

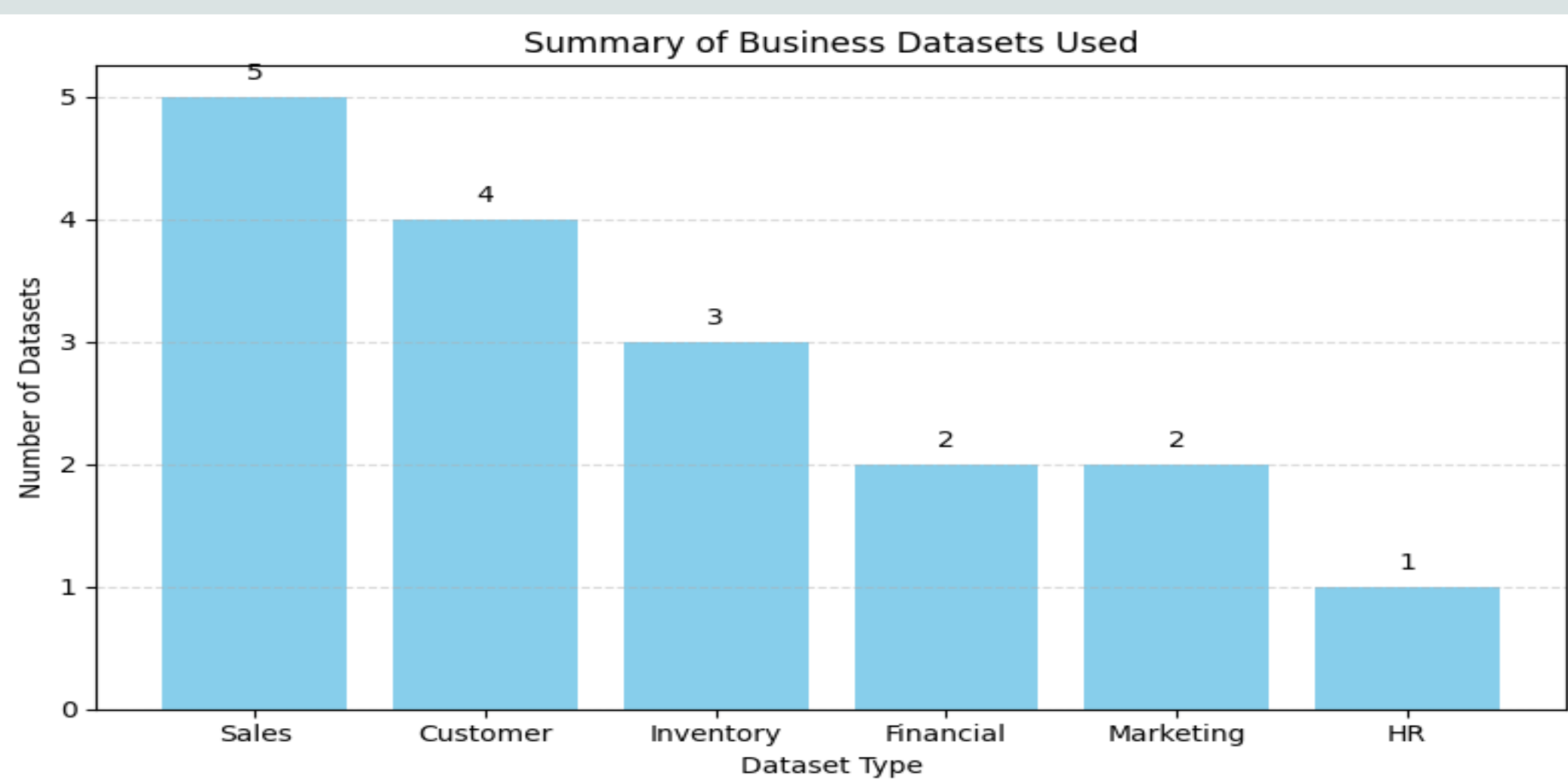
**Aims:**

- How big data and predictive analytics can be effectively leveraged by businesses to enhance strategic decision-making.
- To identify the most suitable predictive modelling techniques for different types of business data and decision contexts.
- To assess the challenges and limitations businesses face when implementing big data analytics solutions.
- To demonstrate the practical value of predictive analytics by applying models to real-world business scenarios and interpreting outcomes.

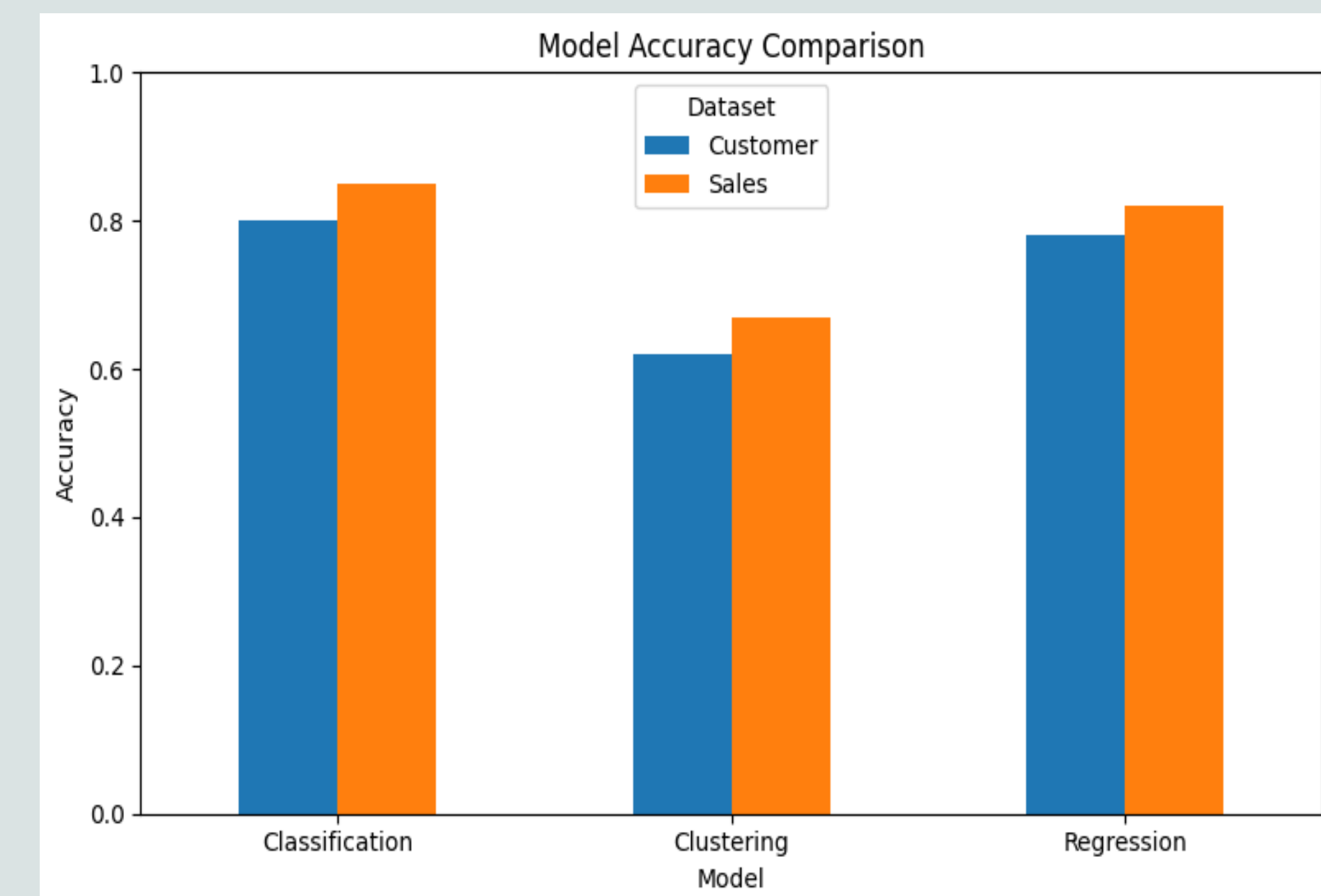
**Research Questions:**

- How can big data and predictive analytics be utilized to support strategic business decisions?
- What predictive models are most effective for analyzing business data?
- How do predictive analytics impact the quality and speed of business decision-making?

**Data Exploration & Context**



- Sales datasets = 5
- Customer datasets = 4
- Inventory datasets = 3,
- Financial and Marketing datasets each = 2
- HR datasets = 1



**Key Steps in Big Data Analysis for Business**

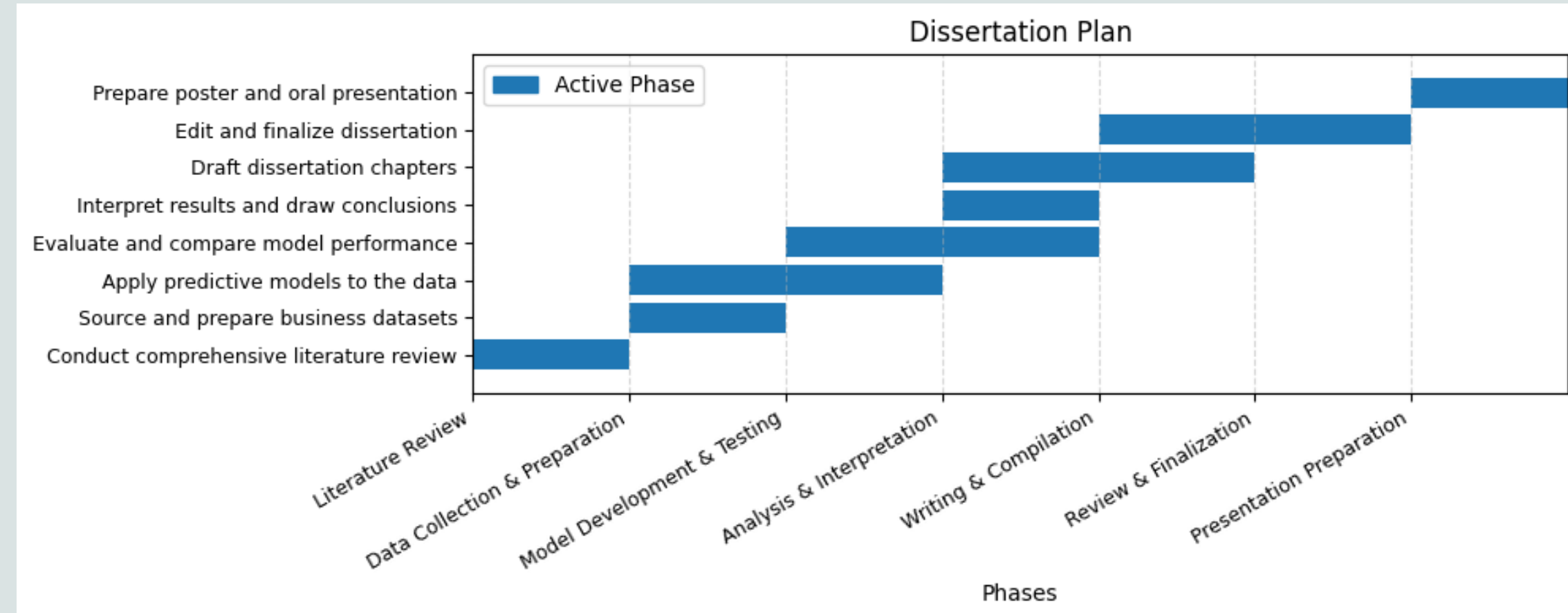


**References:**

- Knerl, L. (2024). The Role of Big Data Analytics in Decision-Making. Hp.com; HP. <https://www.hp.com/us-en/shop/tech-takes/big-data-analytics-decision-making>
- Ohaba, E. (2023, August 3). The Impact Of Big Data Analytics On Business Decision-Making. ELearning Industry. <https://elearningindustry.com/the-impact-of-big-data-analytics-on-business-decision-making>
- Serkan Özen, Volkan Atalay, & Adnan Yazici. (2019). Comparison of Predictive Models for Forecasting Time-series Data. <https://doi.org/10.1145/3372454.3372482>
- Tiwari, V. (2024). Role of Data Analytics in Business Decision Making. Knowledgeable Research a Multidisciplinary Journal, 3(01), 18–27. researchgate. <https://doi.org/10.57067/0zr57x43>

**Objectives:**

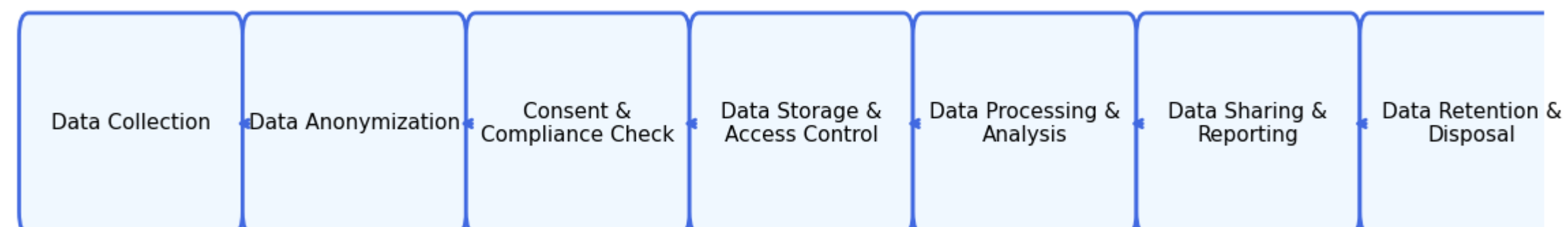
- Analyse publicly available business datasets using predictive analytics.
- Apply and compare different predictive models (regression, classification, time series forecasting) to business data. (Serkan Özen, Volkan Atalay, & Adnan Yazici, 2019)
- Demonstrate how predictive insights can inform and improve business strategy.
- Evaluate the effectiveness of predictive analytics tools (Python, R) in real-world business scenarios.
- Discuss ethical considerations and data governance issues in business analytics.



**Rationale for the Research**

- This research is significant as it explores both the opportunities and obstacles associated with integrating big data analytics into business decision-making according to Ohaba (2023). By systematically exploring various predictive modelling techniques and applying them to real-world datasets, the study aims to bridge the gap between theory and practice. It will showcase not only the potential benefits—such as improved forecasting, risk mitigation, and identification of new business opportunities—but also highlight practical considerations, such as data privacy, ethical use, and organisational readiness. (Knerl, 2024)
- Furthermore, the research will provide actionable recommendations for businesses at different stages of analytics maturity, supporting a broader adoption of evidence-based decision-making. By demonstrating concrete applications and outcomes, this project aspires to contribute to the body of knowledge in both business strategy and data science, ultimately helping organisations become more agile, innovative, and competitive in the digital age. (Tiwari, 2024)

**Data Privacy & Governance Workflow in Analytics Pipeline**



**Data Collection**

The process begins with gathering raw data from various sources, such as business transactions, customer interactions, or external datasets.

**Data Anonymization**

Collected data is anonymized or de-identified to protect individual privacy and comply with regulations (e.g., removing personal identifiers).

**Consent & Compliance Check**

Before using the data, organisations ensure that all necessary consents have been obtained and that data usage complies with relevant laws (e.g., GDPR, HIPAA).

**Data Storage & Access Control**

Data is securely stored, and access is restricted to authorized personnel only. Security protocols and role-based access help prevent unauthorized use or breaches.

**Data Processing & Analysis**

The anonymized and compliant data is then processed and analysed using various analytics or machine learning techniques to extract insights.

**Data Sharing & Reporting**

Results and insights may be shared within the organisation or with external stakeholders, always ensuring that privacy and compliance requirements are maintained.

**Data Retention & Disposal**

Finally, data is retained for only as long as necessary, then securely deleted or destroyed according to data retention policies and regulations.

**Key Literature in the Field**

- Davenport, T. H., & Harris, J. G. (2007). Competing on Analytics: The New Science of Winning.
- Provost, F., & Fawcett, T. (2013). Data Science for Business: What You Need to Know About Data Mining and Data-Analytic Thinking.
- Waller, M. A., & Fawcett, S. E. (2013). Data Science, Predictive Analytics, and Big Data: A Revolution That Will Transform Supply Chain Design and Management.
- Recent journal articles on big data analytics, predictive modelling, and business strategy (e.g., Harvard Business Review, MIS Quarterly).

**Turning  
Data into  
Strategy,  
Insight into Success**