Data and Artificial Intelligence Strategy

A Conceptual Enterprise Big Data Cloud Architecture to Enable Market-Oriented Organisations

UNIVERSIDAD COMPLUTENSE MADRID

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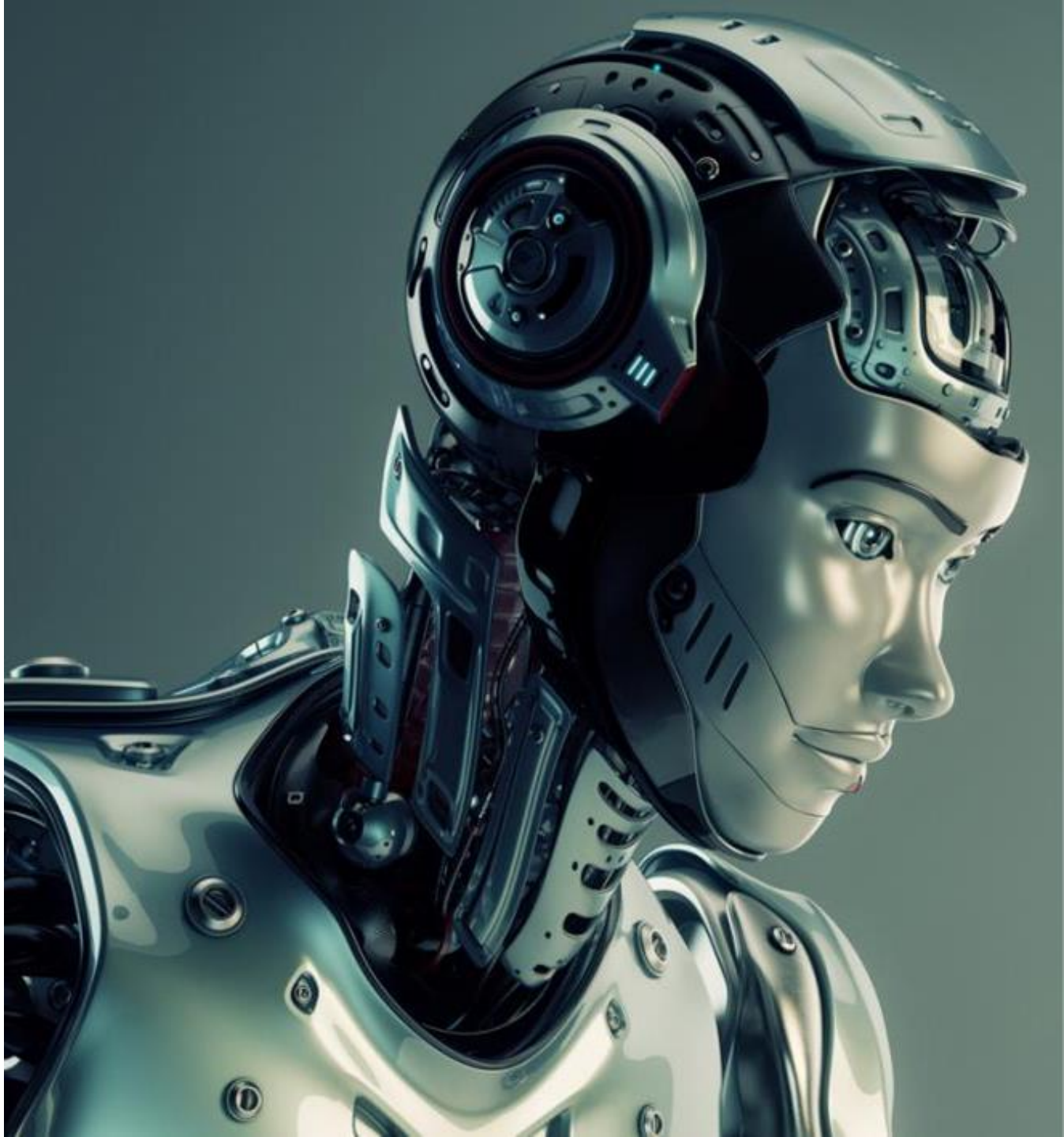

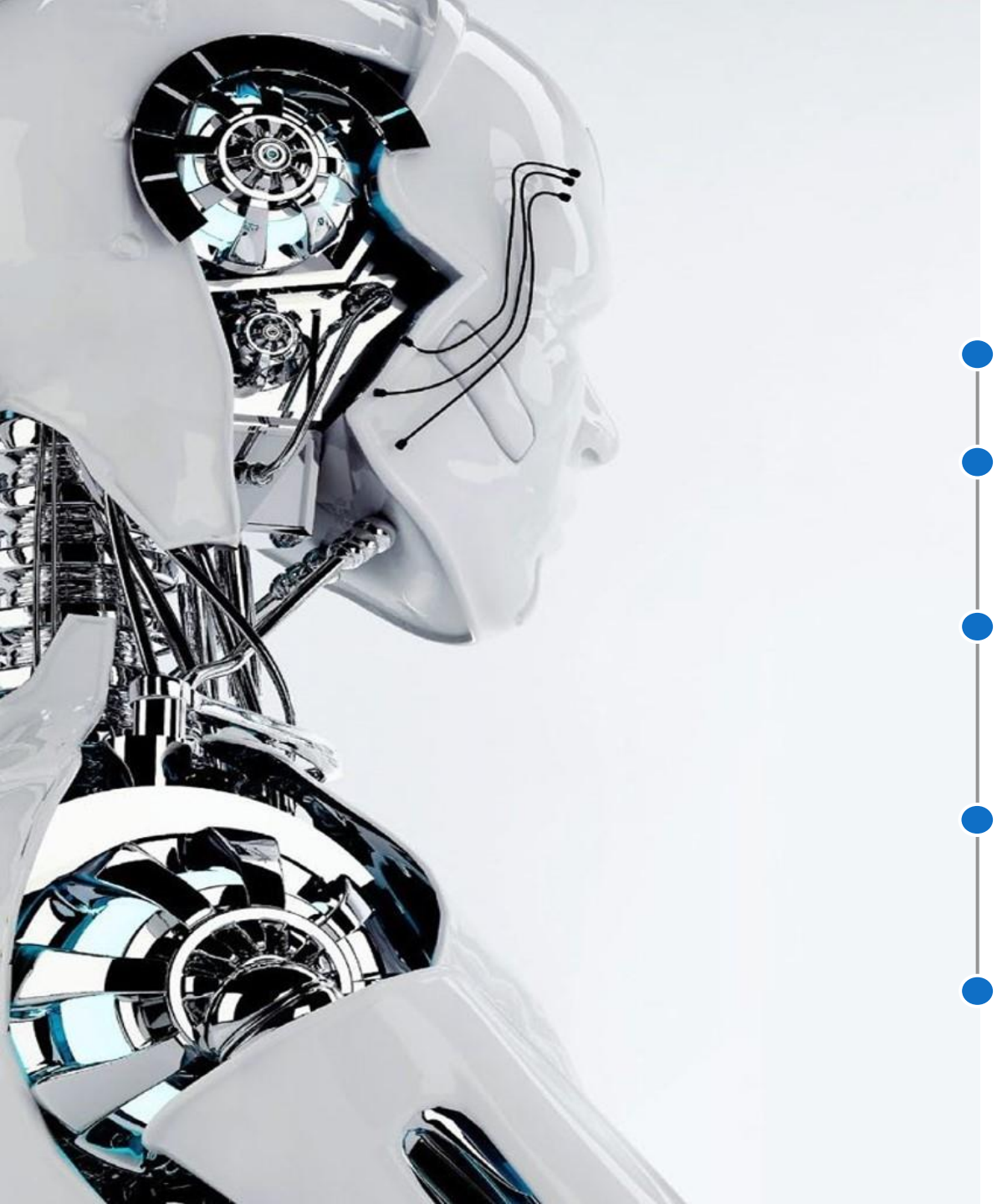

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Agenda

- Authors & Complutense University of Madrid
- Paper Abstract
- Definition of a Conceptual Framework for Market Oriented Organizations Based on an AI and Cloud Architecture
- Data Supermarket & Data Product Lifecycle
- Concluding Remarks and Future Work

Paper authors

Microsoft

Caio started as a Microsoft London, UK employee on January 6, 2020 as Senior Cloud Solution Architect and Data Scientist.

Caio Moreno

Caio Moreno is a Big Data Architect, Data Scientist and Data and AI Solution Architect with 18 years of professional experience, working for companies like AOL (America Online), Pan American Health Organization, IT4biz (CEO and Founder), Hitachi Vantara, Pentaho, and many companies and governments in multiple countries and continents. He is currently a part-time Ph.D. Student at Complutense University of Madrid and Advanced Analytics Manager at Avanade London Office (An Accenture and Microsoft owned company). He holds a master's degree in Business Intelligence and Data Mining at the Complutense University of Madrid, a specialization in Data Science at University Camilo José Cela (UCJC)/U-TAD, an MBA at Getulio Vargas Foundation (FGV-SP) and a Specialization in Software Development/Java at The Federal University of Technology – Paraná (UTFPR). His main field of research is focused on Data Science, Big Data, IoT, Cloud and AutoML (Automated Machine Learning) applied to Marketing and in the financial sector. He has been a professor at The State University of Western Paraná (UNIOESTE) – Brazil (2010-2012) and EOI (Escuela de Organización Industrial) – Spain (2016-2017). Also, a public speaker in many international events in Brazil, Europe, Africa and USA. Fluent in English, Spanish and Portuguese. He is married and has 2 daughters.

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Ramón Alberto Carrasco

Ramón Alberto Carrasco has worked in the financial sector for over 24 years and has extensive experience acting as a leader of several departments related to Analytical Marketing and Business Intelligence. He completed his PhD in data mining at the University of Granada. His main field of research is focused on Data Science applied to Marketing (Data Mining, Multicriteria Decision-Making, Sentiment Analysis, Recommender Systems, etc.) on which he has written several textbooks as well as around 60 research papers published in international journals and conferences specialized on these topics. He is currently involved in various (European, national, regional and local) Research, Development and Innovation (R&D&I) Projects. Dr Carrasco is a member of the SCI2S and SECABA Research Groups and is also serving as reviewer for several international journals and conferences. He has been an professor at the University of Granada, Granada, Spain (2004-2013) and currently at the Complutense University, Madrid, Spain (from 2013).

Enrique Herrera-Viedma

Enrique Herrera-Viedma is Professor in Computer Science and A.I in University of Granada and currently the new Vice-President for Research and Knowlegde Transfer. His current research interests include group decision making, consensus models, linguistic modeling, and aggregation of information, information retrieval, bibliometric, digital libraries, web quality evaluation, recommender systems, and social media. In these topics he has published more than 250 papers in ISI journals and coordinated more than 22 research projects. Dr. Herrera-Viedma is Vice-President of Publications of the IEEE SMC Society and an Associate Editor of international journals such as the IEEE Trans. On Syst. Man, and Cyb.: Systems, Knowledge Based Systems, Soft Computing, Fuzzy Optimization and Decision Making, Applied Soft Computing, Journal of Intelligent and Fuzzy Systems, and Information Sciences.

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Complutense University of Madrid was founded in 1293 and has grown to become the biggest university in Spain.

The Complutense University of Madrid is a public research university located in Madrid, and one of the oldest universities in the world.

Our research paper

Special Issue on Use Cases of Artificial Intelligence, Digital Marketing and Neuroscience

Data and Artificial Intelligence Strategy: A Conceptual Enterprise Big Data Cloud Architecture to Enable Market-Oriented Organisations

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Abstract

Market-Oriented companies are committed to understanding both the needs of their customers, and the capabilities and plans of their competitors through the processes of acquiring and evaluating market information in a systematic and anticipatory manner. On the other hand, most companies in the last years have defined that one of their main strategic objectives for the next years is to become a truly data-driven organisation in the current Big Data context. They are willing to invest heavily in Data and Artificial Intelligence Strategy and build enterprise data platforms that will enable this Market-Oriented vision. In this paper, it is presented an Artificial Intelligence Cloud Architecture capable to help global companies to move from the use of data from descriptive to prescriptive and leveraging existing cloud services to deliver true Market-Oriented in a much shorter time (compared with traditional approaches).

Keywords

Market-oriented Organisations, Big Data, Cloud Architecture, Artificial Intelligence Strategy, Data Supermarket.

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Paper Abstract

Market-Oriented companies are committed to understanding both the **needs of their customers**, and the **capabilities and plans of their competitors** through the processes of **acquiring and evaluating market information** in a systematic and anticipatory manner. On the other hand, most companies in the last years have defined that one of their main strategic objectives for the next years is to become a truly **data-driven** organisation in the current **Big Data** context. They are willing to invest heavily in **Data and Artificial Intelligence Strategy** and build **enterprise data platforms** that will enable this Market-Oriented vision. In this paper, it is presented an **Artificial Intelligence Cloud Architecture** capable to help global companies to **move from the use of data from descriptive to prescriptive** and leveraging existing **cloud services** to deliver true Market-Oriented in a much **shorter time** (compared with traditional approaches).

Market-Oriented Enterprise Strategy based on Data

The formal process of strategic planning

Fig. 1. The formal process of strategic planning (based on [1]).

Market-Oriented Enterprise Strategy based on Data

Most of the modern organizations have invested, for many years, in a conceptual framework similar to the one proposed by Stone and Woodcock [6], and explained in the previous section, as the way to implement their Market Orientation..

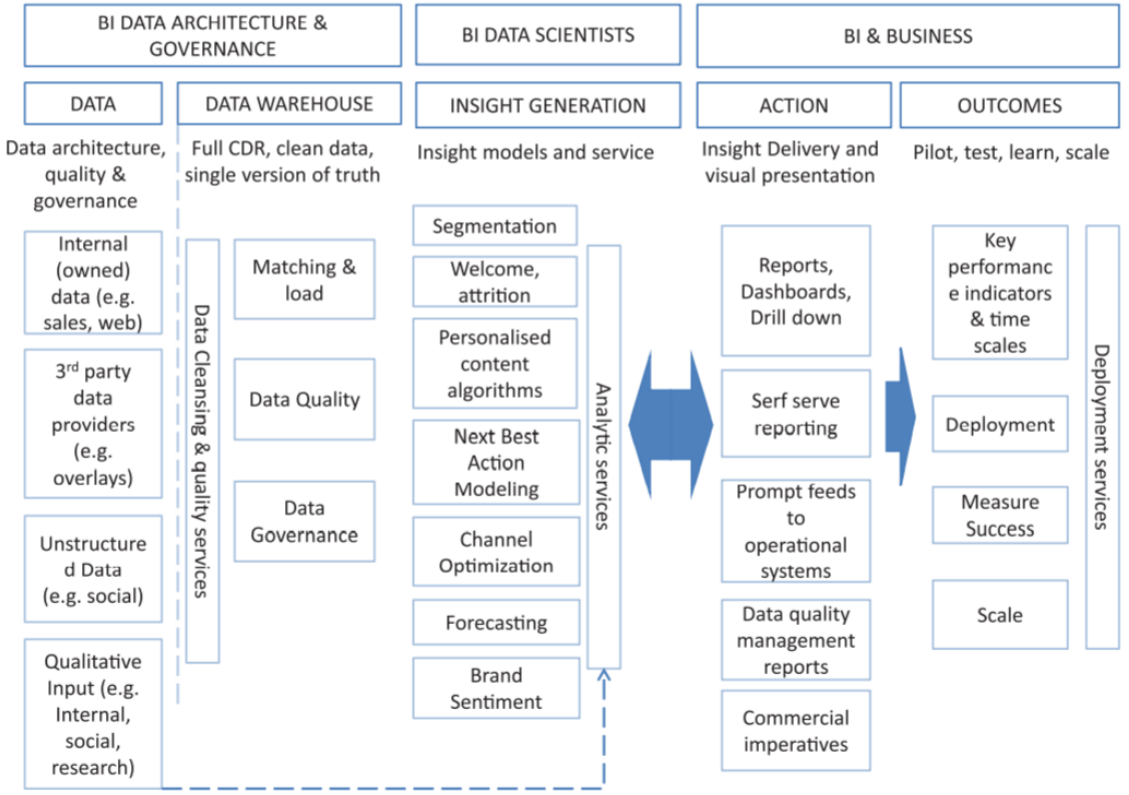


Fig. 2. BI applied to the MO (based on [6]).

[6] M. D. Stone, N. D. Woodcock, "Interactive, direct and digital marketing: A future that depends on better use of business intelligence", Journal of research in interactive marketing, vol. 8, no. 1, pp. 4-17, 2014.

Data and AI Supermarket Architecture

Our proposed and new formal framework for companies that want to adapt to a Big Data MO strategy.

Fig 3 shows the added necessary components:

- Multiple source of data
- Cloud Data Lake and Data Warehouse
- **Data Supermarket**
- Deep Learning, AutoML and Cloud AI
- Chat Bots
- Real-time alerts
- DevOps (CI/CD)
- E2E Data Science Lifecycle using MLOps and Machine Learning Model Management

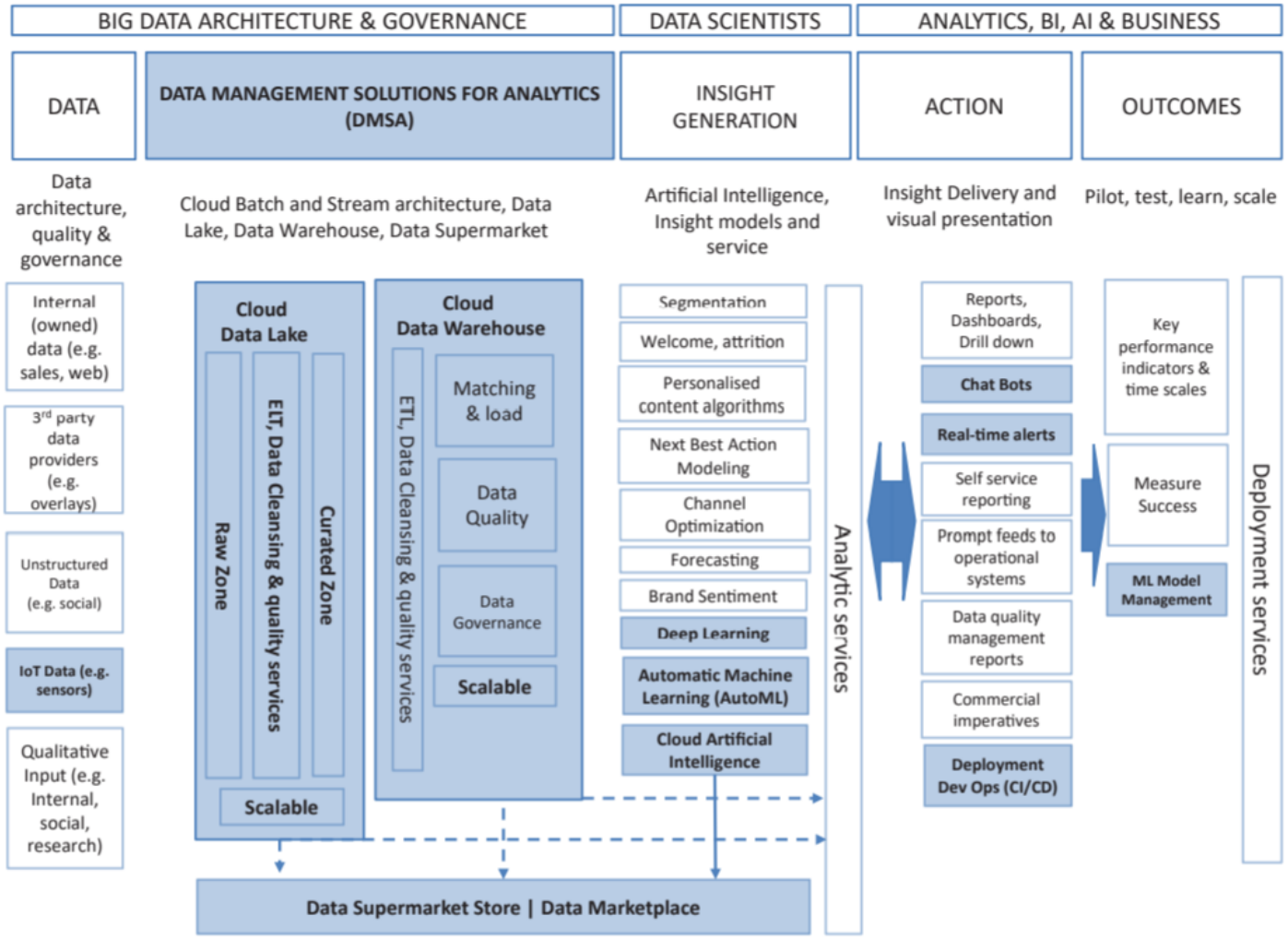
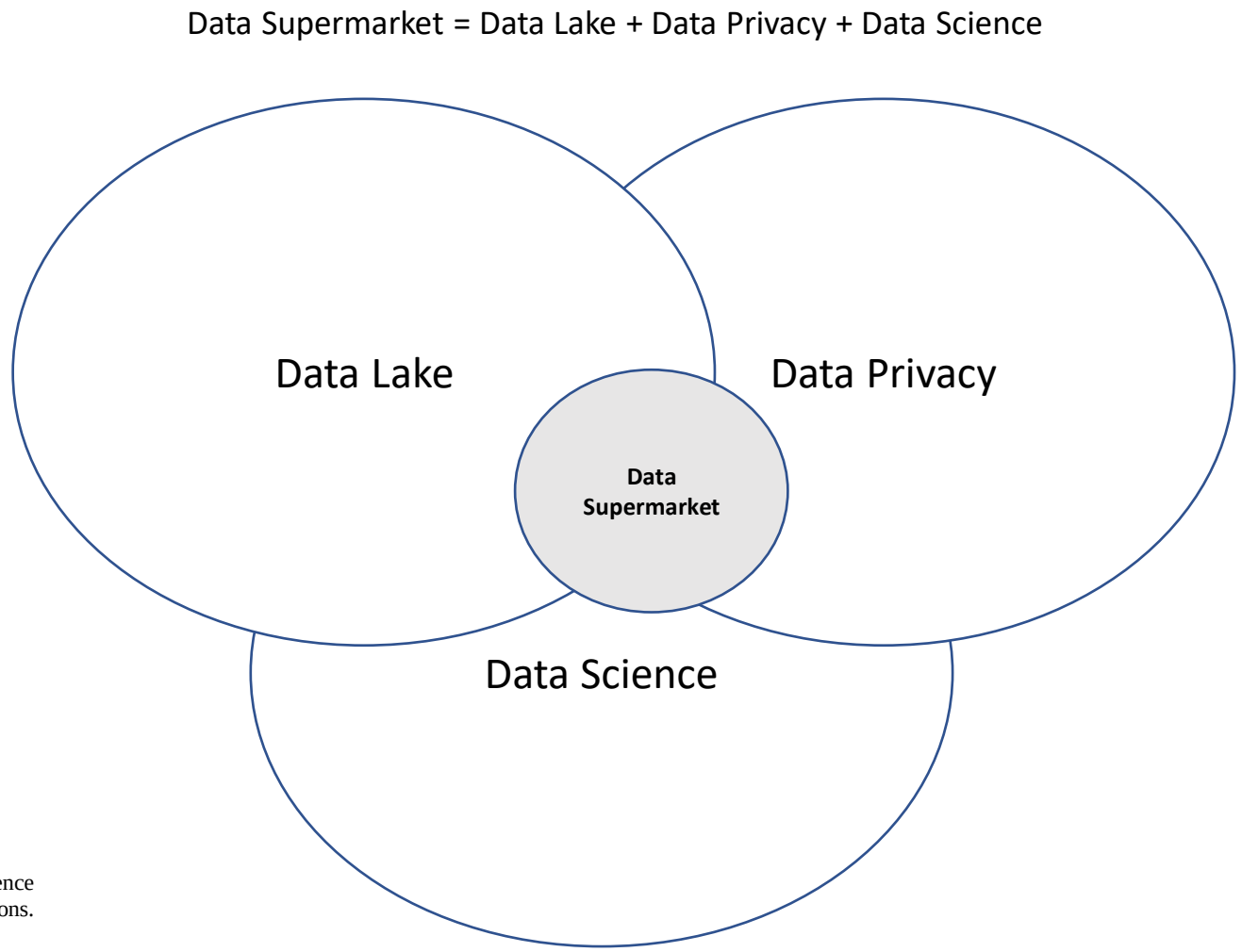


Fig. 3. A conceptual Big Data MO strategy architecture.

Data Supermarket definition

According to Moreno, C., Alberto Carrasco, R., & Herrera-Viedma, E. (2019) [1] a Data Supermarket is “a place to commercialize the data products generated by the insight generation process to other consumers exchanging them for a monetary value”.



[1] Moreno, C., Alberto Carrasco, R., & Herrera-Viedma, E. (2019). Data and Artificial Intelligence Strategy: A Conceptual Enterprise Big Data Cloud Architecture to Enable Market-Oriented Organisations. International Journal of Interactive Multimedia & Artificial Intelligence, 5(6).

Data Supermarket key component

The company of the future will build and sell **data products**.

The **Data Supermarket** is a key component to enable data driven organizations to build **data products** and **monetise** their data.

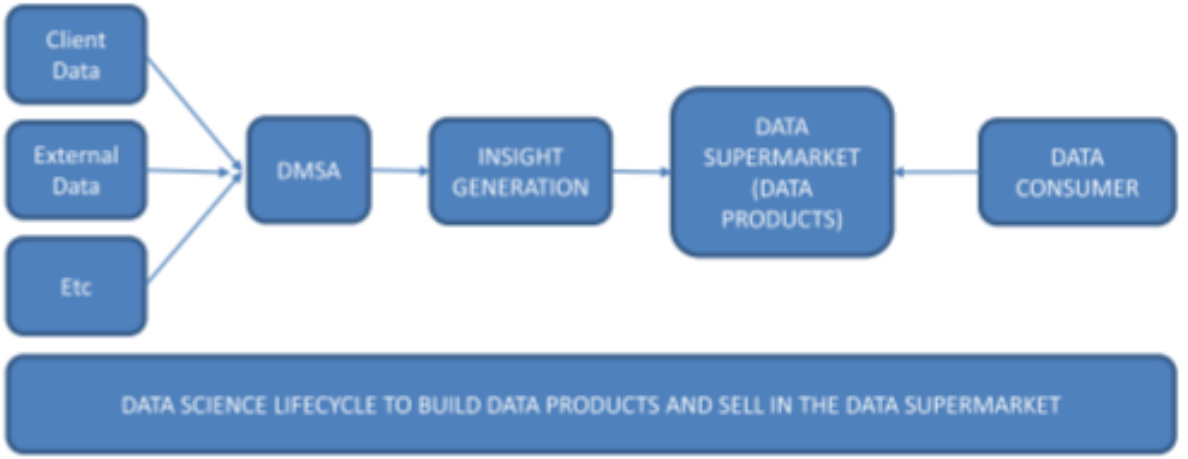
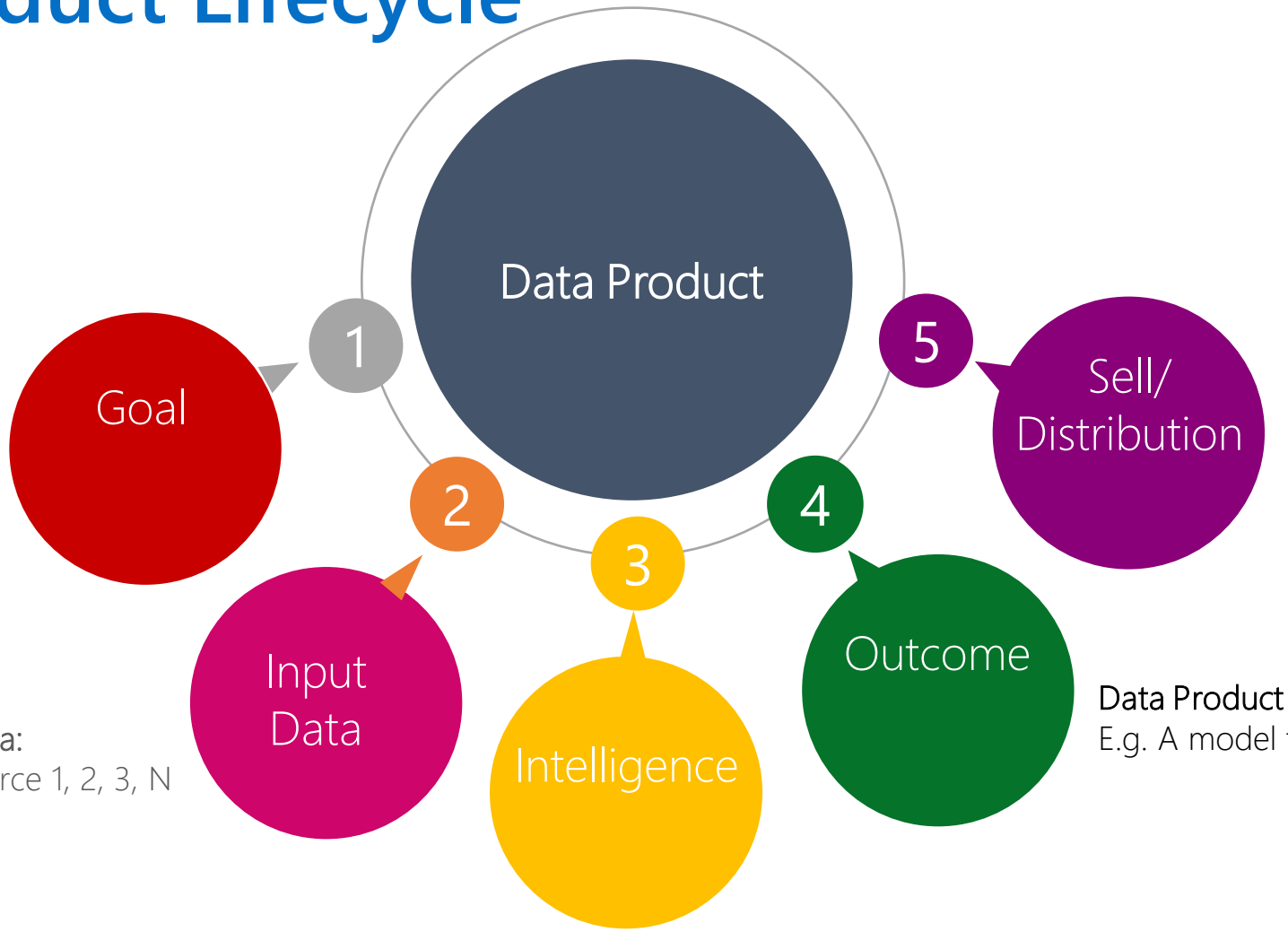


Fig. 6. Data science lifecycle to build data products and sell in the data supermarket.

Data Product Lifecycle



Data Product Goal:
E.g. Predict Churn

Input data:
Data Source 1, 2, 3, N

Data Product Intelligence:
Intelligence Engine to deliver the Data Product desired outcome

Data Product outcome:
E.g. A model to predict churn

Sell and Distribution:
Pricing the data product and distributing internally and externally

Data Product benefits

- New Revenue Streams
- Better Products & Services
- Operational Efficiency
- Profit Optimization

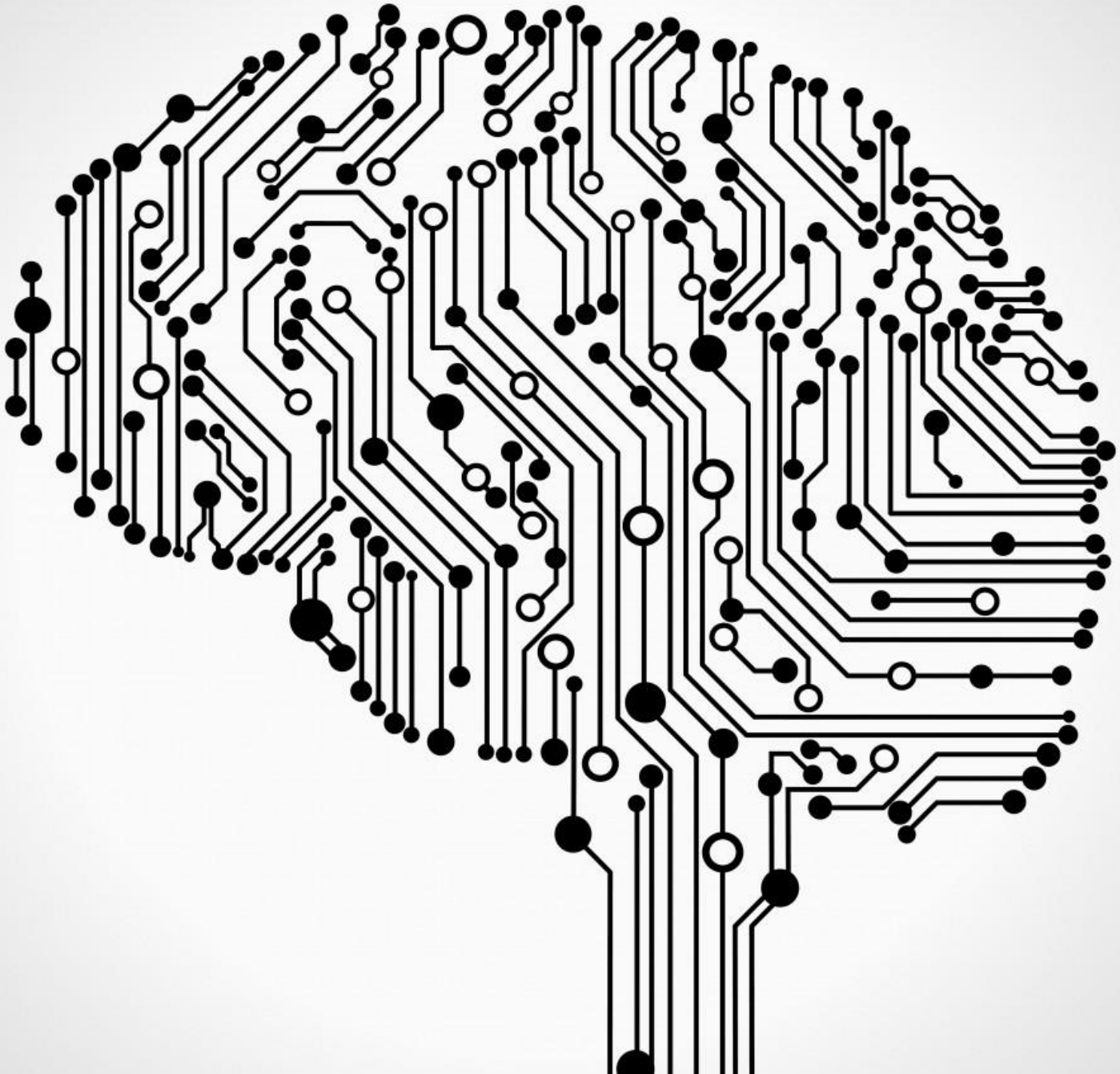
Real life example of a Data Product

Smart Steps from **Telefonica** is a successful example of building data products and providing them to external companies. **Smart Steps** is an insight solution that uses anonymized and aggregated mobile network data to provide useful insights [33].

[33] Telefonica. “Smart Steps”. URL (consulted 2019): https://www.businesssolutions.telefonica.com/en/products/big-data/business-insights/smart-steps/

Our paper

Paper link: https://doi.org/10.9781/ijimai.2019.06.003



Future Work

- Evolve the Data and AI Supermarket Architecture
- Improve Data Privacy
- Promote ways to integrate the Data Supermarket Layer into the existing Modern Data Platform Architecture (Data Lake + Data Warehouse)

Q&A

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