

Report: Comprehensive Data Analysis and Visualization of IAB-Registered Companies

Prepared By: Sumaiya Binte Azad

Batch: 2412 (BI Analyst)

Instructor: Nazamul Islam Nazim

Institution: Grad Bunker Akaademy

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1. Introduction

1.1 Project Overview

Architecture plays a vital role in shaping urban development and reflecting cultural identity. To better understand the current landscape of architectural practice in Bangladesh, this project analyzes data from 142 firms registered with the Institute of Architects Bangladesh (IAB).

The dataset, originally sourced from a PDF, was unstructured and required extensive cleaning to prepare it for analysis. After transforming it into a structured format, the study focused on key areas such as industry growth trends, firm characteristics, geographic distribution, digital presence, and client-facing indicators like Google ratings. The insights gained lay the groundwork for informed decision-making, strategic improvements, and further research within the architectural sector.

2. Objectives

The specific objectives of this project are as follows:

1. To determine the total number of architectural firms registered with IAB.
2. To group companies by their establishment year and classify them into specific time intervals, such as 5, 10, or 15-year periods.
3. To calculate the total manpower and distinguish between IAB-registered and non-registered firms.
4. To identify firms with active and operational websites.
5. To determine how many companies utilize professional email addresses.
6. To categorize firms based on their location (inside versus outside Dhaka).
7. To segment company locations at a police station level for detailed geographical analysis.
8. To collect and analyze Google ratings and geo-location data for each company.
9. To estimate project completion numbers using logical assumptions based on Google ratings and years of experience.
10. To identify the top three firms in each police station based on their years of experience.
11. To predict companies exhibiting professionalism and quality based on parameters such as Google ratings, website presence, and project completion data.

12. To distinguish firms specializing in high-end commercial projects, aesthetic apartment buildings, and regular construction projects.
13. To estimate which firms are likely to charge higher or lower fees based on their experience, ratings, and other parameters.

These objectives are addressed and satisfied through the detailed analysis, reporting, and documentation presented in this report.

3. Data & Methodology

3.1 Data Aggregation

- **Source of Data:** The dataset was extracted from a PDF document containing records of 142 architectural firms.
- **Transformation Process:** The data was transposed into a tabular format using tools such as Microsoft Excel and Google Sheets. Functions like LEN, TRIM, CONCATENATE, LEFT, RIGHT, MID, and VLOOKUP were employed to organize and structure the data.
- **Data Enrichment:** Missing information, including email addresses, website links, and Google ratings, was manually researched and filled in to ensure completeness and accuracy.

3.2 Data Cleaning

- **Tools Used:** Microsoft Excel and Google Sheets.
- **Cleaning Process:**
 - a. Inconsistencies were addressed using functions such as Text-to-Columns, nested formulas, and logical conditions (IF/IFS).
 - b. Companies were categorized into 5-year establishment periods using IF conditions.
 - c. Duplicate and incomplete data entries were identified and resolved.

3.3 Data Analysis

- **Key Metrics Analyzed:**
 - a. Total manpower of each firm: Summed up using staff data from the dataset.
 - b. Geographical distribution, including segmentation by city and police station.
 - c. Digital presence indicators such as website and email usage.

- d. Google ratings and user engagement: Reviewed based on available feedback and rating counts.
- **Techniques & Tools Applied:**
 - a. Descriptive Statistical Analysis
 - b. Pivot Tables
 - c. Visual representations in Excel & Google Colab
 - d. Python for visual analysis in Google Colab

3.4 Dashboard Creation

- **Tool/Platform:** Google Looker Studio
- **Dashboard Features:**
 - a. Dynamic filters for real-time analysis.
 - b. Visualizations depicting geographic segmentation, ratings, and firm classifications.
 - c. User-friendly design to facilitate intuitive exploration of data.



Figure 1: Dashboard for IAB Registered Architectural Firms

4. Key Findings & Insights

4.1 Total Firms & Manpower

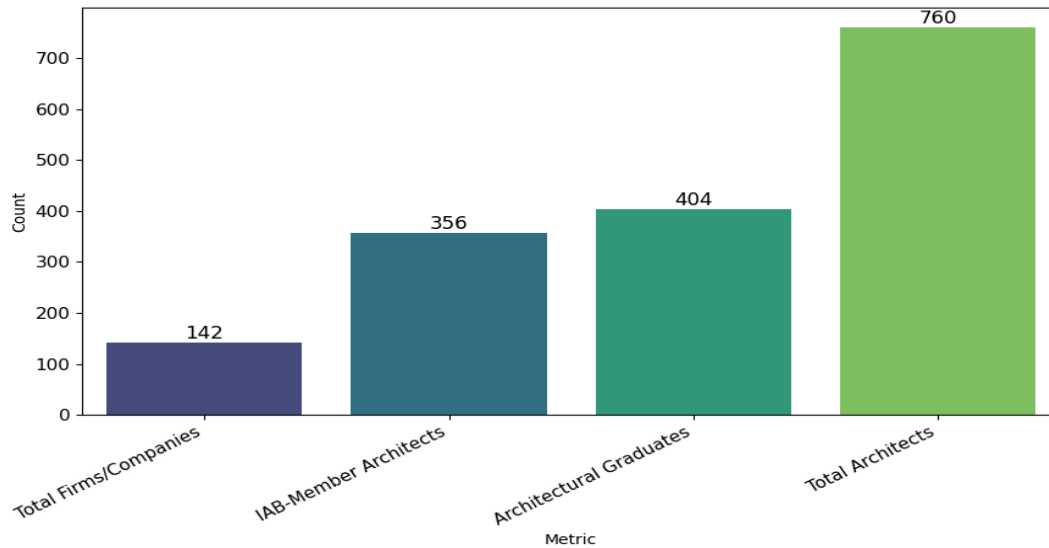


Figure 2: Manpower Breakdown

4.2 IAB-Registered vs. Non-Registered Websites

4.2.1 Website Status:

- Firms with Registered Websites ≈ 100
- Firms with Unregistered Websites ≈ 42

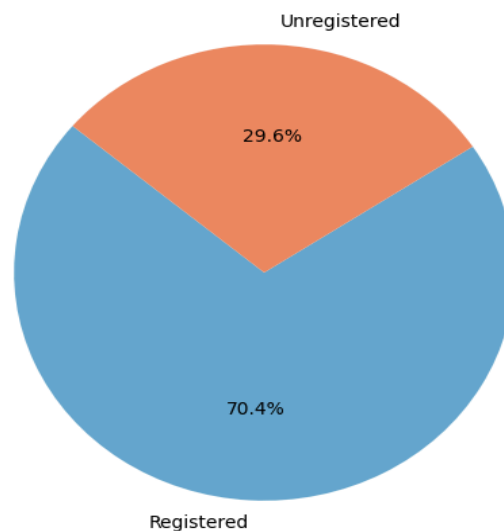


Figure 3: Website Status

4.3 Establishment Year Analysis

4.3.1 5-Year Period Distribution

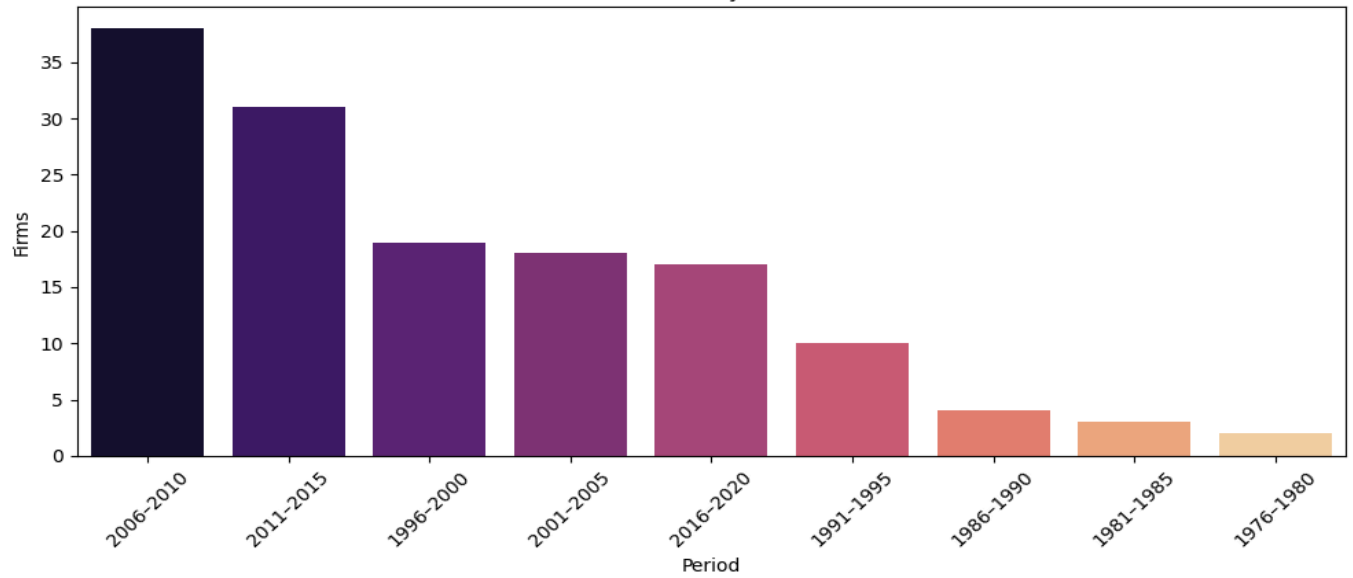


Figure 4: Firms Established by 5- Year Buckets

4.3.2 Cumulative Trends

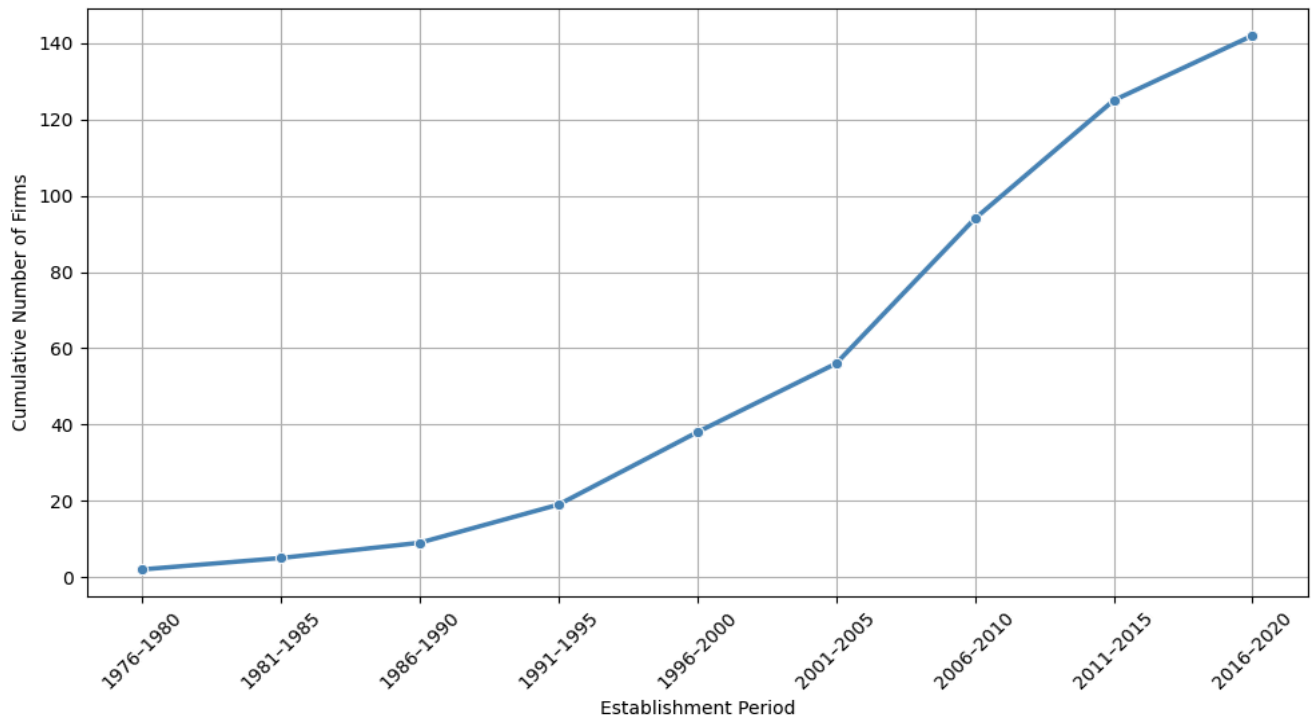


Figure 5: Cumulative Growth of Registered Firms Over Time

4.3.3 Observation: Industry Growth

- The majority of firms were established between 1996 and 2015, with the peak growth occurring from 2006 to 2010.
- Several firms have been operational since the 1970s and 1980s, reflecting the industry's maturity and evolution.

4.4 Email Presence

4.4.1 Professional vs Non-Professional Emails

- Assuming professional emails contain a company domain (not gmail, yahoo, etc.)
- Over **76%** of firms utilize professional email addresses, contributing to their credibility.
- Firms lacking a digital presence may struggle to remain competitive in the modern market

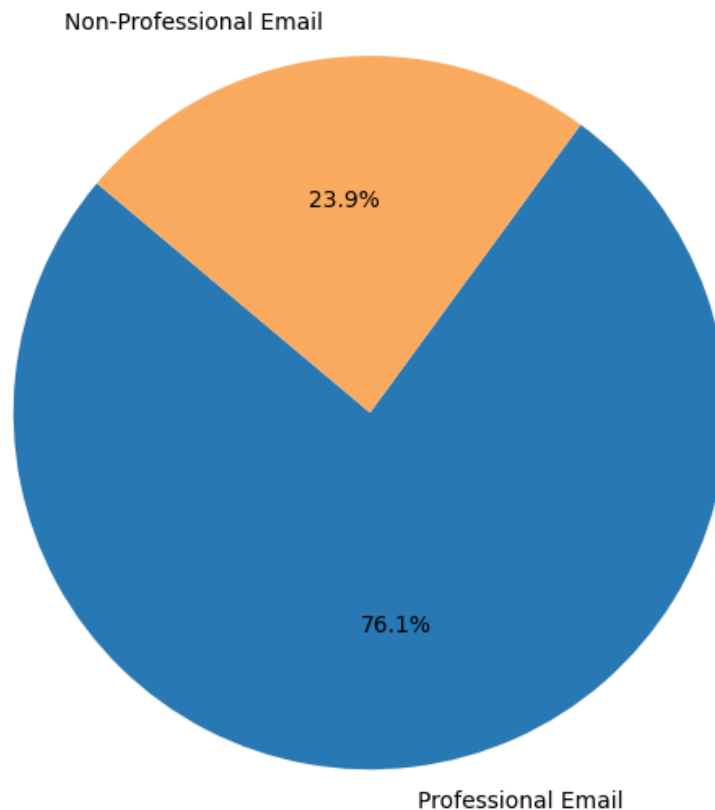


Figure 6: Professional Email Usage

4.5 Geographic Distribution

4.5.1 Divisions

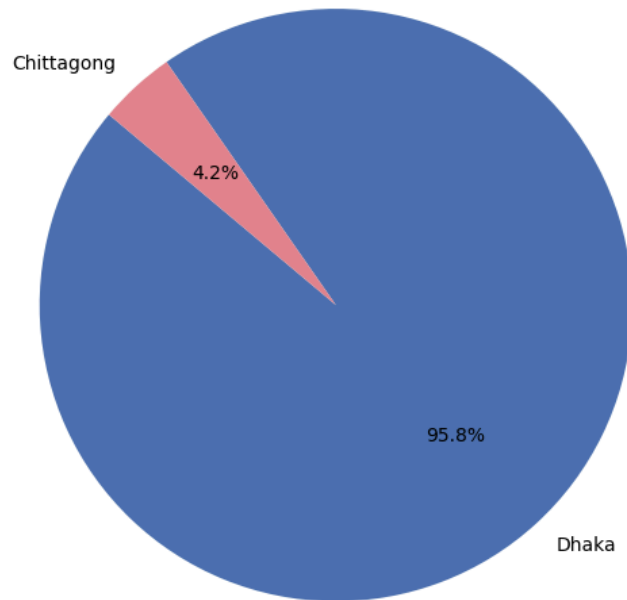


Figure 7: Division-Level Distribution

4.5.2 Thana-Level Distribution

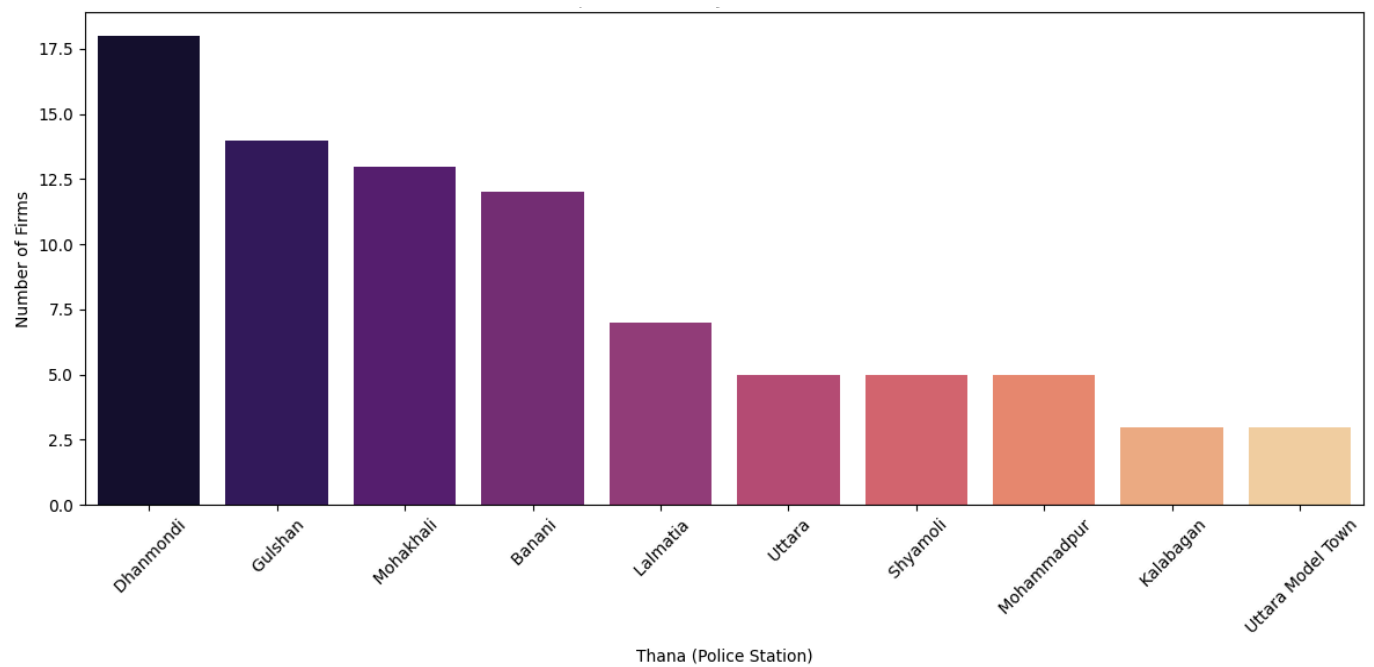


Figure 8: Thana-Level Distribution

4.5.3 Top 3 Rated Experienced Firms per Police Station/Thana

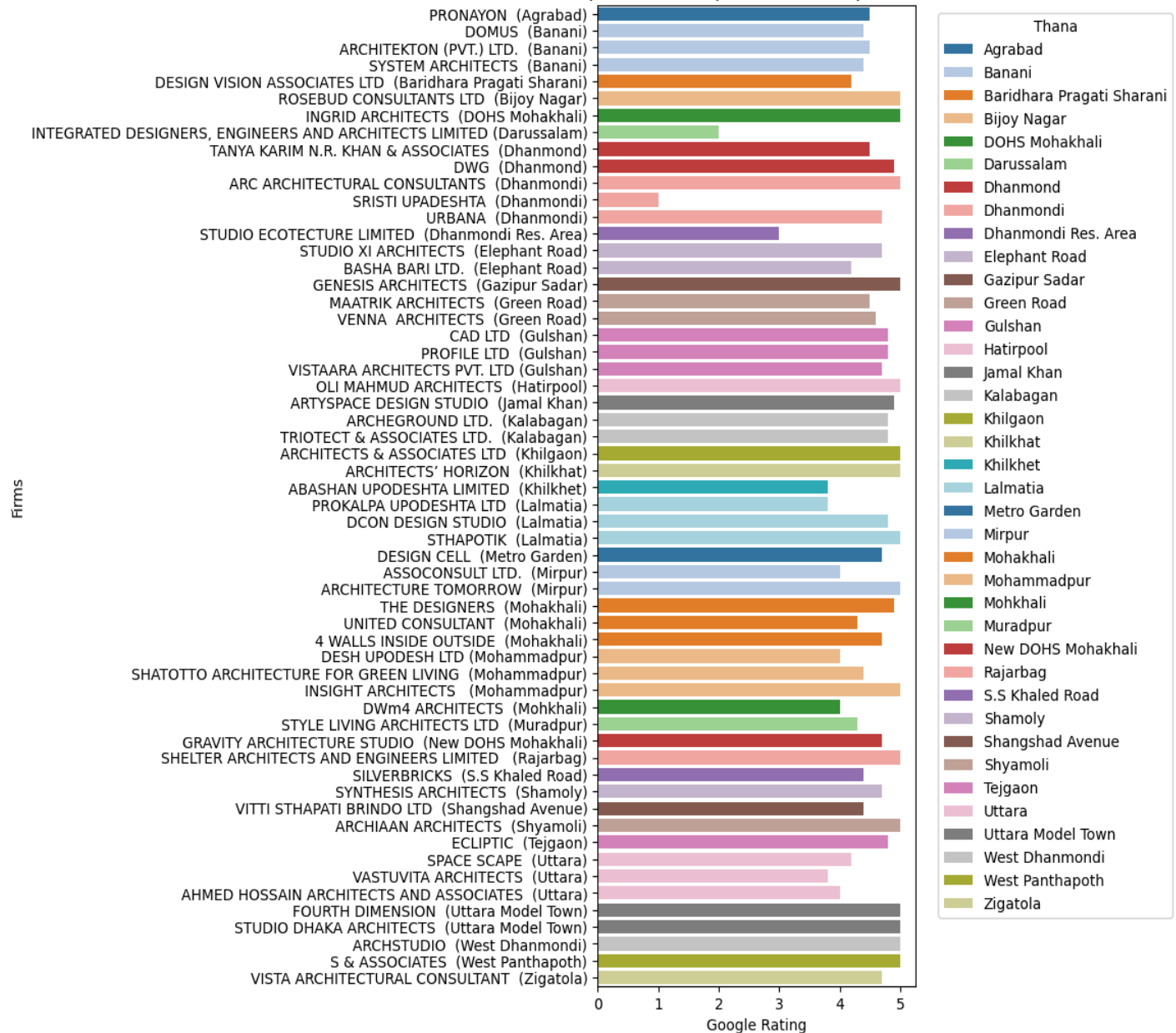


Figure 9: Top 3 Rated Experienced Firms per Police Station/Thana

4.5.4 Observation

- **Dhaka as the Epicenter:** Around 95% of firms are concentrated in Dhaka, particularly in areas like Banani, Gulshan, and Mohakhali.
- **Opportunities in Emerging Cities:** A limited number of firms are located outside Dhaka, with notable activity in Chittagong.

4.6 Leadership Designations

4.6.1 Staff Composition

- **"Principal Architect"** and **"Managing Director"** are the most common leadership roles, highlighting a balance between creative and managerial leadership across firms.
- The presence of titles like **"Proprietor"**, **"Partner"**, and **"Managing Partner"** suggests many firms operate under individual or collaborative ownership models.
- Less frequent roles like **"CEO"** and **"Chairman"** indicate only a few firms have adopted more corporate-style leadership structures.

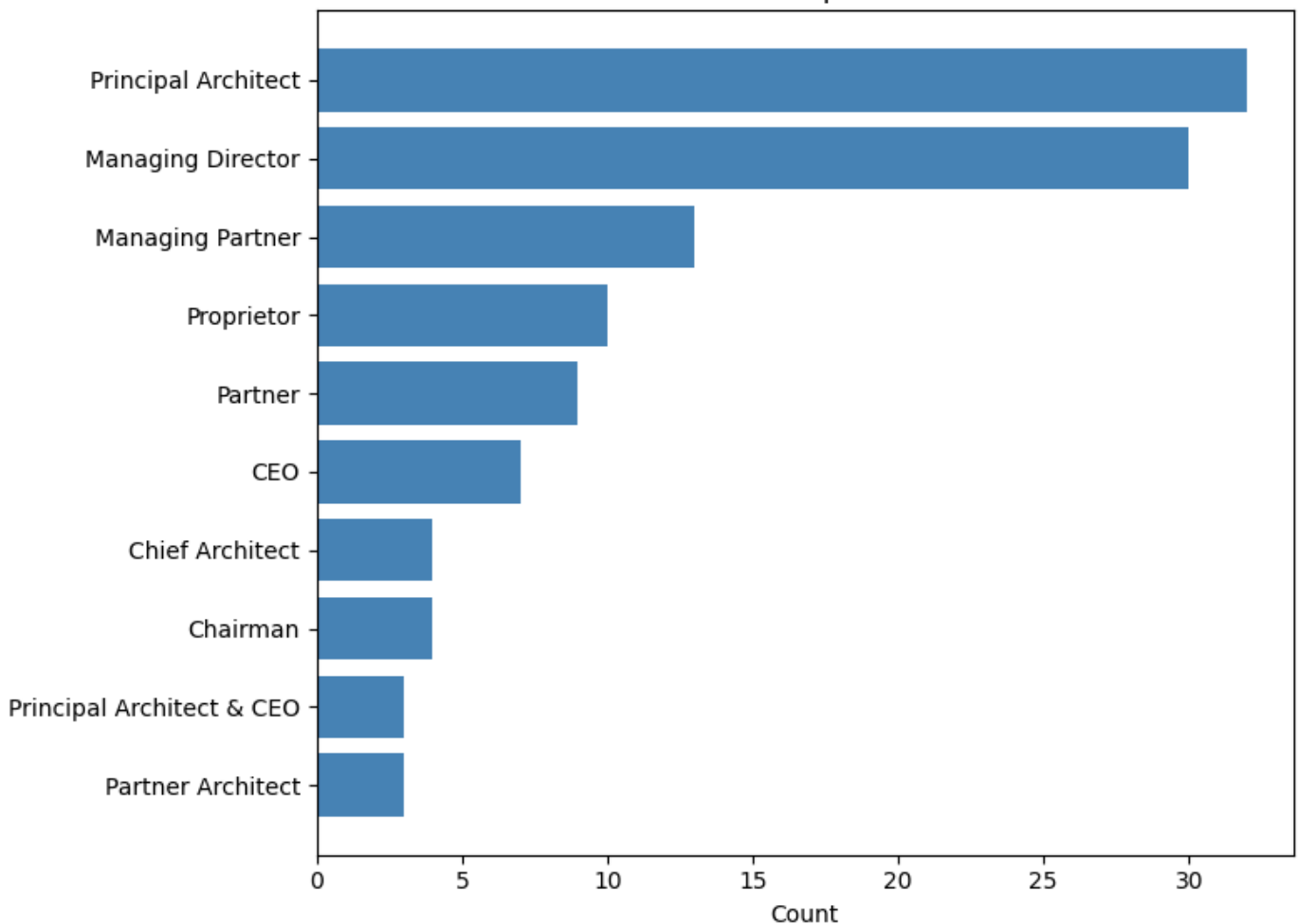


Figure 10: Staff Composition

4.7 Google Ratings Analysis

4.7.1 Rating Availability on Google Maps

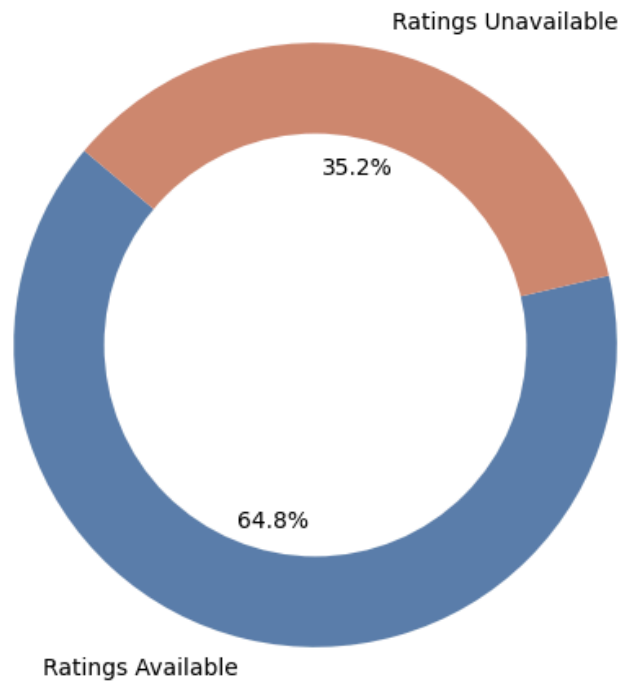


Figure 11: Rating Status

4.7.2 Top Ratings by Users

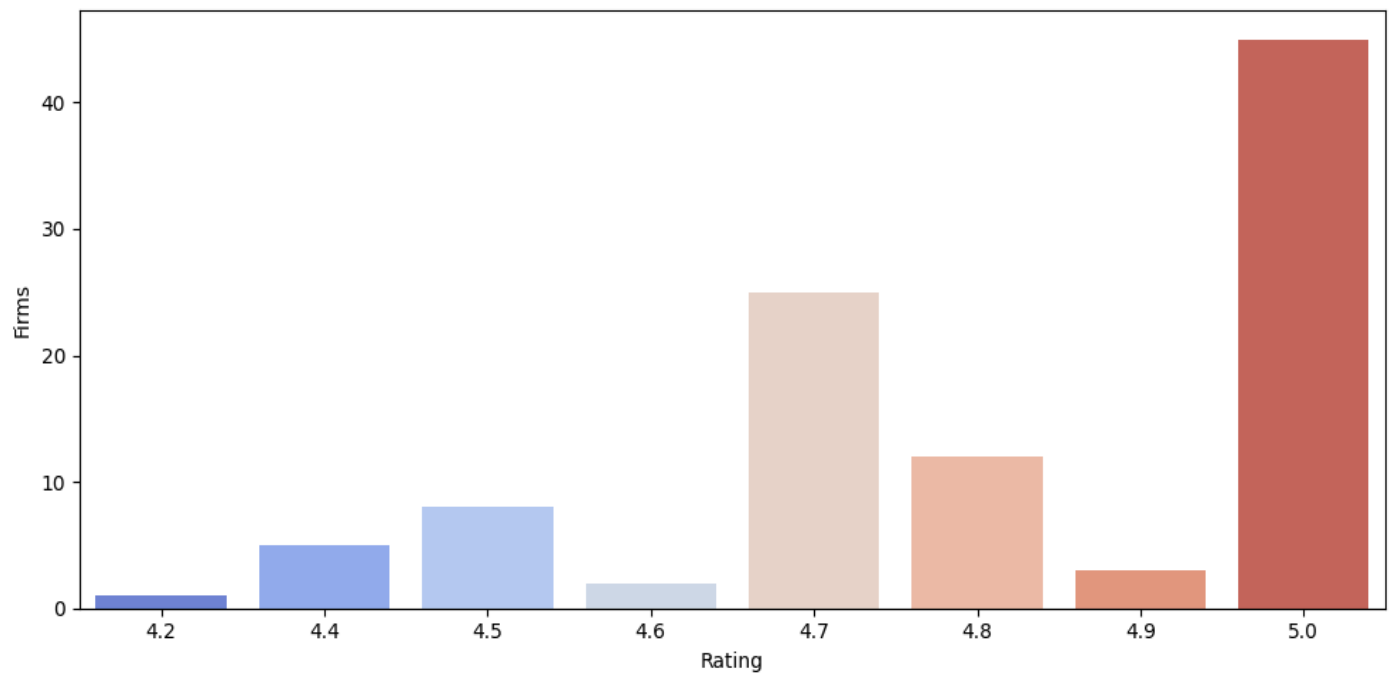


Figure 12: Distribution of Ratings by Users

4.8 Project Completions, Professionalism & Quality Prediction

- **Parameters:** Google rating ≥ 4.7 , experience bucket ≥ 2006 , active website, ≥ 5 architects.
- **Result:** 27 firms meet all criteria (Anwar & Associates, Artesan Architects, Binyash, Domus, DCON, etc)

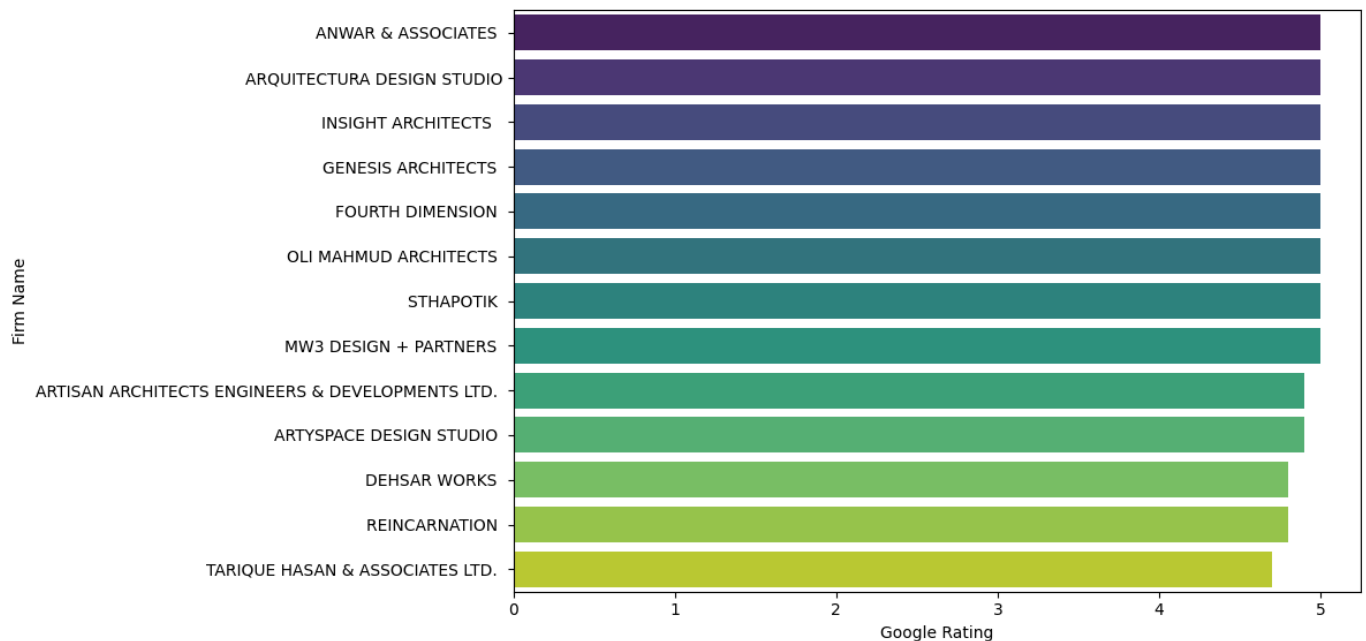


Figure 13: Project Completions, Professionalism & Quality Prediction

4.9 Specialization Categories

- **High-End Commercial:** firms in Gulshan, Banani, Uttara with ≥ 8 architects.
- **Aesthetic Apartments:** firms with 'Architectural Graduate' ≥ 5 and high ratings (≥ 4.8).
- **Regular Construction:** small firms (≤ 3 architects), no website.

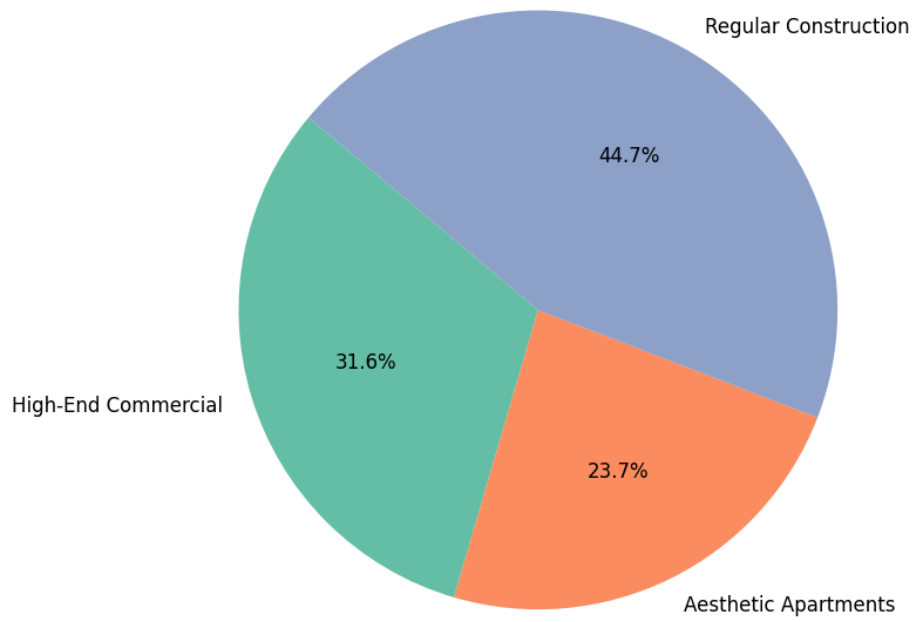


Figure 14: Specialization Categories

4.10 Fee-Charging Predictions

- **Higher Fees:** Website Registered; Rating ≥ 4.8 , Total Members ≥ 8
- **Lower Fees:** Rating < 4.0 to 0, Website Unregistered, Total Members ≤ 3

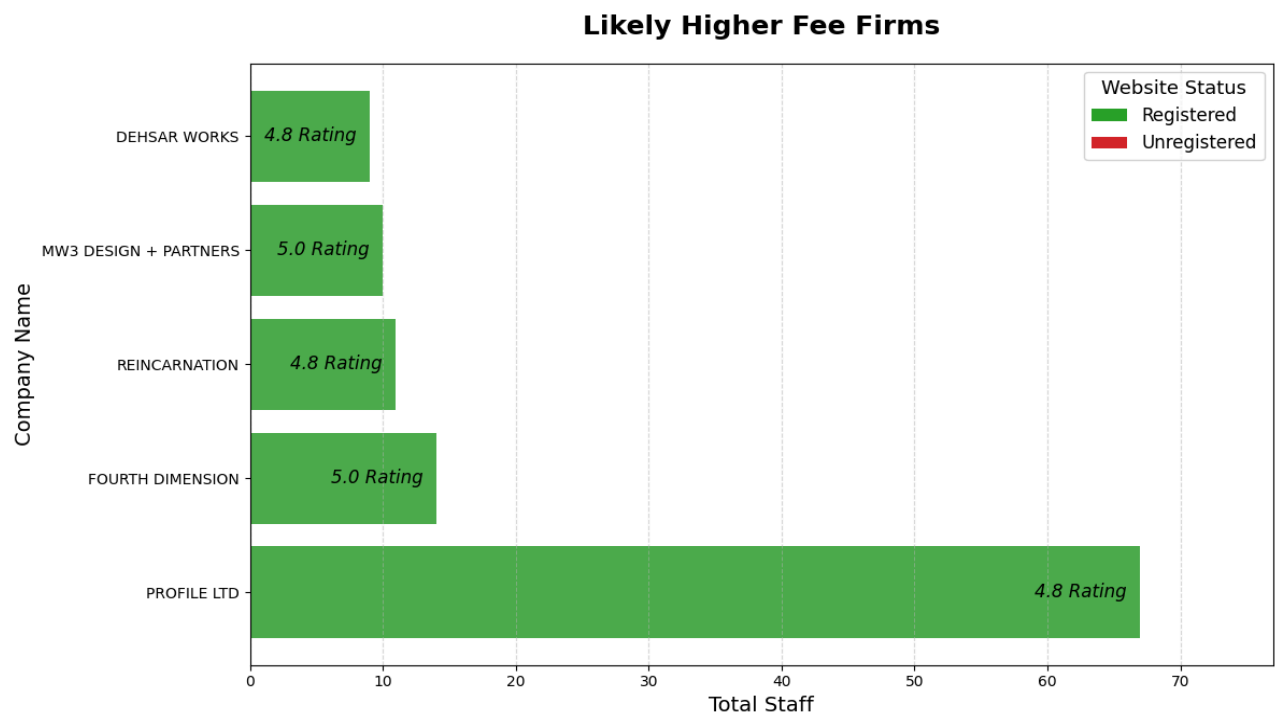


Figure 15: Prediction of Higher Fee-Charging Firms

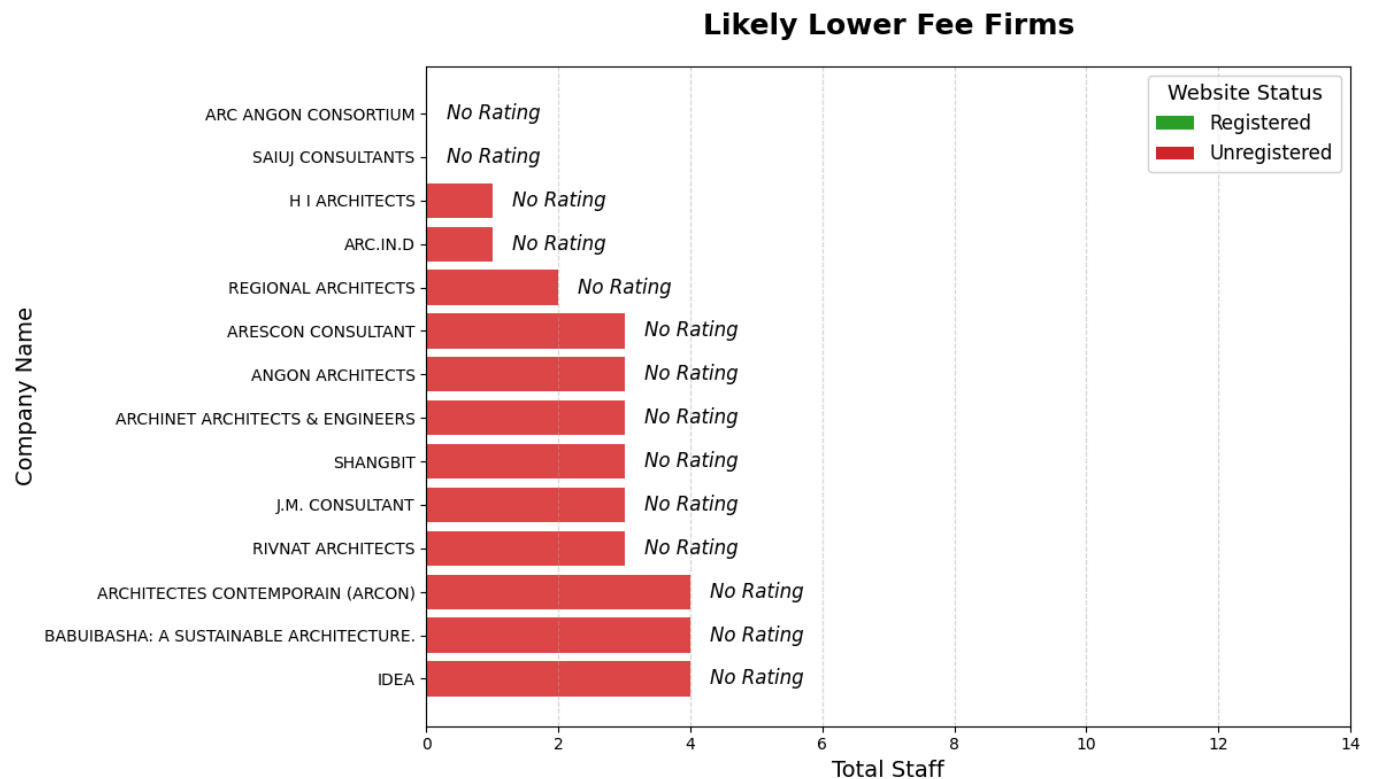


Figure 16: Prediction of Lower Fee-Charging Firms

5. Tools and Techniques Used

5.1 Data Aggregation and Cleaning:

- Tools: Microsoft Excel, Google Sheets.
- Functions: TRIM(), MID(), LEFT(), RIGHT(), LEN(), IF(), CONCATENATE(), VLOOKUP(), and more.

5.2 Data Visualization:

- Tools/Platforms: Looker Studio, Google Colab.
- Techniques: Pie charts, bar graphs, donut, chart, geographic mapping, etc.

5.3 Reporting:

- Tools: Microsoft Word, Google Docs.
- Output: Structured, professional report with embedded visuals.

6. Challenges and Learning Outcomes

6.1 Challenges & Solutions

- **Challenge:** Missing geo-coordinates for several firms
Solution: Manually searched firm addresses on Google Maps to retrieve latitude and longitude.
- **Challenge:** Inconsistent naming conventions (e.g., "Arch." vs. "Architects")
Solution: Standardized entries using Excel's SUBSTITUTE() function to ensure uniformity.
- **Challenge:** Rating data inconsistencies (e.g., "N/A", blank cells)
Solution: Replaced "N/A" and empty values with 0 or marked as "Unavailable" for consistent calculation and filtering.
- **Challenge:** Time-consuming manual enrichment of missing email addresses and websites
Solution: Conducted detailed Google searches and visited official websites to fill in missing fields.
- **Challenge:** Limited publicly accessible data for newer or smaller firms
Solution: Used logical assumptions based on similar firms' patterns for prediction and classification where direct data was unavailable.

6.2 Learning Outcomes

- **Strengthened technical proficiency** in using Excel, Google Sheets, and dashboard tool (Looker Studio) for real-world data handling and presentation.
- **Refined data preparation and analysis skills**, including data cleaning, transformation, and visualization using a variety of functions and techniques.
- **Developed strategic thinking** in aligning analytical findings with practical business objectives and decision-making.
- **Gained hands-on experience** in interpreting incomplete datasets, making logical assumptions, and deriving actionable insights.
- **Improved communication and reporting abilities** through the creation of professional reports and interactive dashboards tailored to diverse audiences.

7. Recommendations & Future Work

- **Support Digital Presence:** Launch onboarding programs to help firms without websites or professional emails establish a credible online identity.
- **Create a Verified Rating System:** IAB should standardize and validate firm ratings to ensure trust and consistency.
- **Maintain an Updated Firm Database:** Regularly track and publish firm data to highlight emerging players and industry trends.

8. Conclusion

This project provides valuable insights into the state of architectural firms in Bangladesh, highlighting key trends and opportunities. A significant digital gap exists, with over 29% of firms lacking a website underscoring the need to enhance online visibility for competitiveness. The data reveals that firms with strong digital presence, higher ratings, and greater experience are generally perceived as more professional and likely to command higher fees. Additionally, the heavy concentration of firms in Dhaka points to a need for geographic diversification to improve regional access. Supporting newer firms, particularly those established after 2015, with mentorship and digital literacy initiatives could significantly improve their market presence and client reach.

9. Appendices & Deliverables

9.1 Project Workflow Documentation

- [Click Here to Access](#)

9.2 Dashboard & QR Code

- Interactive Looker Studio Dashboard:

[Click Here to Access](#)

- QR Code (For Scanning):



Figure 17: QR Code of Dashboard

9.3 Google Colab & Codebase

- [Click Here to Access](#)

9.4 Full Project Access

- [Click Here to Access the Full Project on GitHub](#)

10. References & Footnotes

1. IAB Raw Data (PDF):
<https://github.com/sumu-az/Data-Analytics-Projects/blob/main/IAB%20Data%20Analyis%20Using%20Advanced%20Excel%20%26%20Looker%20Studio/1.%20IAB%20Raw%20Data.pdf>
2. Google Maps: [Manual Search](#)
3. QR Code Generator: <https://qr-code.io/>