IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, November 2025
Impact Factor: 7.67

Design and Architecture of Global Universities Success Analysis Using Power BI

Megha Nikhare[1] and Prof. Renuka Naukarkar[2]
Student, Department of Computer Science and Engineering (Data Science)[1]
Supervisor, Department of Computer Science and Engineering (Data Science)[2]
Tulsiramji Gaikwad Patil College of Engineering & Technology, Nagpur, India.

Abstract: *This paper presents the design and architectural approach of a Power BI-based data analytics system that evaluates the performance of global universities. The model integrates data from multiple international ranking sources including Times Higher Education (THE), Shanghai ARWU, and CWUR, and processes it through data collection, cleaning, normalization, and computation layers. The system architecture ensures accurate visualization of university ranking performance across various metrics. The proposed framework highlights how effective data visualization can assist in academic benchmarking and global education policy analysis.*

Keywords: Data Analytics, Power BI, University Rankings, Data Visualization, Higher Education, Data Integration

I. INTRODUCTION

The quality of higher education is one of the most important factors influencing global development. Institutions around the world are evaluated through ranking systems such as Times Higher Education, Shanghai (ARWU), and CWUR, which use different methodologies. However, direct comparison between them remains difficult due to variation in scales, criteria, and weightage. This paper aims to design a unified analytical framework that collects, cleans, and visualizes these datasets on a single platform using Power BI for comprehensive performance evaluation.

II. SYSTEM DESIGN

The system design focuses on building an efficient, modular, and scalable architecture. The overall system is divided into multiple layers, including:

- Data Collection Layer: Responsible for gathering data from global university ranking sources and storing them in CSV format.
- Data Cleaning Layer: Handles removal of missing or duplicate records and standardizes data formats for consistency.
- Normalization Layer: Uses z-score normalization to adjust variations in different ranking scales.
- Computation Layer: Aggregates normalized scores to calculate average performance values across ranking systems.
- Visualization Layer: Displays final dashboards in Power BI, representing global and country-level analysis.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, November 2025
Impact Factor: 7.67

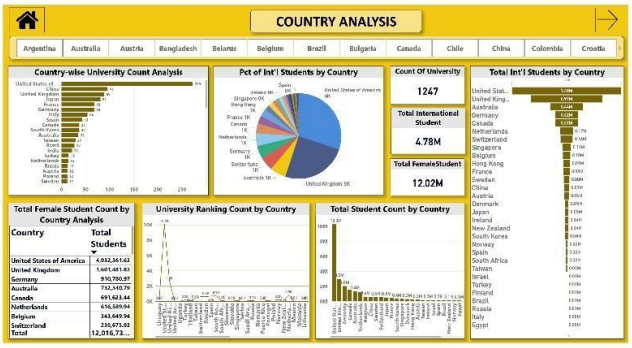

Fig. 1. System Architecture for Global University Analysis

III. METHODOLOGY

Python was used for data preprocessing, while SQL handled data storage and retrieval. After cleaning and normalization, the datasets were integrated into Power BI where interactive dashboards were developed. Key performance indicators (KPIs) such as overall ranking, international student percentage, and gender ratio were visualized using bar charts, line graphs, and maps.

IV. RESULT AND DISCUSSION

The Power BI dashboard generated clear insights into university performance trends. Countries such as the USA and the UK dominated top positions, while Asian institutions showed significant improvement in research and teaching scores. The dashboard allowed quick comparison of metrics across multiple ranking systems.

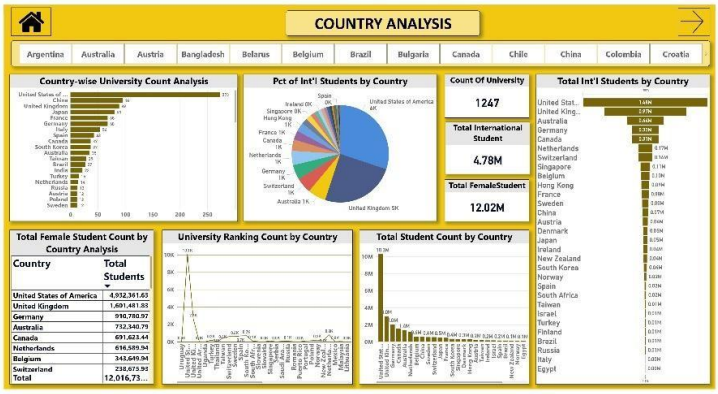

Fig. 2. Power BI Dashboard Displaying Global and Country-Wise University Performance

V. CONCLUSION

This paper successfully demonstrates how Power BI can be used for integrating and visualizing multi-source ranking data. The architecture supports efficient data management, comparability, and real-time visualization. Future work may include machine learning-based prediction models for university performance and the inclusion of QS ranking datasets.

VI. ACKNOWLEDGEMENT

The author would like to thank the Department of Computer Science and Engineering (Data Science), Tulsiramji Gaikwad Patil College of Engineering & Technology, Nagpur, and project guide Prof. Prof. Renuka Naukarkar for their continuous support and valuable guidance throughout this research work.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, November 2025
Impact Factor: 7.67

REFERENCES

[1]. Microsoft Corporation. (2024). Power BI Documentation: Data Visualization and Dashboarding Tools. Microsoft Learn.
[2]. Organisation for Economic Co-operation and Development (OECD). (2022). Education at a Glance 2022: OECD Indicators. OECD Publishing, Paris.
[3]. Times Higher Education. (2016). World University Rankings Methodology (2005–2016). Times Higher Education, London, UK.
[4]. ShanghaiRanking Consultancy. (2016). Academic Ranking of World Universities (ARWU) Methodology. ShanghaiRanking Consultancy, Shanghai, China.
[5]. Center for World University Rankings (CWUR). (2016). Global University Ranking Methodology and Reports (2005–2016). CWUR, UAE