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**CCT College Dublin Continuous Assessment**

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| **Programme Title:** | Higher Diploma in Data Analytics for Business / Higher Diploma in AI Apps | | |
| **Delivery Mode:** | Online | | |
| **Cohort Details:** | Higher Diploma Data Analytics Sep2025 FT/PT Semester 1 | | |
| **Module Title(s)**: | Strategic Thinking | | |
| **Assignment Type:** | Individual | **Weighting(s):** | 20 % |
| **Assignment Title:** | CA 1 – Capstone Project Proposal | | |
| **Lecturer(s)**: | Taufique Ahmed | | |
| **Issue Date:** | 22nd Sept 2025 | | |
| **Submission Deadline Date:** | 29th October, 2025 at 23:59 | | |
| **Late Submission Penalty:** | Late submissions will be accepted up to **5** calendar days after the deadline. All late submissions are subject to a penalty of **10%** of the mark awarded.  Submissions received more than 5 calendar days after the deadline above **will not** be accepted and a mark of 0% will be awarded. | | |
| **Method of Submission:** | **This assignment is submitted via Moodle.** | | |
| **Instructions for Submission:** | Your work must be uploaded to Moodle.  • Capstone Project Proposal in Word format ONLY. The word count is 1,000.  • Ethics form signed by all students and submitted as PDF.  • ZIP or RAR files will not be accepted. Files must be submitted separately. | | |
| **Feedback Method:** | **Results posted in Moodle gradebook** | | |
| **Feedback Date:** |  | | |

Strategic Data Analysis for Student Retention in Jiu-Jitsu Academies

**Introduction**

The expansion and viability of a Jiu-jitsu academy depend essentially on the ability to keep students engaged and committed. Compared to other business models with continuous income, student loyalty is key to reducing churn and ensuring the academy's long-term economic stability. This project aims to put data analysis into practice to convert customer relationships from reactive to proactive.

**Problem Definition**

The high student turnover rate is a commercial weakness that has an immediate impact on the academy's financial organisation, resulting in extra costs such as marketing and attracting new students. The threat of attrition is amplified by the fundamental principle of Customer Relationship Management (CRM), which posits that the cost of acquiring a new customer can be up to five times higher than the cost of retaining an existing customer (Dyche, 2002). This problem is most evident at the base: ‘the biggest and most immediate retention opportunity for most academies is definitely in retaining white belts’ (JJGF, n.d.)

**Objectives**

This Capstone project aims to analyse strategy gaps through thorough data analysis in order to accurately predict which students are highly likely to drop out. The goal is to enable the creation of a new methodology for the engagement and retention programme that is economically sustainable and focused, improving investments in CRM.

**Scope of the Project**

The scope of the project focuses on using data analytics techniques and predictive models to identify risk patterns based on engagement metrics such as average class attendance and contract duration. The main area of focus will be to concentrate retention efforts on groups of students recognised as high risk, confirming the strategic value of Data Analytics in the sustainability of ongoing service businesses.

Methodology

The method will consist of the following steps:

1. Exploratory Data Analysis (EDA): Identification of dropout correlates (e.g., belt level and training frequency)

2. Predictive Modelling: Application of Decision Trees, a model for Data Analytics for Business due to its high interpretability and ability to generate clear business rules (Dyche, 2002).

3. Retention Strategy Development: Proposal of a segmented retention plan. The predictive model will be translated into actionable business rules (e.g., ‘If frequency is less than X and the contract is monthly, activate incentive plan Y’), allowing for continuous and proactive management action.

**Data Sources**

This project will use a high-volume public domain dataset that focuses on customer churn, such as ‘Gym customer features and churn,’ which is available on Kaggle:

URL: https://www.kaggle.com/datasets/adrianvinueza/gym-customers-features-and-churn

This database will be adapted to the BJJ context, where generic retention variables (e.g., Frequency and Contract Duration) will be mapped to the gym. The specific variable of attrition (Belt Level), which is crucial for BJJ (JJGF, n.d.), will be simulated (imputed) based on the literature to ensure maximum relevance to the business problem.

**Ethical Considerations**

The ethical focus, a key element of the project, is data privacy and confidentiality. To avoid handling Personally Identifiable Information (PII) and proprietary data from real academies, the study is based solely on a public domain dataset, adapting the variables to the BJJ context. The method adopted ensures the technical accuracy of the classification model without compromising moral integrity and compliance with data privacy guidelines.

**References**

(Dyche, 2002) The CRM Handbook: A Business Guide to Customer Relationship Management. Boston: Addison-Wesley.

Available at: https://books.google.com/books?id=2E6S1\_vqTKwC

Jiu-Jitsu Global Federation (JJGF, n.d.) The JJGF Guide to Student Retention.

Available at: https://jjgf.com/images/guide\_retention.pdf

ResearchGate (2022) Student Retention Using Educational Data Mining and Predictive Analytics: A Systematic Literature Review. Available at: <https://www.researchgate.net/publication/361808707_Student_Retention_using_Educational_Data_Mining_and_Predictive_Analytics_A_Systematic_Literature_Review>.

**Appendix**

Declaration of AI use for Brainstorming: I declare that the brainstorming process for this proposal was guided by an Artificial Intelligence tool. The conceptual development, research, critical analysis, methodological decisions (e.g., choice of Decision Tree) and final content of the work are my own, based on the knowledge I acquired during the course.

The Artificial Intelligence tool was used as a brainstorming assistant to help develop the business idea for this Capstone proposal. The goal was not to generate final content, but rather to organise ideas and align the project structure.

The guidelines provided to the tool and the decisions made in the structuring process were structured according to the following prompt:

**Prompt 1.**

I need you to help me brainstorm ideas for retaining students at a jiu-jitsu academy. The initial idea is to provide me with guidelines so that I can expand my knowledge to start a structured project:

**Answer:**

Analyse dropout and engagement rates; create a welcome programme, challenges and events; use data and feedback to predict dropouts; strengthen bonds with students through personalised communication and motivational actions to increase retention.

**Prompt 2.**

I need you to provide me with some theoretical foundations to support my research, but first analyse whether there is any literature on student retention in jiu-jitsu academies:

1. Yes — there is practical literature on retention in martial arts academies (including jiu-jitsu). Examples:

Academic Context (Data Analytics for Business): Request to justify the choice of Decision Tree over other models, based on its high interpretability and ability to generate actionable business rules.

2. Feasibility and Ethics: Guideline to use a public domain dataset (from Customer Churn) to ensure the technical feasibility of the analysis, adapting its variables to the context of BJJ student retention, and simulating the Belt Level variable based on the literature.

3. Literature Support: Guideline for incorporating citations from BJJ-specific literature (e.g., JJGF Guide) to validate the high dropout rate of white belts as the central business problem.