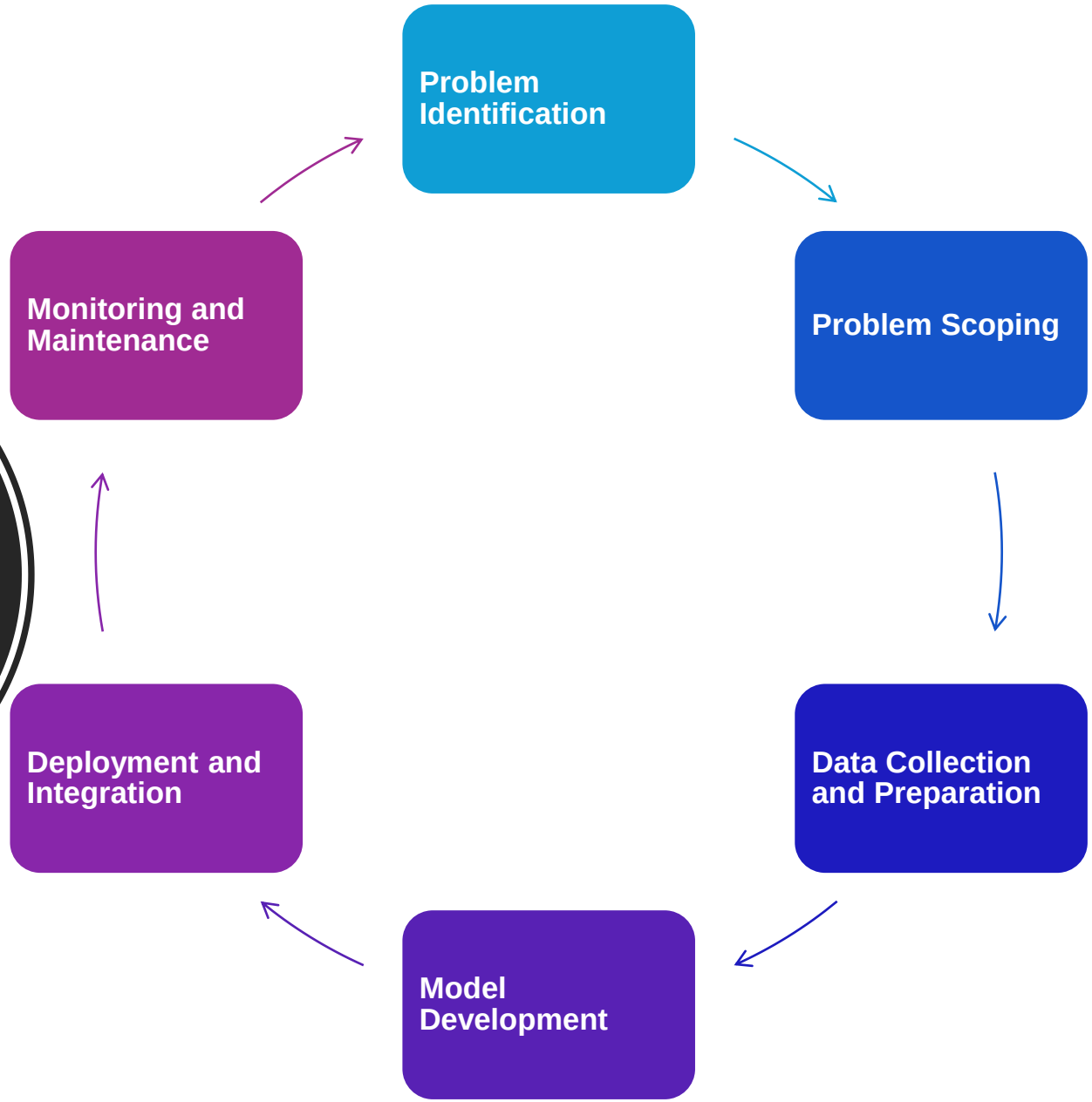
Dirbtinio intelekto sistemų inžinerija

AI Project Lifecycle. Overview of AI project management methodologies

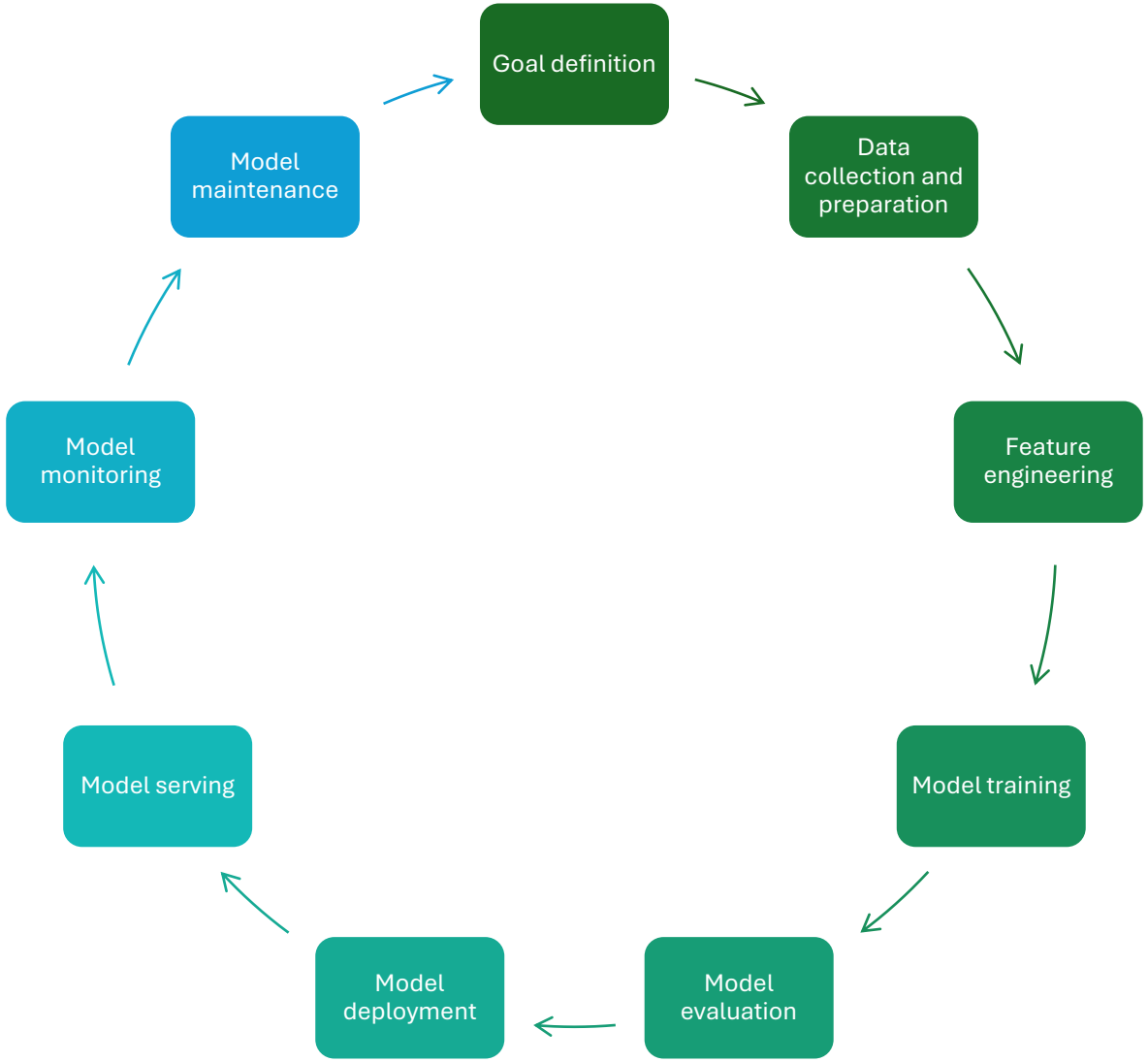
Artificial Intelligence System Engineering

AI Project Lifecycle. Overview of AI project management methodologies

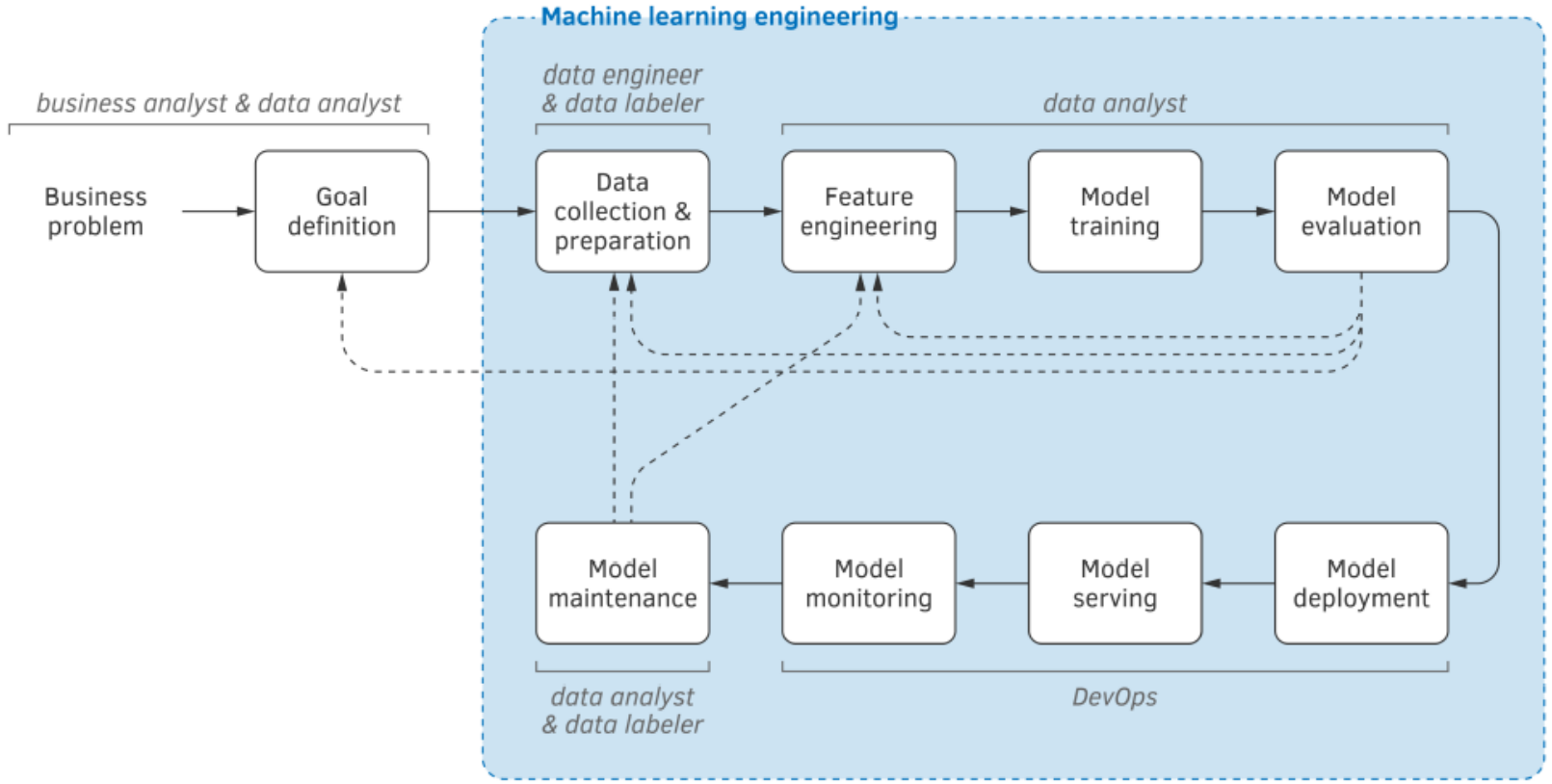
Stages of the AI Project Lifecycle



Stages of ML Project Lifecycle



ML lifecycle



Andryi Burkov. Machine Learning Engineering

Project Management methodologies (Evolution)

- Traditional Project Management (Waterfall Model)
- Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT)
- Agile Project Management
- Scrum Framework (an Agile Approach)
- Lean Project Management
- Kanban (Flow-Based Approach)
- Hybrid Methodologies (e.g., Waterfall-Agile, Agile-Stage-Gate)
- Scaled Agile Frameworks (SAFe, LeSS, Disciplined Agile)
- DevOps and MLOps (Integration with Operations)

AI Project Management methodologies

- Nature of model development is itterative and evolving;
- The most beneficial ones are those which concentrate on flexibility, experimentation, and continuous improvement;
- Sense/Analyze/React loop
  - CRISP-DM (Cross-Industry Standard Process for Data Mining)
  - PDCA
  - OODA (in realtime AI applications)
- TDSP (Team Data Science Process)
- Agile and Scrum for AI/ML Projects

CRISP-DM in AI Projects

CRISP-DM (Cross-Industry Standard Process for Data Mining)

One of the most widely used methodologies in data science and AI

- Business Understanding
- Data Understanding
- Data Preparation
- Modeling
- Evaluation
- Deployment

Why?

- Iterative nature
- Focus on Business Value
- Comprehensive data handling

Agile and SCRUM for AI

Agile Principles:

- Iterative, incremental development allows for flexibility.
- Early and frequent delivery of functional models enables continuous improvement.

SCRUM Framework:

- AI projects benefit from sprints, daily stand-ups, and review sessions.
- End-of-sprint reviews help assess model performance and adapt as needed.

Team Data Science Process (TDSP)

- **Steps in TDSP**:
  - **Problem Scoping**: Identify business needs and define goals.
  - **Data Acquisition and Understanding**: Gather and explore data.
  - **Modeling**: Iteratively test models and algorithms.
  - **Deployment**: Roll out models, ensuring they meet performance benchmarks.
  - **Customer Acceptance**: Get stakeholder feedback for final adjustments.
  - **Best for**: Teams requiring structured collaboration, particularly with non-technical stakeholders.

DevOps/MLOps for AI Projects

- **DevOps**: Combination of software development (Dev) and IT operations (Ops) aimed at improving collaboration, increasing deployment frequency, and achieving faster time-to-market.
- **MLOps**: Extension of DevOps practices to Machine Learning (ML) and AI, addressing unique challenges of ML model deployment and lifecycle management.

MLOps Workflow