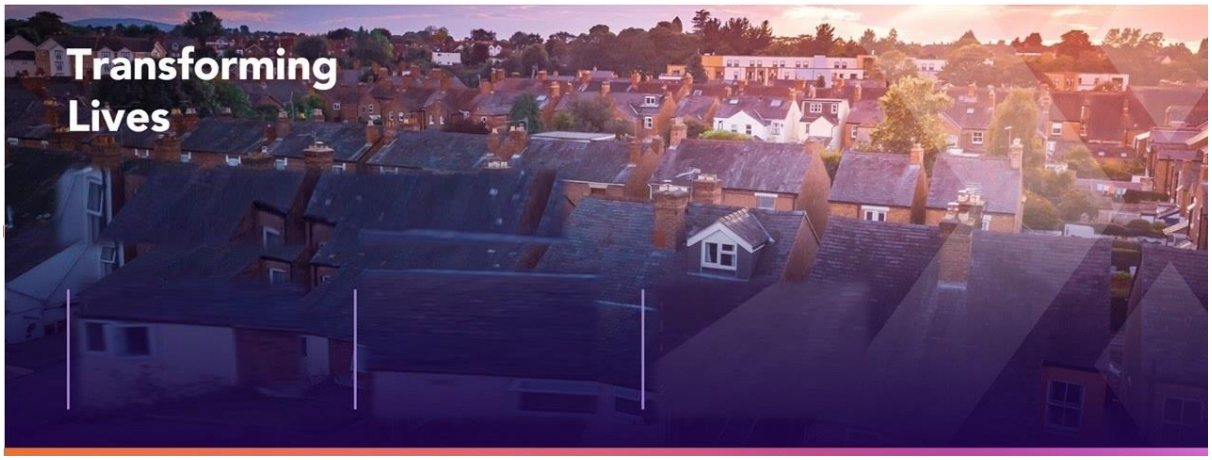
maximus



Power BI Report Standardisation Guidelines

Key people

- Teruyuki Ito - Reporting and Data Visualisation Manager (FT)
- Jon Watson - Employability BI Manager

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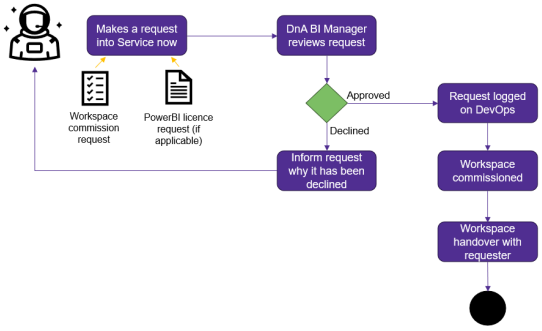
10. **Standardize Template**

Rules for Deployment of Production Reports;

Commissioning Workspaces:

The following steps need to be completed to start developing reports:

1. Complete and submit ‘Workspace initiation’ document creating a request ticket in Service Now.
2. Submit request for Power BI Pro licencing in Service Now.



1 - Power BI Workspace Commissioning Flow

Deployment Pipeline Requirements;

Prerequisites;

Before deploying Power BI reports, ensure the following prerequisites are met:

- Power BI Service Premium or Premium Per User (PPU) license is required for using deployment pipelines.
- Power BI Workspace for each environment:
  - Development
  - Test
  - Production
- The user performing the deployment must have Admin or Member permissions in the workspaces.
- Reports and datasets should be prepared and published to the development workspace.

Pipeline Overview;

A Power BI deployment pipeline consists of three stages:

- Development: The initial environment where changes to reports and datasets are made.
- Test : The intermediate environment used for testing and validation.
- Production: The final environment where end users consume the reports.

Typical Workflow;

1. Changes are made and tested in the Development environment.
2. Reports are deployed to the Test environment for validation.
3. Once validated, reports are deployed to the Production environment for end users.

Development Workspace;

The development workspace is where initial report creation and ongoing modifications take place. Key aspects include:

- Access limited to developers and administrators
- Used for creating new content and making changes to existing reports
- Connects to development or sample data sources
- Allows for experimentation and frequent iterations
- Not accessible to end-users or testers

Test Workspace;

The test workspace serves as an intermediary stage for quality assurance and user acceptance testing. Its characteristics include:

- Access granted to developers, administrators, and UAT testers
- Used for data validation and functionality testing
- Typically connects to test or UAT data sources that mirror production data
- Allows stakeholders to review and approve content before production release
- May have an associated app for easier access by testers

Production Workspace;

The production workspace is the final stage where approved content is made available to end-users. Key features include:

- Contains only thoroughly tested and approved reports and dashboards
- Access restricted to administrators and select developers
- Connects to live production data sources
- Associated with a production app for distribution to end-users
- Subject to stricter change management processes
- Monitored for performance and usage metrics

Step-by-Step Process;

1. Create a Deployment Pipeline

2. Assign Workspaces to the Pipeline

3. Deploy from Development to Test

4. Validate and Test Reports in Test. If any issues are found, return to the Development stage to fix them, then redeploy to Test.

5. Deploy from Test to Production

6. Post-Deployment Validation in Production

7. Communicate with end users that the updated reports are live in Production.

Best Practices;

1. Backup Workspaces: Maintain backups of all Power BI reports and datasets in case a rollback is needed.
2. Prefix the workspace name with the division such as ESD or CEN. Followed by a workspace name and post fixed with the workspace posture, e.g. [Dev] or [Test] , Ex. CEN_Technology [Dev]
3. Version Control: Track changes to reports and datasets through versioning to ensure that you can identify which versions have been deployed.
4. Data Source Configuration: Ensure that each environment (Development, Test, Production) is configured with the correct data sources.
    a. Development: Use sample or development datasets.
    b. Test: Use data that is similar to production data.
    c. Production: Use live production data.

5. Row-Level Security (RLS): Test RLS configurations thoroughly in Test before deploying to Production.
6. Automated Refreshes: Configure automatic refreshes in Test and Production environments to ensure data is up to date.

Implementing these separate workspaces allows for:

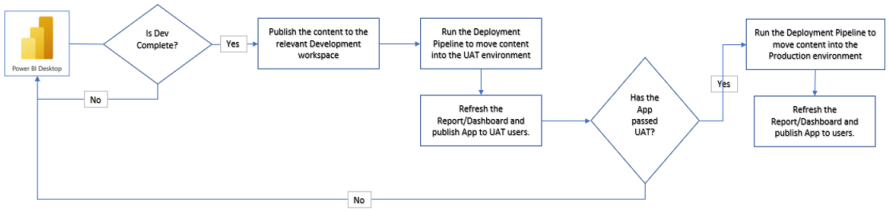
1. Controlled content progression through development stages.

2. Isolation of development and testing activities from production environments.

3. Opportunity to use different data sources for each stage.

4. Structured user acceptance testing before production release.

5. Reduced risk of exposing unfinished or untested content to end-users.



2 - Report Deployment Flow

Report Deployment through Azure DevOps;

Power BI report deployment pipelines can be integrated with Azure DevOps which can significantly enhance the automation, version control, and governance of Power BI reporting environment. In Azure DevOps, configure the triggers for the pipeline to execute automatically based on commits, pull requests, or manual approvals. This setup ensures that changes in the DevOps repository automatically trigger deployments in Power BI.

Stage Identifiers and Report Colourisation;

Power BI does not offer a native feature that identifies the stage in a visual way in the report itself. But we can add a visual identifier to the report by making use of conditional formatting in Power BI. In DnA published reports, there will be a grey banner on top of the report that signifies that they are looking at development, amber bar when they look at test and the bar disappears when they look at production.

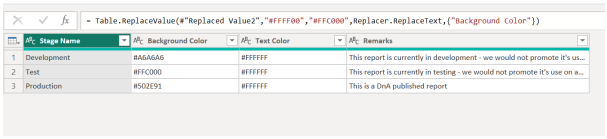
Step-by-Step Process;

Step 1: Adding a table to the model

We aim to automatically adjust the bar colour and text in the bar for each stage, we can adjust this based on a parameter (will be created in step 2), so we start with adding a table to the model. We can do this by simply using the Enter Data option in the top ribbon. We can then populate a table with four columns and fill it for each stage.

- Stage name, just a simple name which we will steer based on the parameter.
- Background colour, we will use this later for the bar and this must be the HEX colour code.
- Text colour, this must be the HEX colour code as well.
- Stage Remarks text, the text to show in the bar.

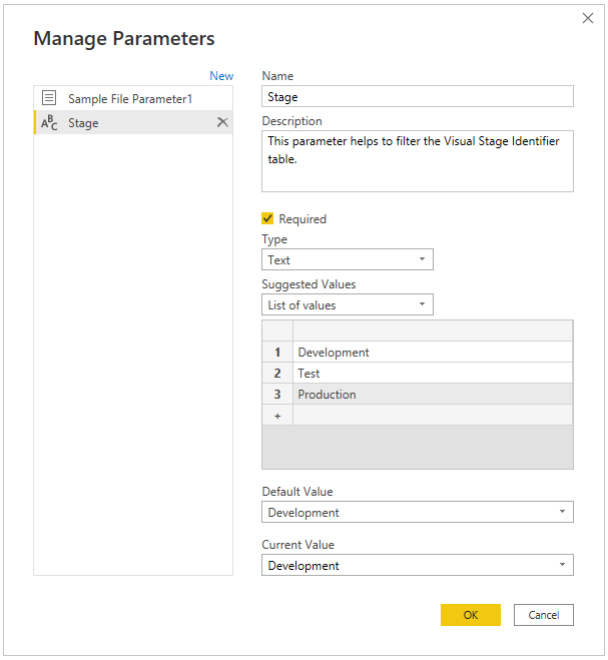
Since we want to hide the bar in total for production, then we will use the colour coding identical to the background colour for the production stage and leave the Remarks Text empty like below.



3 - Stage Identifiers

Step 2: Adding a the parameter

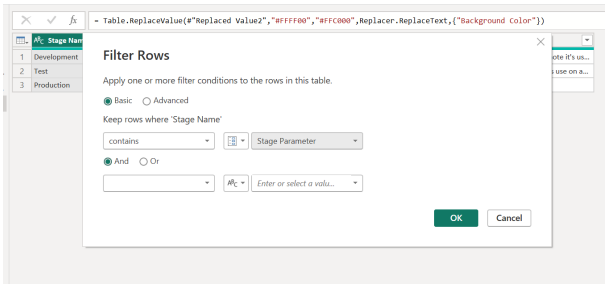
Next, we create a parameter, as we always want to have only one row of data in the table we just added. Based on the parameter value we filter on either Development, Test or Production.



4 - Manage Parameter

Step 3: Filter the table by the parameter value

Now, we filter the table based on the parameter we just created, so we only have one row left in our table and we can click Close & Apply to load the data to the model.



5 - Filer by Parameter Value

Step 4: Build measures to swap values can conditional formatting

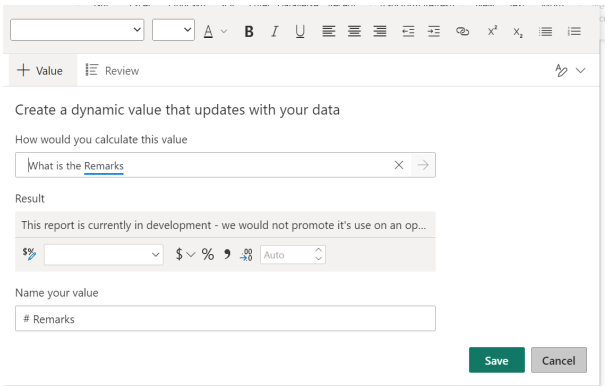
As we want to automatically adjust the bar color and text shown, we want Power BI to only pick up the value we have. In order to use it in the conditional formatting, we need to build two DAX measures to return the values we want. Based on the column names we used, the measures will look like below.

- Stage Colour Formatting = SELECTEDVALUE('Stage Identifier'[Background Colour])

- Stage Font Formatting = selectedvalue('Stage Identifier'[Text Colour])

Step 5: Add a textbox / smart narrative to the canvas

In the report canvas, we add a text box to the canvas. We can use smart narratives and directly call the measure value we just created.



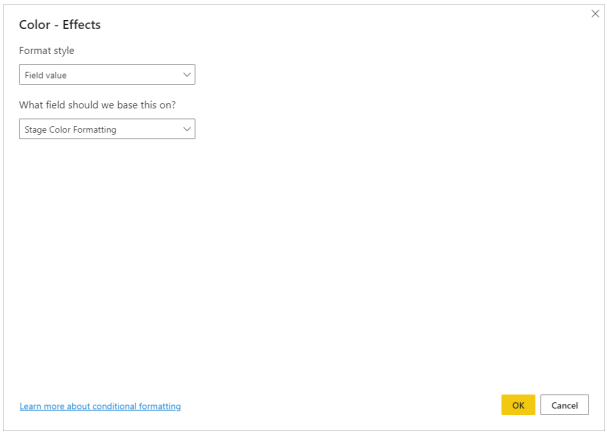
6 - Smart Narratives

After configuring the smart narrative, we will then see the text value directly appear in the text box. This smart narrative will now capture the value of the measure we just created.

Step 6: Conditional formatting for the background colour

We also added a colour coding to our table that we want to use for the background colour. Next is to go to the format pane of the text box / smart narrative, where we search for the Effects settings. Here we will find the background settings. By switching on the background, the fx symbol becomes available.

With the fx we can conditionally format the background colour. As we already build a measure to return us the HEX colour code, we can configure it like below to use the field value from our earlier created measure. Possibly you can also adjust the transparency of the bar in the same settings.



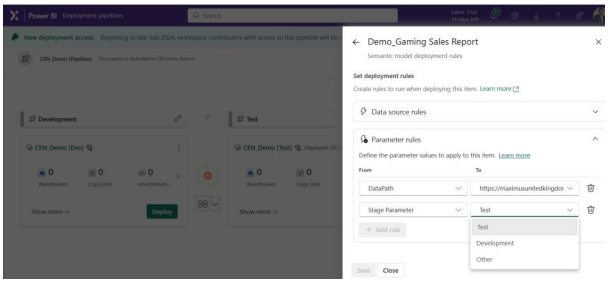
7 - Conditional formatting of background using Field Value

We have the bar shown in Power BI Desktop and based on the parameter, we can directly switch to test mode, or even production mode. In order to apply the change, we have to click close and apply again in Power BI desktop, as we basically changed the filter in our Power Query expression.

Step 7: Adjust parameter based on deployment rules

The final step we want to make, is to adjust this parameter automatically when we move content from Development to Test and finally to Production.

In the deployment pipeline setup, we can configure the deployment rule by clicking on the lightning icon on the right top of a stage. Here we can define the rules for a parameter, so we can automatically adjust the value once we deploy to the Test stage. Similarly we can configure the update the parameter value for Production.



8 - Specify deployment rule to update parameter in Power BI Deployment Pipeline

Data Classification;

In Power BI, data classification refers to the practice of categorizing and labelling data based on its sensitivity or confidentiality level. On top of complying on the ISO standards, this

feature helps us in protecting our data by ensuring that our stakeholders and clients are aware of the nature and appropriate use of the data they are interacting with.

Power BI integrates with Microsoft Information Protection (MIP) to apply sensitivity labels to datasets, reports, dashboards, and dataflows. These labels help indicate how sensitive or confidential the data is and inform us about how the data should be handled. Sensitivity labels are defined and managed by Maximus Information Security department through Microsoft 365 compliance policies.

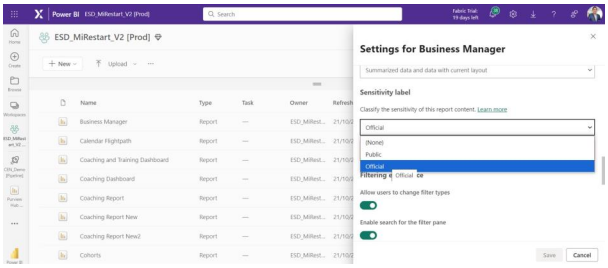
The Maximus classifications are as follows;

- Official / Sensitive - Information, which if disclosed without authority (even within the organisation) would cause serious damage in terms of financial loss, legal action, or loss of reputation. Access is restricted to personnel with specific roles and clearance or with statutory rights of access.
- Official -Information available to approved individuals within Maximus UK and which contains business value, or which requires protection due to it being personal or confidential data. Access is restricted to staff within the organisation in connection with their employment.
- Public - Information that can be made available in the public domain and which would not cause damage or harm if released.

All reports, dashboards, dataflows and apps that is created in DnA has to be data classified. This can be done in 3 ways;

1. Assigning a sensitivity label at the report settings in the workspace.
2. Assigning a sensitivity label on the Power BI desktop
3. Assigning a sensitivity label at the semantic model in the workspace.

The last one is the most preferred since setting the right label to the semantic model will propagate out the label downstream.



9 - Selecting Sensitivity label in the Workspace

Once applied, sensitivity labels are visible to our stakeholders and clients who interact with the content in Power BI, such as when viewing a report or dataset. This ensures that they

will be aware of the level of sensitivity of the data and the need for caution when sharing or using the data.

Currently, we have automatically set the label to "Official" as a default label configured in the admin portal. Our BI developer can still manually select a different label as needed by following either of the 3 ways describe above.

On top of that sensitivity labels in Power BI are not just for informational purposes, they can also trigger automated security policies. For example:

- Preventing unauthorized sharing of sensitive data.
- Applying encryption to reports or datasets that are classified as confidential.
- Limiting export, sharing, or printing of highly sensitive data.
- Consistency Across Microsoft 365 Ecosystem, Power BI's data classification and sensitivity labels are integrated with the broader Microsoft Information Protection (MIP) framework, which allows our information security department in Central to apply the same labels and policies to data in other services, such as Excel, SharePoint, and Outlook. This ensures consistent data governance across Maximus.

Data classification in Power BI, particularly through the use of sensitivity labels, is a way to categorize data based on its sensitivity and ensure that appropriate security measures and handling policies are followed. This system allows Maximus to better protect sensitive information, maintain compliance, and enforce governance policies across their data ecosystem.

AD Groups;

All AD groups created start with UK_BI_PRD followed by the acronym for the division/department/contract and role type. For example, UK-BI-PRD-SFG-MGH-ALL was created for safeguarding team and Migrant Help contract data specifically within the safeguarding team app for Connect Assist. All AD groups need to be added to the central list, with a description, keeping the same format with an IT call placed in.

The IT call needs to have the following in it:

- AD group name
- Users to be added to the AD group

All AD groups need to be updated in the central list. To add a new user or update the AD group the IT call needs to have the following in it: AD group name, Users to be added to the AD group.

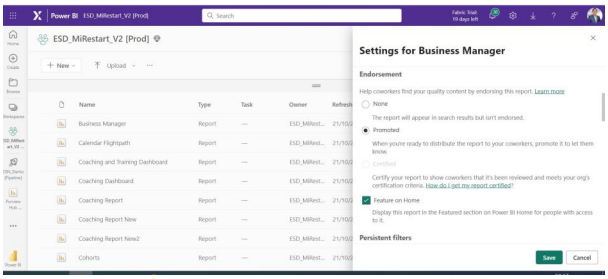
Report Endorsement;

In Power BI, report endorsement is a feature that allows users to mark reports with specific labels to indicate their level of trust and reliability. There are two types of endorsements:

1. Certified: This is the highest level of endorsement, and it is typically reserved for reports that have been thoroughly vetted by data governance teams or authorized individuals within the organization. Certified reports are considered highly reliable and are usually business-critical.
2. Promoted: This endorsement is for reports that are considered useful and have been validated, but may not go through the same rigorous certification process. Promoted reports are often shared by team members or departments and are marked as trusted within a specific context.

Steps to Endorse Reports in Power BI;

1. Open Power BI Service: Navigate to your report in the Power BI service
2. Open the Report: Open the report you want to endorse by navigating to the workspace where it's saved.
3. Endorse the Report:
    a. Click on the More options (three dots) next to the report name.
    b. Select Settings from the drop-down menu.
    c. Scroll down to the Endorsement section.
    d. Choose one of the following options:
        i. None: No endorsement.
        ii. Promoted: Mark the report as promoted.
        iii. Certified: This option is available if your organization has set up certification processes. Only authorized users can certify reports.



10 - Report endorsement selection

Benefits of Report Endorsement;

- Increased Visibility: Promoted and certified reports appear at the top of search results in Power BI, making it easier for users to find trusted content.
- Trust: Endorsements help users identify reliable reports, reducing the risk of using incorrect or unverified data.
- Governance: Certified reports can help with data governance, ensuring that only vetted and approved content is used for critical decision-making.

This feature allows organizations to streamline access to trusted, high-quality data and improve collaboration by encouraging the sharing of validated reports.

Report Sign-off;

Integrate with Power Automate for Sign-Off Workflow

We can use Power Automate to automate the sign-off and UAT approval process. Power Automate allows to create a workflow where reviewers are notified to review and sign off on the reports developed by DnA.

Steps to create a sign-off workflow with Power Automate;

1. In Power Automate, create a new flow that triggers when a report is published.
2. Set the flow to notify reviewers (via email or Teams) to review the report.
3. Incorporate an approval action where reviewers can approve or reject the report directly from the email or Microsoft Teams.
4. Once all approvals are received, we can now move the report to the final workspace or notify the report owner.

Example Power Automate Flow;

- Trigger: When a report is added to the "Test Workspace".
- Action: Refresh the dataset and send an email or Teams notification to the reviewers.
- Approval Action: Reviewers can approve or reject the report.

- Final Action: Once approved, notify the report owner and move the report to the Production workspace.

Use Comments and Feedback in Power BI Service;

- Power BI Service allows users to add comments directly to the report, facilitating collaboration and feedback from stakeholders.
- Reviewers can leave comments on specific visuals or the entire report, which can then be addressed by the report author before final sign-off.

How to use comments;

1. Open the report in Power BI Service.
2. Click on the Comments icon in the toolbar.
3. Add a comment and tag specific stakeholders (e.g., "@Manager" or "@DataAnalyst") to get their attention.
4. Respond to comments, make necessary updates, and notify the team when changes are made.

Sign-Off on Report Metadata;

In Power BI Service, we can use metadata or report descriptions to include sign-off information. After the report has been approved, update the report description with details like "Approved by [Stakeholder Name] on [Date]" to indicate who signed off on the report.

How to add metadata;

1. Go to the Power BI Service and navigate to the report.
2. Click on the More options (three dots) next to the report name and select Settings.
3. Add a description in the Description section (e.g., "This report was approved by the Employability Team on Oct 25, 2024").
4. Save the changes.

Once the report is signed off, apply the Certified or Promoted label in Power BI Service. This will indicate to all users that the report has been officially reviewed and approved by the appropriate team.

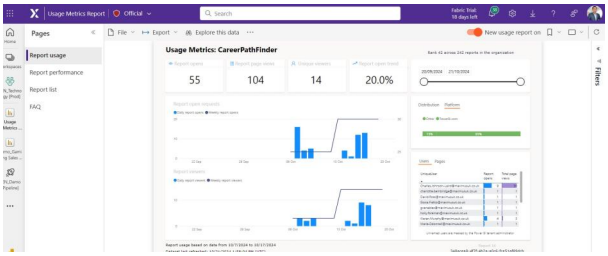
Report Usage Monitoring;

Report usage monitoring in Power BI Service is a valuable feature for understanding how reports are used by our stakeholders and clients. It provides insights into user behaviour, report performance, and helps optimize report delivery.

Further, report usage monitoring helps identify which users are actively using the reports and how frequently they are accessing them. This provides insights back into DnA if whether the intended audience is engaging with the report.

To view a report's usage metrics in Power BI:

1. Go to the workspace that contains the report
2. Select More options (...) for the report from the workspace content list
3. Select View usage metrics report
4. If this is the first time you're viewing the usage metrics report, Power BI will create it and let you know when it's ready
5. Select View usage metrics to see the results



11 - The Usage Metrics Report

Report Deployment Checklist;

For every report that was developed by DnA shall go through a deployment checklist, this is to ensure that reports are developed, deployed, and maintained efficiently, securely, and in line with Maximus standards.

- [ ] Report developed in Development Workspace.
    - [ ] Ensure that the dataset is published along with the report.
    - [ ] Setup data refresh configuration, including data gateway it the data source are on-premises.
    - [ ] Appropriate colourisation is applied.
    - [ ]Data classification and endorsement label are applied.
    - [ ] UAT conducted in UAT Workspace.
    - [ ] Stakeholder approval is obtained.
    - [ ] AD groups created and configured.
    - [ ] Support agreement is signed.
    - [ ] DnA team review is completed.
    - [ ] Final deployment to Production Workspace.

Standardize Template;

DnA reports differentiator;

The report differentiator ensure that users can clearly identify official, vetted Power BI reports and distinguish them from reports created outside of DnA.

For DnA developed reports, users will see a badge or label indicating that the report is either Certified or Promoted when they search for or view reports in Power BI. These reports will appear at the top of search results in Power BI, giving them priority visibility over other non-endorsed reports.

There will be a metadata and detailed descriptions , these will be written on the report description to clarify who developed them and their purpose. The descriptions can include details such as, "This report was developed and certified by the Data & Analytics

Department for official use". When users hover over a report, they can see the description or view the report’s metadata, which will indicate that it's from the DnA team.

There will be a footer at the bottom of the report displaying that the report was developed by DnA, moreover, relevant contact information will be imbedded in the info icon at the top of the report, such as the DnA team's email or the BI manager responsible for the report. This reinforces the identity of the report as coming from a specific department and provides a point of contact for users with questions.

Report template as below;

Report Template.pbix

Maximus Theme (JSON File).json