Monitoring, Evaluation and Dashboarding in the context of National Development Plans

Work in Progress

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ABSTRACT

This paper presents a dashboarding approach to the monitoring and evaluation of development plans and SDGs: A key exercise allowing governments to measure progress, identify discrepancies from objectives and plan the future.

First, key performance indicators and their weights are defined enabling the quantitative assessment of the overall performance of national policies, SDGs and sectoral policies. Second the visual structure of the dashboard for national plans is described investigating several opportunities to customize reports and track progress at different geographic levels. This Dashboard is then applied to the case of Saudi Arabia in monitoring and evaluating its National Development Plan.

In a context of heightened claims for a better governance and accountability, a dashboard will improve coordination between ministerial departments, ease the access and organization of data and reinforce the accountability of policy makers alongside with the ability of citizens to interpret data and assess progress.
1. INTRODUCTION

Planning is an essential means of achieving a country’s development objectives by establishing effective coordination of efforts undergone by ministries and public institutions to reach development objectives and ensure sustainable growth and prosperity. It aims at creating a consensus toward the vision of development considering both political arbitrage and the economic and social conditions pervading in a country, as such it is an effective tool to help Governments or policy makers know where they stand today and where they are heading.

Indeed, it is a dynamic process which evolves with the change of national and regional priorities and needs alongside with global economic conditions. On its design, it relies first on the long term economic viability of implemented projects and their social impact especially in countries subject to social unrest or instability and second on the resources that a country possesses or aims at generating. Hence, planning departments become a critical part of any accountability process where policy makers are expected to provide an acceptable level of service at the lowest possible cost.

Given their critical importance in ensuring sustainable growth, development plans need to be monitored and assessed on a timely fashion. This exercise relies on the availability of data owned by different departments which coordination efforts might depend on political affinities or other considerations that would threaten the continuous collection of data. A Dashboard address this issue, and ensure the continuous collection of data, coordination between several stakeholders and greater policy continuity in case of transitions. It helps monitor and evaluate programs and policies at different levels of details allowing for customization of indicators and reports.

This paper aims at suggesting a dashboarding approach to the monitoring and evaluation of development plans undergone by developing countries. It defines first the concepts of monitoring and evaluation within that context. These would allow to lay out the UNESCWA dashboarding approach for monitoring both SDGs and national objectives organized within a vision or a national development plans. With this regard, the theoretical foundations of Key Performance Indicators (KPIs) necessary to track and measure performances at a national or sectoral level will be explained and the related visualization tool presented. The last part applies these concepts to the case of Saudi Arabia in monitoring and evaluating its National Development Plan.

2. MONITORING, EVALUATION AND DASHBOARD: CONCEPTS

Monitoring and Evaluation (M&E) is a continuous collection, analysis and use of management information system to support decision-making throughout the life cycle of a plan/project (Figure 1), both provide an early opportunity for corrective action. It is referred to as the Results-based management (RBM) approach that aims to reconcile between continuous improvement, better accountability and sound risk monitoring to improve current and future decisions taken by an organization. Beyond organizational improvement, RBM enhances individual learning and promote a culture of honesty, information sharing and team collaboration. In such setting, information reporting becomes a smooth process guaranteeing the full involvement, deep focus on results and effectiveness and ownership of all stakeholders. Sometimes the process involves a stakeholder’s
analysis step to identify key players, incorporate the expectations of vulnerable groups and includes the gender dimension in the overall analysis. In which cases, it set the ground for the M&E by identifying beneficiaries, interests and understanding power relations within a specific context.

2.1 MONITORING

Monitoring relies on a set of methods and techniques to measure performances and progress achieved through a set of indicators related to objectives with the intended aim to report progress or discrepancies from goals to managers. It occurs at all the steps of any project and involves several dimensions; an assessment of inputs, activities, outputs, outcomes and goals. It helps also avoid time delays and cost overruns from the beginning: a major risk in any big project by allowing the early detection of problems. Existing monitoring methods can be grouped in two large groups: Implementation focused and result based. They differ in their implementation, context and limits.

Implementation focused monitoring is mainly used for projects and report on the impact of a series of interventions that lead to the final outcome. It involves the monitoring of inputs and outputs over the lifecycle of a project to inform on the overall effectiveness of the use of available resources.

As opposed to a results based monitoring that is mainly used to assess interventions and strategies and assess the perception of change among various stakeholders to know to which extent the output of an intervention achieved the desired outcomes as perceived by beneficiaries. It involves extensive discussions with all the parties involved in the project with the aim to incorporate qualitative information in addition to the quantitative ones to provide a broad understanding of the relevance and impact of a policy/intervention.

2.2 EVALUATION

Evaluation incorporates lessons learned during the process of designing, implementing and assessing the results of a project or policy. It could lead to the redefinition of objectives, standards,
performance measures or a program. Unlike monitoring, it is not a continuous process but a periodic one that looks at the change brought by each objective and its relevance within a specific context and infer best practices that could be generalized to other projects.

Evaluations differ on their methods, periodicity and the organization responsible for it. They all rely heavily on the way they are managed and how their results are used. It is important to make sure that the ethics and values of an organization translate in their work, with this regards the inclusiveness of the process, impartiality of evaluators, accuracy of the methods and results and their ownership by stakeholders are a key to the success of an evaluation.

2.3 DASHBOARD

A dashboard is a Performance Information System (PIS) that could be displayed in an interface (usually web-based) presenting summarized information and data allowing users and viewers to analyze this information easily. It usually offers the possibility to generate and customize reports, scorecards, and charts that incorporates visualization tools. Dashboards are also designed to be user friendly, allowing users to have immediate visibility of the performance results and Key Performance Indicators (KPI) that are relevant to their role and function, and to assess instantly whether performance is on target or within an acceptable range.

The dashboard allows the accurate tracking of the performance of a strategy or a plan to carry on necessary adjustments whenever any deviation from targets is observed. It gives a better visibility to planners and ease the management of projects, measure achievements to identify best practices, save time through the instant access to timely data and ease the identification of areas of improvement in any project not evolving according to expected results.

The relevance of a dashboard relies heavily on the type of metrics used to track progress; it is important that this choice align with the priorities of a country. After identifying these, all underlying determinants and measures need to be listed and selected based on their impact on these priorities. Hence, these metrics shall be adapted to the evolution of these interrelations.

3. DASHBOARDING IN THE CONTEXT OF NATIONAL PLANNING

Development planning offers the opportunity to set and prioritize economic and social expectations of a country within a timeframe given specific resources. Its success relies heavily on coordination opportunities between different stakeholders to draw evidence based assessment of the impact of economic and social policies on creating synergies between several dimensions of sustainability. As such, it places the planning department at the heart of policy design and monitoring guaranteeing the alignment of sectoral policies with national development priorities.

Several planning frameworks have been developed to support policymaking and integrate developments agendas into NDPs and monitoring their progress:

- Policy Coherence for Sustainable Development (PCSD) (OECD,2016)
- Integrated Green Economy Implementation Programme (IGEIP)(UNEP,2014)
In the context of National Planning, ESCWA proposes to develop a Dashboard to enable policy makers to monitor the performance of the plan and provide, among other functionalities, at-a-glance views of KPIs relevant to the objectives either national development plans including SDGs.

As such, it will link physical and financial information collected at the projects/policies level to developmental objectives as defined in the national development plans. By feeding updated data at projects/policies level into the module periodically (biannually or annually), the dashboard will visualize the progress in the implementation of the national development plans. The dashboard can be used for internal purposes only, or, for increased transparency, made available to the public on the website of the concerned Ministry. A public use of the dashboard could form part of a broader communications strategy as an evidence-based, comprehensible visualization of the progress in implementing the national development plan. Other advantages include harmonizing indicators used to track progress against goals and identifying and alerting on any deviation from objectives.

It will also allow decision makers to detect any deviation from the planned objectives early on. The system would use the KPIs as proxies to alert policymakers of possible deviations from the initial objectives. The alertness of the early warning module will depend on the regularity of which updated information is fed into the dashboard module. It will provide planners and policy makers with the historical underpinnings of the underlying variables. Valuable insights can be drawn if policy instruments of the desired states are looked at in their historical context. Change in an indicator over time can be determined through the analysis of its growth rate during a certain period. Important historical developments such as internal and external shocks can be used as milestones in the analysis of indicators. This will not only lead to the analysis of an indicator in isolation from other indicators, but also enrich analysis by facilitating cross-sectoral comparison.

The preparation of the dashboard follows the following development cycle phases:

**3.1. Defining the Logical Framework of a National Plan**

Most National plans incorporate two dimensions. The first one is developmental (or horizontal) which focuses on macro effect of strategies and national objectives on social welfare and sustainable growth and the second one sectoral (or vertical) which looks at the intrinsic dynamics of change taking place at a sectoral level, indeed the development plan incorporates strategies aiming at improving sectors identified as priorities for the Government whom strategies are designed and supervised by relevant ministries.

The National developmental performance is an aggregation of the performance of several national goals. The performance of each goal is the aggregation of different policies. For each policy, one or more KPIs is defined. The performance of the policy is then defined as the aggregation of all the KPIs (Figure 2) including SDGs indicators adopted by the government.
The same logic is followed for the sectoral performance. The national sectoral performance is the aggregation of all sectors. The performance of each sector is the aggregated performance of each policy. For each policy one or more than one KPI is defined. The performance of the policy is then defined as the aggregation of all the KPIs.
This structure implies that the data needs will be identified as soon as the KPIs are defined for each National and sectoral policy and a weighting system that will allow aggregation of different levels.

### 3.2. Construction of the Dashboard

#### 3.2.1 Definition of the Key Performance Indicators and the weighting system

Experts can be commissioned to develop a vector of measurable indicators to track the performance of national and sectoral policies over a predetermined timeframe and their levels at the baseline year. The set of indicators provided by SDGs framework needs to be used as part of the set of indicators. This inclusion will check and insure the coherence and the matching between the national developmental goals and the SDGs.

These indicators will be earmarked to be monitored later. They have also to provide a weight for each indicator, the weighting system adopted is a revelation of the importance given by the policy maker to each indicator/policy/ objective. Their definition should be a result of an inclusive dialogue between different stakeholders and the experts. The definition of these indicators and their weights is the corner stone of this work, many of these indicators are qualitative the dashboard would assist on quantifying them to ease their monitoring. They have been defined and agreed with all national counter-parts to be (1) simple and easy to use; (2) measurable; (3) reliable; (4) replaceable upon need; and (5) comparable.

#### 3.2.2 Definition of a system of aggregation of KPIs from different levels:

**A. The Developmental Performance**

The Performance of National Policies

The first step will consist of harmonizing and normalizing the indicators agreed upon at earlier stage to build a set of comparable and additionable indicators. This procedure will be conducted for both National and sectoral indicators and will consist on dividing them in four categories absolute, relative, flow or cumulative terms; and transforming them into a cumulative value and convert them into percentages of realization. After this procedure and a set of Harmonized Target Index $HTNI(t)$ and Harmonized Realization Index and $HRNI(t)$ will be defined according to the methodology summarized in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Harmonization of National policies indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator provided by the expert</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
</tbody>
</table>
| National Target Index, $TNI(t)$ and National Realization Index, $RNI(t)$ | $HTNI(t) = \sum_{i=1}^{t} TNI(i)$
$HRNI(t) = \sum_{i=1}^{t} RNI(i)$ | $NKPI(P, t) = \left| \frac{HTNI(t) - HRNI(t)}{HTNI(t)} \right|$ |
| If the indicator is a non-nil flow (ex: building a 100 km each year) | $HTNI(t) = e^{TNI(t)}$
$HRNI(t) = e^{HNI(t)}$ | |
| If the indicator is nil | $HTNI(t) = TNI(t)$
$HRNI(t) = HNI(t)$ | $NKPI(P, t) = 0$ if not implemented $NKPI(P, t) = 1$ if implemented |
| If the indicator is a non-nil stock. Ex: be ranked at the 5th position worldwide | $HTNI(t) = TNI(t)$
$HRNI(t) = HNI(t)$ | |
| If the indicator is a 0/1 indicator. Ex policy implemented or not | $HTNI(t) = TNI(t)$
$HRNI(t) = HNI(t)$ | |

The performance of a National policy $(NP)$ indicator is defined as the weighted average of the scores of all its KPIs:

$$NPI(NP, t) = \sum_{KPI\in NP} W(KPI, NP) NKPI(P, t)$$

$W(KPI, NP)$ is the weight given to the National KPI in the related National policy.

**The Performance of National Objectives**

The performance of each National objective $(Obj)$ is defined as the weighted average of the realization of all its related policies:

$$PIN(Obj, t) = \sum_{NP\in Obj} W(NP, Obj) NPI(NP, t)$$

$W(NP, Obj)$ is the weight given to the National Policy $(NP)$ in the related national performance of the objective $(Obj)$.

**The National Developmental Overall performance**

The overall performance at the National level, $PIN(t)$ is defined as weighted average of the performance of all the National objectives, $PIN(Obj, t)$.

$$PIN(Obj, t) = \sum_{obj=1}^{n} [W(Obj)PIN(Obj, t)]$$
**SDG performance:**
Using all indicators belonging to the SDGs, it would be able to track SDG performance using the below formula:

\[
SDG_{obj} = \sum_{\text{Ind} \in SDG} W(\text{SDG}_\text{Ind}, \text{OBJ}) PIN(\text{Obj}, t)
\]

Where \(W(\text{SDG}{}_{\text{Ind}}, \text{OBJ})\) is the weight of the Objective (OBJ) in the SDG goal. All indicators identified as SDGs will be earmarked and the dashboard will be able to group them by SDG goals and make the needed performance assessment using the weighted average formula.

**B. The Sectoral Performance**

**Performance of Sectoral policies**

The same harmonization procedure will be conducted for sectoral policies in order to define the harmonized Sectoral Target index, \(TSTI(t)\) and Harmonized Sectoral Realization Index, \(HSRI(t)\).

<table>
<thead>
<tr>
<th>Table 2: Harmonization of Sectoral policies indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator provided by the expert Sectoral Target Index, (TSI(t)) and Sectoral Realization Index, (RSI(t))</td>
</tr>
<tr>
<td>If the indicator is a non-nil flow (ex: building a 100 km each year)</td>
</tr>
<tr>
<td>If the indicator is nil</td>
</tr>
<tr>
<td>If the indicator is a non-nil stock. Ex: the be ranked at the 5(^{th}) position worldwide</td>
</tr>
<tr>
<td>If the indicator is a 0/1 indicator. Ex policy implemented or not</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The Performance of a Sectoral Policy (\(SP\)) Indicator, is defined as the weighted average of the scores of all its KPIs:

\[
SPI(P, t) = \sum_{KPI \in NP} W(KPI, NP) SKPI(P, t)
\]
$W(KPI, SP)$ is the weight given to the National KPI in the related National Policy.

The Performance of Each Sector
The Performance of each Sector $S$ is defined as the weighted average of the realization of all its related policies:

$$PIS(S, t) = \sum_{NP \in Obj} W(SP, NP)SPI(SP, t)$$

$W(SP, S)$ is the weight given to the Sectoral policy $SP$ in the performance of the sector, $S$.

The Overall Sectoral Performance
The overall Sectoral Performance at the National Level, $OSP(t)$ is defined as weighted average of the performance of all sectors.

$$OSP(t) = \sum_{obj=1 \rightarrow n} [W(S) PIS(Obj, t)]$$

$W(S)$ is defined as the weight of sector $(S)$ in the overall Sectoral performance.

3.3. Definition of the Visual Structure of the Dashboard for National Plans

The dashboard suggested by the ESCWA will present KPIs and SDGs in a graphical manner. As such, it will link physical and financial information collected at the projects/policies level to developmental objectives as defined in the national development plans. By feeding updated data at projects/policies level into the module periodically, the dashboard will visualize the progress in the implementation of the national development plans. The dashboard can be used for internal purposes only, or, for increased transparency, made available to the public on the websites of the concerned Ministry. A public use of the dashboard could be part of a broader communications strategy as an evidence-based, comprehensible visualization of the progress in implementation of the national development plan.

It incorporates an early warning module which will allow decision makers to detect any deviation from the planned objectives early on. The system will use KPIs as proxies to alert policymakers of possible deviations from the initial objectives. The alertness of the early warning module will depend on the regularity of which updated information is fed into the dashboard module. It will provide planners and policy makers with the historical underpinnings of the underlying variables. Valuable insights can be drawn if policy instruments of the desired states are looked at in their historical context. Change in an indicator over time can be determined through the analysis of its growth rate during a certain period. Important historical developments such as internal and external shocks can be used as milestones in the analysis of indicators. This will not only lead to the analysis of an indicator in isolation from other indicators, but also enrich analysis by facilitating cross-sectoral comparison.
A. Main Screen

The first page displays a quick view of performance indicators for “General Performance of the Plan,” “Overall Sectoral Performance” and “General Performance of the Sustainable Development Goal.” The user can check the status of performance at-a-glance and view the details of performance by clicking each meter or box. It offers also customization features allowing more flexibility on designing reports.

**Figure 4 Main screen of performance indicators**

These performances are expected to involve in the same directions otherwise this would be indicative of an issue that needs to be raised to the attention of the planner.

B. Display of General Performance of the Plan

When the user clicks on the meter of the “General Performance of the Plan,” the screen will display a list of the National objectives with brief overview of the performance for each objective, as shown below.

**Figure 5 General performance of the plan**
Then, the user can click on one of the objectives to see its performance disentangled by National policies that are under each objective in the result table.

**Figure 6 Performance by national objective and national policy**

Clicking on each National policy will display “Performance by National KPI,” in which the key performance indicators for the selected National policy are displayed.

**Figure 7 Performance by national objective and national KPI**

By clicking each goal of the SDGs, the performance indicators of the selected goal will display in a table of “Performance Indicator by Goal,” with scores of each indicator.

**Figure 8 Performance indicators by SDG goals**
Like the display of the “General Performance of the Plan,” the user can select and view the “Overall Sectoral Performance” from the main page. The result will then display a table of “Performance by Sector.”

The user can view the overall performance of each sector on the display, and clicking each sector will lead to “Performance by Policy.”

Clicking on each policy will guide to the result table of the performance for the selected policy, divided by each Key Performance Indicator.
4 USE OF THE DASHBOARD

When all indicators and KPIs are defined the Dashboard will be fed with observed data’s. This process can either be centralized or decentralized. When centralized, focal points from different departments (ministries, public entities,) would provide a single operator files with realized indicators in their concerned institutions. Data will be sent in a preset format files (csv file for example. The operator will enter the data in the dashboard.

In decentralized process, each focal point will feed the system directly using web based/intranet applications the dataset will be then automatically generated and the dashboard will display all the calculations and shows the main results. The below figure summarizes the pattern that the data would take in either case:
5 APPLICATION OF DASHBOARDING TO SAUDI ARABIA

The first application of this approach was undertaken by the Ministry of Economy and Planning in the Kingdom of Saudi Arabia (KSA) in monitoring and assessing their National Development Plan.

At the National level, the NDP of KSA has identified 24 National goals, classified into three main dimensions (Economic, Social, and Institutional Development). Each goal has pillars and each pillar several policies. Overall, there are (24) Goals, (64) Pillars, and (310) Policies.

In addition to national goals, the Tenth National Development Plan (NDP hereinafter) has identified on its (43) chapters, (221) sectorial goals and (981) related policies.

The Tenth NDP Dashboard of KSA is compatible with most browsers (Chrome, IE, Safari, Firefox...) for both Mac and PC. It is designed and optimized for desktops, tablets and smartphones.

Main functionalities includes tracking the evolution of KPIs, displaying data’s in a graphical manner and producing customized reports.

5.1 OPERATING INSTRUCTIONS

The first step is to log in the system. The user should enter his/her credentials by typing in the Username and Password. (Figure 4)
Once the user is logged in, the Dashboard appears. This is the main homepage. The main screen provides a quick gist of the general overview of the performance of the plan and is the starting point for navigation into greater details.

**Figure 14: Main page with assigned nodes and alerts**

The top right toolbar on the main screen has two main navigation buttons of the dashboard, the main page, the data entry page, and the logout exit button.

The main page of the dashboard (Figure 5) is automatically displayed when the user is logged into the dashboard. It allows users to do the following:

1. Visualizing the average real-time reading/status of the General performance of the plan at the national level and by dimension: economic, social, and institutional at the national level.
2. Graphical display quick view of the performance indicators:
   - Red revolution sign indicates a red alert. This means that the average results of performance of the NDP at the national level represents an alarming risky situation.
   - Blue revolution indicates a blue alert. This means that the average results of performance of the NDP at the national level represents a normal or no risk situation.
3. Managing the year of the performance review through the Years selection drop down menu.
5. Switching between the General and Detailed performances views by selecting any of the options in the right toolbar menu: Sectoral, Operational, and Mini dashboard.
5.2 Tracking performance results

A. Detailed Performance Results – National Level

The detailed performance results at the national level can be viewed by clicking on the red part of the revolution sign of any graph in the main page. This will display the results of the NDP performance by national objective in a table format and the weighting percentage of each objective, the baseline, year, risk threshold, and alarm status (Figure 6).

Figure 15 View of the detailed national objectives of the NDP

The top navigation section allows the user to navigate and select the name of the required national objective and the year of review. The user can also navigate the objectives separately by clicking on any item provided in the header of the table (Figure 7).

Figure 16 View of the results of the separate indicator
B. Detailed Performance Results Toolbar – Sectoral Level, Operational Level

After selecting one of the options of the Detailed Performance at the right side of the main general overview page another page is opened and shows the results of the NDP performance by objective in a table format alongside with the weighting percentage of each objectives, the baseline, year, risk threshold, and alarm status.

The Mini dashboard allows the user to access the performance results of the national development plan indicators at the operational level. The user can navigate the data available by selecting the filtering criteria or using the search engine for quicker results.

The Data Entry Page allows to enter data, update existing ones and generate customized reports by selecting columns, applying filters, highlighting, and sorting. Users can also define breaks, aggregations, charts, groups, and add their own computations.
5.3 Customizing a Report
The section that follow lists existing feature to customize a report:

A. Search Bar
The top of each report page have a search bar providing the following features:

- **Select columns** enables to identify which column to search (or all).
- **Text area** enables to enter case insensitive search criteria (wild card characters are implied).
- **Go** executes the search. Hitting the enter key will also execute the search when the cursor is in the search text area.
- **Reports** displays alternate default and saved private or public reports.
- **Actions menu** enables to customize a report as explained in the next sessions:

B. Action Menu
The Actions menu appears to the right of the Go button on the Search bar. And is used to customize an interactive report.

The opening screen of the data entry page contains six buttons across the top of the screen. These buttons and their functions are described in Table 3.

<table>
<thead>
<tr>
<th>Action menu</th>
<th>Used to</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National Dimensions</strong></td>
<td>Classify the NDP goals into three main dimensions:</td>
</tr>
<tr>
<td></td>
<td>• Economic Development Dimension</td>
</tr>
<tr>
<td></td>
<td>• Social Development Dimension</td>
</tr>
<tr>
<td></td>
<td>• Organizational and Administrative Development</td>
</tr>
<tr>
<td><strong>National Objectives</strong></td>
<td>View/Browse/Edit/Add/Delete National Objective</td>
</tr>
<tr>
<td><strong>National Objective KPI</strong></td>
<td>View/Browse/Edit/Add/Delete National Objective Key Performance Indicators</td>
</tr>
<tr>
<td><strong>Agencies</strong></td>
<td>View/Browse/Edit/Add/Delete Agencies</td>
</tr>
<tr>
<td><strong>National Field</strong></td>
<td>View/Browse/Edit/Add/Delete National Field</td>
</tr>
<tr>
<td><strong>National Policy</strong></td>
<td>View/Browse/Edit/Add/Delete National Policy</td>
</tr>
</tbody>
</table>

In each of the buttons above, the user can:

1. Create new data entry field by clicking on the Create button.

   **Figure 21 Creating new data entry**

The user needs to fill all the required fields in the screen and click Create or Cancel to disregard the request. Once the user clicks Create, a new entry will be generated and added to the list.

2. Edit existing entries by clicking on the edit sign available at the left side of each entry.
Figure 22 Editing entries

The user can apply the changes needed to the entry (Apply Changes), cancel or disregard the changes (Cancel), or delete the entry (Delete).

3. The user can also specify a string of text to move through the displayed database by entering units of text, such as word or paragraph and clicking on the Go button to search.

   The result display all Rows containing that search criteria.

4. The user can also choose other Actions available in the drop-down menu listed in table 4.

   Table 4: Action buttons

<table>
<thead>
<tr>
<th>Action buttons</th>
<th>Used to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Columns</td>
<td>Select and highlight the desired columns for review or action.</td>
</tr>
<tr>
<td>Filter</td>
<td>View the results, after entering desired values for the search criteria required. You can filter on a column or by row. If you filter by column, select a column (it does not need to be one that displays), select a standard Oracle operator (=, !=, not in, between), and enter an expression to compare against. Expressions are case sensitive. Use % as a wild card (for example, STATE_NAME like A%). If you filter by row, you can create complex WHERE clauses using column aliases and any Oracle functions or operators (for example, G = 'VA' or G = 'CT', where G is the alias for CUSTOMER_STATE).</td>
</tr>
<tr>
<td>Rows per page</td>
<td>Specify the maximum number of rows to be displayed in the page.</td>
</tr>
<tr>
<td>Format</td>
<td>Format enable you to customize the display of the report. Format contains the following submenu: Sort, control break, highlight, compute, aggregate, chart and group by. For more details on the submenu action button, please review section.</td>
</tr>
<tr>
<td>Flashback</td>
<td>A flashback enables to view the data as it existed at a previous point in time. The default amount of time that users can flashback is 3 hours (or 180 minutes) but the actual amount will differ for each database.</td>
</tr>
<tr>
<td>Save Report</td>
<td>Saves the customized report for future use. The user provides a name and optional description and can make the report accessible to the public (that is, all users who can access the primary default report). Four types of interactive reports can be saved: • Primary Default (Developer Only). The Primary Default is the report that initially displays. Primary Default reports cannot be renamed or deleted. • Alternative Report (Developer Only). Enables developers to create multiple report layouts. Only developers can save, rename, or delete an Alternative Report. • Public Report (End user). Can be saved, renamed, or deleted by the end user who created it. Other users can view and save the layout as another report. • Private Report (End user). Only the end user that created the report can view, save, rename or delete the report. In the case of a customized reports, a Reports selector displays in the Search bar to the left of the Rows selector (if this feature is enabled).</td>
</tr>
</tbody>
</table>
**Reset** resets the report back to the default settings, removing any customizations.

**Download** enables the current result set to be downloaded. The download formats differ depending upon the installation and report definition but may include CSV, HTML, Email, XLS, PDF, or RTF.

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**C. Format Sub Menus**

*Format* enables the user to customize the display of the report. *Format* contains the following submenu:

<table>
<thead>
<tr>
<th>Submenu buttons</th>
<th>Used to</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sort</strong></td>
<td>Used to change the columns to sort on and determines whether to sort in ascending or descending order. You can also specify how to handle NULLs. The default setting always displays NULLs last or always display them first. The resulting sorting displays to the right of column headings in the report. Control Break: Used to create a break group on one or several columns. This pulls the columns out of the interactive report and displays them as a master record.</td>
</tr>
</tbody>
</table>
| **Highlight**   | Enables to define a filter. The rows that meet the filter criteria display as highlighted using the characteristics associated with the filter. Options include:  
  - **Name** is used only for display.  
  - **Sequence** identifies the sequence in which the rules are evaluated.  
  - **Enabled** identifies if a rule is enabled or disabled.  
  - **Highlight Type** identifies whether the row or cell should be highlighted. If Cell is selected, the column referenced in the Highlight Condition is highlighted.  
  - **Background Color** is the new color for the background of the highlighted area.  
  - **Text Color** is the new color for the text in the highlighted area.  
  - **Highlight Condition** defines filter condition. |
| **Compute**     | Enables to add computed columns to the report. These can be mathematical computations (for example, `NBR_HOURS/24`) or standard Oracle functions applied to existing columns. Some display as examples and others (such as `TO_DATE`) can also be used. Options include:  
  - **Computation** enables to select a previously defined computation to edit.  
  - **Column Heading** is the column heading for the new column.  
  - **Format Mask** is an Oracle format mask to be applied against the column (for example, `$9999`).  
  - **Computation** is the computation to be performed. Within the computation, columns are referenced using the aliases displayed. Below computation, the columns in query display with their associated alias. Clicking on the column name or alias includes them in the “Computation.” Next to Columns is a keypad. This keypad functions as a shortcut to commonly used keys. On the far right are Functions. The following example computation demonstrates how to display total compensation:  
    ```sql
    CASE WHEN A = 'SALES' THEN B + C ELSE B END
    ```
    (where A is `ORGANIZATION`, B is `SALARY` and C is `COMMISSION`) |
| **Aggregate**   | Aggregates are mathematical computations performed against a column. Aggregates display after each control break and at the end of the report within the column they are defined. Options include:  
  - **Aggregation** enables to select a previously defined aggregation to edit.  
  - **Function** is the function to be performed (for example, `SUM`, `MIN`). |
• **Column** is used to select the column to apply the mathematical function to. Only numeric columns display.

**Chart**

One chart can be defined per saved report. Once defined, the user can switch between the chart and report views using view icons the Search bar. Options include:

- **Chart Type** identifies the chart type to include. Select from horizontal bar, vertical bar, pie, or line.
- **Label** enables to select the column to be used as a label.
- **Axis Title for Label** is the title that displays on the axis associated with the column selected for Label. This is not available for pie chart.
- **Value** enables to select the column to be used as the value. If the function is a COUNT, a Value does not need to be selected.
- **Axis Title for Value** is the title that displays on the axis associated with the column selected for Value. This is not available for pie chart.
- **Function** is an optional function to be performed on the column selected for Value.
- **Sort** allows to sort the result set.

**Group By**

One **Group By** view can be defined per saved report. Once defined, the user can switch between the group by and report views using view icons on the Search bar. To create a Group By view, identify:

- The columns on which to group
- The columns to aggregate along with the function to be performed (average, sum, count, etc.)

**Flashback**

A flashback query enables to view the data as it existed at a previous point in time. The default amount of time that user can flashback is 3 hours (or 180 minutes) but the actual amount will differ for each database.

**Save Report**

Saves the customized report for future use. The user provides a name and optional description and can make the report accessible to the public (that is, all users who can access the primary default report). Four types of interactive reports can be saved:

- **Primary Default** (Developer Only). The Primary Default is the report that initially displays. Primary Default reports cannot be renamed or deleted.
- **Public Report** (End user). Can be saved, renamed, or deleted by the end user who created it. Other users can view and save the layout as another report.
- **Private Report** (End user). Only the end user that created the report can view, save, rename or delete the report.

In the case of customized reports, a Reports selector displays in the Search bar to the left of the Rows selector (if this feature is enabled).

**Reset**

Resets the report back to the default settings, removing any customizations.

**Download**

Enables the current result set to be downloaded. The download formats differ depending upon the installation and report definition but may include CSV, HTML, Email, XLS, PDF, or RTF.

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**D. Column Heading Menu**

Clicking on any column heading exposes a Column Heading menu. Options include:

- **Sort Ascending** icon sorts the report by the column in ascending order.
- **Sort Descending** icon sorts the report by the column in descending order.
• **Hide Column** hides the column. Not all columns can be hidden. If a column cannot be hidden, there will be no “Hide Column” icon.

• **Break Column** creates a break group on the column. This pulls the column out of the report as a master record.

• **Column Information** displays help text about the column, if available.

• **Text Area** is used to enter case insensitive search criteria (no need for wild cards). Entering a value reduces the list of values at the bottom of the menu. The user can then select a value from the bottom and the selected value will be created as a filter using '=' (for example, column = 'ABC'). Alternatively, then click the Flashlight icon and enter a value to be created as a filter with the 'LIKE' modifier (for example, column LIKE '%ABC%').

• **List of Unique Values** contains the first 500 unique values that meets filter criteria. If the column is a date, a list of date ranges is displayed instead. If a value is selected, a filter will be created using '=' (for example, column = 'ABC').

### E. Report Setting

If an interactive report is customized, the **Report Settings** display below the Search bar and above the report. This area can be collapsed and expanded using the icon on the left.

For each **Report Setting**, the user can:

• Edit a setting by clicking on the name.

• Disable/Enable a setting by unchecking or checking the Enable/Disable check box. Use this control to temporarily turn a setting off and on.

• Remove a setting by clicking the Remove icon.

If the user creates a chart, group by or pivot, the dashboard offer the possibility to toggle between them and the base report using the **Report View**, **Chart View**, **Group by View**, and **Pivot View** links shown on the right.

Settings can be edited by clicking on **Edit** link while viewing the chart, group by or pivot.

### 6 CONCLUSION

In a context of heightened individual claims for a better access to information and data’s especially those linked to the budgeting of public projects a dashboard would both lead to better performances of policy makers and improve accountability and transparency associated with reporting on these issues. Citizens and non-governmental organizations will be able to fully exercise their role as a catalyst for change by holding accountable their governments for its actions and being able to improve their advocacy by incorporating quantitative measures.

A dashboard will also ease the collection and dissemination of data available at the regional level but not reaching the central departments. The increased regionalization where more autonomy is granted to regions raises the need of data to monitor progress at the finest possible geographic level: A challenge faced by most of developing countries that would jeopardize the achievement of Sustainable Development Goals.

Improved data collection at a regional level will be associated with several positive spillovers: A better promotion of regional distinctiveness in measuring performances, a better integration of regional priorities in national sectoral plans, preventing the overlap between the work of national and regional commissions and finally placing the economic performance or effectiveness of a project over political affinity: an acute problem especially at the regional level.
Better dissemination of the information is a step toward achieving better access to data. However, in many developing countries citizens lack statistical literacy to interpret the data and come up with suggestions, the technical nature of these measures and complexity make the assessment of the impact of policy interventions by citizens difficult. A dashboard should account for that by providing detailed explanations of the indicators used for measuring progress.

In addition to monitoring progress, the dashboard approach contributes to identify better ways of using and disseminating data’s, a core component of any efficient dashboard. The extensive cooperation with governments and national stakeholders allowed the identification of priority areas for capacity building initiatives and settled the foundations of the collection of data relevant to policy impact analysis. It would introduce the notion of accountability for policy makers and decision-makers.
REFERENCES


