Data-Driven Analysis of Alumni Success: Analyzing Employment Outcomes in the Data Analytics Engineering Program

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November 20, 2024

Abstract

The effectiveness of Data Analytics Engineering (DAEN) program at George Mason University is critical as the DAEN department aim to provide sustained education and productive learning to the students. This study presents analysis of the DAEN program at George Mason University's College of Computing and Engineering, examining post-graduation outcomes and program effectiveness through detailed alumni feedback. The research methodology employs a mixed-methods approach, combining qualitative and quantitative interview questions to evaluate various success metrics including academic profile, employment trajectories, technical skill utilization, and program feedback. Data was collected through structured interviews with DAEN program alumni, focusing on key indicators such as job titles, career progression, technology stack adoption, and program-specific skill acquisition. Interview transcripts were processed using AWS transcription services and analyzed using natural language processing toolkit to extract meaningful patterns and insights. The processed data was then visualized using Tableau to identify patterns in employment outcomes, skill utilization, and areas for program enhancement. Results from this analysis provide actionable insights for curriculum development and program improvements, while also offering valuable metrics for assessing the program's effectiveness in preparing graduates for industry demands. This research contributes to the broader understanding of DAEN program effectiveness.

Keywords: Data Analytics Engineering (DAEN), Alumni, Employment, Program, Data, Analysis, Skill

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1 Introduction

1.1 Purpose

The primary objective of this research is to evaluate the DAEN program's effectiveness through comprehensive alumni interviews. Through structured feedback obtained from program graduates, this study conducts a detailed analysis of employment outcomes and program performance metrics. These insights are instrumental in enabling the DAEN department to implement strategic enhancements to the program, encompassing curriculum development, technology integration, and key focus areas for student development and satisfactory.

1.2 Readership

The report is intended for the DAEN program academic and administrative personnel including leaderships, key stackholders, and development team. The findings and recommendations presented in this report will provide valuable insights for improving program effectiveness, curriculum design, and student outcomes.

1.3 Doc Structure

This report is organized into seven main sections. The Introduction establishes the research context and objectives. The Problem Statement formulates the core research questions and scope. The Data section outlines the interview-based data collection methodology and questionnaire design. The Analysis section details the data processing pipeline and techniques employed. The Visualization section presents the derived data visualizations and their interpretations. The Findings section synthesizes key insights obtained through visual analytics. Finally, the Next Steps and Lessons Learned section proposes future research directions and methodological improvements.

2 Problem Statement

2.1 Alumni Feedback

Analysis of feedback from DAEN program alumni between 2019-2023 reveals significant insights into program effectiveness. Across 13 alumni respondents, the average program satisfaction rating is 3.7 out of 5, indicating general satisfaction but with room for improvement. Alumni consistently emphasized the value of practical skills acquired through courses like database systems, statistical analysis, and machine learning. However, they also highlighted gaps between academic preparation and industry requirements, particularly in areas of cloud computing and hands-on projects.

2.2 Focus

This research examines the DAEN program's effectiveness through analysis of alumni career trajectories and employment outcomes. Our data shows alumni have secured positions across various roles including Data Scientists, Data Engineers, Data Analysts, and Machine Learning Engineers at prominent organizations such as Fannie Mae, Capital

One, and Activision Blizzard. The study specifically focuses on evaluating how well the program's curriculum aligns with industry technology requirements, with particular attention to programming languages, cloud platforms, and analytical tools commonly used in professional settings.

2.3 Problem

The DAEN program faces key challenges in obtaining comprehensive alumni data to evaluate the program effectiveness. After the alumni feedback was gathered, some key problems with the program was discovered. First, while the program provides strong theoretical foundations, alumni feedback indicates a need for increased hands-on experience with industry tools and technologies. The data reveals that while 85% of alumni work with cloud platforms (AWS, Azure, GCP) in their current roles, many received limited exposure to these technologies during their coursework. Second, there is a significant demand for enhanced project-based learning, with multiple alumni suggesting earlier integration of capstone projects and more extensive project planning experience. Third, the technology stack taught in the program requires continuous updating - while many courses focus on R programming, industry positions predominantly require Python proficiency, as evidenced by 77% of alumni reporting Python as a primary tool in their current roles. Additionally, emerging areas such as AI ethics, DataOps, and machine learning operations need stronger representation in the curriculum to better prepare students for current industry demands. These challenges must be addressed to maintain the program's effectiveness in preparing graduates for successful careers.

3 Data

3.1 Collection Process

The data collection process was conducted through structured interviews with DAEN program alumni. Alumni were identified and contacted through LinkedIn for interview scheduling. To ensure consistency and comprehensive data gathering, each interview followed a standardized set of questions covering academic background, career progression, technology and tools used, and program feedback. Interviews were conducted remotely and recorded with permission while maintaining participant anonymity throughout the process.

3.2 Questions

The interviews were structured with the following 12 questions in the same order for each participating alumni:

1. What year and spring/fall did you graduate from the Data Analytics Engineering (DAEN) program?

This question aims to establish the alumni's graduation year and semester to track the program's impact over time.

2. Did you receive an M.S. or Certificate?

3. What was the title of your first job, the name of the company and the general responsibilities?

4. What technologies/tools did you use for this job title?

5. What is your current job title, the name of the company and the general responsibilites?

6. How many jobs have you had since you graduated?

7. List the most used technologies/tools in your career. (E.g. Programming language, framework, cloud, ML)

8. What knowledge and skills that you acquired in the DAEN program have been the most valuable to your career? Can you specify the concepts/methodologies/technologies that were most valuable?

9. If DAEN program provided these specific courses, topics, or training, I would have been more prepared in my career...

10. How well did the DAEN courses prepare you for your career? (Scale: 1 – Not well at all, 5 – Very good)

11. Have you completed any courses/certifications since you graduated from the DAEN program?

3.3 Data Process

[Explain how the data was processed and summarized]

3.4 Data Quality

[Discuss the quality and reliability of the data]

4 Analysis

[Present your detailed analysis]

5 Visualization

Figure 1: Your caption here

6 Findings

[Present your key findings]

7 Next Steps and Lessons Learned

7.1 Next Steps

[Outline future recommendations]

7.2 Lessons Learned

[Discuss key takeaways and learning points]

A Background

[Additional background information]

B References

References

[1] Author, A. (Year). Title. Journal/Publisher.