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**Assessment Cover Page**

***Stimulating Ireland’s Innovation Ecosystem: Adapting to a New Geopolitical Era***

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| *Student Full Name* | Adriana Soledad Yash Menjivar |
| *Student Number* | 2025141 |
| *Module Title* | Strategic Thinking |
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**Declaration**

By submitting this assessment, I confirm that I have read the CCT policy on academic misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source.

I declare it to be my own work and that all material from third parties has been appropriately referenced.

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.

Summary Table

[1. Introduction 1](#__RefHeading___Toc724_1685620820)

[2. Problem Definition: 1](#__RefHeading___Toc726_1685620820)

[3. Objectives 1](#__RefHeading___Toc1648_1685620820)

[3.1.General Objective: 1](#__RefHeading___Toc1652_1685620820)

[3.2.1.Objective: 1](#__RefHeading___Toc1654_1685620820)

[3.2.2.Objective: 1](#__RefHeading___Toc1656_1685620820)

[4. Literature Review 2](#__RefHeading___Toc730_1685620820)

[4.1.References 2](#__RefHeading___Toc732_1685620820)

[5. Scope Methodology 3](#__RefHeading___Toc1650_1685620820)

[5.1.Out of Scope:  3](#__RefHeading___Toc736_1685620820)

[6.Data Sources: 4](#__RefHeading___Toc1143_1685620820)

[7.Ethical Considerations 4](#__RefHeading___Toc742_1685620820)

# 1. Introduction

In a world shaped by rapid geopolitical shifts, Ireland finds itself at a crossroads. With global political dynamics, particularly the policies under leaders like Donald Trump, influencing international trade, technology, and economic relationships, Ireland must adapt to remain a leader in innovation. This study delves into how Ireland can stimulate its innovation ecosystem, ensuring it not only competes but thrives in this new era. By embracing the crisis as a catalyst for creativity and innovation, we explore the importance of fostering startups driven by scientific knowledge, research think tanks, and cutting-edge technological trends. This study will unfold over two semesters, guided by CRISP-DM as the core framework, aiming to investigate how Ireland can stimulate its innovation environment to remain resilient and competitive.

# **2. Problem Definition:**

Ireland’s innovation economy is under mounting pressure. Geopolitical instability exacerbated by Brexit, aggressive protectionist policies, and the disruptive influence of leaders is eroding the very pillars that have sustained the country’s competitive edge. The heavy reliance on foreign direct investment, cross-border research collaborations, and an international talent pipeline now stands on uncertain ground. Simultaneously, the rise of economic nationalism, supply chain disruptions, and shifting regulatory landscapes threaten to isolate Ireland from the global innovation networks that have fueled its growth. If these forces remain unchallenged, the consequences could be severe: stagnation in key industries, dwindling startup activity, and a weakened position in the global economy. The question is then how can Ireland adapt to this volatile geopolitical era and safeguard its innovation driven future?

# 3. Objectives

## **3.1.General Objective:**

To identify and evaluate policy interventions that safeguard and enhance Ireland’s innovation ecosystem through data driven analysis of external factors. This will involve leveraging Python for data processing, querying relevant datasets, and deriving actionable insights to support the growth of knowledge based startups and innovation driven industries.

## **3.2.1.Objective:**

To analyze the impact of emerging geopolitical and economic shifts such as protectionist policies and trade realignments on Ireland’s innovation landscape by processing and modeling relevant datasets using Python and Jupyter Notebook.

## **3.2.2.Objective:**

To assess technological adoption trends and their potential influence on Ireland’s innovation ecosystem by conducting a data-driven evaluation of industry adoption rates, investment flows, and regulatory frameworks, utilizing Python for data modeling and visualization.

# 4. Literature Review

Government policies, investments in education, and Ireland's strategic EU positioning have shaped its innovation ecosystem (European Commission, 2023). However, challenges like Brexit and the need for industrial diversification present both risks and opportunities. Brexit has disrupted trade and innovation with the UK, highlighting the need for market diversification (The Guardian, 2025). Ireland’s EU membership remains crucial for research collaboration. Emerging technologies, such as blockchain, offer growth potential, as seen in Ripple’s partnership with Trinity College Dublin, though challenges like scalability remain (Neuron Expert, 2025; TecnoHispano, 2025). Strengthening ties with partners like the United States and promoting local entrepreneurship are key to building a resilient economy (Taoiseach, 2021; Irish Government, 2021; Eurofound, 2021).

## 4.1.References

* European Commission, 2023. Digital Economy and Society Index (DESI) 2023: Ireland. [online] Available at: <https://ec.europa.eu/digital-strategy/our-policies/desi> [Accessed 22 March 2025].
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* The Guardian, 2025. Impact of Brexit on Ireland’s Economy. [online] Available at: <https://www.theguardian.com/business/brexit-impact> [Accessed 26 March 2025].
* **ChatGPT, 2025.** Assistance in brainstorming and refining ideas for research. [AI-generated response]. OpenAI, 28 March 2025. Available at: [https://chat.openai.com](https://chat.openai.com/) [Accessed 28 March 2025].

# 5. Scope Methodology

CRISP-DM provides a structured framework for data analysis (Shearer, 2000).

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| ****Phase**** | ****Description**** | ****Time**** | ****Tools & Actions**** |

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| **Phase 1: Business Understanding** | Define objectives, stakeholders, and key questions. Conduct a literature review (qualitative). | 1st month | Secondary data (European Commission, Eurofound, Irish Government), Literature review. |

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| **Phase 2: Data Understanding** | Collect and understand datasets (quantitative). Analyze economic indicators (trade, employment). | 2nd month | Python (Pandas), Excel for data exploration. |

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| **Phase 3: Data Preparation** | Clean data, handle missing values, outliers (quantitative). | 2nd month | Python (Pandas), Jupyter Notebook for preprocessing. |

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| **Phase 4: Modeling** | Apply machine learning models (regression, classification, unsupervised learning). | 3rd month | Python (Scikit-learn, TensorFlow), Jupyter Notebook. |

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| **Phase 5: Evaluation** | Evaluate models (accuracy, precision, recall). Refine models. (quantitative). | 3rd month | Python (Scikit-learn), metrics libraries. |

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| **Phase 6: Deployment** | Provide actionable insights and recommendations. Summarize findings (quantitative). | 3rd month | Python (Matplotlib, Seaborn), Jupyter Notebook, Git, GitHub. |

## 5.1.Out of Scope:

We won’t be going out into the field to do **primary data collection,** that means no surveys, interviews, or any form of hands on data. Our focus will be entirely on using **existing, publicly available datasets**. Also, we won’t be doing any **data identification** or creating new datasets.

# 6.**Data Sources:**

Data will be sourced from **Eurostat, OECD, WIPO, ECB, EEA, and the UN SDG Database**, covering economic, innovation, patent, financial, and environmental indicators. Historical data from the past 5 years will be analysed using **Python (Pandas, NumPy) in Jupyter Notebook**, with **GitHub for version control**. All datasets are **open-access**, requiring no special permissions. These sources will provide a comprehensive foundation for assessing Ireland’s innovation ecosystem within the European and global context.

# 7.Ethical Considerations

As we move forward with the project, ethical considerations are key to ensuring the integrity. Here’s how we’ll address them:

* **Data Privacy & Anonymity**: All datasets used will be **publicly available** and **anonymized.**
* **Avoiding Bias & Misrepresentation**: Committed to using **validation techniques** to ensure that our analysis is free from biases.
* **Compliance with GDPR & EU Regulations**: The project will comply with all necessary regulations, especially the **General Data Protection Regulation (GDPR).**
* **Transparency & Objectivity**: Ensure full transparency in the methods and data used, providing a clear rationale for each decision made throughout the process.
* **No Harm Principle**: The goal is to create recommendations that **benefit all stakeholders**, ensuring that the insights and strategies without causing harm to businesses or communities.