Business Intelligence tools

Lecturer: Maria Chiara Debernardi

Language

English

Course description and objectives

To manage a company, of any size, it is necessary to make decisions based on reliable information. Often in the company the data are badly organized, the data sources are heterogeneous, and it is difficult to extract useful information for the decision-making process. Business Intelligence aims to organize company data in a Data Warehouse (through the source integration and data cleaning processes), to analyze them and subsequent share the insights in an automated way.
The course aims both to provide an overview of the approaches used to introduce and manage a Business Intelligence system, and to teach how to share the information it produces inside the company, with a focus on data visualization.

Upon successful completion of this course, the students will be able to:

- understand the global architecture of a Business Intelligence system
- use a BI Self Service tool widely present in nowadays companies
- understand the logics and be able to produce meaningful BI reports for top and middle management

Audience

The course is open to all Bocconi's Master of Science students. In particular it is targeted at:

- those who want to learn the fundamental aspects of Business Intelligence using a practical approach
- those who want to use a BI Self Service tool for their data analysis and reporting

The course is part of the Enhancing Experience activities that grant two credits exclusively to students attending at least 75% of lessons and passing the exam during the final lesson.

Prerequisites

No prior coding experience, nor knowledge of Power BI or Power Query is assumed.
A good knowledge of Microsoft Excel is highly recommended.

Duration

20 hours

Teaching mode

It will be possible to join the course in presence and/or in distance, by connecting remotely and following the streaming of the lesson held in the classroom (no lesson video recordings).

The **final test** on the last day of class, however, can **only** be taken **in physical presence**. Online mode will not be provided.

Calendar

Lecture	Date	Time	Room
1	Mon 06/02/2023	18.15 – 19.45	N16
2	Thu 09/02/2023	18.15 – 19.45	N16
3	Mon 13/02/2023	18.15 – 19.45	N16
4	Thu 16/02/2023	18.15 – 19.45	N16
5	Mon 20/02/2023	18.15 – 19.45	INFOAS05
6	Thu 23/02/2023	18.15 – 19.45	INFOAS04
7	Mon 27/02/2023	18.15 – 19.45	N16
8	Thu 02/03/2023	18.15 – 19.45	N16
9	Mon 06/03/2023	18.15 – 19.45	N16
10	Thu 09/03/2023	18.15 – 19.45	InfoAS04/05

Note: lessons will be held in the traditional room and **all the students have to bring their own device**.

Syllabus of the course

Lecture	Topics
1	**Introduction to BI** - BI: what it is and why we need it - The elements of a BI system - How to install Microsoft Power BI - Overview of the tool ***Exercises***
2	**The Data Warehouse** - What it is - The main theories (Kimball and Inmon) - From the DWH to the Data Lake - Getting data inside Power BI from diverse sources - The ETL phase ***Exercises***
3	**The data model** - Build the Power BI data model - The relationships between the tables - Fact table and dimension tables ***Exercises***
4	**Building a dynamic report** - Data visualization: standard graphs and tables - New variables: hierarchies and groups - Filtering data (*slicer*) - Using themes and templates - Best practice ***Exercises***
5	**Introduction to DAX language** - DAX = Data Analysis Expression - Create new variables: calculated columns - Create new variables: measures ***Exercises***
6	**Expanding Power BI capabilities** - Advanced use of DAX - Working with time formulas - Quick measures - Look for written scripts on web - Using R and Python inside Power BI (*only hints*) ***Exercises***

Lecture	Topics
7	**Improving the reports** - New visuals from internet - Playing with maps: geo-maps, treemaps, heatmaps - Conditional formatting - Filtering with images - Connecting pages in a report ***Exercises***
8	**BI reports and more** - The Q&A feature: ask questions with natural language - Not only printable reports - Effective reports and dashboards - Power BI ecosystem - Sharing results ***Exercises***
9	**The BI tools market** - Is there anything else than Power BI? - The vendors in the BI tools market - Evolutionary trends in the sector ***Exercises***
10	**Final test – *in presence only*** - Guided recap exercise - Doubts, questions, clarifications - Final exam

Suggested bibliography

The reference bibliography for the exam is based on slides and commented exercises provided by the Lecturer.
Additional bibliography:

- Nisal Mihiranga, *Power BI Data Modeling: Build Interactive Visualizations, Learn DAX, Power Query, and Develop BI Models*, BPB Publications, 2022
- DAX in the BI Tabular Model Whitepaper and Samples: https://www.microsoft.com/en-us/download/details.aspx?id=28572

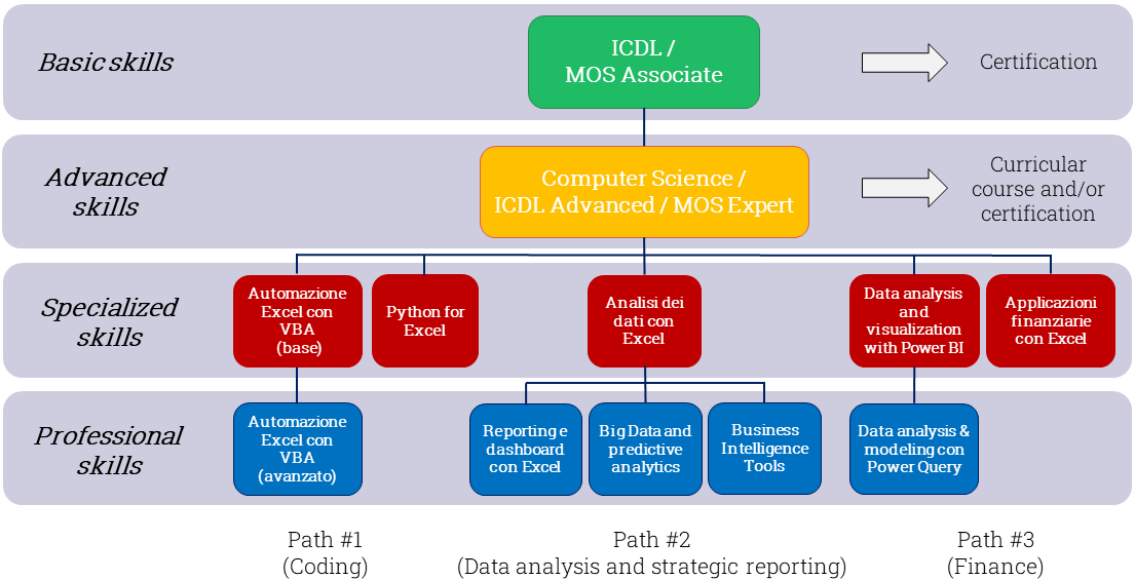
Software used

Microsoft Power BI Desktop: https://powerbi.microsoft.com/en-us/desktop/

You can download it from:
https://www.microsoft.com/en-us/download/details.aspx?id=58494

It was decided to use this Personal BI application because it allows unlimited and free use with Bocconi student account, unlike other BI tools.
Please, note that **Power BI Desktop does not exist for Mac!** If you want to install it on your Mac, there are ways to install Windows applications on Mac machines. Bocconi will supply Windows Virtual Machine to Mac-user students attending in distance (installation specifications will be shared in Blackboard).

Available seats

This activity is limited to **110** participants and reserved to **students of the Master of Science Programs**.
Registrations cannot be carried out once this number has been reached or after closing of the registration period.

Spreadsheet paths