

Skill and Performance Analytics on Global Freelancers

1. Introduction:

- The freelance economy is rapidly expanding worldwide, powering a diverse range of digital and technical services. This project aims to uncover key trends and insights in the global freelance marketplace by analysing profiles from 1,000 professionals spread across 21 countries and 10 technical skill domains.
- The study explores demographic diversity, skill distribution, earnings, and performance ratings, helping illustrate the evolving landscape of remote and contract-based work.
- The project demonstrates practical skills in data cleaning, transformation, exploratory data analysis (EDA) and visualization, highlighting how data-driven analysis can inform market understanding and freelance workforce management.

2. Data Cleaning Process:

2.1. Data Categories:

- Country and language
- Primary technical skill
- Gender and age
- Years of experience
- Hourly rate (USD)
- Rating and client satisfaction
- Active status (currently working/not)

2.2. Data Incompleteness:

- Client Satisfaction: 176 missing entries (17.6%)
- Rating: 101 missing entries (10.1%)
- Hourly Rate: 94 missing entries (9.4%)
- Active Status: 89 missing entries (8.9%)
- Years of Experience: 51 missing entries (5.1%)
- Age: 30 missing entries (3.0%)

2.3. Data Standardization:

- **Gender Field Standardization:**
 - Mapped ten different representations of gender to two standardized values ("Female" and "Male"), resulting in clear and consistent classification for analysis (Female: 490, Male: 510).
- **Age Category Standardization:**
 - Filled missing age values using the median age (41 years) and validated all entries to fall within a realistic working age range of 20 to 60, eliminating outliers for accurate analysis.
- **Hourly Rate Standardization:**
 - Removed currency symbols and prefixes from various rate formats; converted all entries to numeric values within the valid range of \$20 to \$100.
- **Active Status Standardization:**
 - Unified eight inconsistent Boolean representations into just two values ("YES" and "NO"), clarifying freelancer activity (44.6% active, 55.4% inactive).
- **Client Satisfaction Standardization:**
 - Converted satisfaction scores from percentage strings to pure numeric format (60–100), enhancing their usefulness for statistical analysis and reporting.

3. Data Analysis:

3.1. Skill Distribution (Bar Chart):

- **Insight:** The analysis shows that freelancers are evenly distributed across key technical domains such as DevOps, AI, and UI/UX Design. No single skill overwhelmingly dominates the market, indicating balanced opportunities and a broad demand for expertise.

3.2. Geographic Spread (Pie Chart):

- **Insight:** Freelancers originate from a wide range of countries, with substantial representation from South Korea, Canada, Germany, and the US. The diversity in language and location underscores the truly global nature of the dataset and the reach of freelance platforms.

3.3. Earnings Analysis (Box Plot):

- **Insight:** Most freelancers earn median hourly rates between \$40 and \$50, while specialties like Cybersecurity and DevOps command the highest rates. The distribution suggests competitive compensation for in-demand technical talent and identifies areas where upskilling may deliver higher pay.

3.4. Ratings & Client Satisfaction (Histogram):

- **Insight:** The majority of freelancers have ratings between 2 and 4 out of 5 and client satisfaction scores generally fall within the 70–90% range. This indicates a stable quality of work across the freelance pool, with room for improvement toward top performance.

3.5. Gender & Activity (Count Plot):

- **Insight:** The gender split is nearly equal among freelancers, and 44.6% of profiles are marked as active. Notably, active freelancers earn higher average rates, demonstrating the benefits of staying engaged and maintaining an up-to-date profile.

3.6. Experience Trends (Scatter Plot):

- **Insight:** There is a modest, positive relationship between years of experience and hourly rate. This pattern highlights that experience contributes to earning power, validating the importance of career growth and ongoing skill development in the freelance market.

4. Suggestions:

- Adding new variety of data such as freelancer education, project types, or industry, to uncover richer trends and correlations.
- Collection of periodic data to track how market rates, skills demand, and performance metrics evolve over time.