PROJECT REPORT

IMPROVING UN SDG DASHBOARD

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EXECUTIVE SUMMARY

This report identifies visualization bias and lack of detail in the current dashboard for the Sustainable Development Goals (SDGs). It presents an improved dashboard which answers the same questions as the existing dashboard in a more effective manner.

- To map the global performance, the new dashboard changes the country symbolization and coloring scheme to indicate low performers without bias.
- To visualize the performance trend of a particular country, the new dashboard presents the performance scores of the past years and predicts towards 2030.
- For a country to identify low-performance sections within each SDG, the new dashboard shows performance scores at the SDG target level.

1. INTRODUCTION

In 2015, all United Nations (UN) Member States adopted 17 Sustainable Development Goals (SDGs) to be achieved by 2030. The UN Sustainable Development Solutions Network (SDSN) has provided an interactive dashboard, which is an important tool for global leaders to monitor progress and identify areas requiring faster progress. The current dashboard (SDSN, 2018) has spurred many local initiatives to assess SDG achievement and helped to mobilize international expertise to foster progress.

However, to better inform global decision makers, SDSN should present more information on the dashboard and improve the data visualization methods. The report focuses on how the data presentation can be improved to reduce visualization bias and include more information.

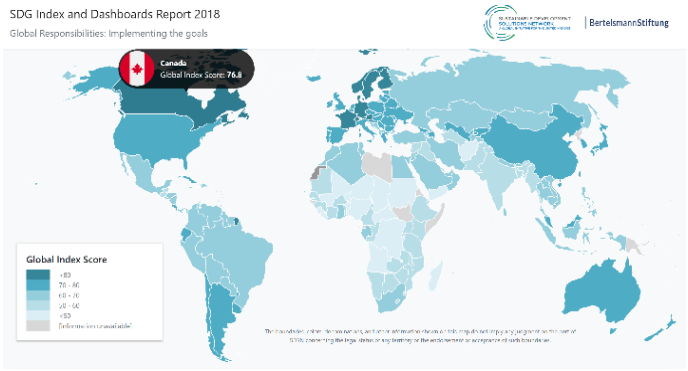
Section 2 analyzes the problems with the existing dashboard, and Section 3 exemplifies how new insights can be obtained from the revised dashboard. The new dashboard is more effective than the current dashboard in answering:

A. How is the world performing overall? (Section 3.1)
B. What is the past and predicted performance for a specific country? (Section 3.2)

2. PROBLEM ANALYSIS

The current dashboard has two main functions. It maps the global performance scores (0-100) and allows the user to select a country to see its performance profile. Main issues with the current dashboard include visualization bias and lack of detail.

Figure 1 Current Visualization of Global Performance (SDSN, 2018)



Referring to Figure 1, the mapping strategy of global performance is questionable. The current dashboard classifies the continuous score into 5 classes, rendering countries with similar scores (e.g., 79 and 81) to be misleadingly contrastive. It is also difficult to see small-sized countries and differentiate between the five shades of blue.

Figure 2 Current Visualization of China's Performance (SDSN, 2018)

Referring to Figure 2, the performance profile of an individual country should include more details. In terms of the performance trend for the 17 SDGs, it is unclear about from when to when the changes were measured and the magnitude of the changes; it also fails to provide a prediction towards 2030. As for the country's performance on the 17 goals, the dashboard does not provide information on what constituting areas (SDG targets) of each goal are lacking progress, so the country is not informed of the domains it should devote more effort into. In addition, the dashboard could

include facts about data quality (e.g., proportion of missing values) so that the viewer can make judicious use of the data.

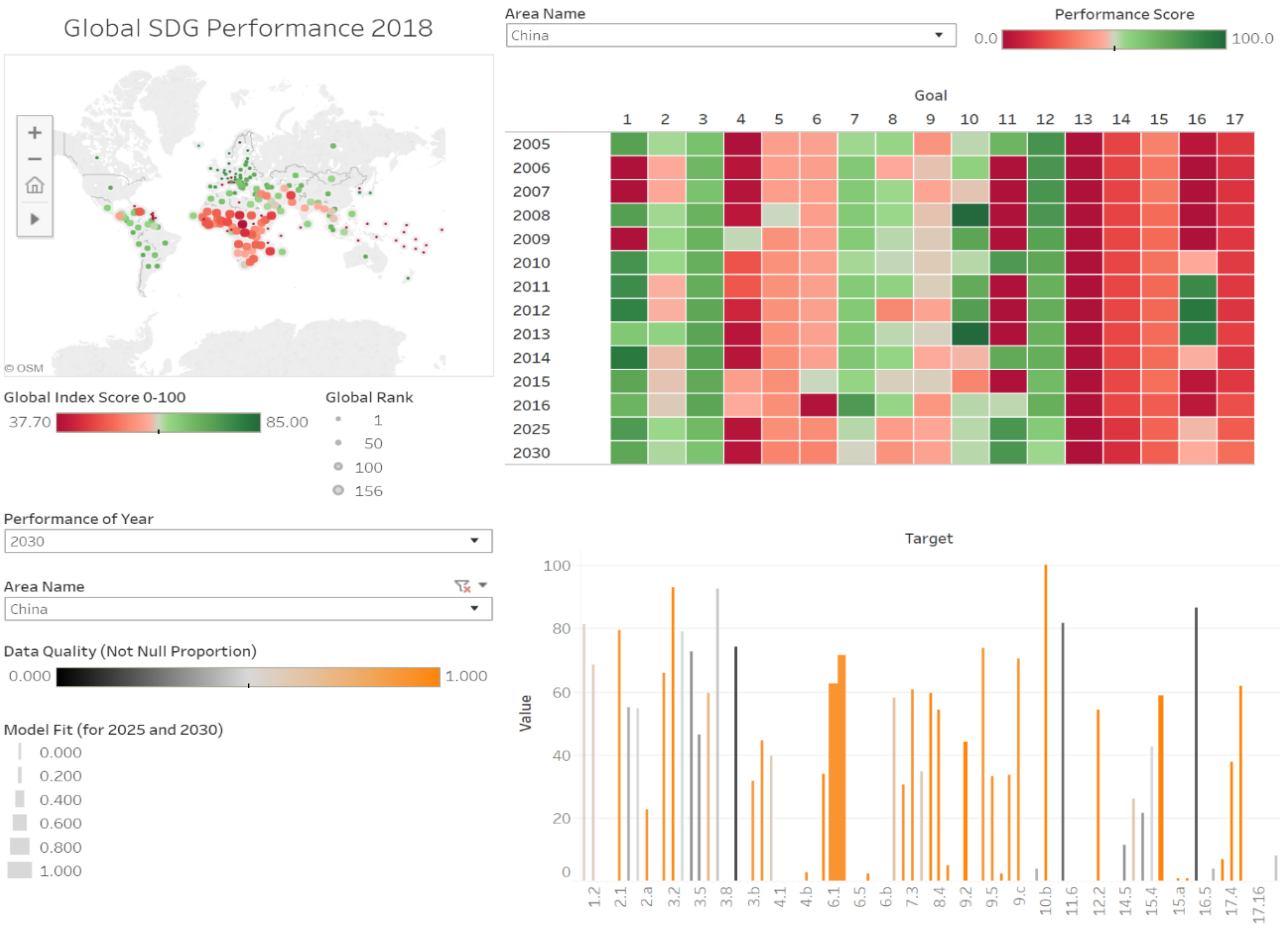
Therefore, an improved dashboard is necessary to help users answer

A. How is the world performing overall?
B. What is the past and predicted performance for a specific country?

3. DRAWING FINDINGS FROM THE IMPROVED DASHBOARD

The improved dashboard (Figure 3) contains three graphs: a map, a heat map, and a bar chart. The map (Section 3.1) answers Question A while resolving problems with Figure 1, and the other two graphs (Section 3.2) address Question B and problems with Figure 2. Refer to Appendix I for the data and methods to build the improved dashboard.

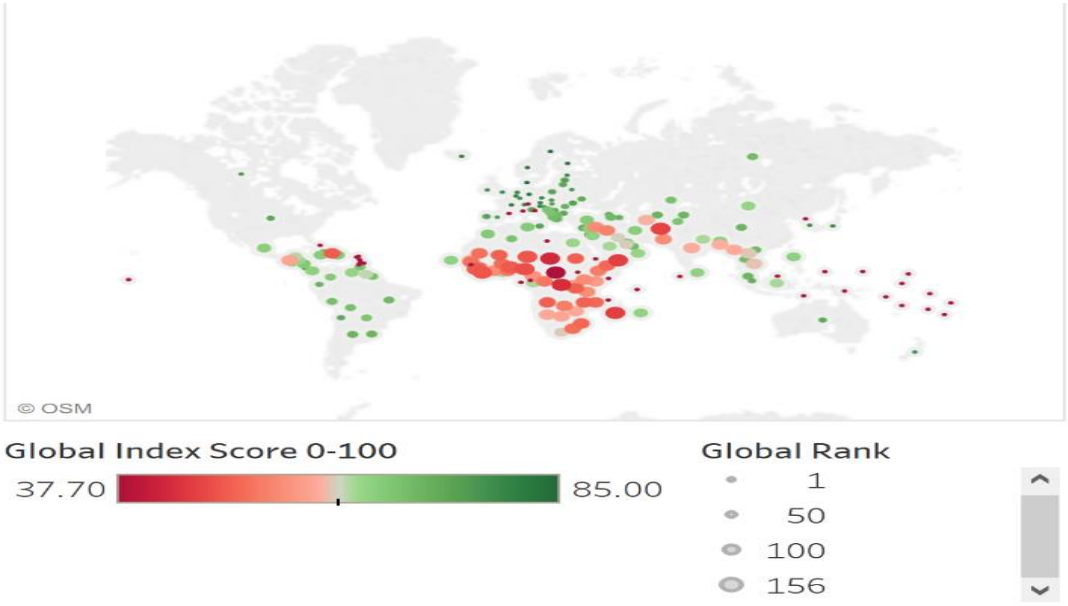
Figure 3 The Improved Dashboard



3.1 World Overall Performance

The improved dashboard uses the same dataset as Figure 1 to answer Question A "How is the world performing overall?" Different from the current dashboard, the improved dashboard employs a gradient red-green color scheme and represents countries as dots. Referring to Figure 4, the dashboard immediately directs attention to African and small island countries which are low performers on the SDGs in 2018. This information aligns with UN's findings (UN, 2019).

Figure 4 Global SDG Performance 2018



3.2 Past and Predicted Performance for a Specific Country: China

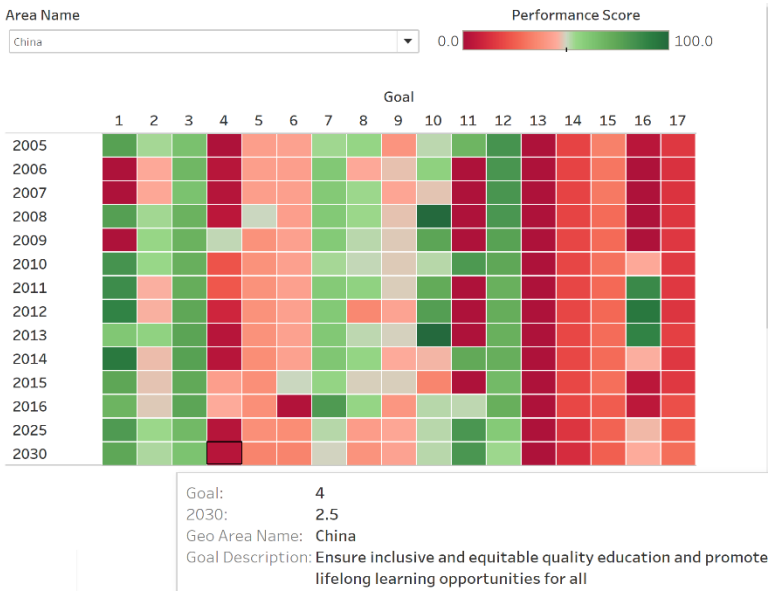
The new dashboard addresses problems with Figure 2 and answers Question B "What is the past and predicted performance for a specific country?" This question can be answered in three parts:

- how a particular country performs on the SDG goals (3.2.1)
- how a particular country performs on the SDG targets (3.2.2)
- data quality of past performance and model accuracy of predicted values (3.2.3)

3.2.1 How is the selected country (China) performing on the SDG goals?

By referring to Figure 5, we can easily identify the goals China performs well and poorly on. For example, China has been performing poorly on Goal 4 and a low performance score is predicted for 2030 (the message box in Figure 5). The dashboard will alert China to take actions and inform global leaders to mobilize assistance for China towards the 4th SDG.

Figure 5 Past and Predicted Performance for the Selected Country



3.2.2 How is the selected country (China) performing on the SDG targets?

The dashboard provides information on what SDG targets are lacking progress, so the selected country will be informed of the domains it should devote more effort into. Continuing the example in 3.2.1 (Goal 4 Quality Education), this section examines the underlying targets of Goal 4.

Figure 6 Target-Level Performance of the Selected Country (China) in 2016

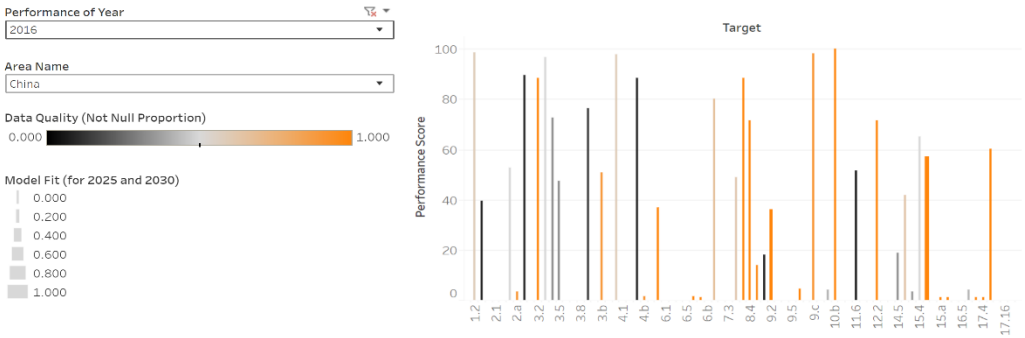


Figure 6 presents China's target-level performance in 2016. While there are 10 targets under Goal 4, only Targets 4.a and 4.b are measured for China in 2016.

- In 2016, China performed well on Target 4.a (education facilities) but the data are insufficient (8% not null). China should better monitor the indicators associated with this target to keep track of progress.
- In 2016, China scored poorly on Target 4.b (global scholarships) and the data are sufficient (92% not null). China can focus on target 4.b to increase overall performance for the 4th SDG.

3.2.3 How good are the data and the predictive model?

The dashboard provides information about data quality and prediction accuracy when presenting a country's performance on the SDG targets (3.2.2). Referring to Figure 7, we should be concerned when using the dashboard to evaluate China's future performance.

Figure 7 Confidence in 2030 Prediction for the Selected Country (China)

Overall, the data are insufficient (indicated by grey bars or blanks) and the models fit the data poorly (indicated by thin bars).

- Although China is predicted to score highly on Target 16.1 in 2030, there were insufficient data for the prediction and the model fitted the data terribly. China should collect more data to keep track of progress.
- By comparison, predictions for Goal 6 (clean water) are more reliable because of sufficient data and high R-squared values.

CONCLUSION

In summary, the improved dashboard is more successful in presenting the world's overall performance performing on the SDGs. The dashboard enables users to easily identify the African and small island countries that are performing below average in 2018. The dashboard also provides more detail on a country's past and predicted performance, and reveals facts about data quality and model fit to help users view the performance scores in perspective. By implementing the revised dashboard, global leaders will be empowered to make more informed SDG decisions.

REFERENCES

Sustainable Development Solutions Network (SDSN). (2018). 2018 Interactive Dashboards. Retrieved from http://sdgindex.org/dashboards/

United Nations (UN). (2019). Transforming our world: the 2030 Agenda for Sustainable Development. Retrieved from https://sustainabledevelopment.un.org/post2015/transformingourworld

APPENDIX I DATA AND METHODOLOGY

Appendix I introduces the data and methods to build the improved dashboard. Figure I-1 provides a summary of the datasets and software used, and Table I-1 presents the descriptions of the datasets. The most important dataset "simplifiedGOAL1-17.csv" is a subset of UN Global SDG Indicators Database (Figure I-2), where each row is uniquely identified by the columns {GeoAreaName, Goal, Target, Indicators, SeriesCode, Year} with Year being 2005-2016.

Figure I-1 Data Summary

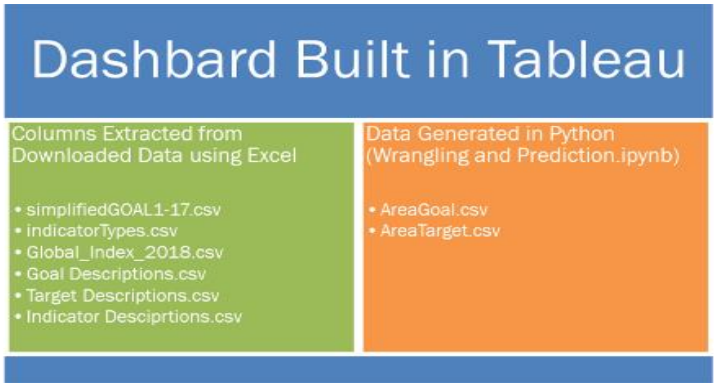


Table I-1 Dataset Descriptions

File Name	Description
simplifiedGOAL1-17.csv	Extracted relevant columns (Figure 4) from UN Global SDG Indicators Database https://unstats.un.org/sdgs/indicators/database/
indicatorTypes.csv	Extracted 416 unique values of {Indicator, SeriesCode} from simplifiedGOAL1-17.csv. Added column {IndicatorType} and manually classified the indicators according to https://undocs.org/A/RES/71/313
AreaGoal.csv AreaTarget.csv	Generated from the two datasets above using Python. Both datasets include GeoAreaName, aggregate performance score 2005-2016 (at goal level or target level), predicted performance for 2025 and 2030, predictive model goodness-of-fit, proportion of missing values.
Global_Index_2018.csv	The dataset for Figures 1 and 6. Extracted relevant columns from 2018 SDG Index and Dashboards Results (Excel) http://sdgindex.org/reports/2018/
Goal Descriptions.csv Target Descriptions.csv Indicator Desciprtions.csv	Each of the files contains the ID and description for SDG goals, targets, or indicators. Generated from "Global Indicator Framework.csv" from https://unstats.un.org/sdgs/indicators/indicators-list/

Figure I-2 Relevant Columns from UN Global SDG Indicators Database