DATA ANALYSIS AND BUSINESS INTELLIGENCE

24hrs
Number of credits : 3
Language of instruction: English
Course leader: CHARLOT Jean-Marc
Teacher: CHARLOT Jean-Marc and external lecturers

COURSE DESCRIPTION

Business intelligence (BI) or decision support system (DSS) is information technology used by decision-makers and company managers. It refers to the means, tools and methods used to collect, consolidate, model and restore data, whether tangible or intangible, from a company in order to provide decision support and allow a decision-maker to have an overall view of the activity being processed.
This type of application is based on a common architecture.
1. Operational data is periodically extracted from heterogeneous sources: flat files, Excel files, databases (DB2, Oracle, SQL Server, etc.), web services, massive data and stored data in a data warehouse.
2. The data is restructured, enriched, aggregated, reformatted, and nomenclatured to be presented to the user in a semantic form (meaningful business views) that allows decision-makers to interact with the data without having to know its physical storage structure, other schemas that allow facts and measures to be distributed according to hierarchical dimensions, pre-prepared reports that can be parameterized, and more synthetic and interactive dashboards.
3. This data is delivered to the various functional areas (strategic management, finance, production, accounting, human resources, etc.) through a security system or specialized datamart for consultation, analysis, pre-defined alerts, data mining, etc.
Business Intelligence is therefore the set of tools and methods aimed at transmitting relevant information to company managers. Its goal is to help them understand their environment and to support them in their strategic decision-making. The user's needs are therefore at the heart of effective Business Intelligence.
Originally, Business Intelligence was the prerogative of a few experts and the departments concerned could be counted on the fingers of one hand: accounting, finance, logistics, possibly commerce, etc. However, for several years now, web technologies and the increase in computing power of IT tools have facilitated the distribution of BI tools to users, in discrete forms. Most businesses now use Business Intelligence to consolidate the information they have at their disposal.

COURSE OBJECTIVE

The objective of this course is to show students how to use raw data to do strategic analysis, using a tool present in all companies, Excel.

Three tools, present in Excel, are Business Intelligence tools:

1. Power Query is a tool that facilitates and automates data manipulation.

2. Power Pivot allows you to create a structured data model in Excel and to increase the analytical capacities of pivot tables tenfold thanks to the DAX language.

3. Choropleth Maps and 3D Maps allow you to work with geospatial data.

It is mandatory that students work on a Windows environment. This implies that students with a MAC install a Windows desktop.

LEARNING OBJECTIVES

Learning goal	Action
Learning objective	Make proposals, take initiatives
Outcomes	Lev. 2 – Construct unexpected proposals with high responsiveness

TACKLED CONCEPTS

Big Data, Data, Information, Knowledge, Methods and tools for data analysis and processing, Data modeling, Relational models, Business Intelligence, Interactive dashboards, DAX language, Pivot tables, Data visualization, Storytelling

TEACHING METHODS

Courses, Practical work on Excel

EXPECTED WORK AND EVALUATION

In class assessment as team project with a final viva
Final Exam on Blackboard requiring the use of Excel

BIBLIOGRAPHY

Business Analytics : a management approach. R. Vidgen, S. Kirshner & F. Tan. Bloomsbury Academic, 2022

Business Intelligence avec Excel : des données brutes à l'analyse stratégique. Boris Nord. ENI Editions, 2020

Business Intelligence simple et efficace avec Excel et PowerPivot. Jean-Philippe Gouigoux, 2014

Analyser efficacement vos données à l'aide des tableaux croisés dynamiques. Pierre Rigollet. ENI Editions, 2020

Datavisualisation : utiliser le storytelling pour faire parler vos données. Cole Nussbaumer Knaflic. Pearson, 2019

EVALUATION METHODS

50% In class assessment
50% Final Exam

SESSIONS

1	Course presentation (content and assessment process) Introduction to the concepts of data, information, Big data, data processing/analysis... Presentation of Power Query, Power Pivot, DAX language and data visualization tools LECTURE & PRACTICAL WORK : 02h00
2	Data cleaning and transformation with Power Query - part one - Interface overview and general concepts - Accessing different data sources - Clean, transform and aggregate data LECTURE & PRACTICAL WORK: 02h00
3	Data cleaning and transformation with Power Query - part two - Clean, transform and aggregate data (continued) - Combine and merge tables - Loading data into the Power Pivot data model LECTURE & PRACTICAL WORK: 02h00
4	Case Study - Municipal Budget LECTURE & CASE STUDIES & EXERCISES : 02h00

5	Creating a data model with Power Pivot - part one - Concept of a data model - Loading data, creating relationships between tables LECTURE & PRACTICAL WORK: 02h00
6	Creating a data model with Power Pivot - part two - Create calculated columns, create formulas in DAX - Create a date table; Time Intelligence function - Update data LECTURE & PRACTICAL WORK: 02h00
7	Case study - HR dashboard LECTURE & PRACTICAL WORK : 02h00
8	Creating interactive dashboards - part one - Creating KPIs - Using pivots table function LECTURE & PRACTICAL WORK : 02h00
9	Creating interactive dashboards - part two - Create pivot charts, map, Sparkline - Use conditional formatting - Connecting Segments filters to reports 02h00
10	Data Visualisation and Storytelling – part one 02h00
11	Data Visualisation and Storytelling – part two 02h00
12	Case study - Data Visualisation and Storytelling 02h00