IS 5960: Master's Research Project – Experiential Report

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Project title:

Employability Analytics Dashboard for ASP.NET Developer Roles

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Course Number and Section: IS-5960-03: Master's Research Project

Instructor's Name: Maria Weber

Description of the intended user of the application

The primary users of our application are recruitment managers, talent acquisition specialists, and career advisors who are directly involved in the process of hiring ASP.NET developers. These users typically work in IT services, technology consulting, or in-house HR departments for mid- to large-sized companies. Their day-to-day responsibilities include sourcing candidates, shortlisting applicants, comparing salary expectations, assessing required skills, and analyzing hiring risks such as response time delays or talent mismatches.

To understand our intended users better, we analyzed several publicly available job listings and gathered informal feedback from peers who have participated in hiring processes. One recurring pain point was the lack of a centralized, filterable view that allows recruiters to assess demand and hiring efficiency in real-time. Another issue was the difficulty in quickly evaluating if job postings were aligned with competitive market conditions.

A key challenge we faced in identifying user needs was narrowing down which specific factors contribute to an efficient hire. Is it fast recruiter response? High salary? Remote flexibility? Or high skill demand? We addressed this by integrating multiple filters and visualizations into a single platform.

Courses that helped us shape this understanding include:

- Applied Analytics: for identifying metrics that matter to decision-makers
- Software Development: for translating business needs into features and visuals
- Information Retrieval: for understanding how to extract structured data from unstructured job descriptions

Decision-making needs of the user

Our users are under constant pressure to make timely, strategic hiring decisions. The main decisions they need to make include:

1. Determining where demand for ASP.NET roles is highest (by location, job title, and experience level)
2. Benchmarking salaries to stay competitive in a fast-moving job market
3. Identifying job postings that are easy or difficult to fill, based on skill demand, recruiter response time, and compensation offered

To meet these decision-making needs, we structured our dashboard into six interlinked modules:

- Home overview
- Hiring Trends
- Salary Benchmarking
- Candidate-Job Fit
- Hiring Risk
- Recruitment Efficiency

Each of these pages includes slicers for user-controlled exploration and visuals that respond in real-time. For instance, a recruiter can easily filter for "Mid-level ASP.NET roles in Hyderabad with high skill demand and remote flexibility" and instantly get filtered metrics, charts, and KPIs.

We followed a scenario-driven development approach. We defined real use cases like: “A manager wants to identify jobs that are high-paying, fast-moving, and require strong candidates”. These cases helped us focus our dashboard design on answering such critical hiring questions directly.

Relevant courses that guided this process:

- Visualization, Feedback and Dissemination: for user interface best practices, clean layout, effective color use and ensuring our dashboard communicates information clearly and is aligned with stakeholder expectations

Data validation and preparation

Our primary dataset was a cleaned CSV file of around 7,500 job listings focused on ASP.NET and related software development roles. Key fields in this dataset included: job title, location, salary, company name, recruiter response time, remote work availability, education requirement, skill demand, and a comma-separated list of technical skills.

Data preparation was performed in Power BI’s Power Query and included:

- Removing null or empty rows
- Standardizing text formats (e.g., converting "Master’s" and "Masters" to a consistent format)

- Creating derived columns using DAX, such as IsEfficient (a combination of high salary, fast response, and high skill demand) and Salary (to group salary ranges)

We validated the data through:

- Applying filters and visual-level checks to test DAX conditions
- Using summary tables to compare total counts with visualizations
- Manually verifying that filter worked accurately across pages

Courses that contributed significantly at this stage:

- Applied Analytics: for setting up meaningful filters and transformations
- Information Retrieval: for handling embedded text fields like the skills column

Design of the user interface

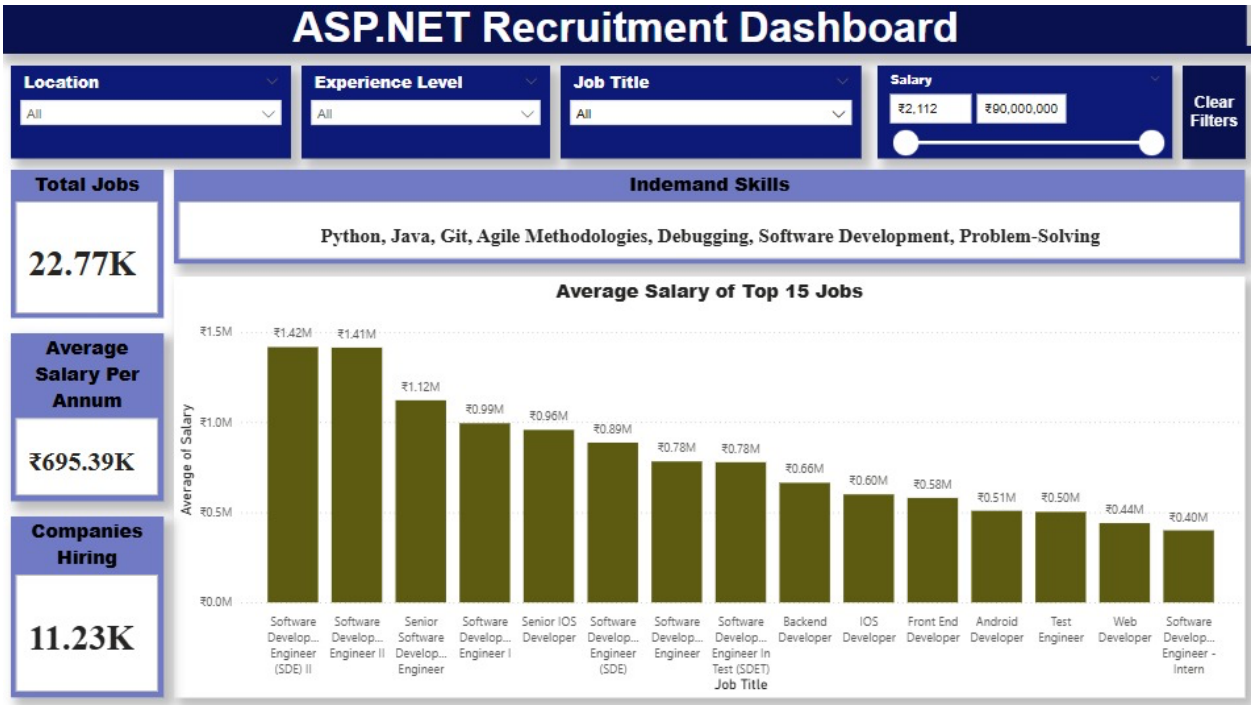
The user interface was developed in Power BI and structured into six cleanly separated pages:

1. Home Page: Provides an overview of the dashboard structure and navigation help
2. Hiring Trends: Displays demand by experience level, location, and job title
3. Salary Benchmarking: Compares salary ranges across roles and experience levels
4. Candidate-Job Fit: Visualizes education vs job level and required technical skills
5. Hiring Risk: Shows jobs that are harder to fill based on compensation and response speed
6. Recruitment Efficiency: Highlights optimal job listings based on salary, speed, and demand

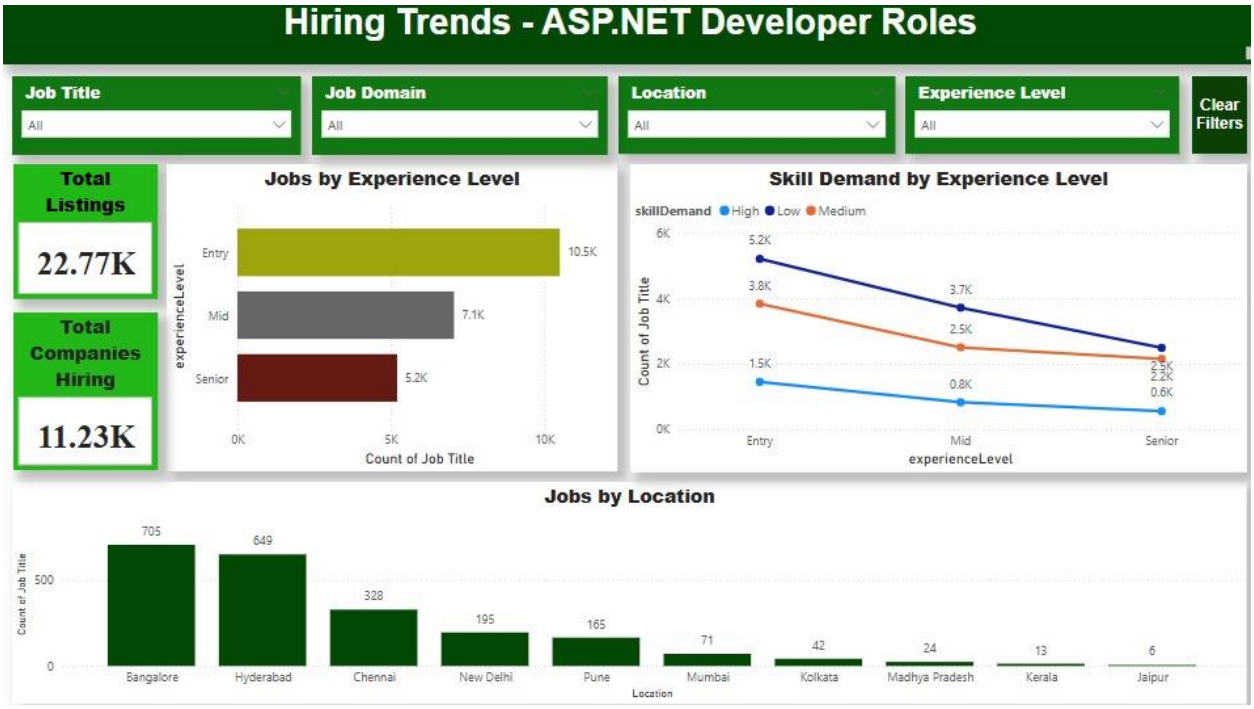
We used slicers at the top of each page for interactivity and included visual types like:

- KPI cards (for summary counts and salaries)
- Donut charts (for distribution analysis)
- Bar charts (for ranking data like top companies)
- Gauges (for risk scoring)

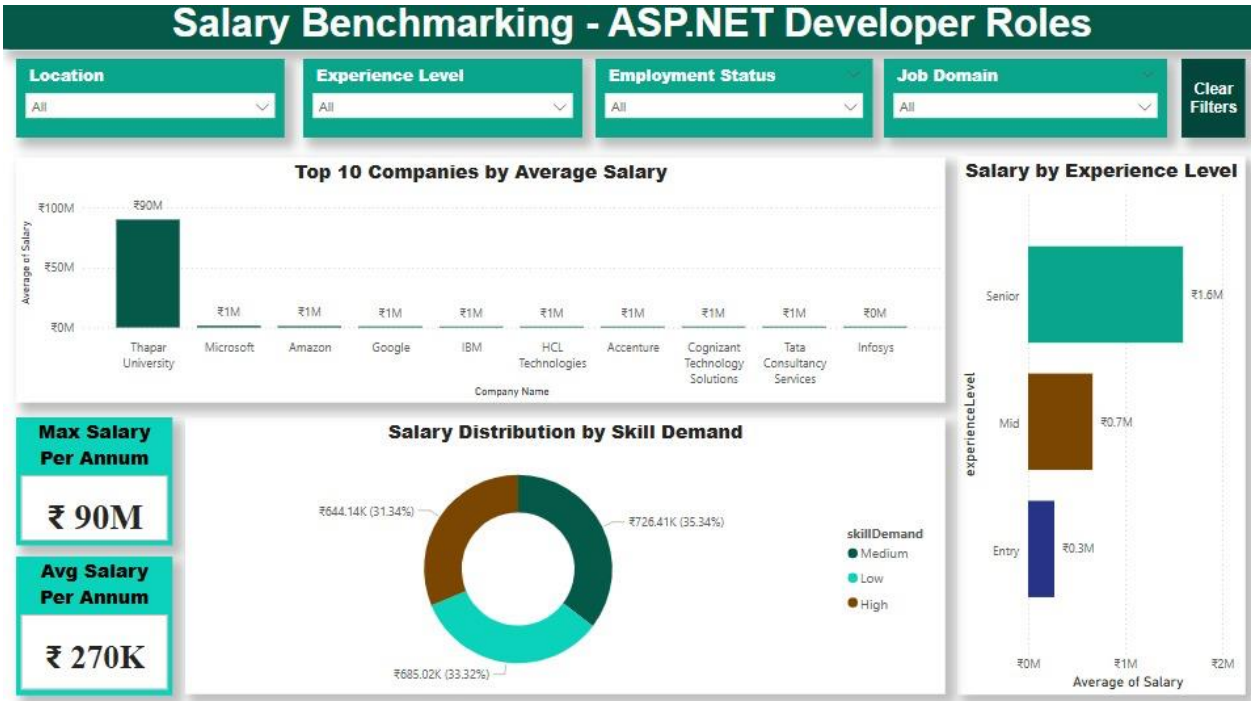
Home Page



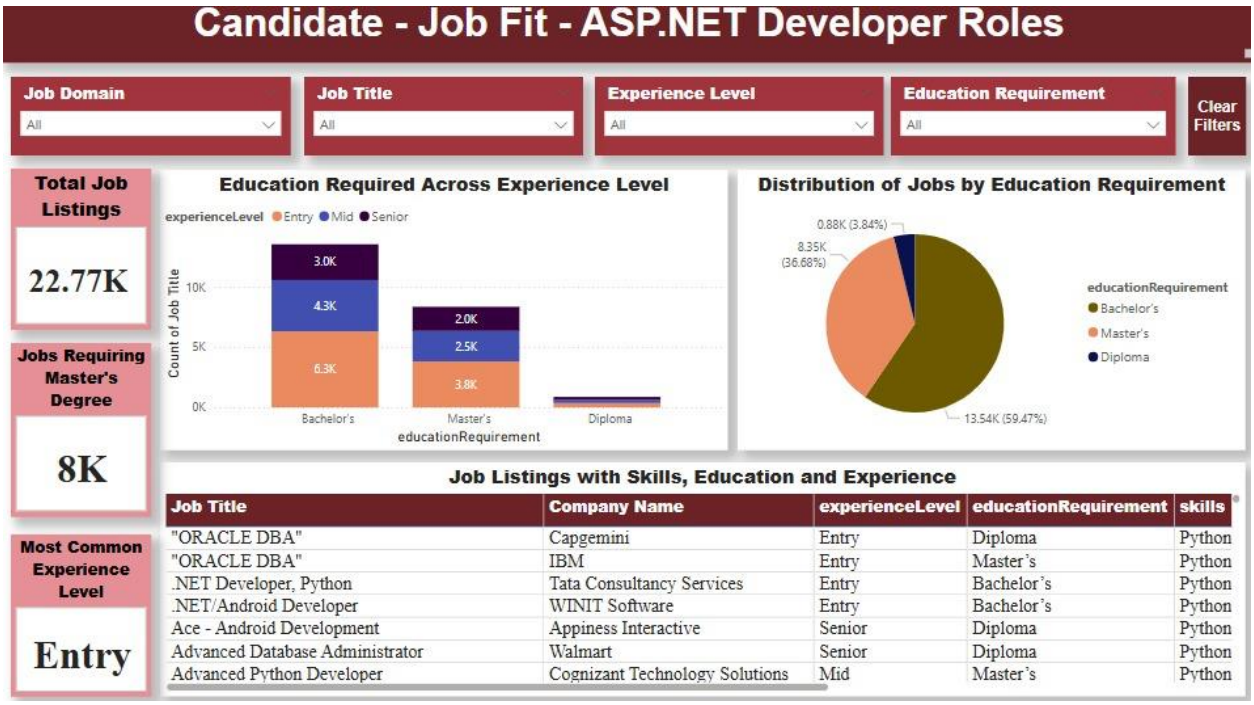
Hiring Trends



Salary Benchmarking



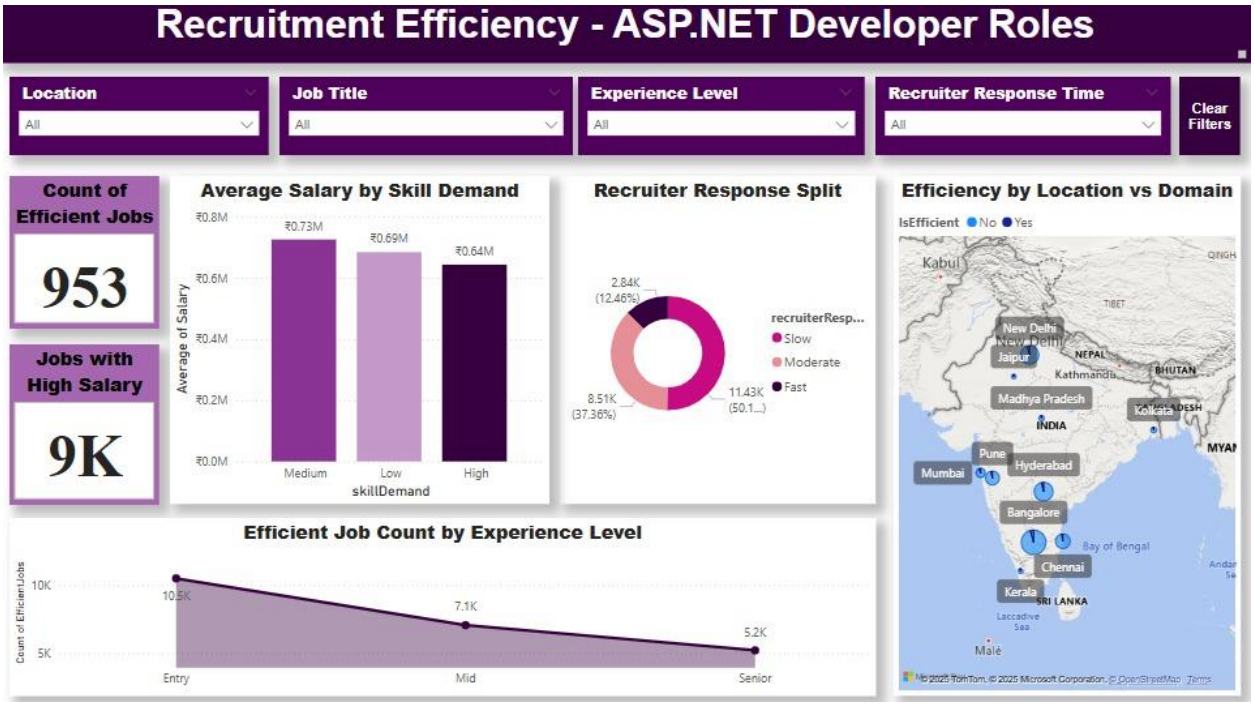
Candidate-Job Fit



Job Title	Company Name	experienceLevel	educationRequirement	skills
"ORACLE DBA"	Capgemini	Entry	Diploma	Python
"ORACLE DBA"	IBM	Entry	Master's	Python
.NET Developer, Python	Tata Consultancy Services	Entry	Bachelor's	Python
.NET/Android Developer	WINIT Software	Entry	Bachelor's	Python
Ace - Android Development	Appiness Interactive	Senior	Diploma	Python
Advanced Database Administrator	Walmart	Senior	Diploma	Python
Advanced Python Developer	Cognizant Technology Solutions	Mid	Master's	Python

Hiring Risk

Recruitment Efficiency



Courses that helped shape UI decisions:

- Visualization: for consistent layout, color use, and emphasis

- Software Development: for applying modular design and user-centered principles

Reflection

This project was a strong hands-on experience in building a complete data product. We learned how to:

- Translate user needs into measurable dashboard components
- Clean, validate, and transform data at scale
- Create interactive experiences that go beyond static charts

Key challenges included:

- Building flexible DAX logic for Yes/No conditions like IsLowSalary or IsEfficient
- Dealing with inconsistent salary formats and text-heavy fields like skills
- Creating visuals that were both rich in information and easy to understand

Team collaboration highlights:

- Manohar: Managed page layouts and led dashboard flow
- Pallavi: Implemented DAX formulas and slicer logic
- Preethi: Built Hiring Risk and Efficiency pages
- Sanitha: Handled data transformation and QA
- Vaishnavi: Created documentation and validation matrix

This project strengthened our skills in planning, iteration, and design thinking. We are more confident in using Power BI and DAX to create dashboards that support decision-making in real-world contexts.

We also appreciated how this project brought together several key courses:

- Applied Analytics: For analytical thinking
- Software Development: For project architecture
- Information Retrieval: For extracting and transforming text-based job info
- Visualization: For effective visualizations

We believe our dashboard is a strong starting point for helping hiring teams streamline recruitment workflows. With minor adjustments, the same structure could be adapted to other tech domains like Java or full stack development.