upload File” and upload the respective file.



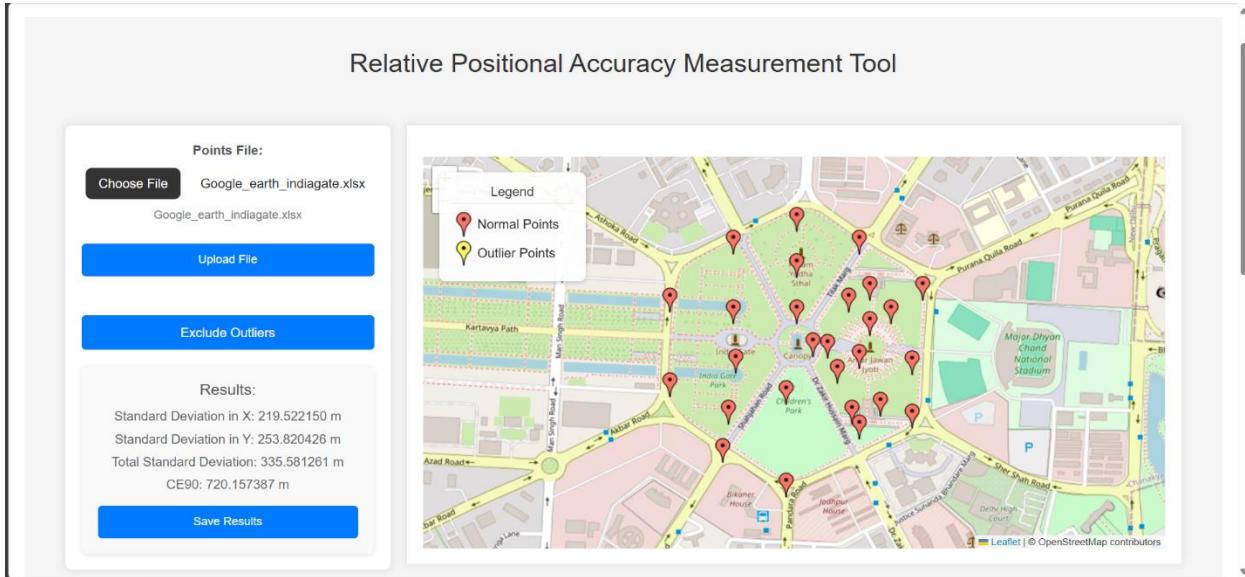
The screenshot shows the same web-based application interface after a file has been uploaded. The "Choose File" button now displays "Google_earth_indiaglate.xlsx". The table of "Uploaded Entries" remains the same as in Figure 45. Below the table, there is a map visualization showing the locations of the points measured.

Figure_46: Checking the Result

- **Step 4:** Here you can see a map orientated result for positional accuracy.
 - Here the distance between the measured points is calculated and then is compared with original long/late to determine the error.
 - And there is determination of **Standard Deviation in X and Y, Total Standard Deviation and CE90 error** and **ratio of Mean Positional Uncertainty to Standard Deviation**.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- Here you got the option to visualize the outlier's differentiation by clicking on “Exclude Outliers”.



Figure_47: Result of Relative Positional Accuracy

- **Step 5:** To Save the results in the database click “**Save Results**”.
 - Here you can save the result to the database and can view and download it later in future.

Uploaded Entries						
Points File	Created At	Std Dev X (m)	Std Dev Y (m)	Total Std Dev (m)	CE90 (m)	Actions
Google_earth_indigate.xlsx	2/14/2025, 10:09:02 AM	219.522150	253.820426	335.581261	720.157387	View Download
TAJ_MAHAL_BINGMAPS.xlsx	2/14/2025, 5:34:30 AM	125.729432	235.994614	267.397360	573.834734	View Download
TAJ_MAHAL_googleearth.xlsx	2/14/2025, 5:13:28 AM	125.370373	235.547465	266.833916	572.625583	View Download
Google_earth_indigate.xlsx	2/13/2025, 12:14:48 PM	219.522150	253.820426	335.581261	720.157387	View Download
TAJ_MAHAL_BINGMAPS.xlsx	2/13/2025, 11:26:38 AM	125.729432	235.994614	267.397360	573.834734	View Download
TAJ_MAHAL_googleearth.xlsx	2/13/2025, 11:25:50 AM	125.370373	235.547465	266.833916	572.625583	View Download
Somnath_Temple_Bingmaps.xlsx	2/13/2025, 11:06:31 AM	59.629768	44.915641	74.653359	160.206109	View Download
TAJ_MAHAL_googleearth.xlsx	2/13/2025, 11:00:35 AM	125.370373	235.547465	266.833916	572.625583	View Download
Somnath_Temple_Bingmaps.xlsx	2/13/2025, 11:00:19 AM	59.629768	44.915641	74.653359	160.206109	View Download

Figure_48: Preview and Download Past Results Page

- To **view and download** the result later.

Points File

- Google_earth_Indiagate.xlsx
- TAJ_MAHAL_BINGMAPS.xlsx
- TAJ_MAHAL_googleearth.xlsx
- Google_earth_Indiagate.xlsx
- TAJ_MAHAL_BINGMAPS.xlsx
- TAJ_MAHAL_googleearth.xlsx
- Somnath_Temple_Bingmaps.xlsx
- TAJ_MAHAL_googleearth.xlsx
- Somnath_Temple_Bingmaps.xlsx

Data Preview

Points File: Google_earth_Indiagate.xlsx

Created At: 2/14/2025, 10:09:02 AM

Standard Deviation in X: 219.522150 m

Standard Deviation in Y: 253.820426 m

Total Standard Deviation: 335.581261 m

CE90: 720.157387 m

Include Outliers

Point i	Latitude i	Longitude i	Point j	Latitude j	Longitude j	Delta X (m)	Delta Y (m)	Distance (m)
1	28.61218539	77.23218622	2	28.61281989	77.23153872	-63.206124	70.553181	94.724682
1	28.61218539	77.23218622	3	28.61027778	77.22916667	-294.758858	-212.116554	363.147652
1	28.61218539	77.23218622	4	28.60944444	77.23083333	-132.065339	-304.779734	332.162521
1	28.61218539	77.23218622	5	28.61120689	77.22931283	-280.489944	-108.804236	300.853736
1	28.61218539	77.23218622	6	28.61166667	77.23083333	-132.063942	-57.679032	144.110220
1	28.61218539	77.23218622	7	28.61242272	77.22951772	-260.487815	26.389892	261.821176

Figure_49: Preview Past Results

26	27.175271	78.043224	26	27.173012	78.041527	-187.052457	-26.799480	189.849759
26	27.175271	78.043224	29	27.174765	78.040996	-220.395410	-56.264633	227.463943
26	27.175271	78.043224	30	27.171081	78.041301	-190.227723	-465.906743	503.245149
26	27.175271	78.043224	31	27.170849	78.042095	-111.683475	-491.703966	504.228112
26	27.175271	78.043224	32	27.17128	78.042231	-98.229829	-443.778952	454.520470
26	27.175271	78.043224	33	27.171115	78.042966	-25.521968	-462.126115	462.830333
26	27.175271	78.043224	34	27.170481	78.043631	40.261514	-532.623699	534.143233
26	27.175271	78.043224	35	27.170497	78.04061	-258.583760	-530.844580	590.475680
26	27.175271	78.043224	36	27.170433	78.042116	-109.606308	-537.961055	549.013333
26	27.175271	78.043224	37	27.171648	78.041801	-140.766179	-402.859219	426.744265
26	27.175271	78.043224	38	27.171672	78.042456	-75.972181	-400.190541	407.337994
27	27.175019	78.042918	28	27.175012	78.041327	-157.382902	-0.778364	157.384826
27	27.175019	78.042918	29	27.174765	78.040996	-190.125878	-28.243511	192.212240
27	27.175019	78.042918	30	27.171081	78.041301	-159.957658	-437.885621	466.186947
27	27.175019	78.042918	31	27.170849	78.042095	-81.413290	-463.682844	470.775853
27	27.175019	78.042918	32	27.17128	78.042231	-67.959686	-415.757831	421.275554
27	27.175019	78.042918	33	27.171115	78.042966	4.748279	-434.104994	434.130961

Figure_50: Preview Past Results(Outliers are highlighted)

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Thematic Quality

Measures the correctness of classified data and attributes. It includes thematic classification correctness, qualitative attribute accuracy, and quantitative attribute correctness.

Types of Thematic Quality:

- **Thematic Classification Correctness:** Proper categorization of data.
- **Non-Quantitative Attribute Correctness:** Accuracy of qualitative attributes.
- **Quantitative Attribute Correctness:** Accuracy of numerical values.

Formula used:

1. Kappa Coefficient: The Kappa statistic measures agreement between predicted and actual classifications, adjusting for chance agreement.

$$\kappa = \frac{P_o - P_e}{1 - P_e}$$

Where:

- P_o = Observed Agreement (sum of diagonal elements of the confusion matrix divided by total samples)
- P_e = Expected Agreement (sum of the products of row and column totals divided by total samples squared)

$$P_o = \frac{\sum_i C_{ii}}{N}$$

$$P_e = \frac{\sum_i (R_i \times C_i)}{N^2}$$

Where:

- C_{ii} = Count of correctly classified instances for class i
- R_i = Total instances in row i (actual class total)
- C_i = Total instances in column i (predicted class total)
- N = Total number of samples

2. Misclassification Rate (Error Rate): The misclassification rate is the proportion of incorrectly classified instances.

$$\text{Misclassification Rate} = \frac{\sum_{i \neq j} C_{ij}}{N}$$

Where:

- C_{ij} = Count of misclassified instances
- N = Total number of samples

3. Correctly Classified Rate (Overall Accuracy): Also known as classification accuracy, it is the proportion of correctly classified samples.

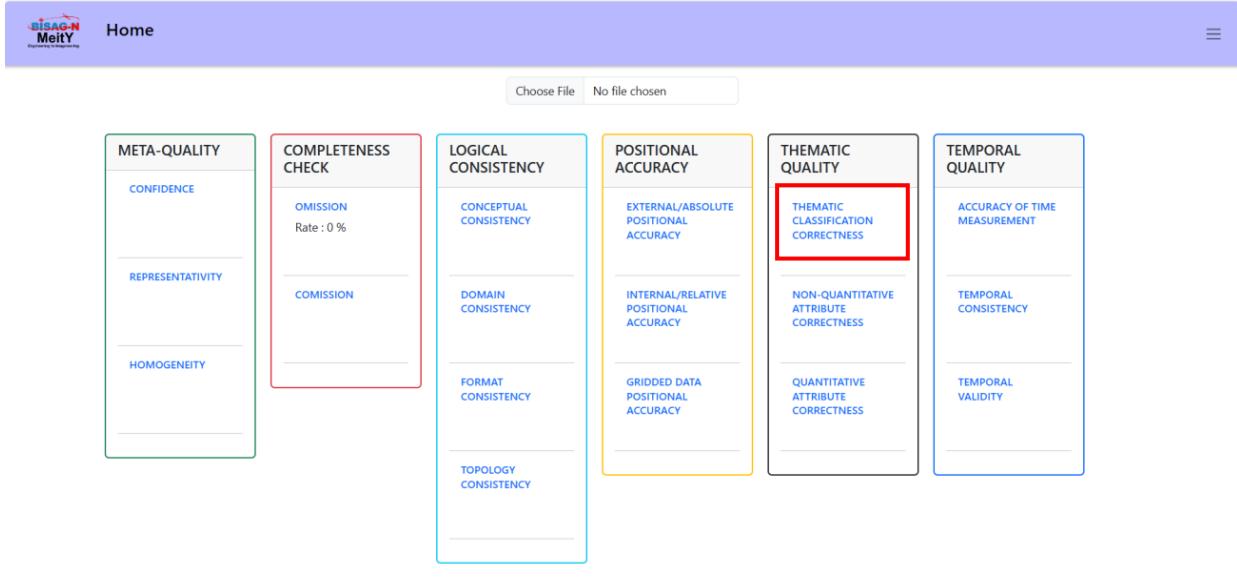
$$\text{Overall Accuracy} = \frac{\sum_i C_{ii}}{N}$$

Where:

- C_{ii} = Count of correctly classified instances for each class
- N = Total number of samples

A. Thematic Classification Correctness

- **Step 1:** Click on Thematic Classification Correctness.



The screenshot shows a web-based dashboard with a purple header bar containing the BISAG-N MeitY logo and a 'Home' button. Below the header is a file upload section with 'Choose File' and 'No file chosen' buttons. The main content area is divided into six colored boxes representing different quality categories:

- META-QUALITY** (Green): Includes sections for CONFIDENCE, REPRESENTATIVITY, and HOMOGENEITY.
- COMPLETENESS CHECK** (Red Box): Includes sections for OMISSION (Rate: 0 %) and COMISSION.
- LOGICAL CONSISTENCY** (Blue): Includes sections for CONCEPTUAL CONSISTENCY, DOMAIN CONSISTENCY, FORMAT CONSISTENCY, and TOPOLOGY CONSISTENCY.
- POSITIONAL ACCURACY** (Yellow): Includes sections for EXTERNAL/ABSOLUTE POSITIONAL ACCURACY, INTERNAL/RELATIVE POSITIONAL ACCURACY, and GRIDDED DATA POSITIONAL ACCURACY.
- THEMATIC QUALITY** (Red Box): This box is highlighted with a red border and contains the section **THEMATIC CLASSIFICATION CORRECTNESS**. It also includes sections for NON-QUANTITATIVE ATTRIBUTE CORRECTNESS and QUANTITATIVE ATTRIBUTE CORRECTNESS.
- TEMPORAL QUALITY** (Light Blue): Includes sections for ACCURACY OF TIME MEASUREMENT, TEMPORAL CONSISTENCY, and TEMPORAL VALIDITY.

Figure_51: Dashboard (Main Page)

- It will navigate to the Thematic Classification Page.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Home ☰

State ▼

ThematicClassification

No file chosen

Available Attribute Headings

>
>>
<
<<

Data Product Specification

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
			<input type="button" value="Select Items"/> <input type="button" value="DeSelect Items"/>				

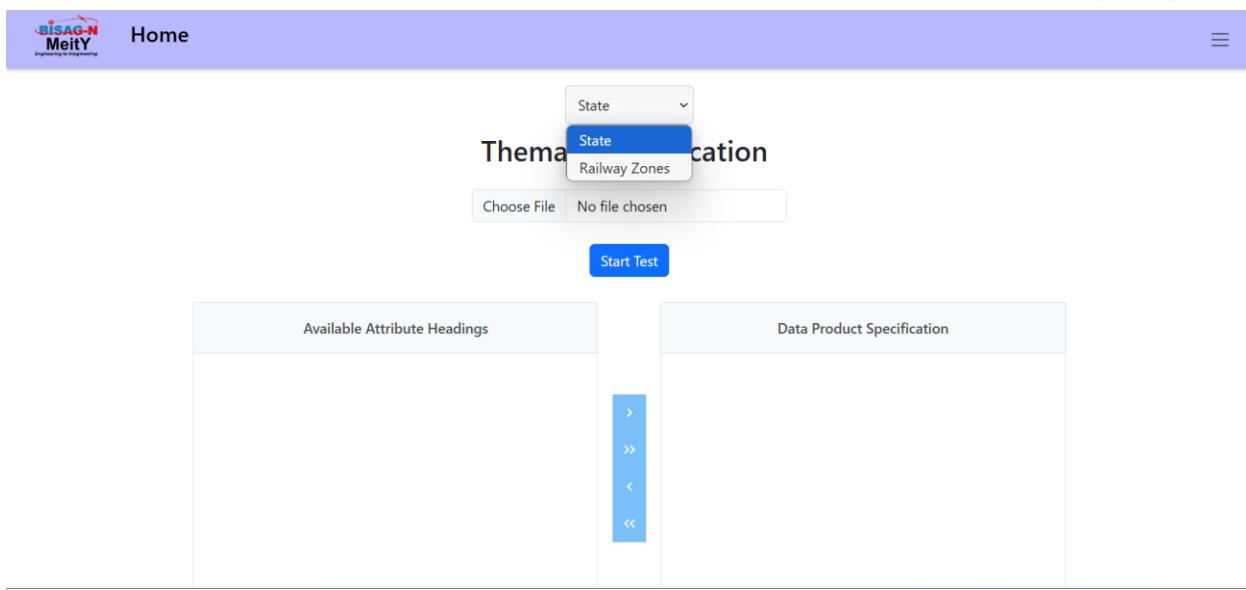
Correctly classified Rate: ---

Misclassification Rate: ---

Figure_52: Thematic Classification Page

- **Step 2:** Select the category. (All the steps are same for both the categories.)

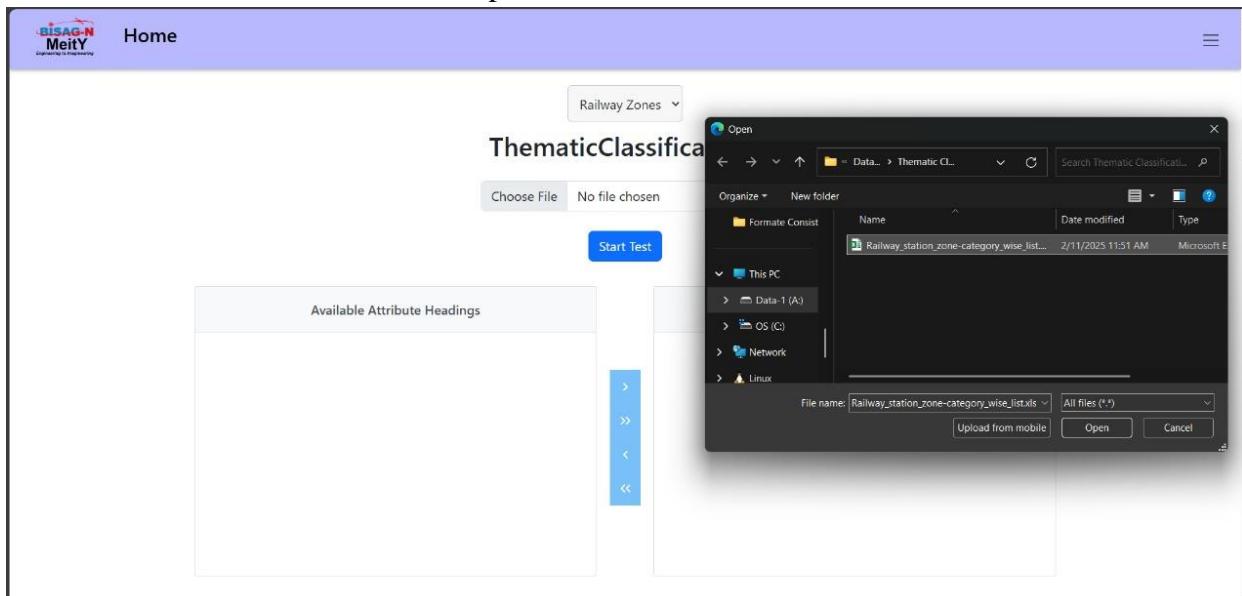
For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Figure_53: Category Dropdown menu

- **Step 3:** Upload the file.

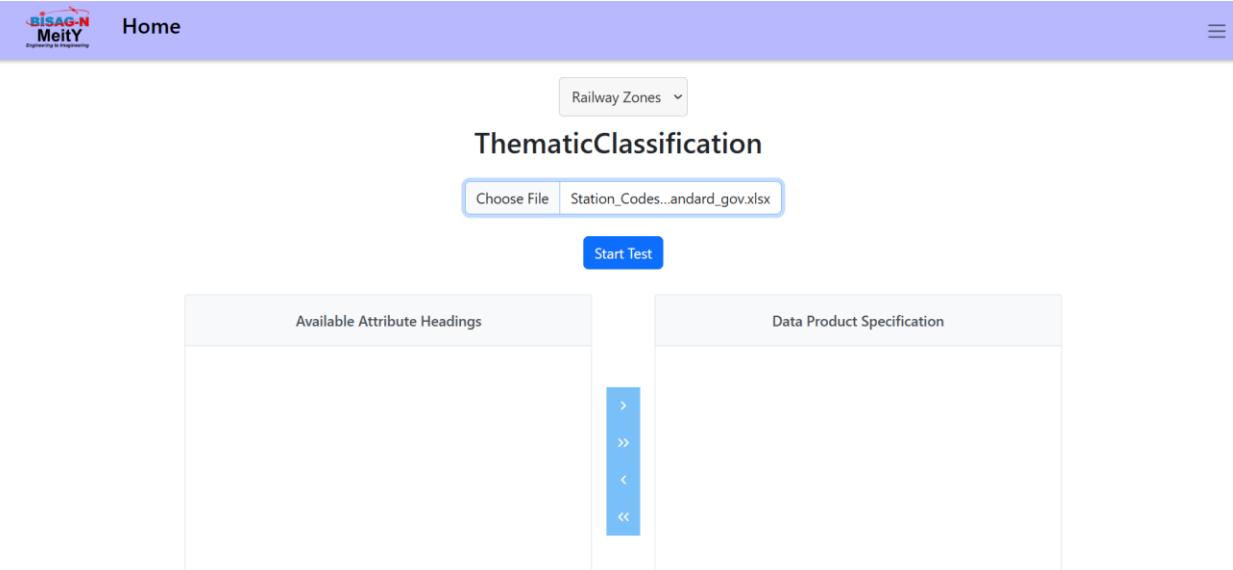
- By clicking “choose file”, choose the appropriate file. This data file (Railway_station_zone-category_wise_list.xlsx)¹⁹ should consist of the Category which has been selected.
- Select the file and click Open.



Figure_54: File Selection

¹⁹ Refer the file (Google_earth_indiagate.xlsx) path: *DataSheets\Thematic Classification\ Railway_station_zone-category_wise_list.xlsx*

- The file name should appear like this.

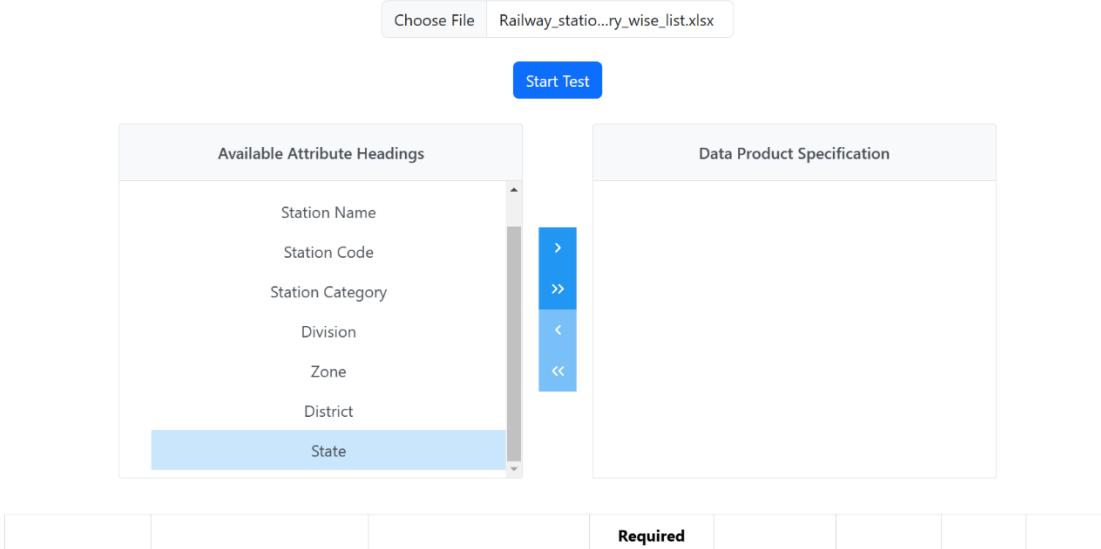


The screenshot shows a web-based application titled "ThematicClassification". At the top, there is a navigation bar with the "Home" link and a "Railway Zones" dropdown menu. Below the navigation is a file upload section with a "Choose File" button and a selected file name "Station_Codes...andard_gov.xlsx". A blue "Start Test" button is located below the file selection area. The main interface consists of two tables: "Available Attribute Headings" on the left and "Data Product Specification" on the right. Between the tables is a vertical column of four blue navigation arrows: a single right arrow (">"), a double right arrow (">>"), a single left arrow ("<"), and a double left arrow ("<<"). The "Available Attribute Headings" table contains the following list of attributes:

- Station Name
- Station Code
- Station Category
- Division
- Zone
- District
- State

Figure_55: File uploaded

- Click the “Start Test” button.
- The attributes of that file should appear in the table. Then choose the attribute for which the categorization is needed



This screenshot shows the same "ThematicClassification" interface after a file has been uploaded. The "Available Attribute Headings" table now includes the "State" attribute, which is highlighted with a blue background. The "Data Product Specification" table is currently empty. Below the tables is a horizontal table with several columns. The fourth column from the left is labeled "Required" and contains a small blue square icon.

Figure_56: Attributes of file

- Select the attribute and click on the navigate.
- ion arrow to move attribute(es) right side for checking. It should also reflect in the table which is below current table.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Available Attribute Headings		Data Product Specification					
S No		State					
Station Name	>						
Station Code	>>						
Station Category	<						
Division	<<						
Zone							
District							

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
State	Select		Select Items DeSelect Items				

Figure_57: Selection of Attributes

- **Step 5:** Here, you can select the type of attribute.

Available Attribute Headings		Data Product Specification					
Station Code							
Station Category	>>						
Division	<						
Zone	<<						
District							

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
State	Select		Select Items DeSelect Items				

Select
 Integer
 Decimal
 Boolean
 List
String

Correctly classified Rate: ---

Figure_58: Dropdown menu for datatype of category

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
State	List	MAHARASHTRA MADHYA PRADESH KARNATAKA ODISHA ANDHRA PRADESH Odisha CHHATTISGARH BIHAR UTTAR PRADESH JHARKHAND WEST BENGAL HARYANA RAJASTHAN UTTARAKHAND ASSAM West Bengal TRIPURA NAGALAND MIZORAM MANIPUR	<input type="checkbox"/> MAHARASHTRA <input type="checkbox"/> MADHYA PRADESH <input type="checkbox"/> KARNATAKA <input type="checkbox"/> ODISHA <input type="checkbox"/> ANDHRA PRADESH <input type="checkbox"/> Odisha <input type="checkbox"/> CHHATTISGARH <input type="checkbox"/> BIHAR <input type="checkbox"/> UTTAR PRADESH <input type="checkbox"/> JHARKHAND <input type="checkbox"/> WEST BENGAL <input type="checkbox"/> HARYANA <input type="checkbox"/> RAJASTHAN <input type="checkbox"/> UTTARAKHAND <input type="checkbox"/> ASSAM	Min: 3, Max: 19			

Figure_59: Resultant values according to datatype

- Select the required range as per need.

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
State	List	MAHARASHTRA MADHYA PRADESH KARNATAKA ODISHA ANDHRA PRADESH Odisha CHHATTISGARH BIHAR UTTAR PRADESH JHARKHAND WEST BENGAL HARYANA RAJASTHAN UTTARAKHAND ASSAM West Bengal TRIPURA NAGALAND MIZORAM MANIPUR	<input checked="" type="checkbox"/> MAHARASHTRA <input type="checkbox"/> MADHYA PRADESH <input type="checkbox"/> KARNATAKA <input type="checkbox"/> ODISHA <input checked="" type="checkbox"/> ANDHRA PRADESH <input type="checkbox"/> Odisha <input checked="" type="checkbox"/> CHHATTISGARH <input type="checkbox"/> BIHAR <input checked="" type="checkbox"/> UTTAR PRADESH <input type="checkbox"/> JHARKHAND <input type="checkbox"/> WEST BENGAL <input checked="" type="checkbox"/> HARYANA <input type="checkbox"/> RAJASTHAN <input checked="" type="checkbox"/> UTTARAKHAND <input type="checkbox"/> ASSAM	MAHARASHTRA, ANDHRA PRADESH, CHHATTISGARH, UTTAR PRADESH, HARYANA, UTTARAKHAND			

Figure_60: Selection of Range

- Step 6:** Click on “Calculate error rate”. It will calculate and show the value of “Correctly Classified Rate” and “Misclassification Rate”.

Attributes	Data type	Range in data	Required range	Selected range	Total attributes	classified Incorrect	classified correct
State	List	MAHARASHTRA MADHYA PRADESH KARNATAKA ODISHA ANDHRA PRADESH Odisha CHHATTISGARH BIHAR UTTAR PRADESH JHARKHAND WEST BENGAL HARYANA RAJASTHAN UTTARAKHAND ASSAM West Bengal TRIPURA NAGALAND MIZORAM MANIPUR	<input checked="" type="checkbox"/> MAHARASHTRA <input type="checkbox"/> MADHYA PRADESH <input type="checkbox"/> KARNATAKA <input type="checkbox"/> ODISHA <input checked="" type="checkbox"/> ANDHRA PRADESH <input type="checkbox"/> Odisha <input checked="" type="checkbox"/> CHHATTISGARH <input type="checkbox"/> BIHAR <input checked="" type="checkbox"/> UTTAR PRADESH <input type="checkbox"/> JHARKHAND <input type="checkbox"/> WEST BENGAL <input checked="" type="checkbox"/> HARYANA <input type="checkbox"/> RAJASTHAN <input checked="" type="checkbox"/> UTTARAKHAND <input checked="" type="checkbox"/> ASSAM	MAHARASHTRA, ANDHRA PRADESH, CHHATTISGARH, UTTAR PRADESH, HARYANA, UTTARAKHAND, ASSAM, West Bengal, TRIPURA	8477	5422	3055

[Calculate error rate](#)

Correctly classified Rate: 36.04%

Misclassification Rate: 63.96%

[Save](#)

[Confusion Matrix](#)

Figure_61: Calculation of Result

- **Step 7:** Click on “Confusion Matrix” to check the classification.

Confusion Matrix

True Class I	Dataset Class									Total
	MAHARASHTRA	ANDHRA PRADESH	CHHATTISGARH	UTTAR PRADESH	HARYANA	UTTARAKHAND	ASSAM	WEST BENGAL	TRIPURA	
MAHARASHTRA	688	0	0	0	0	0	0	0	0	688
ANDHRA PRADESH	0	447	0	0	0	0	0	0	0	447
CHHATTISGARH	0	0	141	0	0	0	0	0	0	141
UTTAR PRADESH	0	0	0	1173	0	0	0	0	0	1173
HARYANA	0	0	0	0	216	0	0	0	0	216
UTTARAKHAND	0	0	0	0	0	43	0	0	0	43
ASSAM	0	0	0	0	0	0	319	0	0	319
WEST BENGAL	0	0	0	0	0	0	0	1	0	1
TRIPURA	0	0	0	0	0	0	0	0	27	27
Total	688	447	141	1173	216	43	319	1	27	3055

Kappa Coefficient: 1.0000

Number of Incorrect Attributes: 0

Rate of Correct Attributes: 100.00%

Rate of Incorrect Values: 0.00%

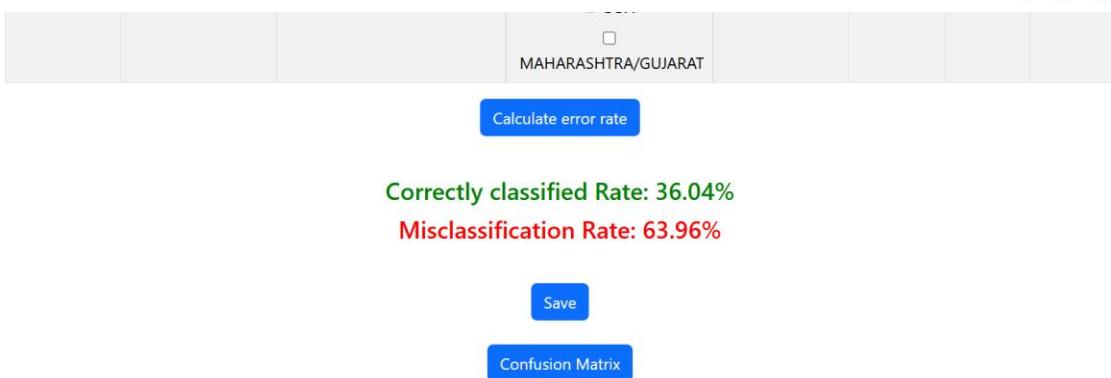
Figure_62: Confusion matrix and its results

Relative Misclassification Matrix

True Class I	Dataset Class									Total
	MAHARASHTRA	ANDHRA PRADESH	CHHATTISGARH	UTTAR PRADESH	HARYANA	UTTARAKHAND	ASSAM	WEST BENGAL	TRIPURA	
MAHARASHTRA	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANDHRA PRADESH	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHHATTISGARH	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UTTAR PRADESH	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
HARYANA	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
UTTARAKHAND	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
ASSAM	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
WEST BENGAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
TRIPURA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00

Figure_63: Relative Misclassification Matrix

- Step 8: Scroll above and click on “Save” to save the results.



Data Table

Sr No.	Dataset values	True values
WEST BENGAL	0.00	0.00
TRIPURA	0.00	0.00

Figure_64: Save Button for Saving the results

- It should appear in the table which is at the bottom of the page.

WEST BENGAL	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	
TRIPURA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	

Name of File	Tested Date	Test Result (%)	View File
20250214T102606_Railway_station_zone-category_wise_list.json	2025-02-13T18:30:00.000Z	63.96	👁
20250214T102539_Railway_station_zone-category_wise_list.json	2025-02-13T18:30:00.000Z	0.00	👁
20250214T101654_Railway_station_zone-category_wise_list.json	2025-02-13T18:30:00.000Z	63.96	👁
20250214T045548_Domain Consistency.json	2025-02-13T18:30:00.000Z	21.74	👁
20250211T051259_auto-mpg.json	2025-02-10T18:30:00.000Z	50.00	👁

Figure_65: Saved log of file

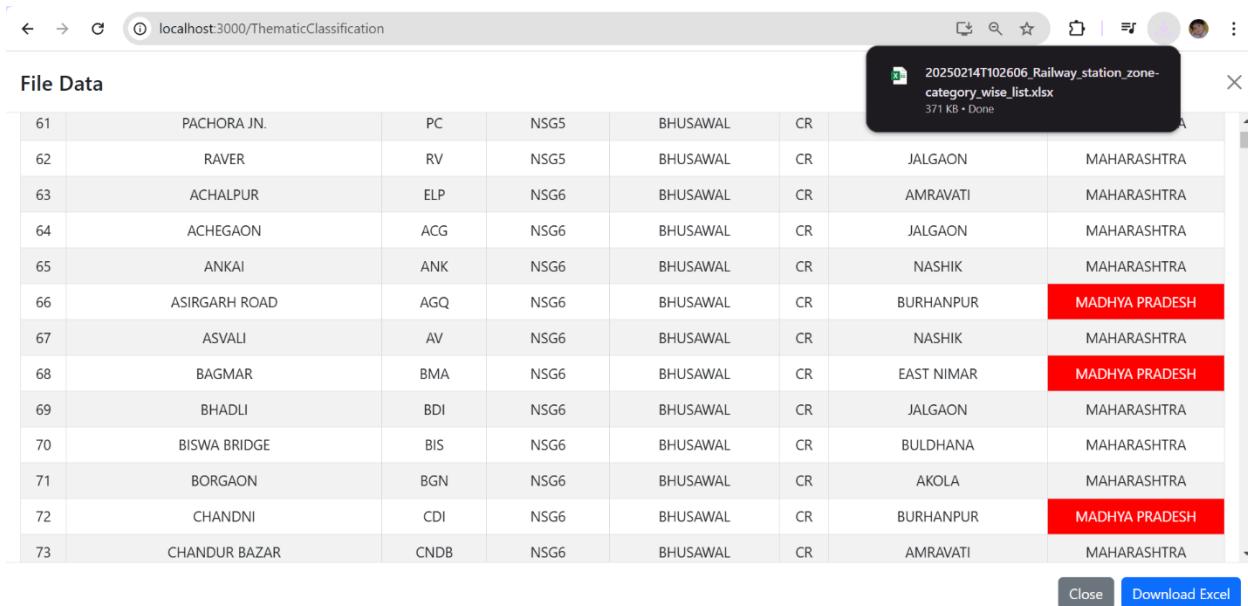
- Step 9:** Click on eye icon to view the saved result. It will show the resulting datasheet with highlighted errors.

File Data

61	PACHORA JN.	PC	NSG5	BHUSAWAL	CR	JALGAON	MAHARASHTRA
62	RAVER	RV	NSG5	BHUSAWAL	CR	JALGAON	MAHARASHTRA
63	ACHALPUR	ELP	NSG6	BHUSAWAL	CR	AMRAVATI	MAHARASHTRA
64	ACHEGAON	ACG	NSG6	BHUSAWAL	CR	JALGAON	MAHARASHTRA
65	ANKAI	ANK	NSG6	BHUSAWAL	CR	NASHIK	MAHARASHTRA
66	ASIRGARH ROAD	AGQ	NSG6	BHUSAWAL	CR	BURHANPUR	MADHYA PRADESH
67	ASVALI	AV	NSG6	BHUSAWAL	CR	NASHIK	MAHARASHTRA
68	BAGMAR	BMA	NSG6	BHUSAWAL	CR	EAST NIMAR	MADHYA PRADESH
69	BHADLI	BDI	NSG6	BHUSAWAL	CR	JALGAON	MAHARASHTRA
70	BISWA BRIDGE	BIS	NSG6	BHUSAWAL	CR	BULDHANA	MAHARASHTRA
71	BORGAON	BGN	NSG6	BHUSAWAL	CR	AKOLA	MAHARASHTRA
72	CHANDNI	CDI	NSG6	BHUSAWAL	CR	BURHANPUR	MADHYA PRADESH
73	CHANDUR BAZAR	CNDB	NSG6	BHUSAWAL	CR	AMRAVATI	MAHARASHTRA

[Close](#) [Download Excel](#)
Figure_66: View of Saved file

- Click on “Download Excel” to download it.



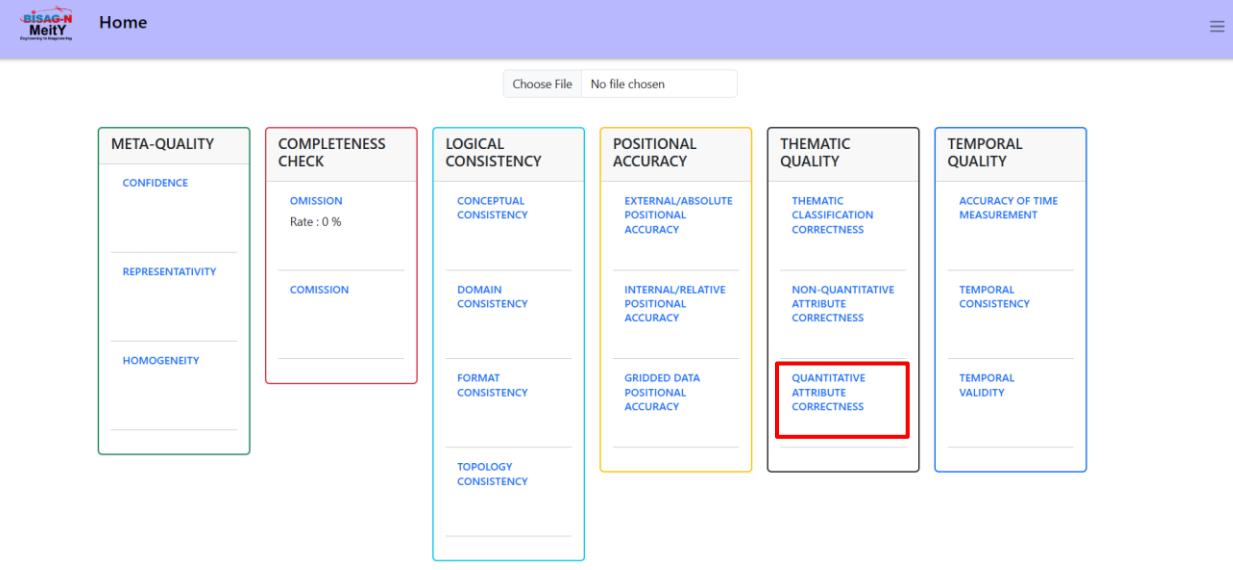
The screenshot shows a browser window with a file download dialog. The dialog displays the file name "20250214T102606_Railway_station_zone-category_wise_list.xlsx", its size "371 KB", and the status "Done". Below the dialog, the browser's address bar shows "localhost:3000/ThematicClassification" and the page content shows a table titled "File Data" with the same data as Figure 66.

61	PACHORA JN.	PC	NSG5	BHUSAWAL	CR	JALGAON	MAHARASHTRA
62	RAVER	RV	NSG5	BHUSAWAL	CR	JALGAON	MAHARASHTRA
63	ACHALPUR	ELP	NSG6	BHUSAWAL	CR	AMRAVATI	MAHARASHTRA
64	ACHEGAON	ACG	NSG6	BHUSAWAL	CR	JALGAON	MAHARASHTRA
65	ANKAI	ANK	NSG6	BHUSAWAL	CR	NASHIK	MAHARASHTRA
66	ASIRGARH ROAD	AGQ	NSG6	BHUSAWAL	CR	BURHANPUR	MADHYA PRADESH
67	ASVALI	AV	NSG6	BHUSAWAL	CR	NASHIK	MAHARASHTRA
68	BAGMAR	BMA	NSG6	BHUSAWAL	CR	EAST NIMAR	MADHYA PRADESH
69	BHADLI	BDI	NSG6	BHUSAWAL	CR	JALGAON	MAHARASHTRA
70	BISWA BRIDGE	BIS	NSG6	BHUSAWAL	CR	BULDHANA	MAHARASHTRA
71	BORGAON	BGN	NSG6	BHUSAWAL	CR	AKOLA	MAHARASHTRA
72	CHANDNI	CDI	NSG6	BHUSAWAL	CR	BURHANPUR	MADHYA PRADESH
73	CHANDUR BAZAR	CNDB	NSG6	BHUSAWAL	CR	AMRAVATI	MAHARASHTRA

[Close](#) [Download Excel](#)
Figure_67: Downloading of Saved file

B. Quantitative Attribute Correctness:

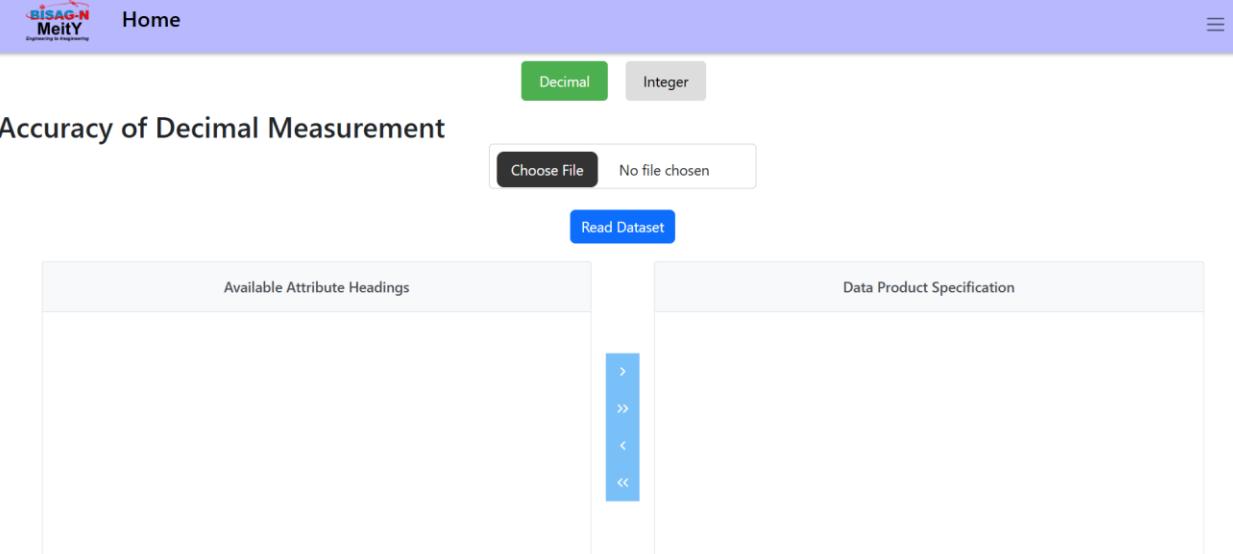
- Step 1: Click on Quantitative Attribute Correctness.



The screenshot shows a dashboard with several categories on the left and their sub-components on the right. The categories are: META-QUALITY (CONFIDENCE, REPRESENTATIVITY, HOMOGENEITY), COMPLETENESS CHECK (OMISSION, COMMISSION), LOGICAL CONSISTENCY (CONCEPTUAL CONSISTENCY, DOMAIN CONSISTENCY, FORMAT CONSISTENCY, TOPOLOGY CONSISTENCY), POSITIONAL ACCURACY (EXTERNAL/ABSOLUTE POSITIONAL ACCURACY, INTERNAL/RELATIVE POSITIONAL ACCURACY, GRIDDED DATA POSITIONAL ACCURACY), THEMATIC QUALITY (THEMATIC CLASSIFICATION CORRECTNESS, NON-QUANTITATIVE ATTRIBUTE CORRECTNESS, QUANTITATIVE ATTRIBUTE CORRECTNESS), and TEMPORAL QUALITY (ACCURACY OF TIME MEASUREMENT, TEMPORAL CONSISTENCY, TEMPORAL VALIDITY). The 'QUANTITATIVE ATTRIBUTE CORRECTNESS' box is highlighted with a red border.

Figure_68: Dashboard (Main Page)

- It will navigate to Quantitative Attribute Correctness page. Select the Category for which the Accuracy measurement is wanted, either Decimal or Integer.



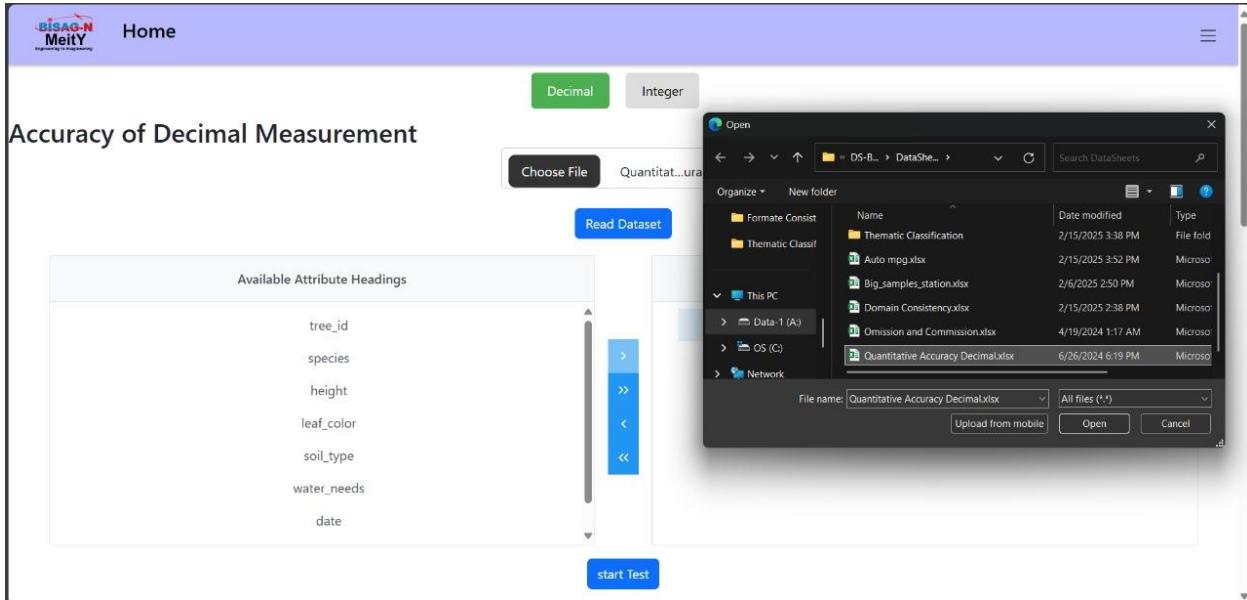
The screenshot shows the 'Accuracy of Decimal Measurement' page. At the top, there are 'Decimal' and 'Integer' buttons. Below them is a 'Choose File' button with 'No file chosen' text. A 'Read Dataset' button is also present. The main area is divided into two sections: 'Available Attribute Headings' on the left and 'Data Product Specification' on the right. A vertical sidebar in the center contains navigation arrows: '>', '>>', '<', and '<<'.

Figure_69: Quantitative Quality Correctness page

- Step 2: Upload the file.

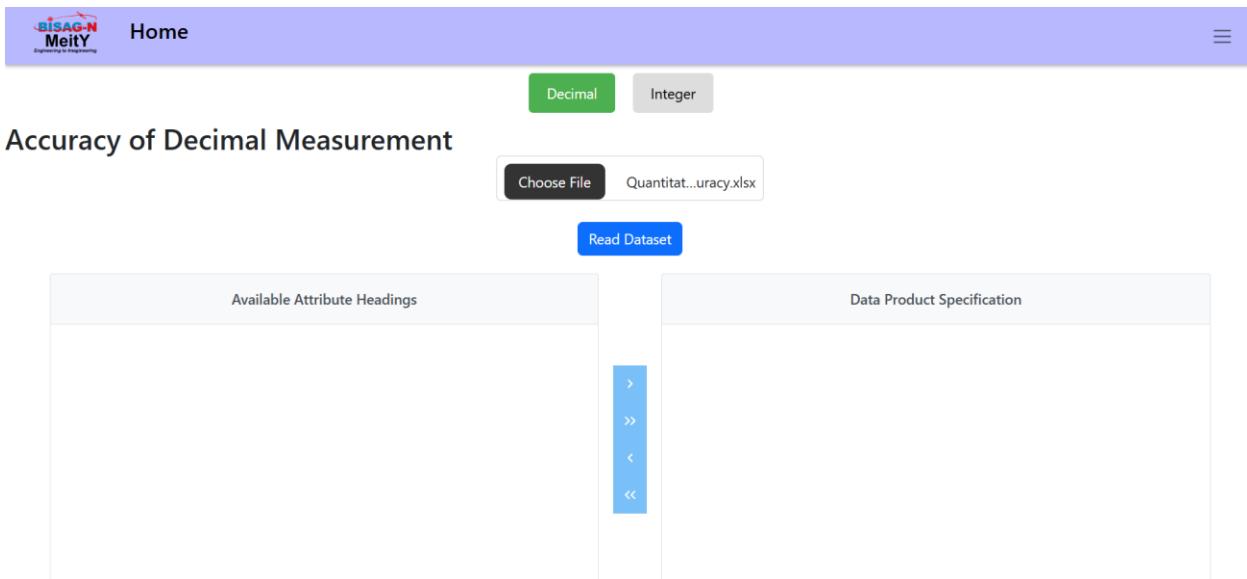
For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

- By clicking “choose file”, choose the appropriate file(Quantitative Accuracy Decimal.xlsx)²⁰. This data file should consist of the Category which has been selected.
- Select the file and click Open.



Figure_70: File Selection

- The file name should appear like this.



Figure_71: File uploaded

- **Step 3:** Click the “Read Dataset” button.

²⁰ Refer the file (Google_earth_indiagiate.xlsx) path: DataSheets\Quantitative Accuracy Decimal.xlsx

- The attributes of that file should appear in the table. Then choose the attribute for which the categorization is needed.

Decimal
Integer

Accuracy of Decimal Measurement

Quantitat...uracy.xlsx

Available Attribute Headings

tree_id	
species	
height	
leaf_color	
soil_type	
water_needs	
date	

Data Product Specification

height

Figure_72: Attributes of file

- Select the attribute and click on the navigation arrow to move attribute(es) right side for checking.

Decimal
Integer

Accuracy of Decimal Measurement

Quantitat...uracy.xlsx

Available Attribute Headings

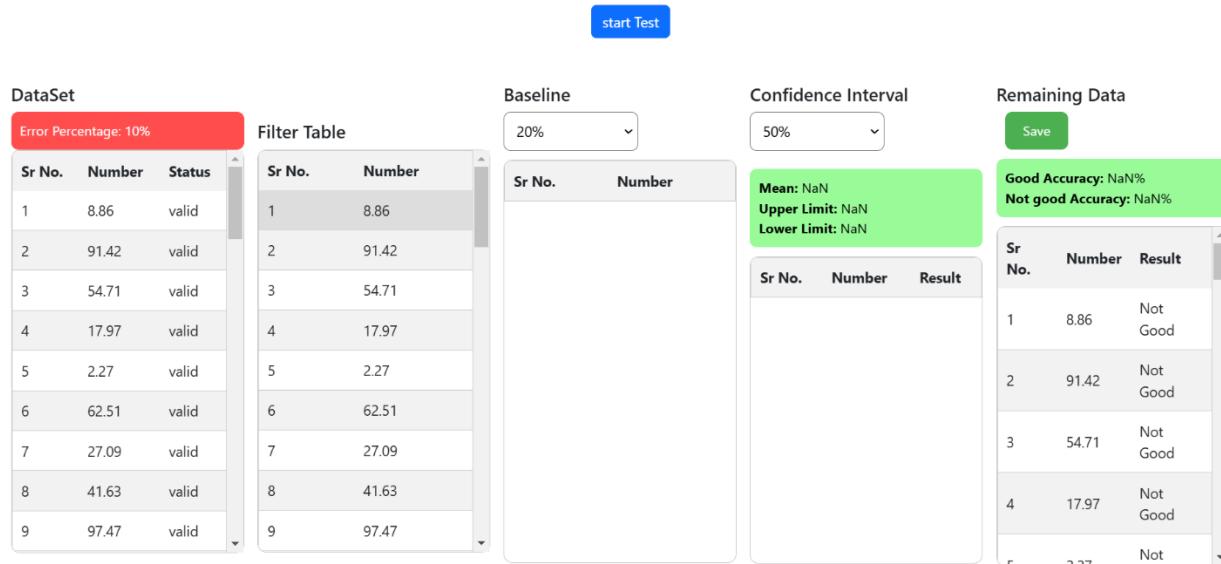
tree_id	
species	
height	
leaf_color	
soil_type	
water_needs	
date	

Data Product Specification

height

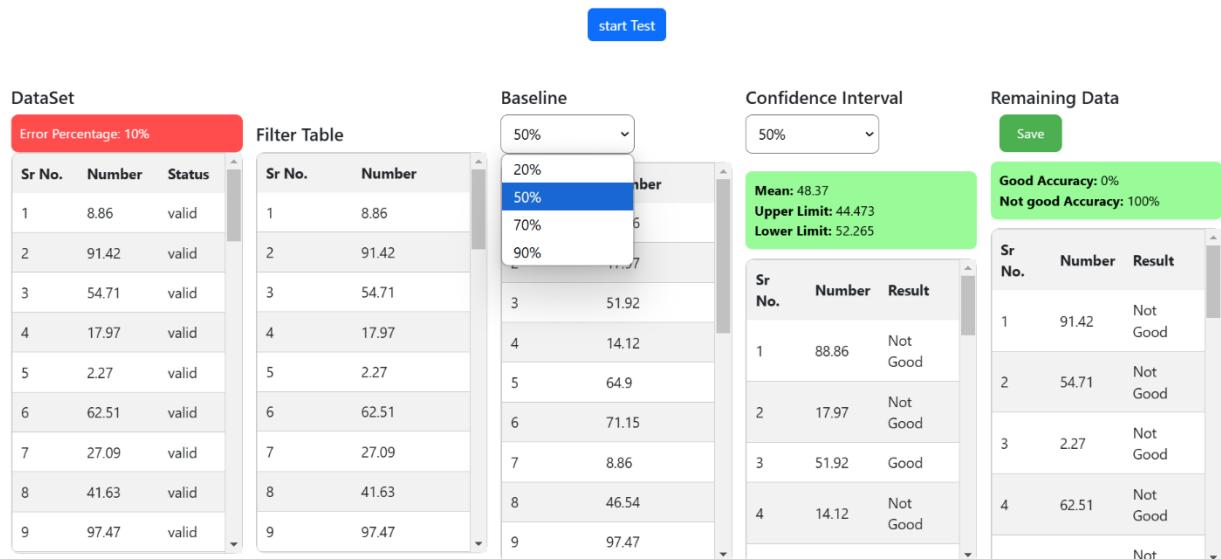
Figure_73: Selection of Attributes

- Step 4:** Click the “Start Test” button to check the results.



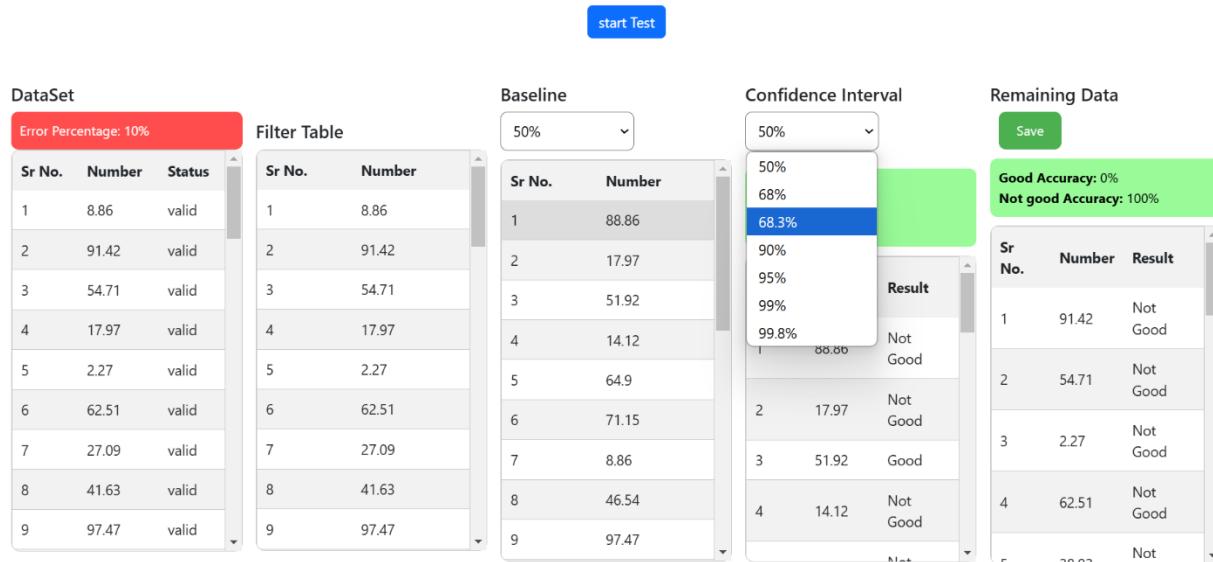
Figure_74: Filtered dataset

- **Step 5:** Choose the Baseline and Confidence Interval as needed.



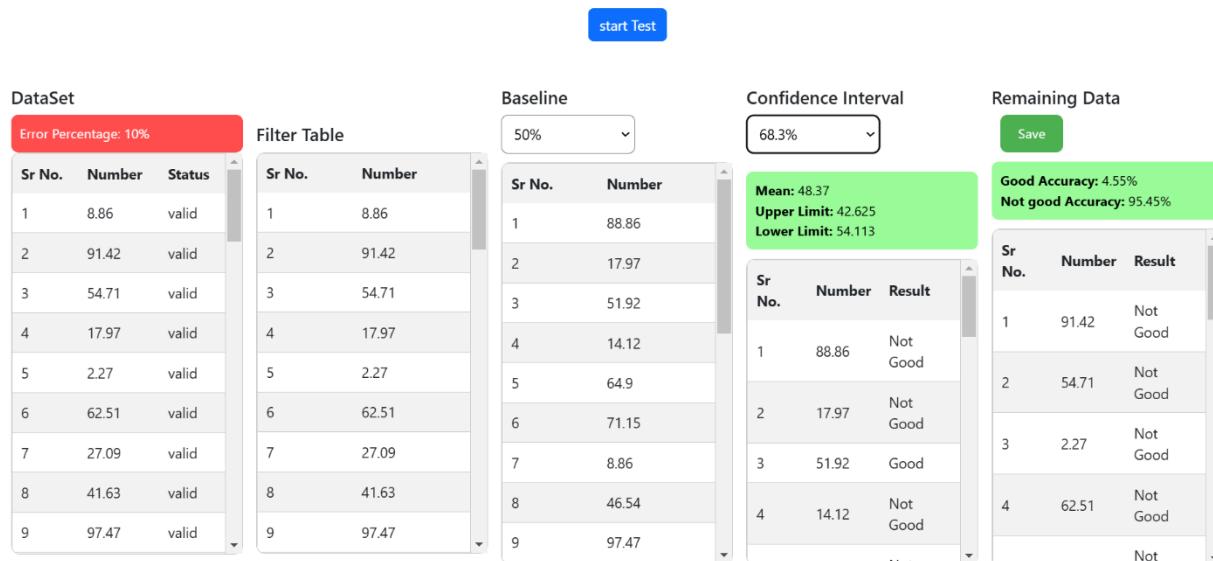
Figure_75: Dropdown menu for Baseline

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Figure_76: Dropdown menu for Confidence Interval

- The result will appear in the rightmost table.



Figure_77: Result

Temporal Quality

Checks the accuracy and consistency of time-related data. It ensures precise time measurements, logical temporal sequences, and relevance over time.

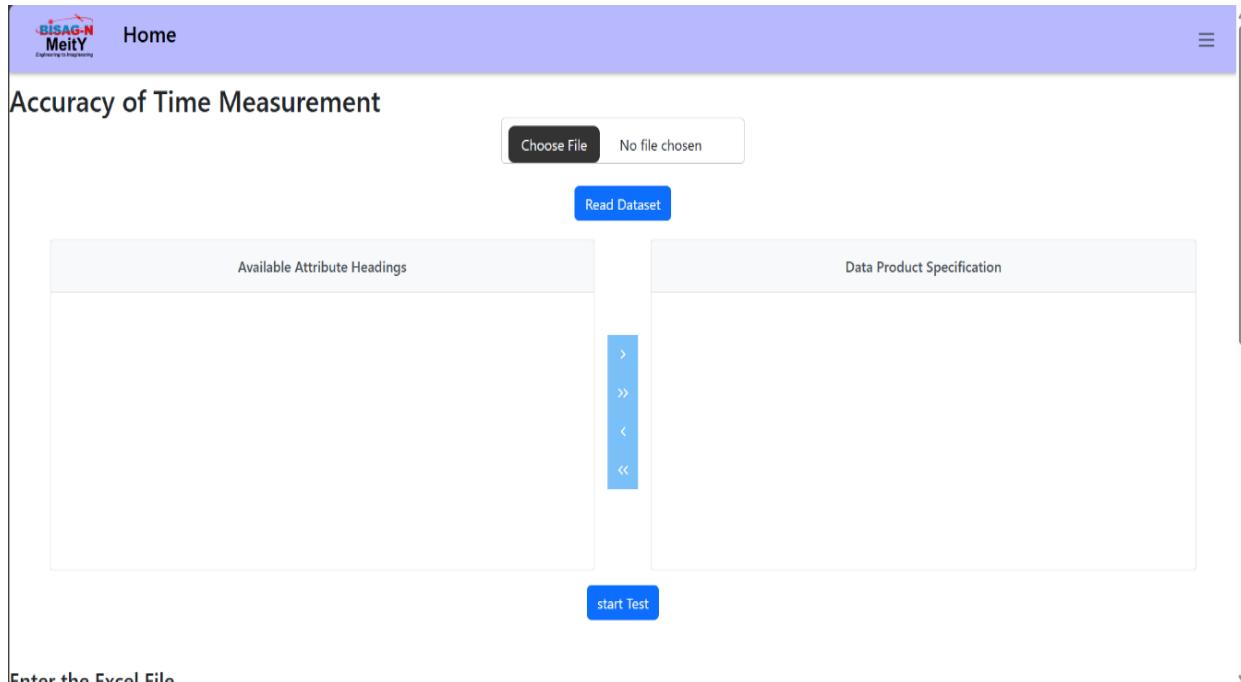
File to be chosen: Temporal Consistency One Date _ Start-End .xlsx²¹

Types of Thematic Quality:

- **Accuracy of Time Measurement:** Precision in recording time.
- **Temporal Consistency:** Logical correctness of time sequences.
- **Temporal Validity:** The data's relevance over time.

A. Accuracy of Time Measurement:

- **Step 1:** Click on Accuracy of Time Measurement.

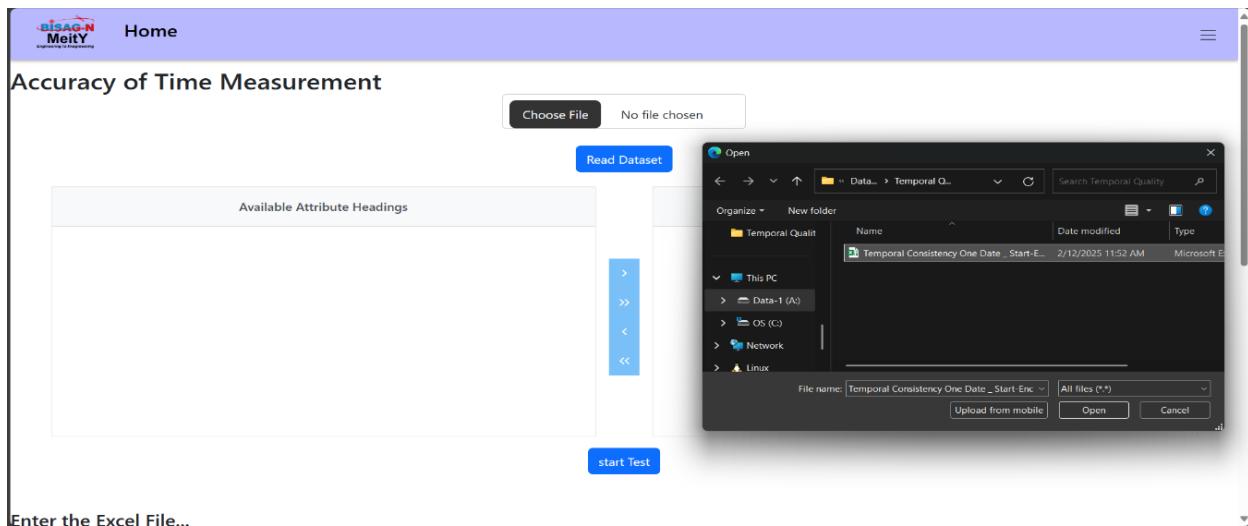


Enter the Excel File

Figure_78: Accuracy of Time Measurement

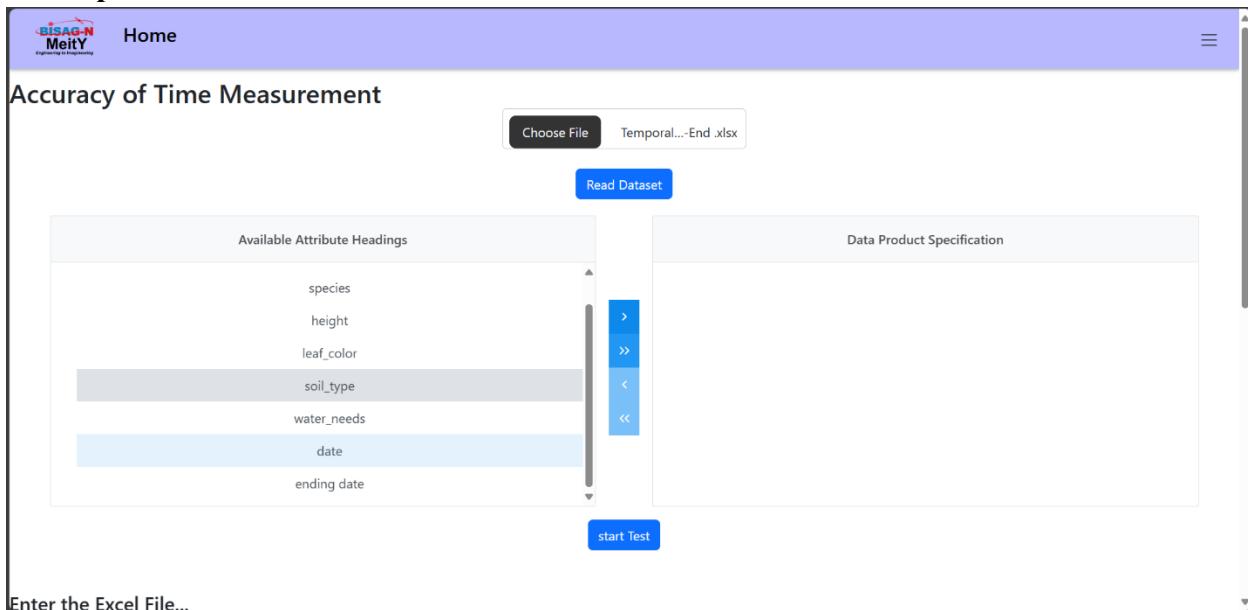
- **Step 2:** Click on Choose file and select the respective file from directory.

²¹ Refer the file (Temporal Consistency One Date _ Start-End .xlsx) path: *DataSheets\Temporal Quality\Temporal Consistency One Date _ Start-End .xlsx*



Figure_79: Uploading the file

- **Step 3:** Click on the Read Dataset and all the attributes of the dataset will be shown



Available Attribute Headings

species
height
leaf_color
soil_type
water_needs
date
ending date

Choose File Temporal...-End.xlsx

Read Dataset

Data Product Specification

start Test

Enter the Excel File...

Figure_80: Reading the Dataset and selecting appropriate column

- **Step 4:** Select Appropriate attributes from the given.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Home

Accuracy of Time Measurement

Choose File Temporal...-End.xlsx

Read Dataset

Available Attribute Headings

- species
- height
- leaf_color
- soil_type
- water_needs
- date
- ending date

Data Product Specification

- date

start Test

Enter the Excel File...

Figure_81: Select appropriate column

- **Step 5:** click “start Test”.
 - Here you choose baseline and confidence interval as required in the result.

ending date

start Test

DataSet

Error Percentage: 22%

Sr No.	Date(YYYY-MM-DD)	Status
1	2012-03-11	Valid
2	2025-02-13	Valid
3	2012-05-11	Valid
4	2012-03-22	Valid
5	1902-03-14	Valid
6	2020-06-10	Valid
7	2010-03-13	Valid
8	2012-01-13	Valid
9	2012-03-03	Valid

Filter Table

Sr No.	Date(YYYY-MM-DD)
1	2012-03-11
2	2025-02-13
3	2012-05-11
4	2012-03-22
5	1902-03-14
6	2020-06-10
7	2010-03-13
8	2012-01-13
9	2012-03-03

Baseline

50%

Sr No.	Date(YYYY-MM-DD)
1	2012-03-23
2	2012-03-13
3	2010-03-13
4	2012-03-13
5	2012-03-13
6	2012-03-30
7	2020-03-13
8	2012-03-13
9	2012-03-13

Confidence Interval

50%

Mean: 39238.15
Upper Limit: 37885.014
Lower Limit: 40591.286

Sr No.	Date	Result
1	2012-03-23	NotGood
2	2012-03-13	NotGood
3	2010-03-13	Good
4	2012-03-13	NotGood

Remaining Data

Save

Good Accuracy: 0%
Not Good Accuracy: 100%

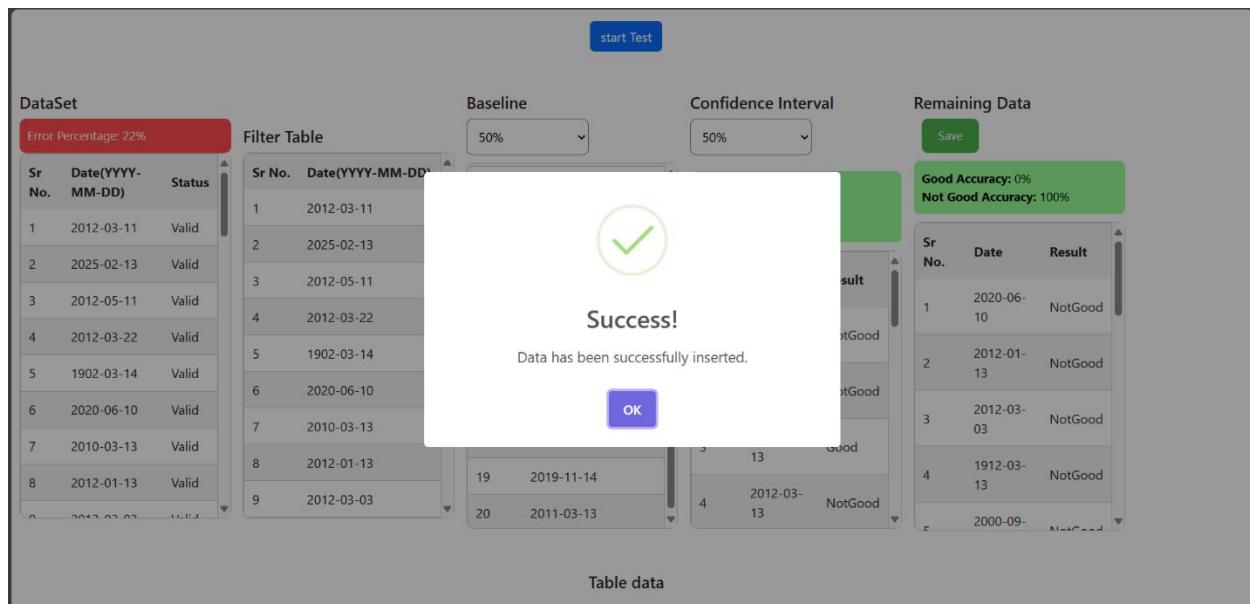
Sr No.	Date	Result
1	2020-06-10	NotGood
2	2012-01-13	NotGood
3	2012-03-03	NotGood
4	1912-03-13	NotGood
5	2000-09-11	NotGood

Table data

Figure_82: Selecting the required option and getting different results

- **Step 7:** By clicking the “Save” button you can save the result for future references.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Figure_83: Saving the result

- **Step 8:** This dataset appears to represent a time-series analysis of dates, with an assessment of data validity, filtering, baseline selection, confidence interval calculations, and accuracy evaluation.
 - Also the user can view and download the past results.

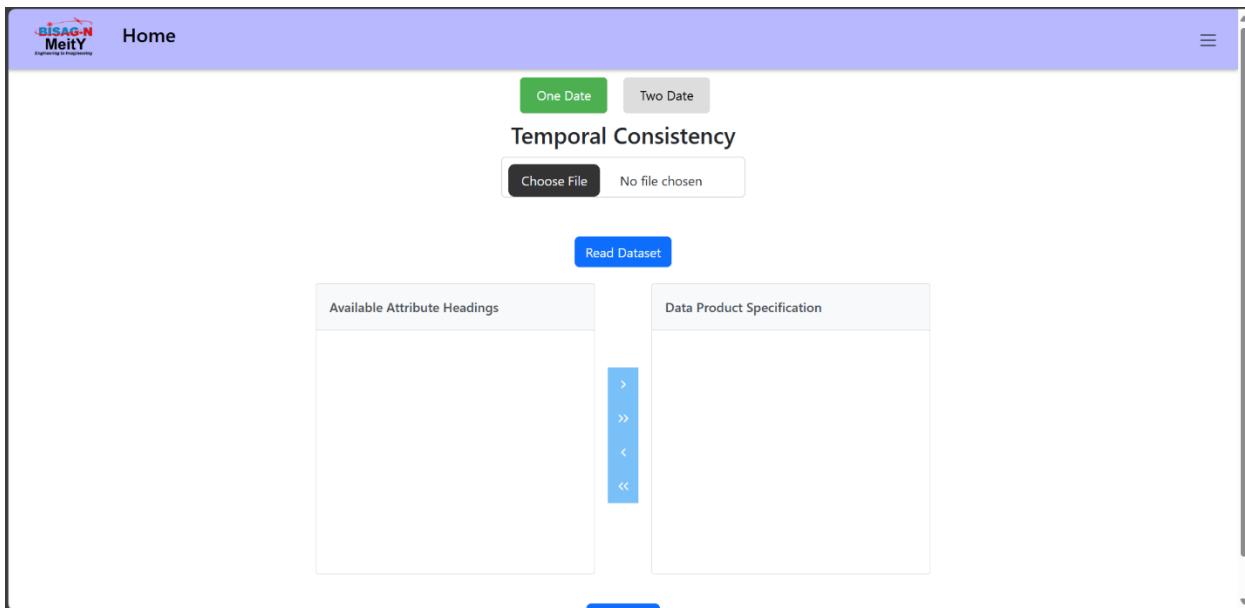
Table data										
FileName	Confidence Level(in%)	Created At (YYYY-MM-DD HH:MM:SS)	Lower Bound	High Bound	Remaining data Good Accuracy (in%)	Remaining data NotGood Accuracy (in%)	selected data Good Accuracy (in%)	selected data NotGood Accuracy (in%)	View/Download	
20240519T062808_copy.json	99.00	2024-05-19 12:05:40	38479.512	41805.288	75	25	80	20		
20240519T064025_copy.json	99.80	2024-05-19 12:19:27	37602.463	42291.537	75	25	80	20		
20240519T062808_copy.json	99.00	2024-05-19 12:05:40	38479.512	41805.288	75	25	80	20		
20240519T064025_copy.json	99.80	2024-05-19 12:19:27	37602.463	42291.537	75	25	80	20		
20240519T062808_copy.json	99.00	2024-05-19 12:05:40	38479.512	41805.288	75	25	80	20		

Figure_84: Past Results

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

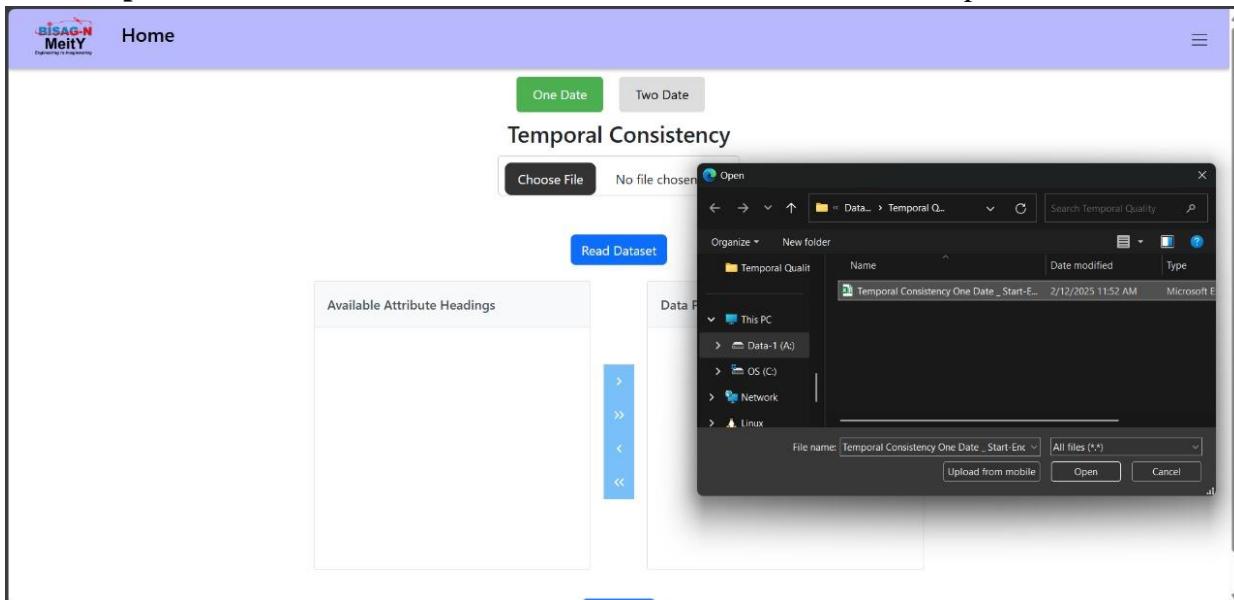
B. Temporal Consistency

- Step 1: Click on Temporal Consistency and then Select between **One Date** or **Two Date**.



Figure_85: Temporal Consistency main page.

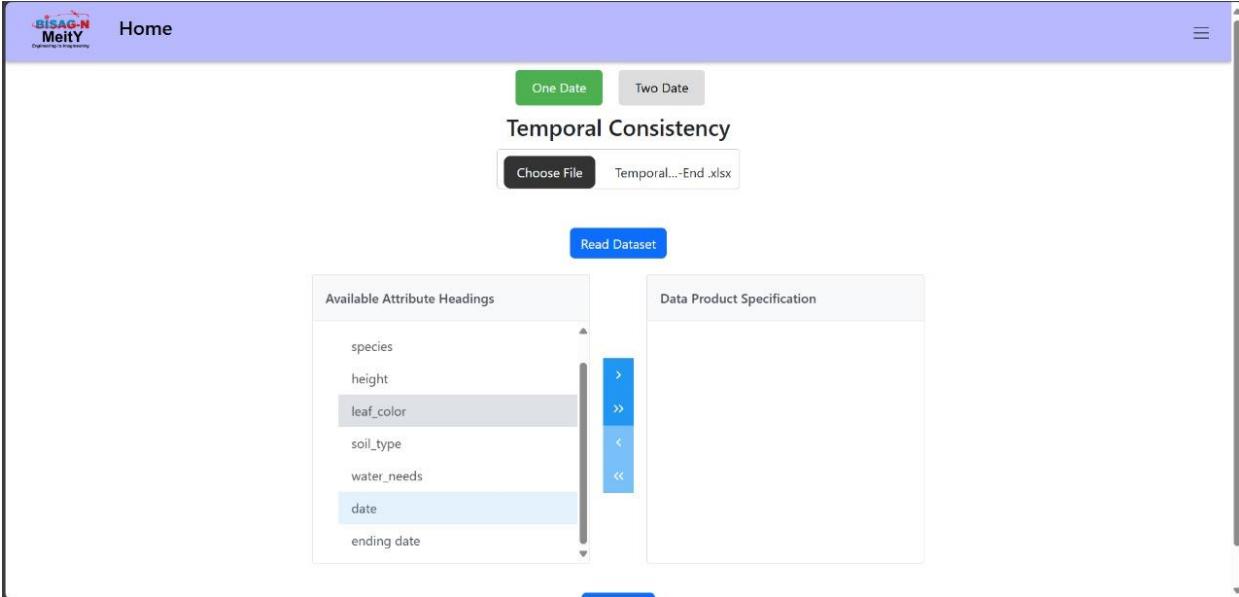
- Step 2: Click on Choose file and select the desired file from the Temporal dataset.



Figure_86: Desired file selection.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

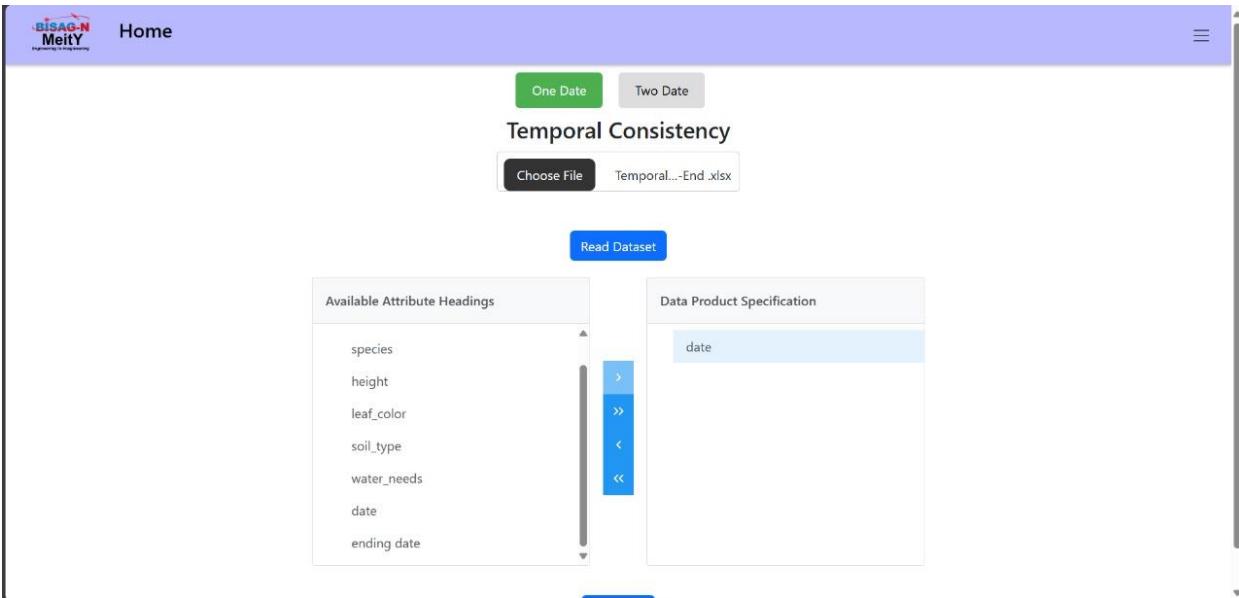
- **Step 3:** Click on the Read Dataset. The attributes of chosen dataset will be displayed on Available Attribute Headings.



The screenshot shows the 'Temporal Consistency' section of the BISAG-N MeitY interface. At the top, there are two buttons: 'One Date' (highlighted in green) and 'Two Date'. Below them is a 'Choose File' button and a file path 'Temporal...-End.xlsx'. In the center, a 'Read Dataset' button is visible. On the left, a list titled 'Available Attribute Headings' contains the following items: species, height, leaf_color, soil_type, water_needs, date, and ending date. The 'leaf_color' item is highlighted with a gray background. On the right, a list titled 'Data Product Specification' contains the item 'date', which is also highlighted with a blue background. Between the two lists are four blue arrows: a single arrow pointing right (>), a double arrow pointing right (>>) and left (<<), and a double arrow pointing left (<).

Figure_87: Display of attributes on selected dataset.

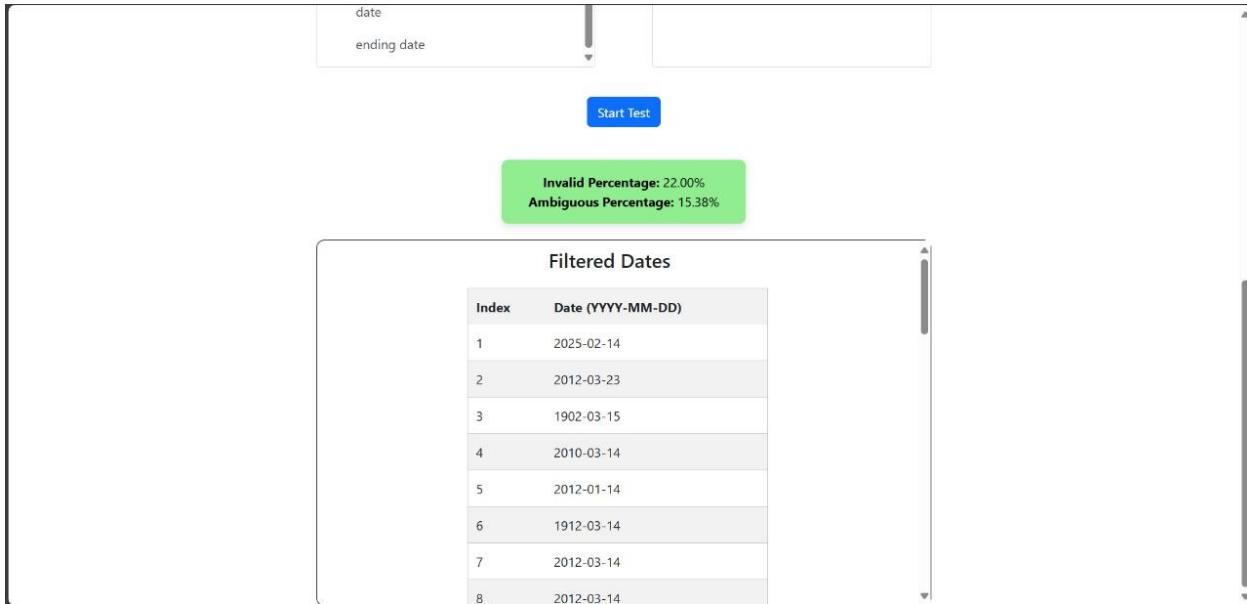
- **Step 4:** Transfer any attribute (here date) from Available Attributes Heading to Data Product Specification for the given dataset.



The screenshot shows the 'Temporal Consistency' section of the BISAG-N MeitY interface after the 'date' attribute has been transferred. The layout is identical to Figure 87, but the 'Available Attribute Headings' list now only contains the items: species, height, leaf_color, soil_type, water_needs, and ending date. The 'date' item has been moved to the 'Data Product Specification' list, where it is highlighted with a blue background. The other items in the 'Data Product Specification' list ('date') are also highlighted with a blue background. The transfer was made using the double arrow pointing right (>>) button between the two lists.

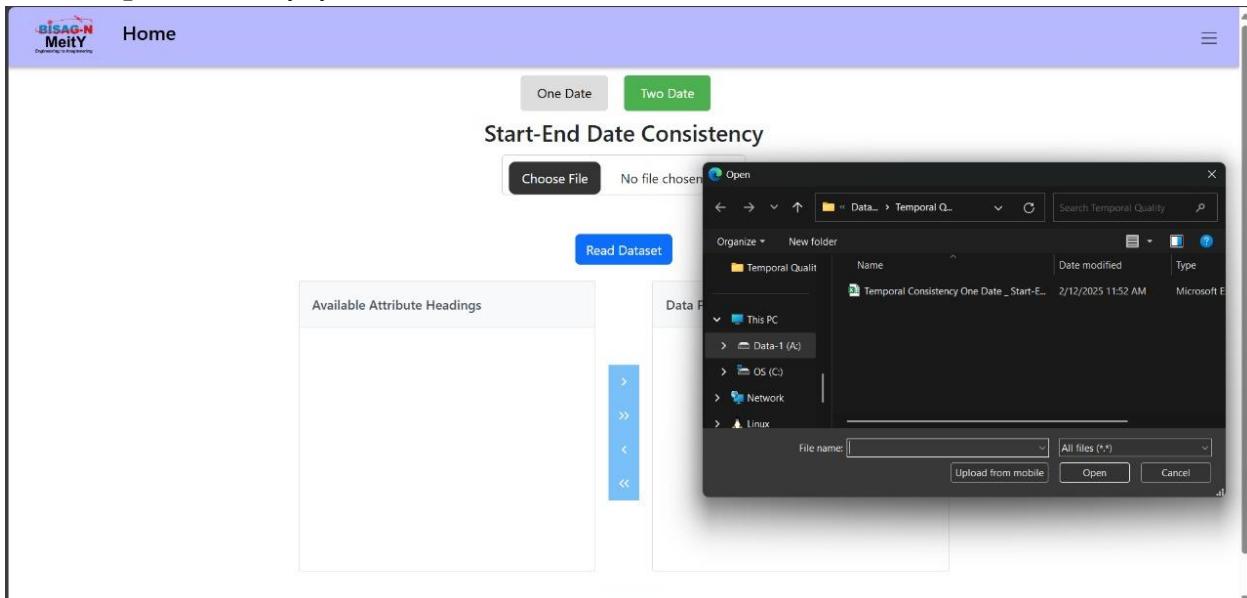
Figure_88: Select appropriate attribute (date).

- **Step 5:** Click on the Start test. This **data filtering and validation interface** is designed to assess the quality of a dataset, likely related to time-series data. It allows users to **start a test**, view **filtered dates**, and analyze **data validity percentages**.



Figure_89: Temporal Consistency result.

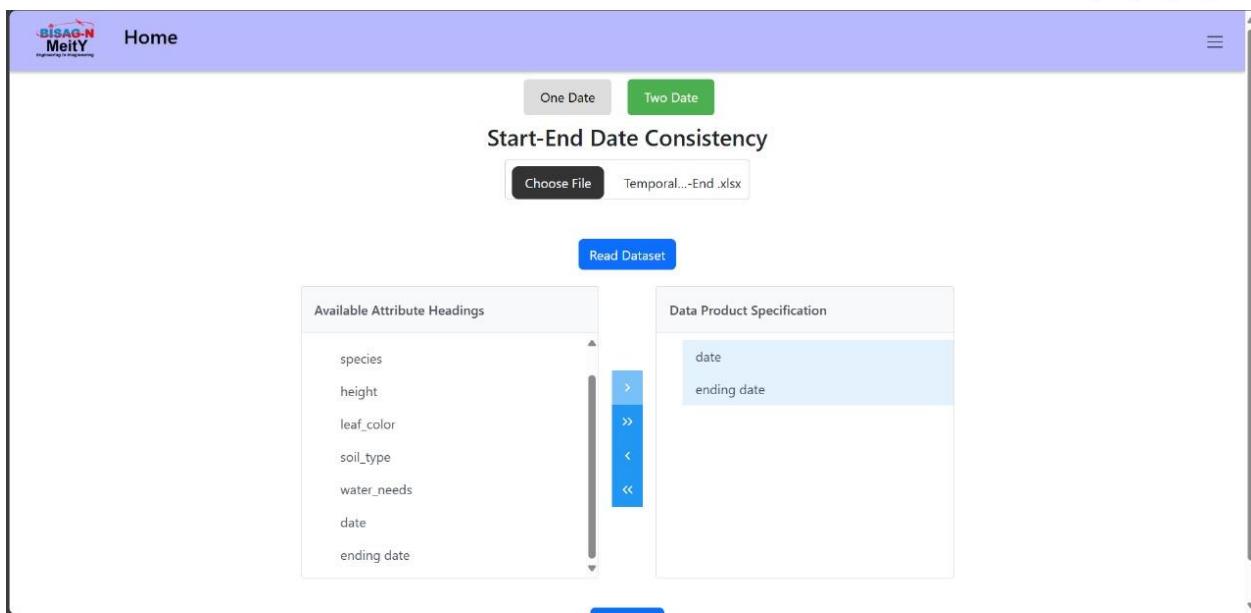
- **Step 6:** Similarly, you can choose **Two Date** and then **Choose File** to select desired file.



Figure_90: Temporal Consistency for Two Date.

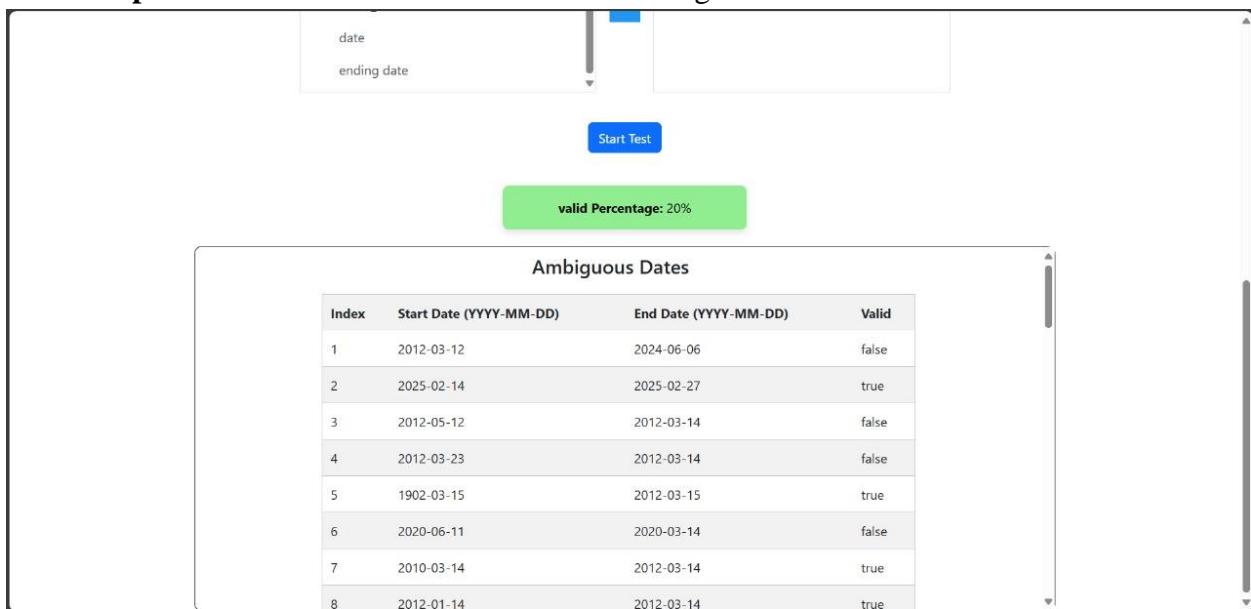
- **Step 8:** Now choose two attributes **date** and **ending date** and this will display on other side of **Data Product Specification**.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements



Figure_91: Selection of date and ending date attributes.

- **Step 9:** Click on **Start Test**. The result will be generated below.



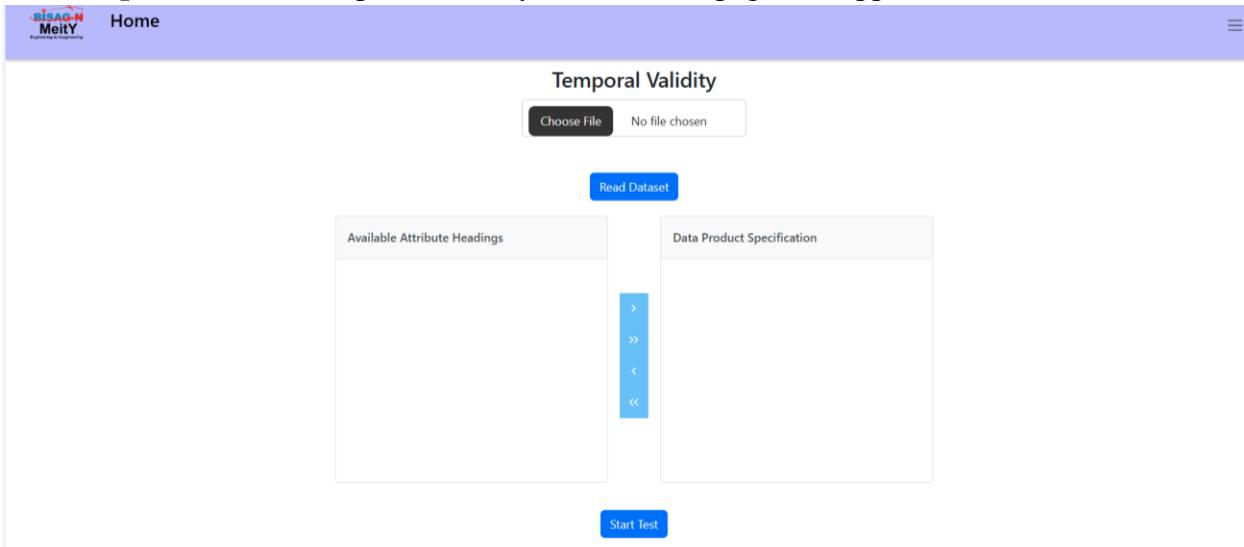
Index	Start Date (YYYY-MM-DD)	End Date (YYYY-MM-DD)	Valid
1	2012-03-12	2024-06-06	false
2	2025-02-14	2025-02-27	true
3	2012-05-12	2012-03-14	false
4	2012-03-23	2012-03-14	false
5	1902-03-15	2012-03-15	true
6	2020-06-11	2020-03-14	false
7	2010-03-14	2012-03-14	true
8	2012-01-14	2012-03-14	true

Figure_92: Result of Temporal Consistency for two date.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

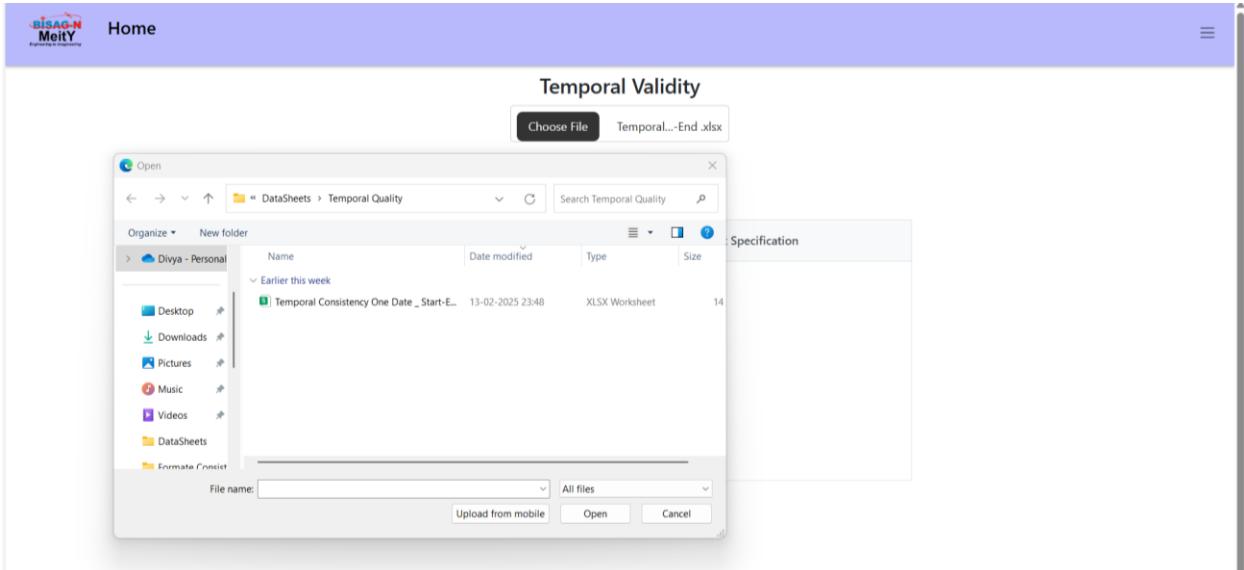
C. Temporal Validity

- **Step 1:** Click on Temporal Validity and the main page will appear as shown below.



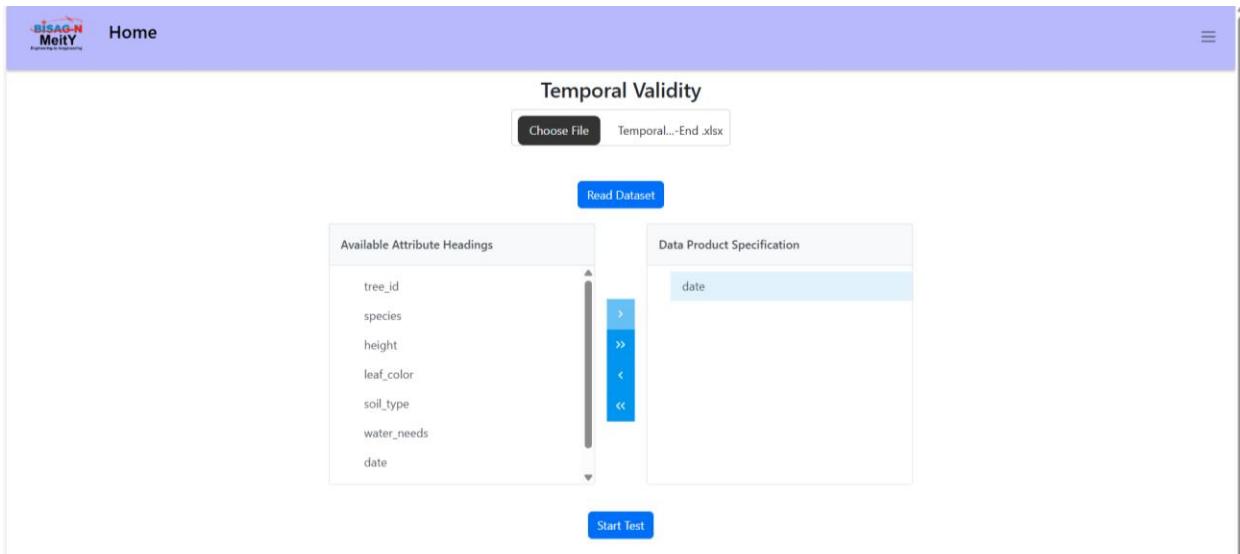
Figure_93: Main page of Temporal Validity.

- **Step 2:** Click on Choose file and Choose the file from the Temporal dataset.



Figure_94: Selection of temporal dataset .

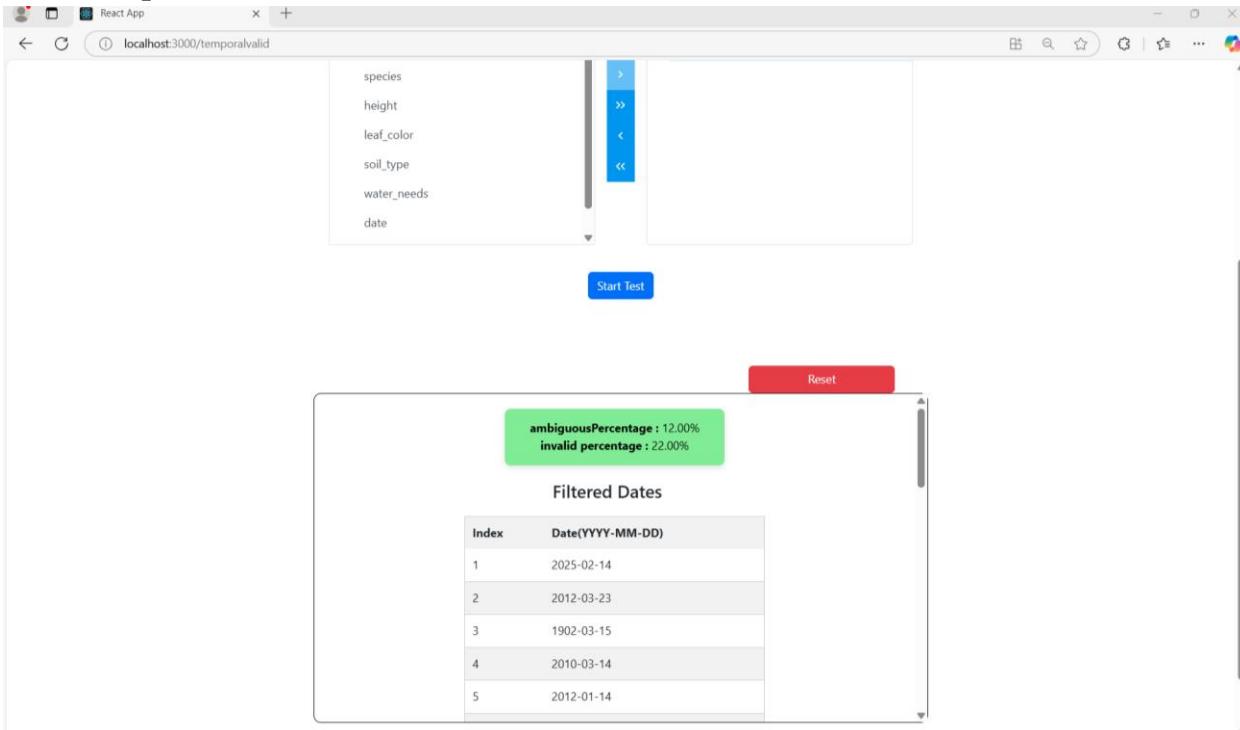
- **Step 3:** Click on the Read Dataset. Choose date attribute and this will appear on Data Product Specification.



The screenshot shows a web-based application titled "Temporal Validity". At the top, there is a "Choose File" button and a text input field containing "Temporal...-End.xlsx". Below this is a "Read Dataset" button. The interface is divided into two main sections: "Available Attribute Headings" on the left and "Data Product Specification" on the right. In the "Available Attribute Headings" section, a list includes "tree_id", "species", "height", "leaf_color", "soil_type", "water_needs", and "date". In the "Data Product Specification" section, the "date" attribute is selected. At the bottom center is a "Start Test" button.

Figure_95: Selection of date attribute.

- **Step 5:** Click on Start Test and it will show the result as shown below.



The screenshot shows the results of the temporal consistency test. The "Available Attribute Headings" section remains the same. The "Data Product Specification" section is now empty. Below the "Start Test" button, a green box displays the results: "ambiguousPercentage : 12.00%" and "invalid percentage : 22.00%". A red "Reset" button is located above a "Filtered Dates" table. The "Filtered Dates" table has columns "Index" and "Date(YYYY-MM-DD)" and contains the following data:

Index	Date(YYYY-MM-DD)
1	2025-02-14
2	2012-03-23
3	1902-03-15
4	2010-03-14
5	2012-01-14

Figure_96: Result of Temporal Consistency for two date.

- **Step 6:** You can select desired option from the drop down list to filter dates.

For definitions and understanding refer: ISO 19157-1:2023(E) Geographic information - Data Quality – Part-1: General requirements

Reset

ambiguousPercentage : 12.00%
 invalid percentage : 22.00%

Filtered Dates

Index	Date(YYYY-MM-DD)
1	2025-02-14
2	 <div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; background-color: #f0f0f0; z-index: 2;"></div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> --Select an option-- </div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> Greater Than Lesser Than Between Include Border Between Exclude Border And Or Xor </div>
3	
4	
5	

--Select an option--
Filter Dates

Figure_97: Selection of required condition for data filtering.

- **Step 7:** You can also choose the range of date for filtering. The **Filter Dates** button applies the selected condition. While the **Reset** button clears all filters and restores the original dataset.

Reset

ambiguousPercentage : 12.00%
 invalid percentage : 22.00%

Filtered Dates

Index	Date(YYYY-MM-DD)
1	2020-03-14
2	2020-03-14
3	2019-11-15

Select Condition:

Between Include Border

Start Date: End Date:

Filter Dates

Figure_98: Result.

File Format Validation

For validating the file formats which you want to accept in the software.

Valid File Formats are:

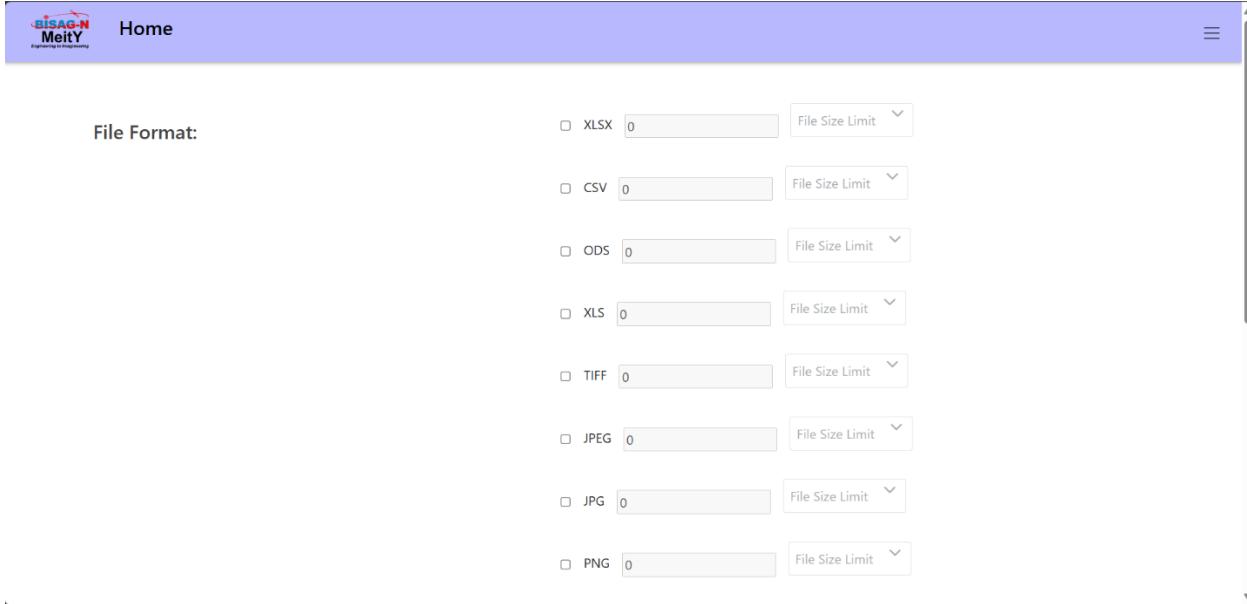
- XLSX
- CSV
- ODS
- XLS
- TIFF
- JPEG
- JPG
- PNG

Here you can remove as well as edit the acceptable format and the size of the uploading file.

To View the admin file format validation page, type:

<https://localhost:3000/format>

- **Step 1:** You will be navigated to the page below.

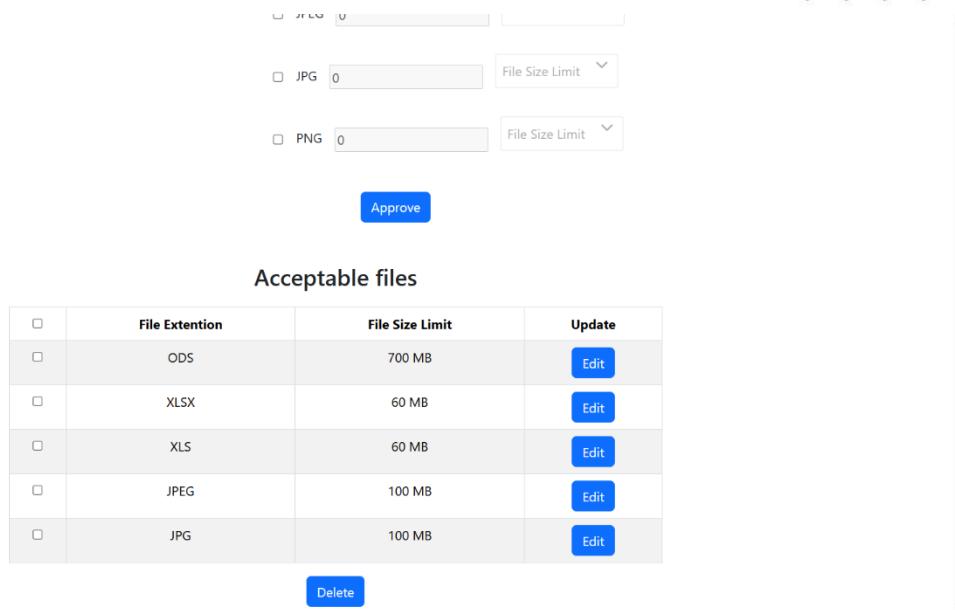


The screenshot shows a web application interface for file format validation. At the top, there is a header bar with the BISAG-N MeitY logo and a 'Home' button. Below the header, the title 'File Format:' is displayed. Underneath the title, there is a list of file formats, each with an input field for file size and a dropdown menu labeled 'File Size Limit'. The file formats listed are XLSX, CSV, ODS, XLS, TIFF, JPEG, JPG, and PNG. Each input field has a value of '0'.

File Format	File Size Limit
XLSX	0
CSV	0
ODS	0
XLS	0
TIFF	0
JPEG	0
JPG	0
PNG	0

Figure_99: File Format Validation Page

- Here all the software supported file formats will be shown.
- And the file format which you currently approved. With the approved size for each format which can be uploaded in the software.



The screenshot shows a software interface for managing file formats. At the top, there are two input fields: one for "JPG" with a value of "0" and a dropdown menu labeled "File Size Limit", and another for "PNG" with a value of "0" and a dropdown menu labeled "File Size Limit". Below these are two large blue buttons: "Approve" and "Delete".

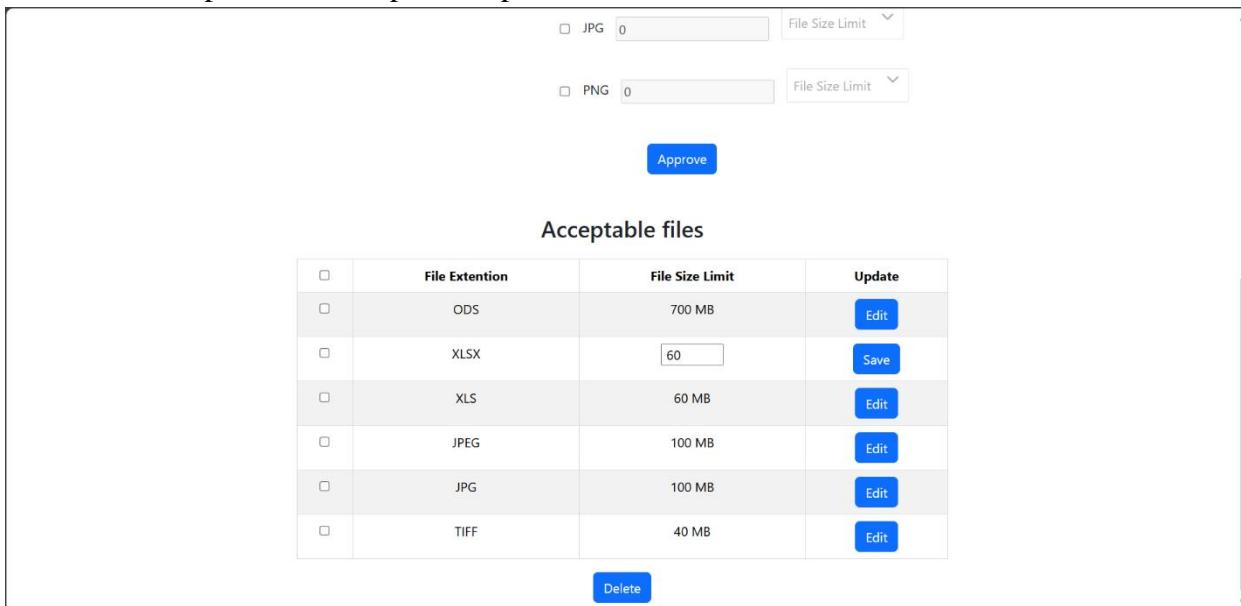
Acceptable files

<input type="checkbox"/>	File Extension	File Size Limit	Update
<input type="checkbox"/>	ODS	700 MB	<button>Edit</button>
<input type="checkbox"/>	XLSX	60 MB	<button>Edit</button>
<input type="checkbox"/>	XLS	60 MB	<button>Edit</button>
<input type="checkbox"/>	JPEG	100 MB	<button>Edit</button>
<input type="checkbox"/>	JPG	100 MB	<button>Edit</button>

Delete

Figure_100: Supported File Formats

- **Step 2:** To edit the size of the specific file format, click “Edit” and then enter the respective size which you want to accept in the software. And press “Save”.
 - Here by selecting and ticking the respective format and then press “Delete”, it will delete the acceptance of the specified process from the software.



The screenshot shows the same software interface as Figure 100, but with changes made to the "XLS" row. The "File Size Limit" field for "XLS" now contains the value "60". The "Update" button has been replaced by a "Save" button. The other rows remain the same.

Acceptable files

<input type="checkbox"/>	File Extension	File Size Limit	Update
<input type="checkbox"/>	ODS	700 MB	<button>Edit</button>
<input type="checkbox"/>	XLSX	60	<button>Save</button>
<input type="checkbox"/>	XLS	60 MB	<button>Edit</button>
<input type="checkbox"/>	JPEG	100 MB	<button>Edit</button>
<input type="checkbox"/>	JPG	100 MB	<button>Edit</button>
<input type="checkbox"/>	TIFF	40 MB	<button>Edit</button>

Delete

Figure_101: Editing Specific format Selecting

- **Step 4:** For addition of a particular supported file format, tick the respective format which you want to use, and enter the approved size for the format, and click “Approve”.

File Format:

XLSX 0 File Size Limit

CSV 0 File Size Limit

ODS 0 File Size Limit

XLS 0 File Size Limit

TIFF 40 MB

JPEG 0 File Size Limit

JPG 0 File Size Limit

PNG 0 File Size Limit

Approve

Figure_102: Addition of the File Format to be approved

---To be Continued----