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**Assessment Cover Page**

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| *Module Title* | Strategic Thinking |
| *Assessment Title* | Predicting Purchasing Intention and conversion optimization in e-commerce |
| *Lecturer/Supervisor* | Taufique Ahmed |
| *Assessment Due Date* | 7th November |
| *Date of Submission* |  |

**Use of AI Tools**

**Choose the statement that fits your work and delete the other.**

I acknowledge the use of **[enter name of the AI tool you used]** for the purpose of **[provide a brief explanation of how you used the tool].**

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I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution.

Abstract

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# Introduction

E-commerce has experienced massive growth over the past decades, becoming a leading retail channel worldwide. With over five billion internet users worldwide, consumers benefit from the advantages of online transactions (Statista, 2025). However, despite this evolution, most e-commerce businesses struggle with customer retention, particularly in maintaining client loyalty. According to recent data, only 2-3% of visitors to e-commerce platforms actually make purchases (Oberlo, 2024), indicating significant conversion challenges.

Predicting purchase intention is crucial for e-commerce businesses because most website visitors leave without purchasing. This creates major challenges: companies cannot identify which visitors are likely to buy, resulting in wasted marketing spend on uninterested browsers and missed opportunities to convert high-intent visitors into long-term customers. Without predictive capabilities, businesses apply generic strategies to all visitors rather than targeted approaches based on purchase likelihood.

This capstone project addresses these challenges by developing machine learning models to predict online shopping purchase intention. Using the Online Shoppers Purchasing Intention Dataset from the UCI Machine Learning Repository, this research will analyze behavioral patterns, temporal factors, and user characteristics to identify key predictors of purchase behavior.

The significance of this project lies in its practical business impact. By accurately predicting purchase intention, e-commerce businesses can implement targeted retention strategies, optimize marketing budgets, and personalize customer experiences. This data-driven approach has the potential to increase conversion rates substantially, directly improving revenue and profitability while enhancing overall customer satisfaction (Content Square, 2025).

# Objectives

This project is guided by the following business hypothesis: by predicting purchasing intention and conversion patterns, business can use machine learning to identify high-potential customers, create better strategies, and significantly improve their conversion rates.

This capstone has four clear objectives:

1. To build and test different machine learning models (like Logistic Regression and Random Forest) that can predict which visitors will make a purchase. The goal is to create models that are accurate enough for businesses to trust and use in their decision-making.

2. To find out what factors make people more likely to buy. This includes analyzing visitor behavior (how they browse the website), timing factors (like special days or weekends), and user characteristics (new vs. returning customers). Understanding these patterns will help businesses know what drives purchases.

3. To create practical strategies that businesses can use to increase conversions. These strategies will be customized for different types of customers, with specific recommendations for engaging each group effectively.

4. To build a visual dashboard that shows the predictions and recommendations in a simple, easy-to-understand way. This tool will help business managers make quick decisions without needing to be data experts.

# Objectives

## Chapter 1.1

### Chapter 1.1.1.

# References

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# Appendix