

CCT College Dublin

Assessment Cover Page

Module Title:	Strategic Thinking
Assessment Title:	The Correlation Between Food and Beverage Sales in Hospitality and The Weather - A study case with Machine Learning
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Declaration

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Introduction:

The Tourism industry is considered vital for most of the countries being the economic sector that shows its beauty, culture and potential to the rest of the world. Its impact on the GDP goes from jobs in many different areas (i.e. hospitality, agriculture, transportation, communications and others) to the Balance of Payments on bringing foreign exchange.

The weather plays an important role on customers - in this case tourists - behaviour, considering it as part of your marketing strategy might be crucial for a business. Throughout history our habits have been impacted by meteorological conditions, for example nowadays a thunderstorm can push customers to buy food online, and a nice temperature can lead people to socialise and eat outside discovering a new place.

This project is a study case of a hotel in Dublin City and has the purpose of investigating if the weather has an impact on the sales in Food and Beverage in Hospitality and how it can be used for its advantage.

Objectives:

As a study case this project aims to help the hotel to improve the F&B sales through a better understanding of its demand. By exploring the data provided the investigation will consist in finding the existent correlation between the main variables - weather and consumption -, and extending to other inner and external aspects that will be analysed as the project progress such as: the impact that certain drinks have on certain meals, number of guests, and the impact of the surroundings as a source of demand.

Problem Definition:

One of the main objectives of any company is to minimise costs and subsequently maximise profits. The proper management of stock is key to achieve the right optimisation: buying only the necessary amount, avoiding wastage and correctly predicting the volume of sales for each season. Food and Beverage is not the leading department in the hospitality industry but still has its importance in the sector, and it is the one that suffers the most if the optimisation of the stock is not done properly due the nature of the goods that demands the right storage.

Another aspect to consider while looking at the revenue optimisation is the roster, if you know in advance how many staff you need on a certain day you can minimise cost, just as bars, restaurants increase their staff on weekends smart restaurants will flex and accommodate staff schedules according to the weather, even though it is not easy to base every single decision on the weather forecast, as it can change completely, it should be taken into consideration.

Scope:

The weather is the main independent variable in this project and its impacts on F&B sales will be investigated using Machine Learning and linear regression to analyse the possible correlation between those variables. Another features will be analysed further in the project due the significant number of advantages given the hotel's location and the proximity to key amenities of Dublin: the city centre (2,2km), to Phoenix Park - the biggest urban public park of Europe - (405m), to Heuston Station - the most important railroad in Ireland, connecting its capital to the main cities in the south, southwest and west - (350m), to The Criminal Courts of Justice - the main criminal court in the country - (300m), to the Four Courts - principal seat of the Supreme Court, the Court of Appeal, the High Court and the Dublin Circuit Court - (1,2km), and many others connected by the Red Line Luas (one of the two trams line in the city) and a variety of bus lines that easily transports the guests to further destinations.

All of the locations written above are potential sources of demand for the hotel in its many departments (bar, restaurant, bedrooms, meeting rooms), and by the end of this project we hope to accomplish a better understanding of the impact of the surroundings on the revenue and set the best marketing plan to capture all these potential clients.

Data Sources:

A merge between different data sources will be necessary for this project. The target variable - the sales in F&B - will be provided by the hotel, consisting in the complete list of the products sold in both environments, the quantity and the revenue. The data for the weather forecast will be retrieved in The Irish Meteorological Service (Met Éireann) using the historical data from the Phoenix Park Station (due to the proximity to the hotel). The chosen parameters were: Precipitation Amount (mm), Maximum Air Temperature (C) and Minimum Air Temperature considering that the rain and the temperature are the features that most impact people's decisions of whether or not going out.

The number of hearings for the surrounding Courts will be extracted manually from The Legal Diary that contains lists of cases in all Courts in Ireland. The National Transport Authority (NTA) will provide us the numbers of passengers per route on a daily basis in Heuston Station. And for the big events in the city the information will be gathered from the City's calendar.

The blending of these different sources will require a thorough process of analysing, cleansing and standardisation in accordance with the main idea of the project which is to analyse all variables on a daily basis. As science is led by experimentation, a temporal transformation is not discarded if necessary.

Ethical Considerations:

The hotel will provide the data for the Food and Beverage department with the condition of anonymity and a data protection form will be signed authorising the usage of the data limiting to this project. For the hearings in the surrounding courts the only data available online are the total incoming and resolved cases per year in each court found in The Courts Service Annual Report, published yearly by the Courts Service. An email was sent to the Freedom of Information Unit (FOI) pleading the possibility to get the data in the daily format, but unfortunately they cannot provide what was required leading us to the manual extract from The Legal Diary on the Courts Service website. A formal acknowledgment document from the

The National Transport Authority FOI Unit will be signed confirming the authorisation of the usage of their data in this project. All the other data will be collected online and referenced accordingly.