

Adaptive Business Intelligence (ABI): Presentation of the Unit

MAP-i PhD (Edition 2024/25)

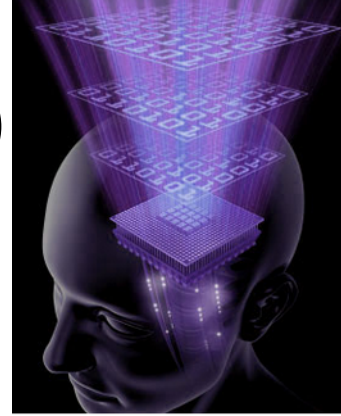
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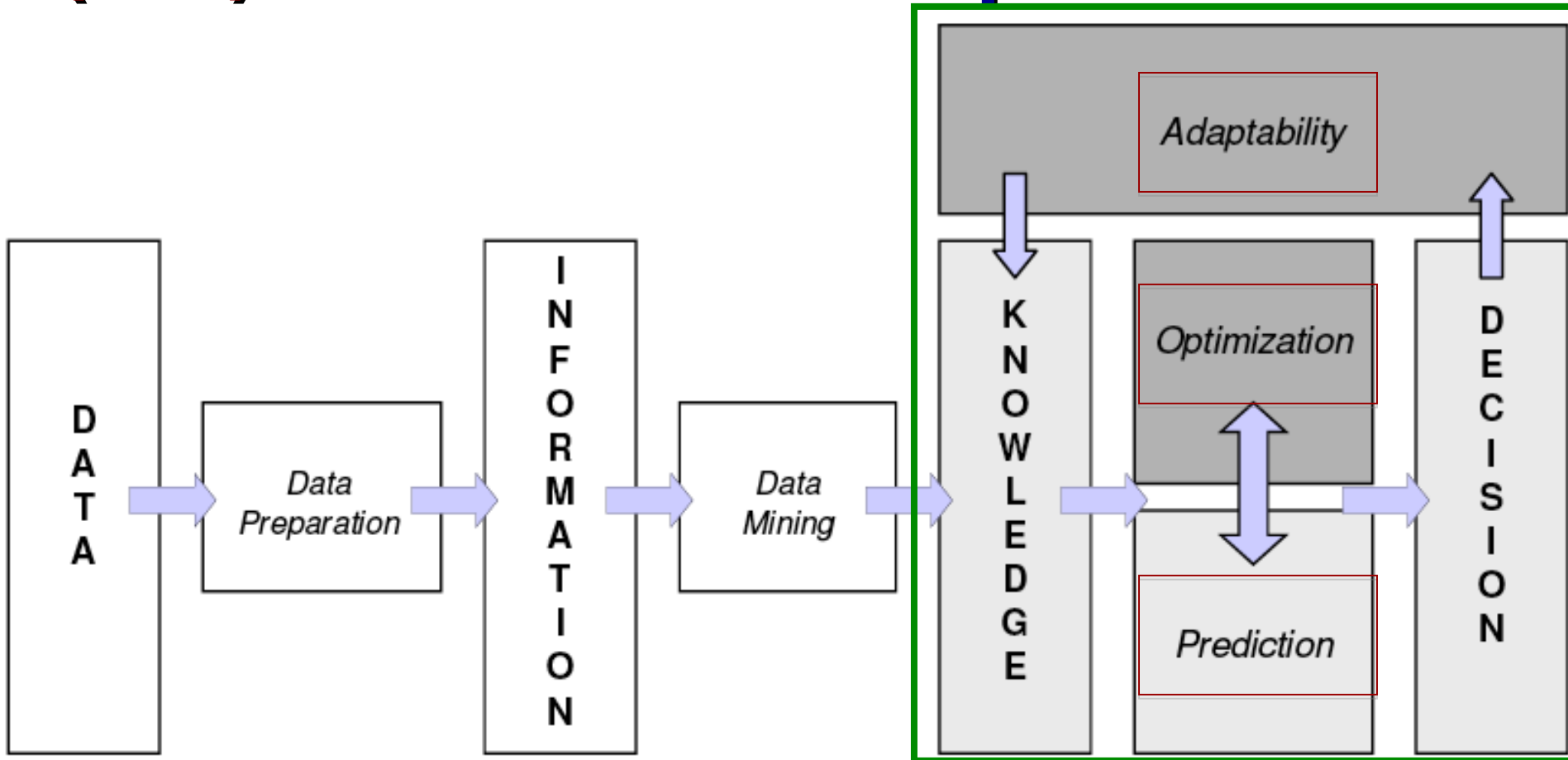
> **Business Intelligence (BI)**

“My name is Sherlock Holmes. It is my business to know what other people do not know.”



- **Business Intelligence (BI)** is an umbrella term that includes methodologies, architectures, tools, applications and technologies to enhance **decision making**.
- The goal of **BI** is to: access data from multiple sources, transform these data into information, knowledge and **actions**.

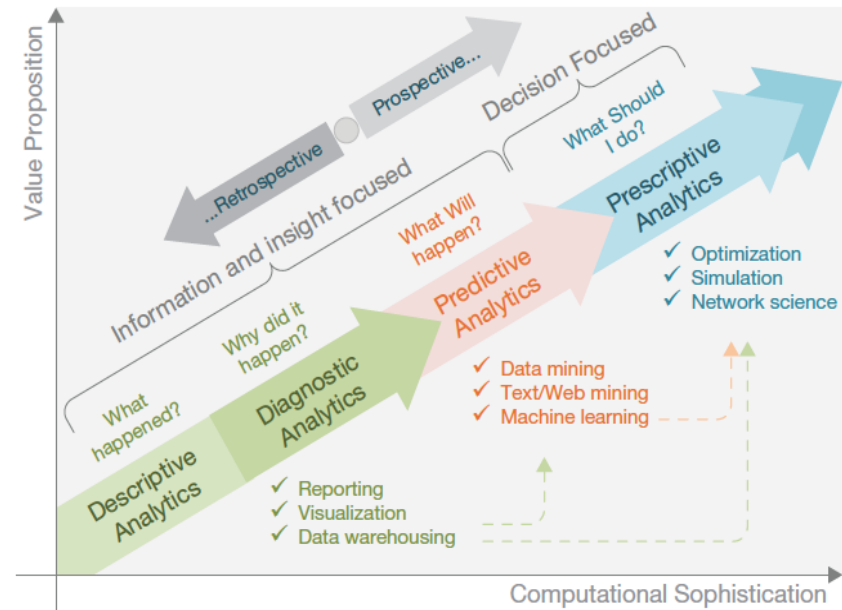
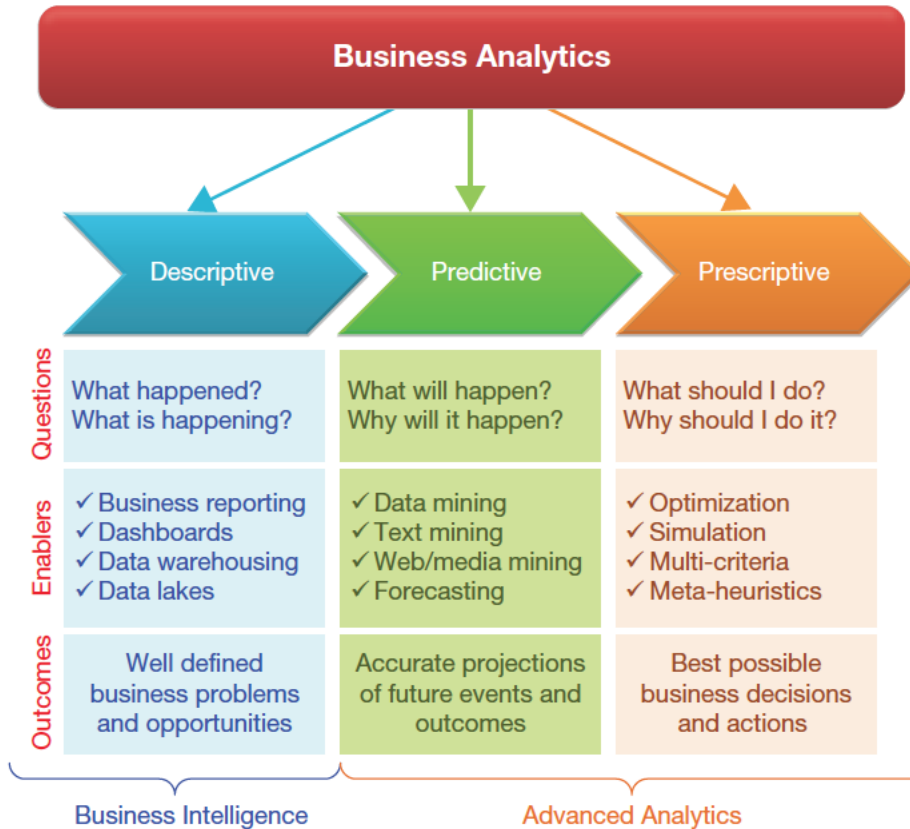
> Adaptive Business Intelligence (ABI): BI+Prediction+Optimization



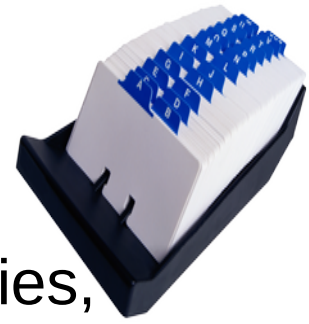
- Useful for **complex business problems**, such as: distribution of cars in USA, marketing campaigns, investment strategies, credit card fraud, online news enhancement, ...

> Adaptive Business Intelligence

ABI = Prescriptive Analytics



> Program



- **Introductory ABI concepts:** introduction, case studies, prediction, optimization and adaptability.
- **Prediction and Modern Optimization methods for ABI:** data mining, supervised learning (e.g., neural networks, support vector machine), clustering (e.g., hierarchical and relational clustering), inductive logic programming, heuristic search (e.g., hill-climbing, tabu-search, evolutionary computation), time series forecasting.
- **ABI tools and methodologies** (e.g., R, WEKA applied to real-world problems as Finance, Economy, Marketing, Science, Engineering). CRISP-DM

ABI can be an interesting complement for:

KDD (Knowledge Discovery from Databases), Advanced Artificial Intelligence (AAI), Advanced Information Extraction (AIE) and other courses.

> Teaching Methodology and Evaluation



Four teaching methodologies will be applied:

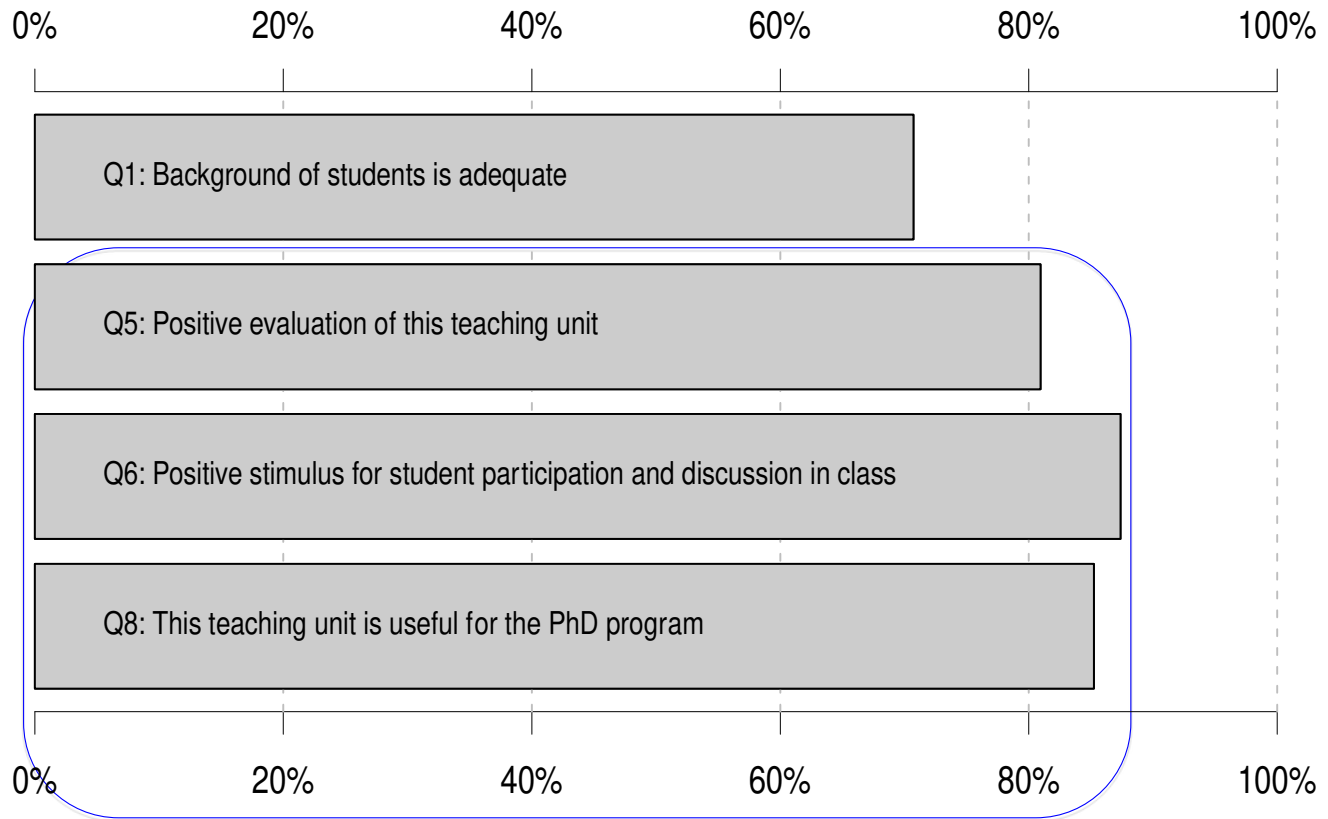
- 1 Lecture exposition of key ABI issues.
- 2 Active learning
- 3 Case-based learning.
- 4 Project based learning;

Evaluation will include two elements:

- A - **review** of an advanced ABI research article from an ISI journal, leading into a presentation and short article (**30%**);
- B - an **ABI project** (group of 2/3 students) that describes the application of ABI tools to a real-world dataset (**70%**);

> Student Feedback

Average of all ABI editions (anonymous answers):



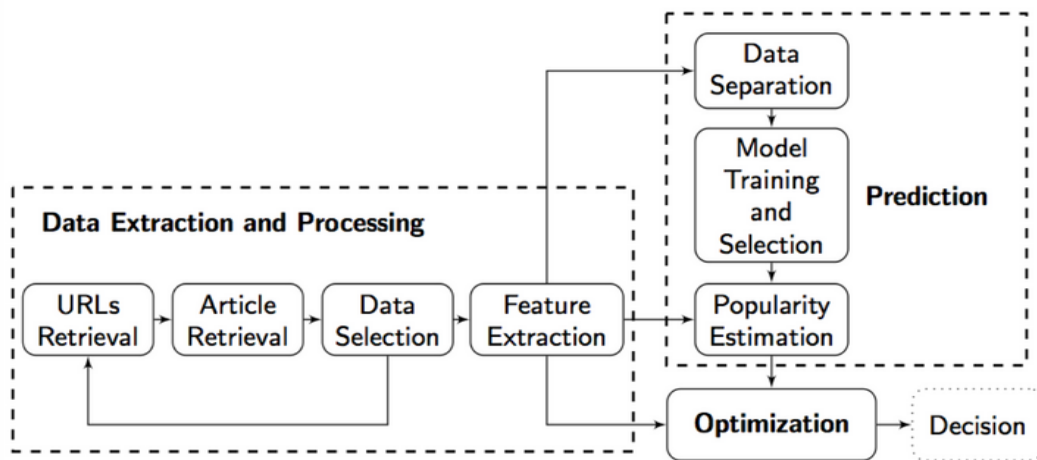
Qualitative feedback from a previous ABI edition:

“I **really enjoyed** participating in Advance Business Intelligence class in previous semester, and that is **really usable and useful for me**, inseting point was **interaction between students and teacher** and also **friendly atmosphere** was very nice”.

> Examples of ABI Projects:

- Influential Peers and Message Propagation in Twitter
- Blood Donation and Patient Diabetes Prediction
- Stock Market Prediction and Optimization
- Customer Credit Assignment
- **Community Crime Prediction and Resources Distribution Optimization (EPIA 2015 paper, Springer)**

Predicting the Popularity of Online News (Best Paper Award of EPIA 2015!)



> **Bibliography**

- Michalewicz, Z., Schmidt, M., Michalewicz, M., and Chiriatic, C. (2006). **Adaptive Business Intelligence**. Springer.
- P. Cortez (2014). **Modern Optimization with R**. Springer.
- Dursun Delen, **Prescriptive Analytics The Final Frontier for Evidence-Based Management and Optimal Decision Making** (2020). Pearson.

