

# Reflective Essay on My Business Analytics Journey at Macquarie University



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Embarking on the Master of Business Analytics program at Macquarie University marked the beginning of an enlightening and transformative phase of my academic and professional journey. As I navigated through numerous courses, collaborated with diverse groups of peers, and delved into complex analytical tools, I gained insights and skills that have profoundly shaped my perspective on the analytics landscape. The purpose of this reflective essay is not just to chronicle my experiences but to critically evaluate the depth of learning I have achieved, connecting theoretical knowledge with practical application. Drawing from personal anecdotes, evidence from my academic journey, and the broader context of the analytics industry, I aim to weave a narrative that underscores the challenges faced, milestones achieved, and the vision I hold for the future in the realm of Business Analytics.

My initiation into the Business Analytics program was akin to stepping into an entirely new dimension. I studied Industrial engineering and gained some management consultation experience in Turkey. While doing so, I realised I needed to improve my English and analytics skills to help businesses more effectively in their decision-making; Therefore, I moved to Australia to study English and acquire a Master's degree in business analytics. The first days were both exciting and overwhelming. With its robust curriculum and innovative teaching methodologies, Macquarie University ensured that I was constantly exposed to a blend of theoretical knowledge and real-world applications.

One of my initial encounters was with the course on Data Visualization. Here, I was tasked with converting raw data into insightful visual narratives. One particular project, "Data and Visualisation for Business Report" involved analysing music sales data using SQL and Tableau. I transformed numbers into charts and graphs using tools like Tableau, revealing patterns and trends previously obscured in spreadsheets (Figure 1). I learnt that I am pretty talented and enthusiastic about data visualisation, and only lack proper education, which is why it was an excellent decision for me to take this course.

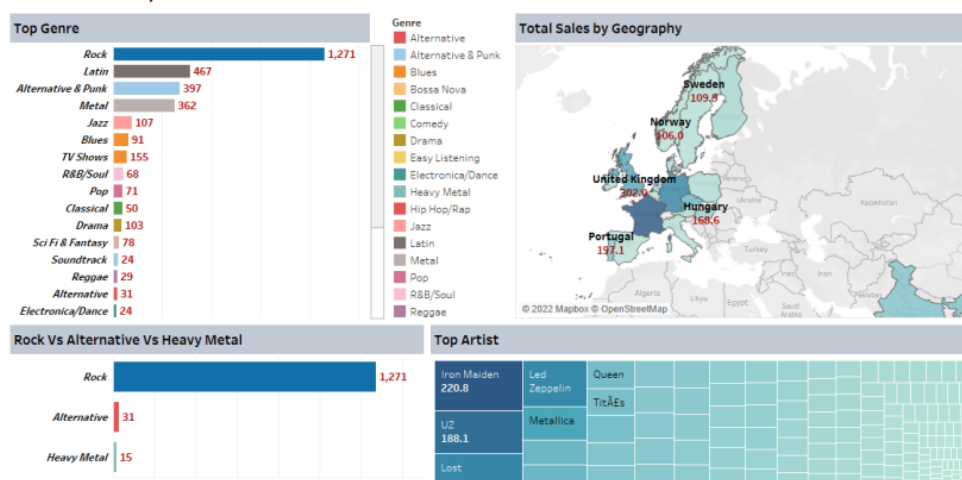
Figure 1 Data Visualisation Project in BUSA8090

#### Visualizations:

1. One visualisation relevant to the data;

#### Solution

Used variety of charts on the dashboards



However, challenges were aplenty. Grappling with advanced statistical tools and techniques in the Predictive Analytics unit was a steep learning curve. It wasn't just about understanding the underlying algorithms but figuring out how they could be used to drive business decisions. A significant hurdle was an assignment where I was tasked to conduct customer segmentation analysis for developing tailored marketing strategies in a supermarket chain. I successfully completed the technical part, customer segmentation. To ensure that my colleagues, who might utilise this information to devise the most effective strategic marketing strategies, fully understand the findings, I crafted my report using clear and comprehensive language. This approach was taken to cater to those who may not have expertise in business analytics. (Figure 2)

Figure 2: Customer segmentation analytics in the Applied Predictive Analytics unit.

#### BUSA8001 Applied Predictive Analytics



Cluster ID	Sex (% Female)	Marital Status (% Not Single)	Avg. Age	Education (Mode)	Avg. Income (\$)	Occupation (Mode)	Settlement Size (Mode)
0	25.3	40.4	32	University	137358	Skilled Employees/Officials	Big Cities
1	36.1	47.7	55	Graduate School	154392	Skilled Employees/Officials	Mid-sized to Big Cities
2	63.8	56.9	32	University	97063	Unemployed/Unskilled	Small Cities

The table above shows the outcome of K-Means clustering, presenting 'Sex' and 'Marital status' as percentages for easy comprehension, while 'Age' and 'Income' are displayed as averages. 'Education', 'Occupation', and 'Settlement Size' are represented by their most common values, known as the mode. This analysis has successfully identified three distinct customer segments:

- "Young Professionals in Big Cities" (Cluster 0) consists of non-single, university-educated males in their 30s, with incomes around \$137,000.
- "Senior, Educated Individuals" (Cluster 1) are predominantly older males with higher education, earning around \$154,000.
- "Young, Lower-Income Singles" (Cluster 2) are primarily single females in their 30s earning about \$97,000.

The experience was not just about mastering a software tool like Python but understanding the story behind the data and effectively communicating it to stakeholders. This assignment ensured that I loved extracting insight from data and proudly telling the story behind the data.

In my journey with the BUSA8030 Management of Data, Analytics and Change unit, I was confronted with the profound transformation AI promises within the game development industry. I faced a whirlwind of emotions. Initially, the anxiety about AI replacing human roles was dominant. But as our group explored the topic, my perspective began to shift. The potential for AI to alleviate workloads and enhance creativity became evident. This assignment reinforced the importance of balancing human insight with technological advancement. Reflecting upon this, I realise the essence isn't choosing between humans and AI but harnessing their combined strengths (Figure 3).

*Figure 3: Executive Summary from our group assignment in management of data (BUSA8030) unit*

### Group 10 - The Mystery Machine

## Executive Summary

This report presents a change management plan addressing the AI integration into the game development industry. By understanding game developers' perspectives, we have identified the key issue: balancing the transition to AI while ensuring job security and work-life balance for developers, and mitigating fears around upskilling.

- **Upskilling Programs:** Comprehensive AI-related training for developers to equip them for the changing industry landscape.
- **Role Adaptation:** Redefining job roles to integrate AI skills, thus maintaining creative expertise while leveraging AI efficiencies.
- **AI Tools for Developers:** Providing AI tools tailored to assist developers, enhancing productivity and work-life balance.

Communication and change management strategies are crucial for the successful implementation of these solutions. The ethical implications of AI integration and responsible AI usage guidelines should also be considered.

Overall, the proposed plan presents a balanced approach to AI transition in the game development industry, fostering a culture of continuous learning, collaboration, and innovation to secure a prosperous future.

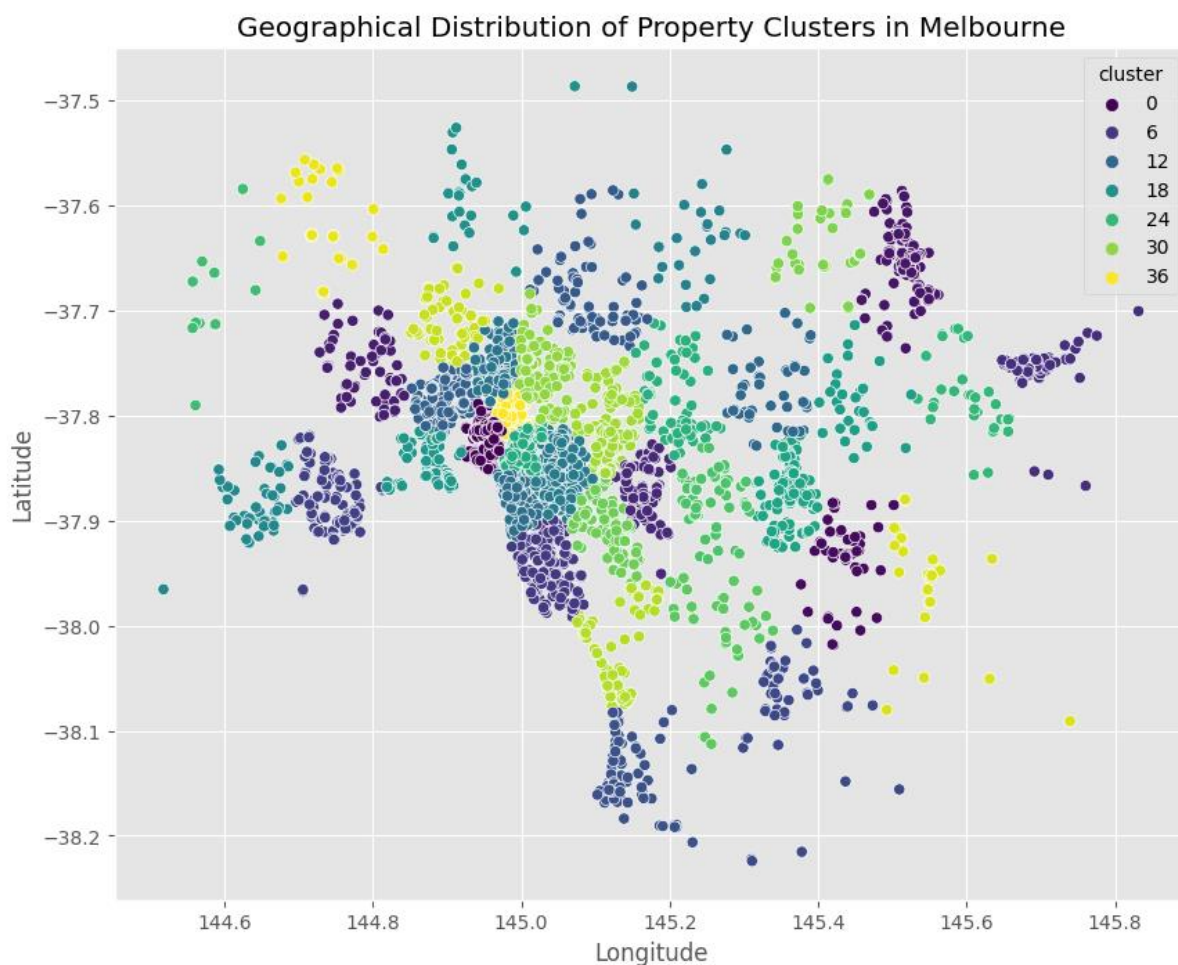
Amid my academic progression, the unit "Techniques in Business Analytics" (BUSA8000) posed a unique challenge for me. Unlike other units where I found an immediate synergy between theory and practical application, BUSA8000 seemed to lean heavily into theoretical terrains, echoing familiar trails from my prior econometrics units. There were moments of self-doubt: was I missing the value in this deep dive into statistics? Was there a hidden practicality I wasn't grasping? But as the course went on, my initial inklings solidified. I found myself desiring more of an applied context to the analytical tools and techniques. Especially during the final exam, as I delved into the intricate depths of statistical inference, I couldn't help but wonder: How would this translate in a real-world scenario? This reflection isn't just about my struggle with a singular unit but a broader realisation of my learning style. I thrive when theory intertwines with application, where I can see the tangible impact of knowledge. The experience with BUSA8000 taught me to seek this balance actively in future learning endeavours and to voice my perspectives, ensuring that my academic journey aligns with my personal and professional aspirations.

Responding to these academic encounters, it was evident that Business Analytics was not a mere composition of numbers and software but a discipline that required a holistic understanding of business, strategy, and communication. The combination of challenges and achievements in these early stages laid the foundation for my evolving perception of the field, prompting me to seek more profound knowledge and hands-on experience in subsequent units.

While distinct in content, the courses were intertwined in their approach, emphasising a holistic understanding of business analytics. As I navigated the program, the interrelation between different subjects became evident. For instance, insights from Business Strategy influenced decision-making in Data-Driven Marketing, ensuring that every decision was data-informed and aligned with broader business goals. This interconnectedness reiterated the need to not just work in silos but to adopt a comprehensive view of the business landscape.

Reflecting upon my journey through the Business Analytics program, I've come to appreciate this field's dynamic and constantly evolving nature. I've realised data is not merely static; it's fluid. This fluidity presents a vast array of possibilities, challenges, and opportunities. My foray into predictive analytics was particularly illuminating. For example, in our final group project for the Applied Predictive Analytics unit, we delved into predicting Airbnb prices in Melbourne. An integral part of this process was feature engineering, during which I clustered the coordinates of Airbnb locations. The visualisation of these clusters was revelatory. As depicted in Figure 4, the graph not only mirrors the geographical layout of Melbourne but also intriguingly aligns with its suburb distribution and population density. Each dot on the graph signifies a property, with its colour denoting the specific cluster it belongs to

*Figure 4: Geographical clustering of Airbnb properties in Melbourne, showcasing the alignment with suburb distribution and population density.*





During a challenging phase of my studies, I undertook an intensive role as a QA Analyst at Hyundai AutoEver. This was not merely a job but a lesson in discipline, tenacity, and adaptability. While the focus was on developing infotainment software systems for vehicles, the real learning came from the intricate dance of managing a full-time job with my academic commitments. During this period, I refined my soft skills immeasurably. Time management became not just a skill but a necessity. It taught me to handle stress, prioritise tasks, and communicate more effectively. As I juggled late work hours with evening study sessions, I recognised an inner resilience and a heightened focus. This demanding experience underscored my commitment to my studies and my capability to maintain balance amidst pressure.

Recently, I led a team under the Kaggle Competition Group (KCG), which I co-founded with two peers, to address a complex bioinformatics challenge set by InVitro Cell Research. Our task was to predict medical conditions based on health characteristics, aiming to outperform existing models like XGBoost and Random Forest. Guiding my team through data imbalances, we employed class weighting techniques and harnessed the Random Forest Model, making strategic decisions based on the variables' importance. Our rigorous approach, documented in our Jupyter Notebook(Figure 5), underscored my leadership skills and showcased our commitment to advancing the field.

Figure 5: Visualisation of our tailored Random Forest Model and variables' importance. A testament to the collaborative efforts under my leadership in the Kaggle competition.

## Train Random Forest Model

Today, we will use the defaults to create the Random Forest Model. By default the model is set to train for a classification task. We will train a model for each fold and after training we will store the model and metrics. Here, we have chosen accuracy and binary\_crossentropy as the metrics.

```
In [ ]: # Loop through each fold
for i, (train_index, valid_index) in enumerate(kf.split(X=dataset_df)):
    print('#### Fold',i+1)
    # Fetch values corresponding to the index
    train_df = dataset_df.iloc[train_index]
    valid_df = dataset_df.iloc[valid_index]
    valid_ids = valid_df.index.values
    # Select only feature columns for training.
    train_df = train_df[FEATURE_COLUMNS]
    valid_df = valid_df[FEATURE_COLUMNS]
    train_ds = tfidf.keras.pd_dataframe_to_tf_dataset(train_df, label=label)
    valid_ds = tfidf.keras.pd_dataframe_to_tf_dataset(valid_df, label=label)
    # Define the model and metrics
    rf = tfidf.keras.RandomForestModel()
    rf.compile(metrics=["accuracy", "binary_crossentropy"])
    rf.fit(x=train_ds, class_weight=class_weight)
    # Store the model
    models[f"fold_{i+1}"] = rf

    # Predict OOF value for validation data
    predict = rf.predict(x=valid_ds)
    # Store the predictions in oof dataframe
    oof.loc[valid_ids, 0] = predict.flatten()

    # Evaluate and store the metrics in respective dicts
    evaluation = rf.evaluate(x=valid_ds, return_dict=True)
    accuracy[f"fold_{i+1}"] = evaluation["accuracy"]
    cross_entropy[f"fold_{i+1}"] = evaluation["binary_crossentropy"]
```

Furthermore, having faced challenges during the course –grappling with complex algorithms, confronting ethical dilemmas, or managing team dynamics during group projects – I've outlined a few strategies for the future. I intend to engage in continuous professional development, seek mentorship from industry veterans, participate in Kaggle competitions and actively participate in analytics communities and forums. These strategies are not just about staying updated but about nurturing a mindset of growth, curiosity, and collaboration.

The journey through the Business Analytics program at Macquarie University has been transformative, to say the least. Not only have I accumulated a treasure of technical skills, but I've also experienced personal and professional growth, which has transformed my perspective on the industry and its vast potential. My immersion in diverse modules, the challenges encountered, and the leadership opportunities I embraced have all concretely sculpted my understanding and vision for the business analytics realm. While the road had its fair share of challenges, each one was a stepping stone towards a broader understanding and a clearer vision of my place in this domain.

The significance of this reflective exercise cannot be overstated. It has provided a unique opportunity to introspect, connect the dots of my academic journey, and envision the path ahead. As my time at Macquarie nears its conclusion, I'm filled with a sense of gratitude and realisation that this, in many aspects, is merely the prelude. Armed with the foundational expertise acquired and insights gleaned, I am primed to make impactful contributions in the ever-evolving landscape of business analytics.

Above all, this journey has reinforced the importance of lifelong learning, adaptability, and the pursuit of excellence. As I transition into the professional realm, these lessons will be my guiding stars, ensuring that my analytical journey is not just about numbers and data but about creating tangible impacts and driving meaningful change.

To visually encapsulate my transformative journey through the Business Analytics program at Macquarie University, I've illustrated the key milestones, experiences, and skills I've acquired in an infographic presented on the next page (Figure 6).

Figure 6: A Visual Reflection of My Business Analytics Journey.

# My Business Analytics Odyssey at Macquarie University

