

# MATLAB EXPO

## 2021

### DevOps for Software and Systems: Putting Algorithms and Models in Operation

*Peter Brady*



*Martin Becker*





*Meaghan Kosmatka*  
Senior Engineer at Deere & Company



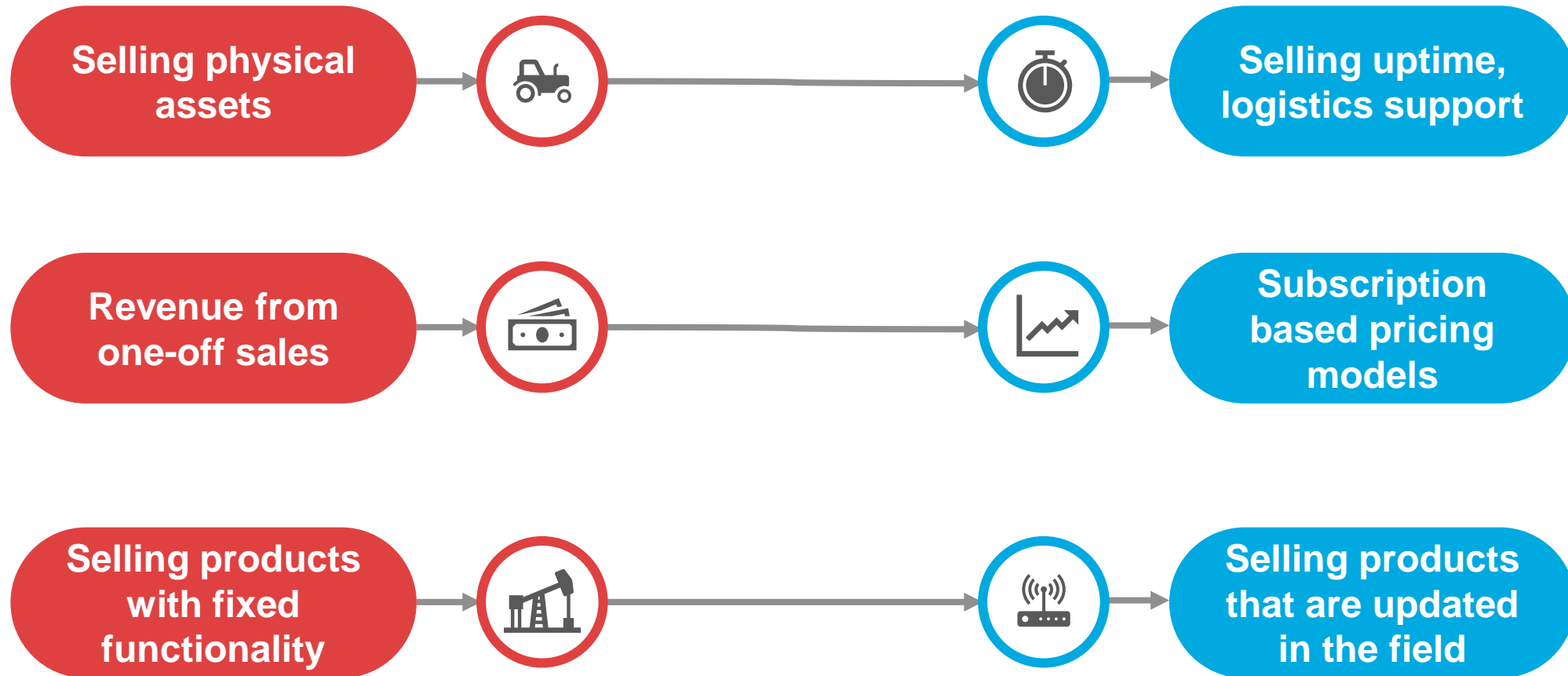
*Arvind Hosagrahara*  
Chief Solutions Architect at MathWorks



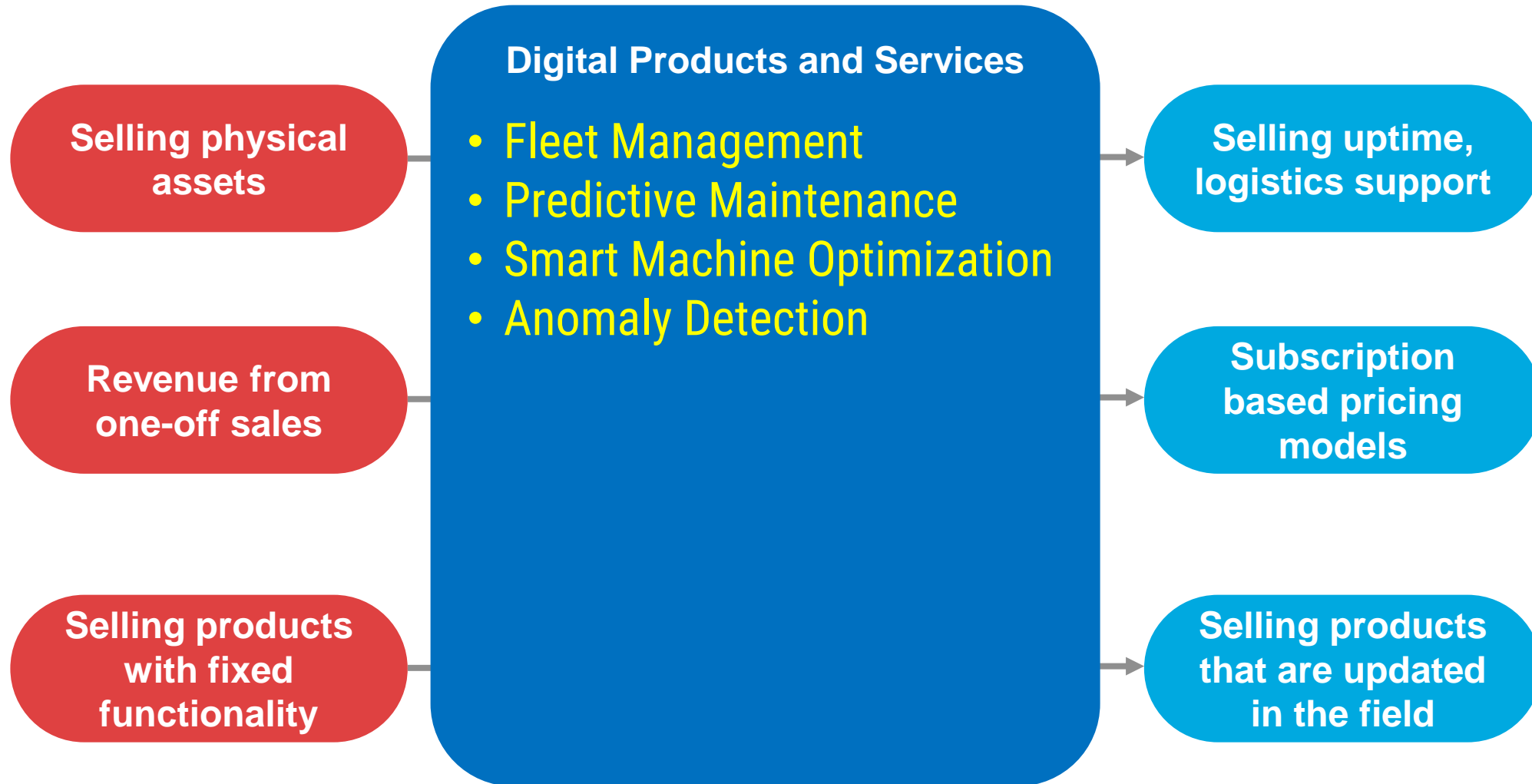
# MATLAB EXPO 2021

DevOps case study at John Deere

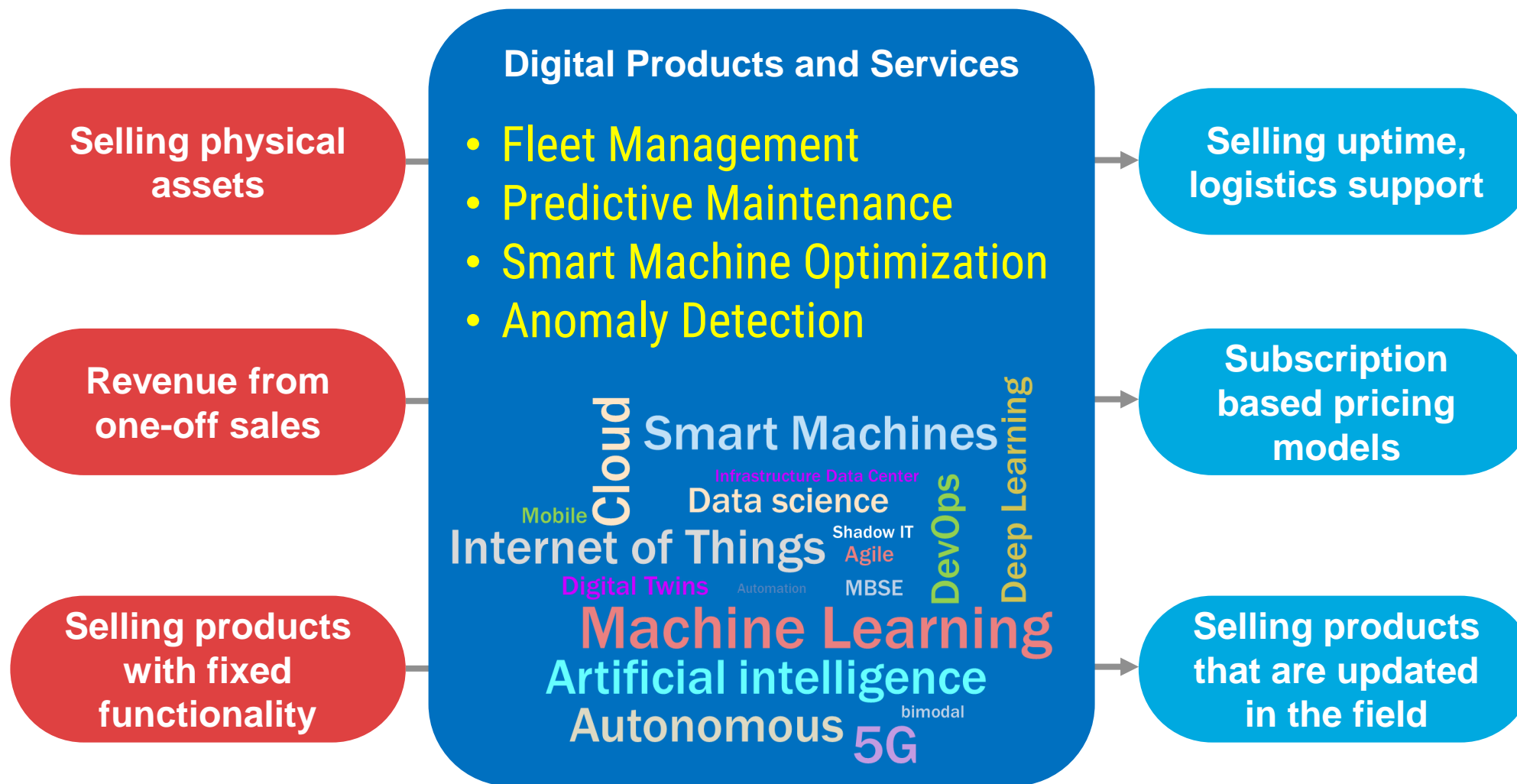
# Companies are transforming their businesses



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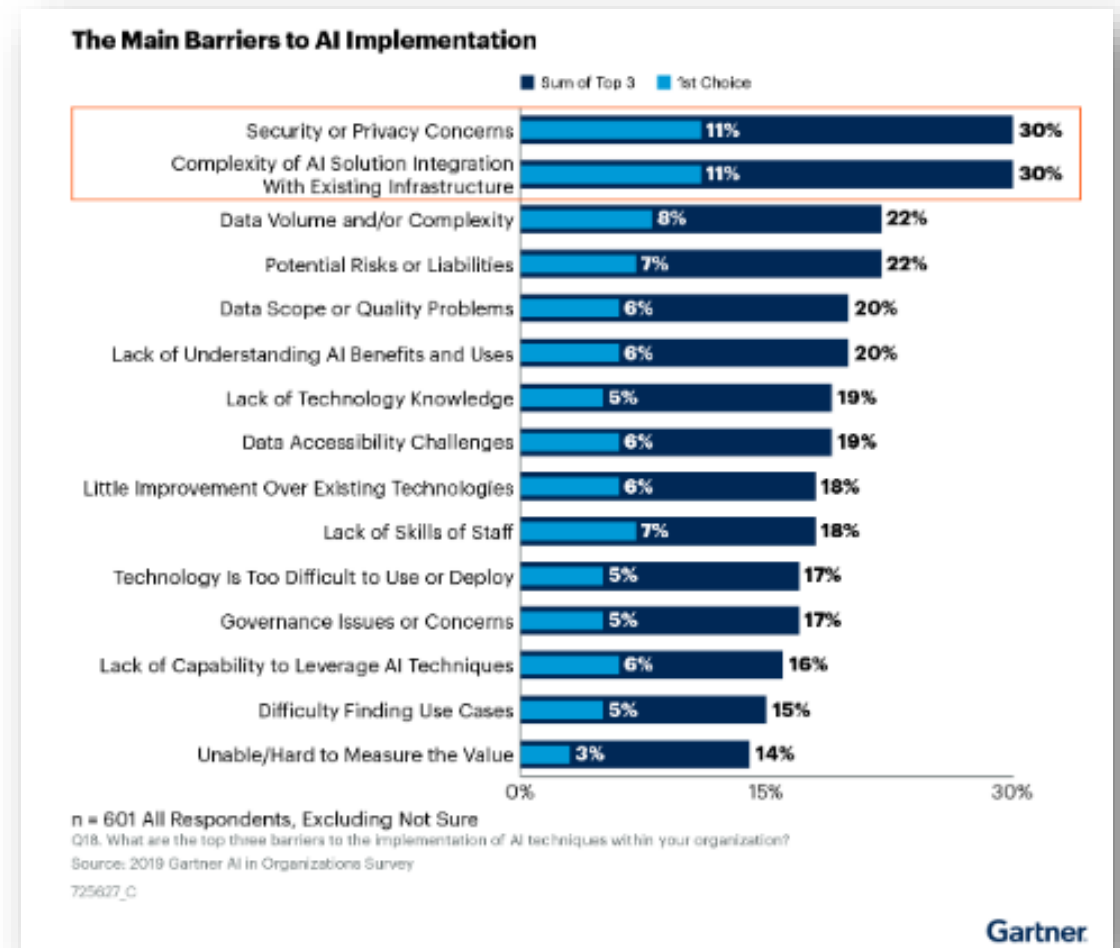


# Companies are transforming their businesses



“Approximately half of all AI models never make it into production due to lack of ModelOps”

Gartner®







# DevOps

“A set of practices and culture that combine software development (Dev) and IT operations (Ops)”

# Model

“A MATLAB algorithm, or a mathematical, machine learning, deep learning, or Simulink model”

# DevOps

“A set of practices and culture that combine software development (Dev) and IT operations (Ops)”

# Model + DevOps

“A MATLAB algorithm, or a mathematical, machine learning, deep learning, or Simulink model”

“A set of practices and culture that combine software development (Dev) and IT operations (Ops)”

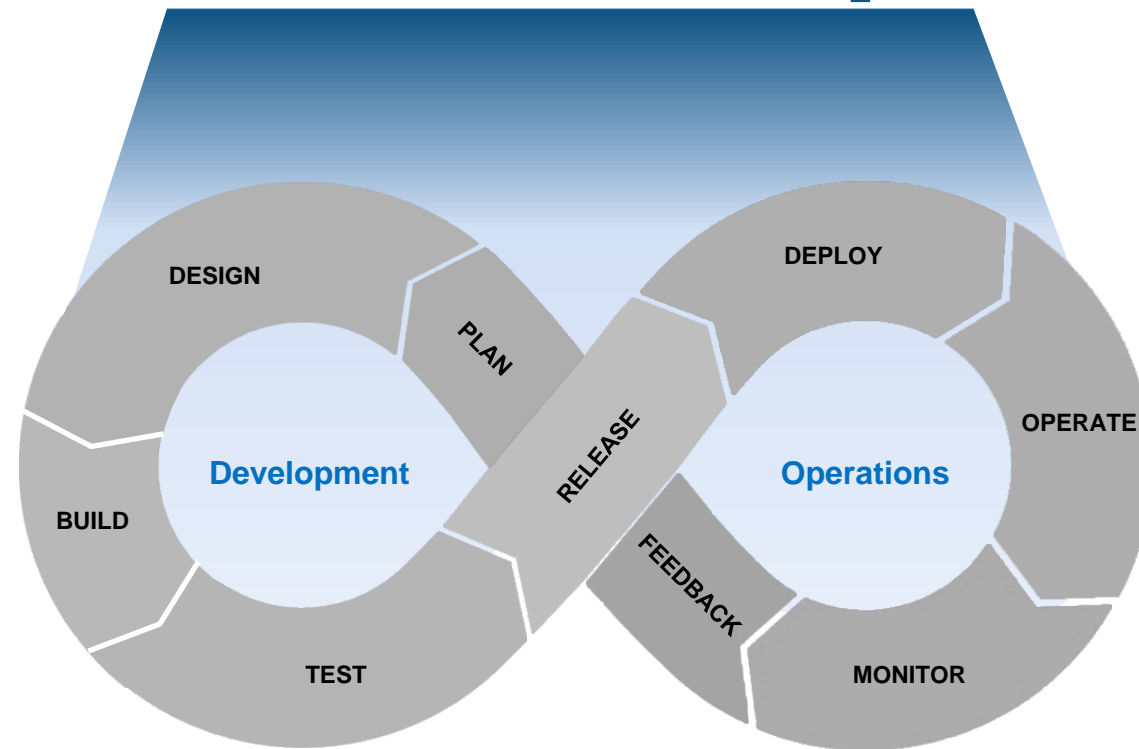


## Model DevOps

“Set of best practices, workflows, and tools that combine model development and model operations”

Realize the business value of your models by applying DevOps processes and deploying them into production

# Model DevOps



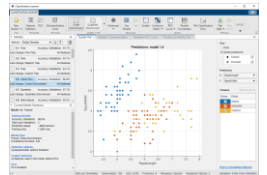
# Model DevOps brings agile processes to both data-driven and physics-based models

## Model DevOps



### Code-based:

- Optimization
- Financial



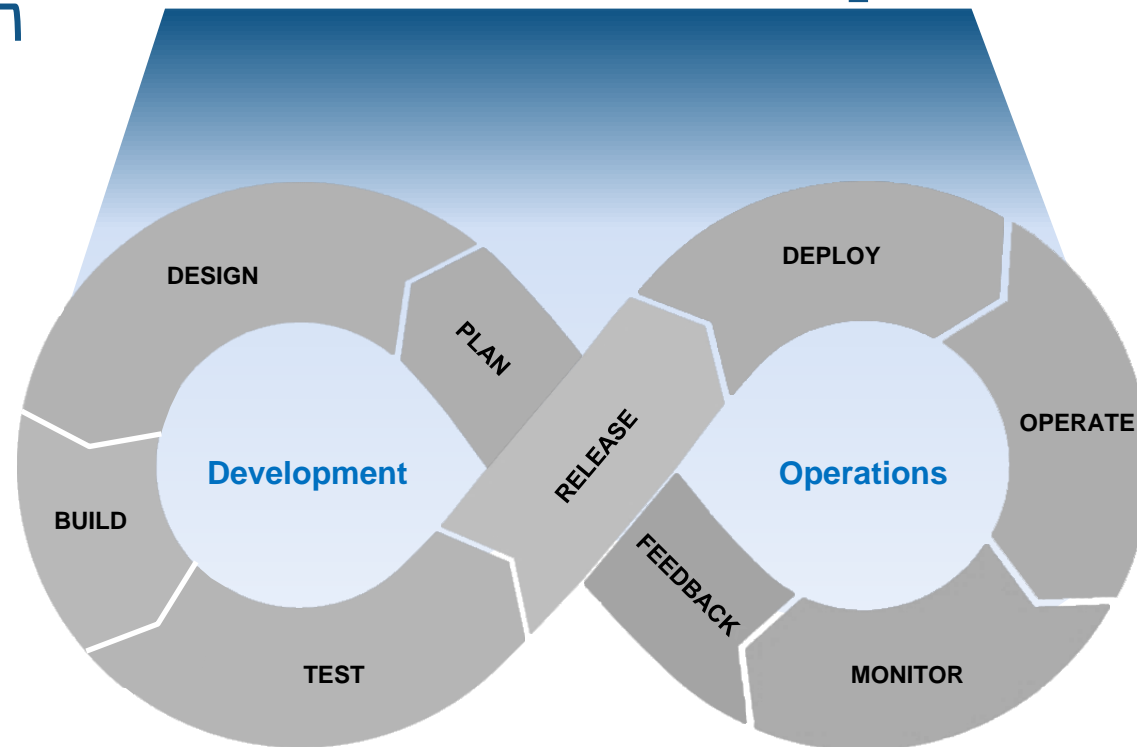
### Data-driven:

- Machine Learning
- Deep Learning



### Physics-based:

- Mechanical
- Electronic
- Hydraulic



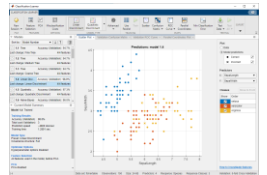
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## Model DevOps



### Code-based:

- Optimization
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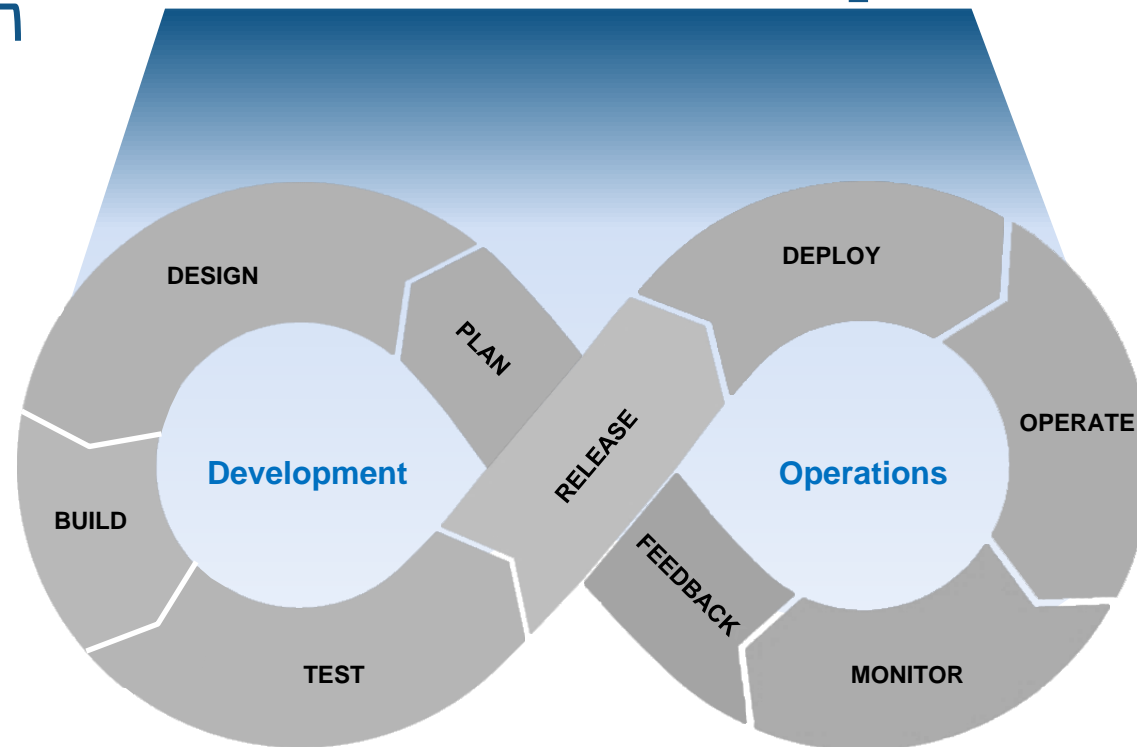
### Data-driven:

- Machine Learning
- Deep Learning



### Physics-based:

- Mechanical
- Electronic
- Hydraulic



- Docker containers
- Software component



- Edge systems
- Embedded devices

# What are some of the challenges of working with models?



Integrating with design, build, test, and development toolchains

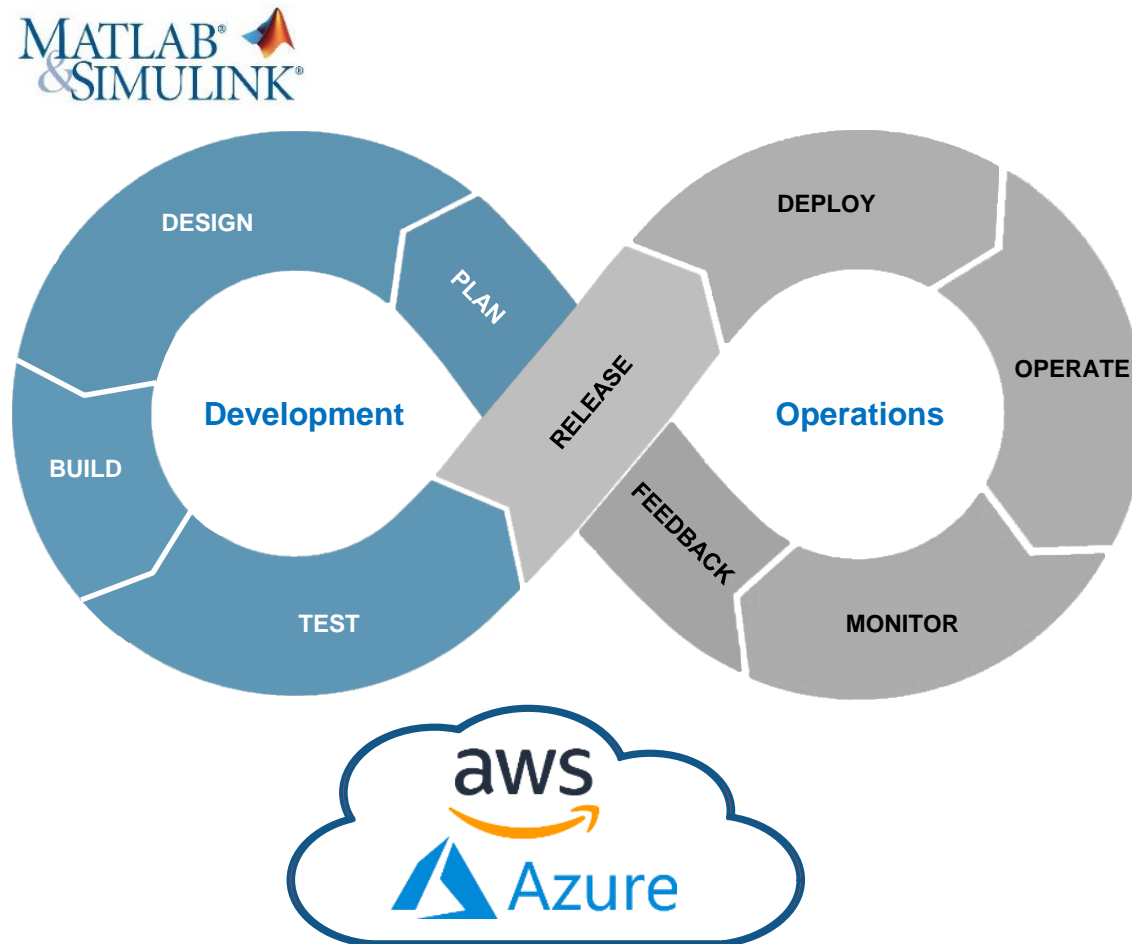


Getting access to data on-premises and in the cloud



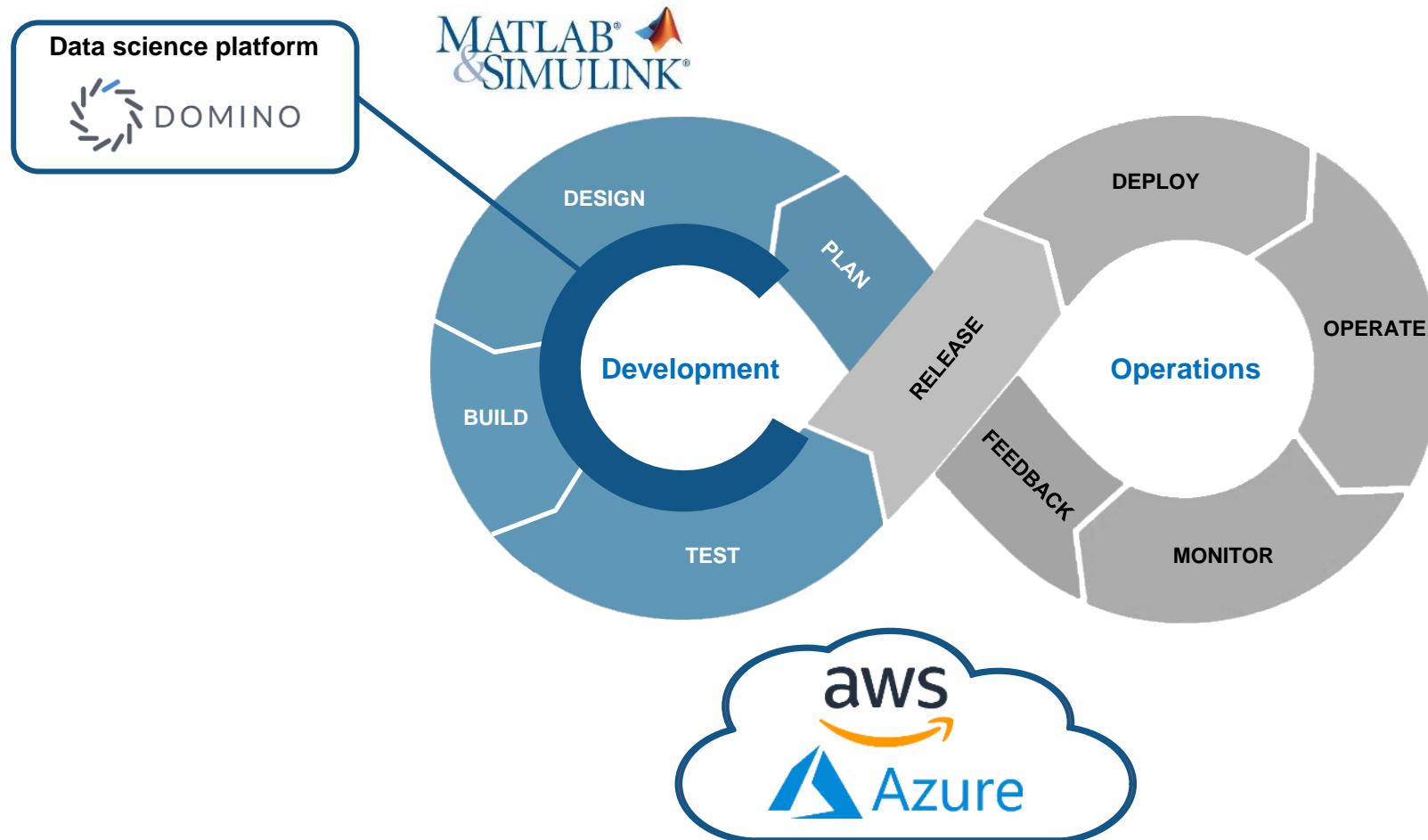
Collaborating with other departments, for example IT, data scientists, production operations

# MATLAB and Simulink work with your organization's development platforms and toolchain

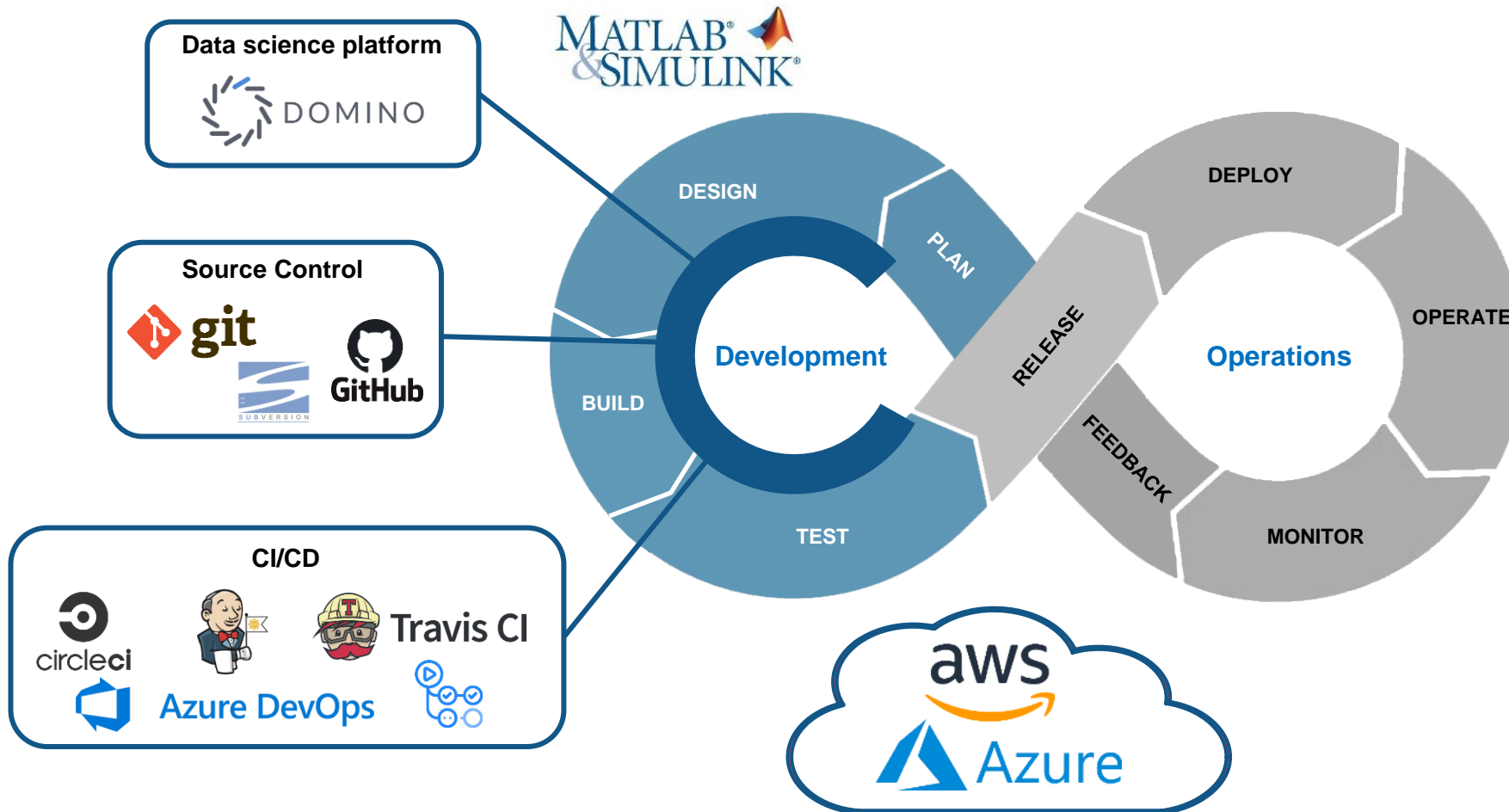




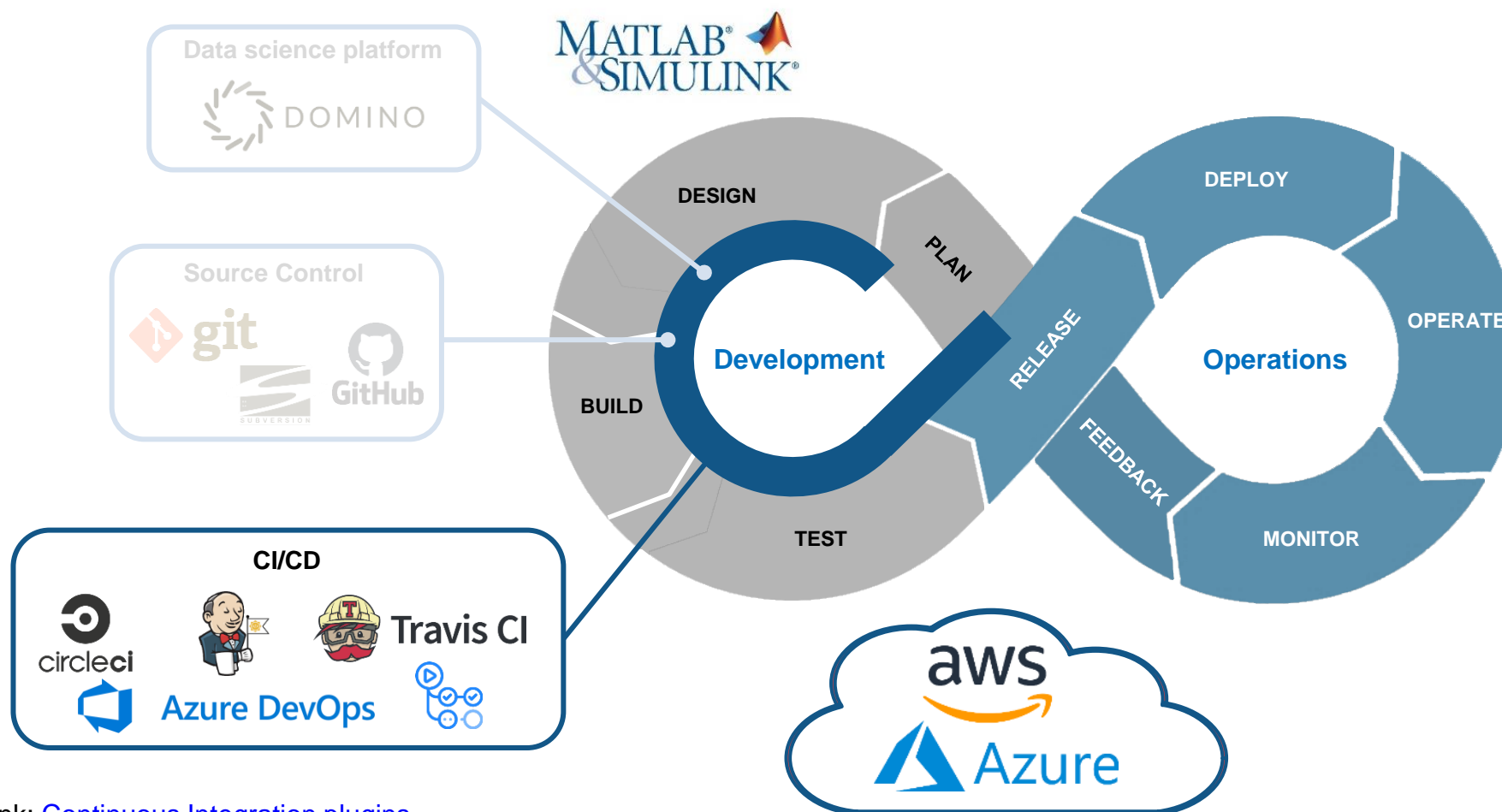
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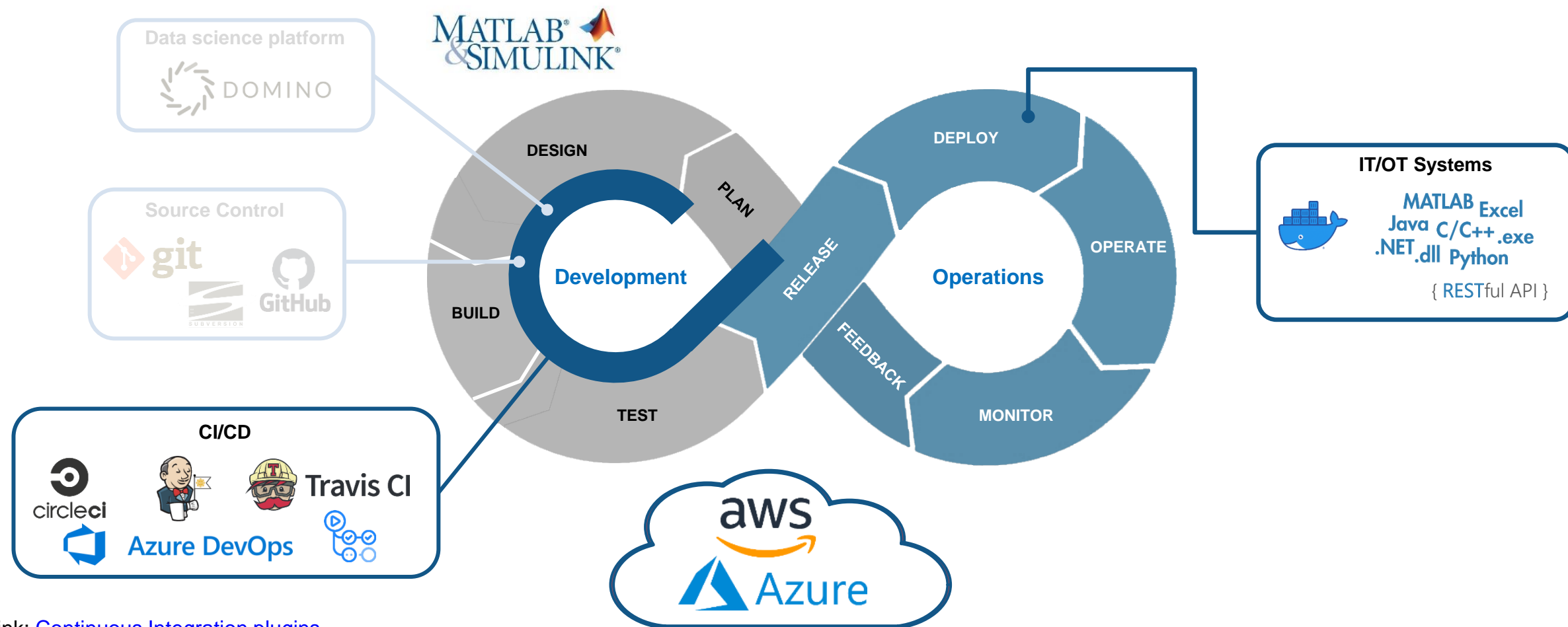
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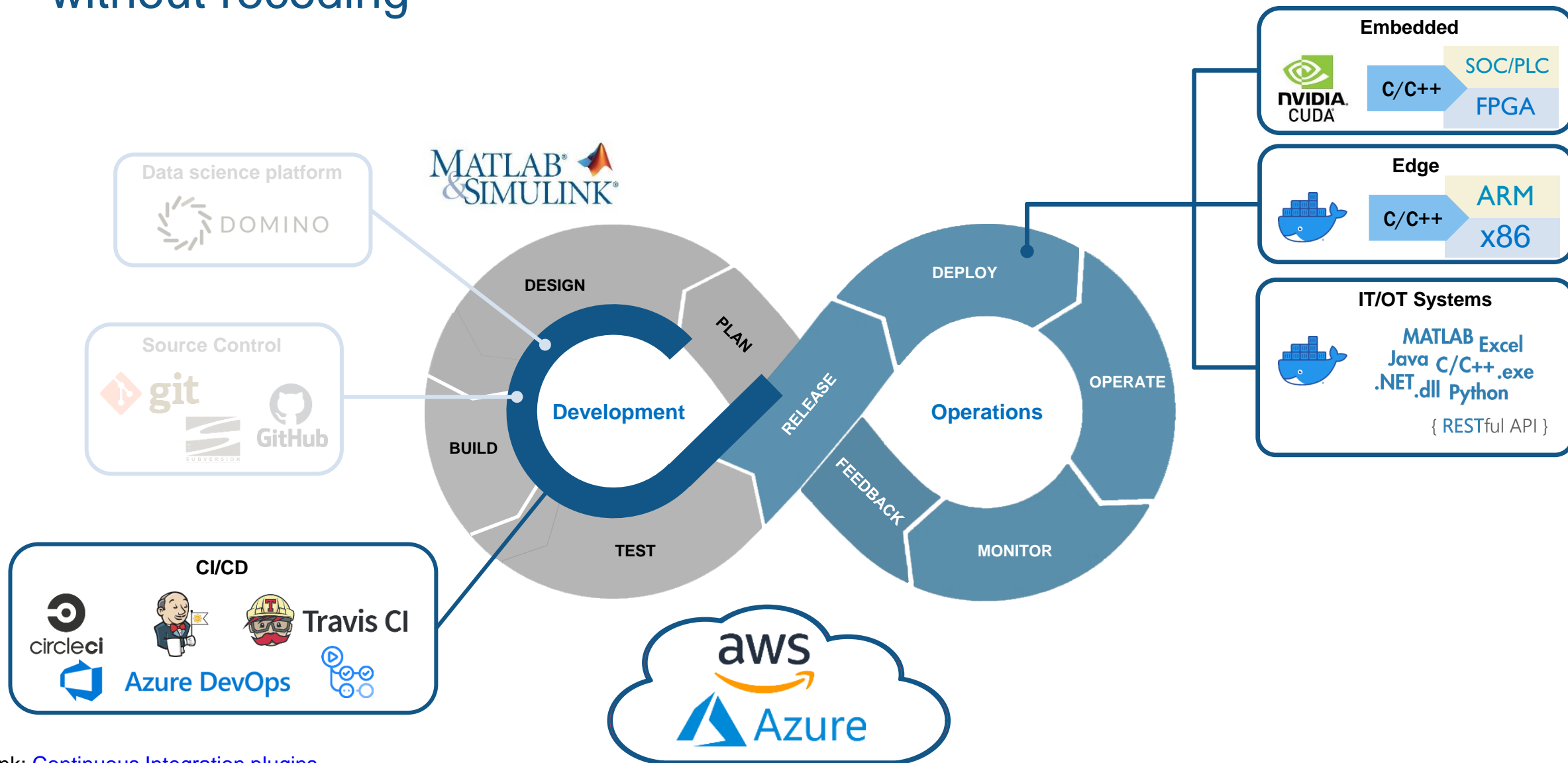
# Operationalize your models on embedded, edge, or IT systems without recoding



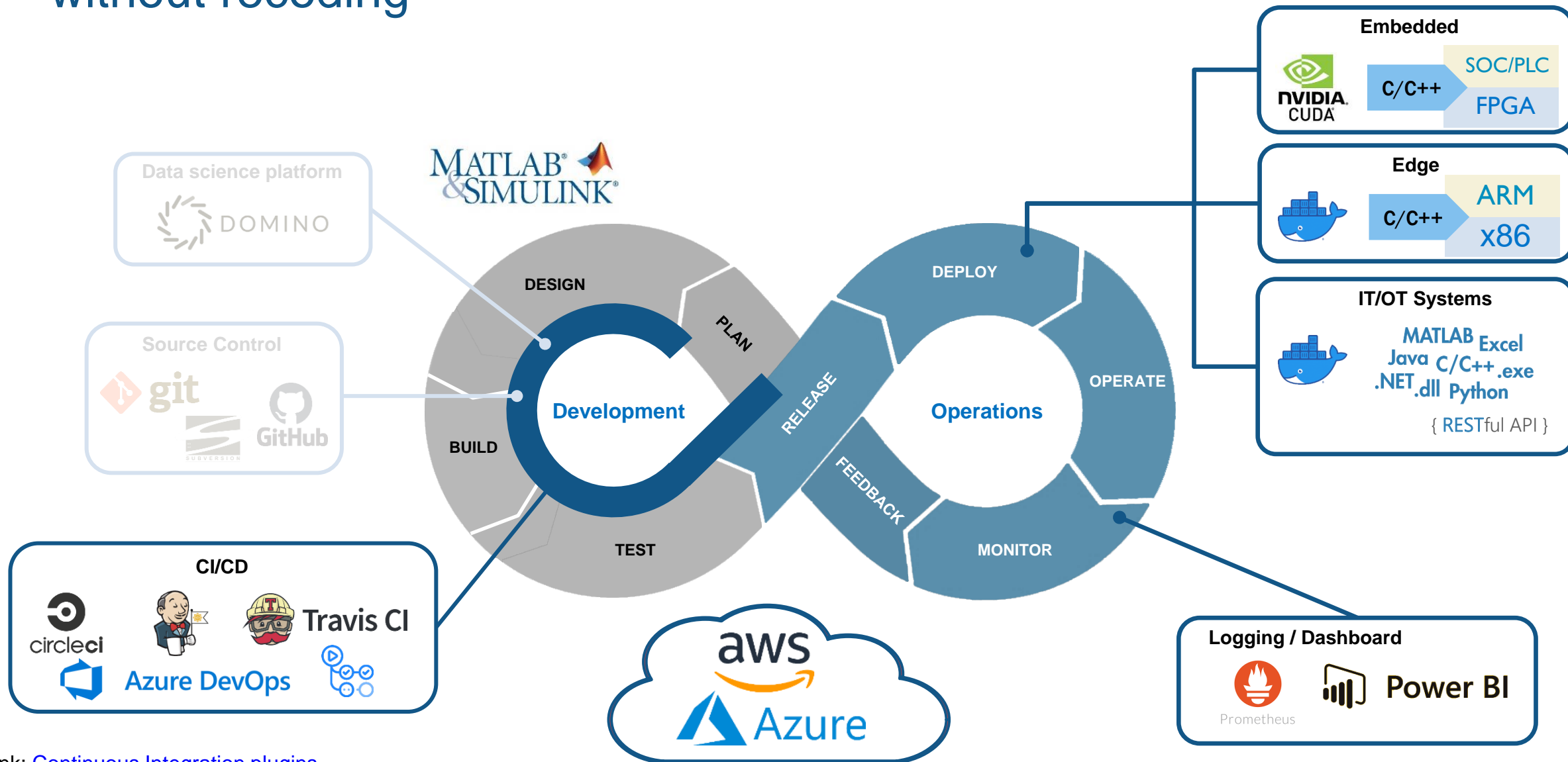
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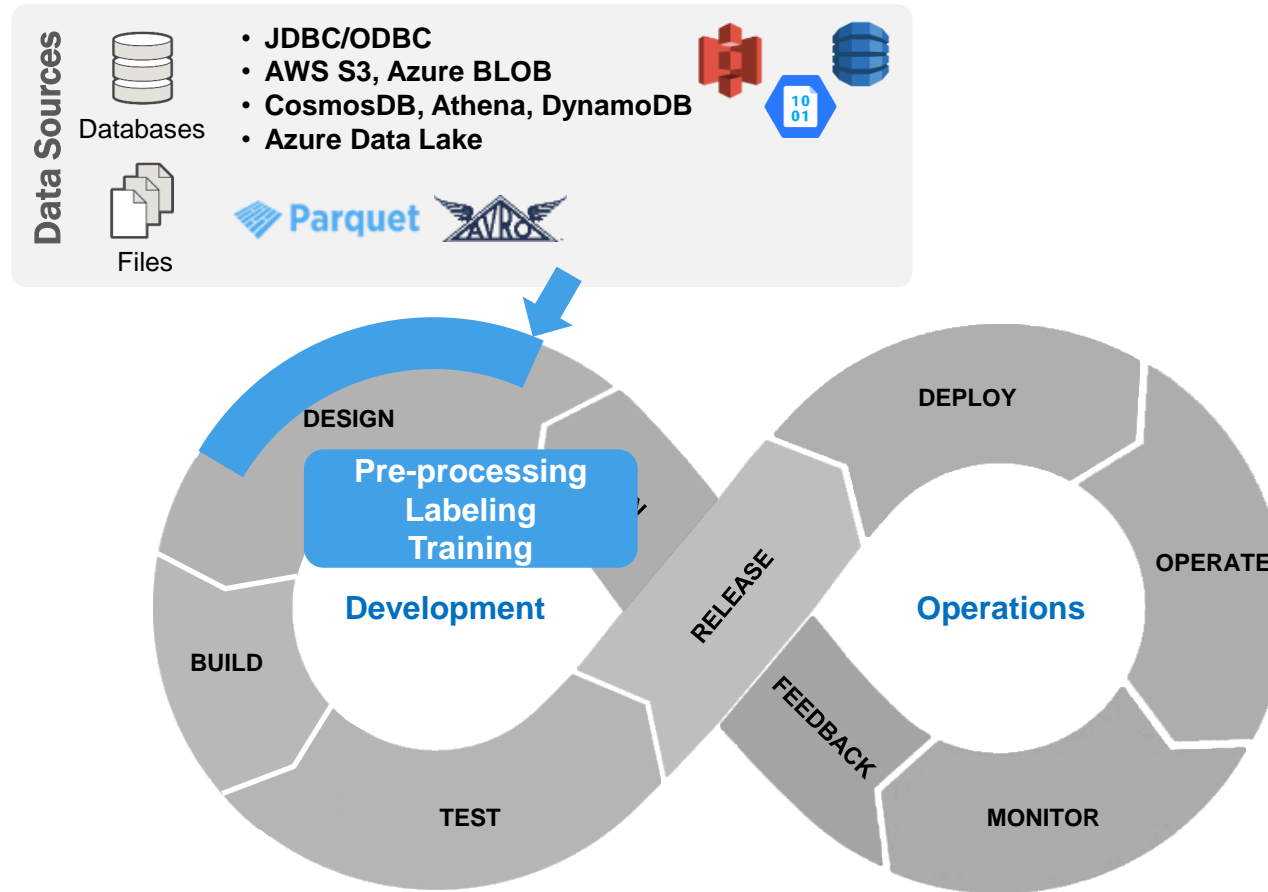


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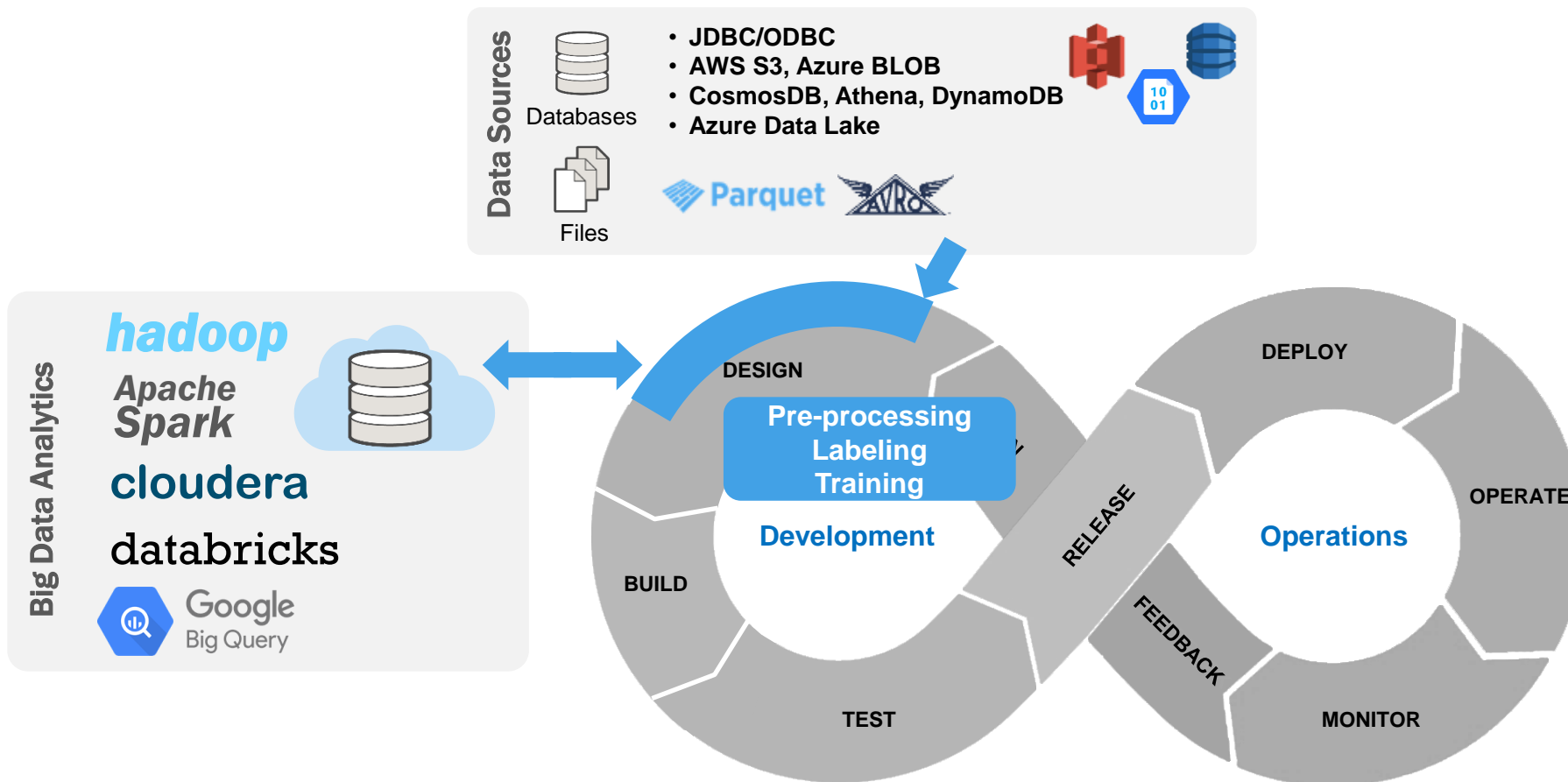


# Data is essential for both development and operations

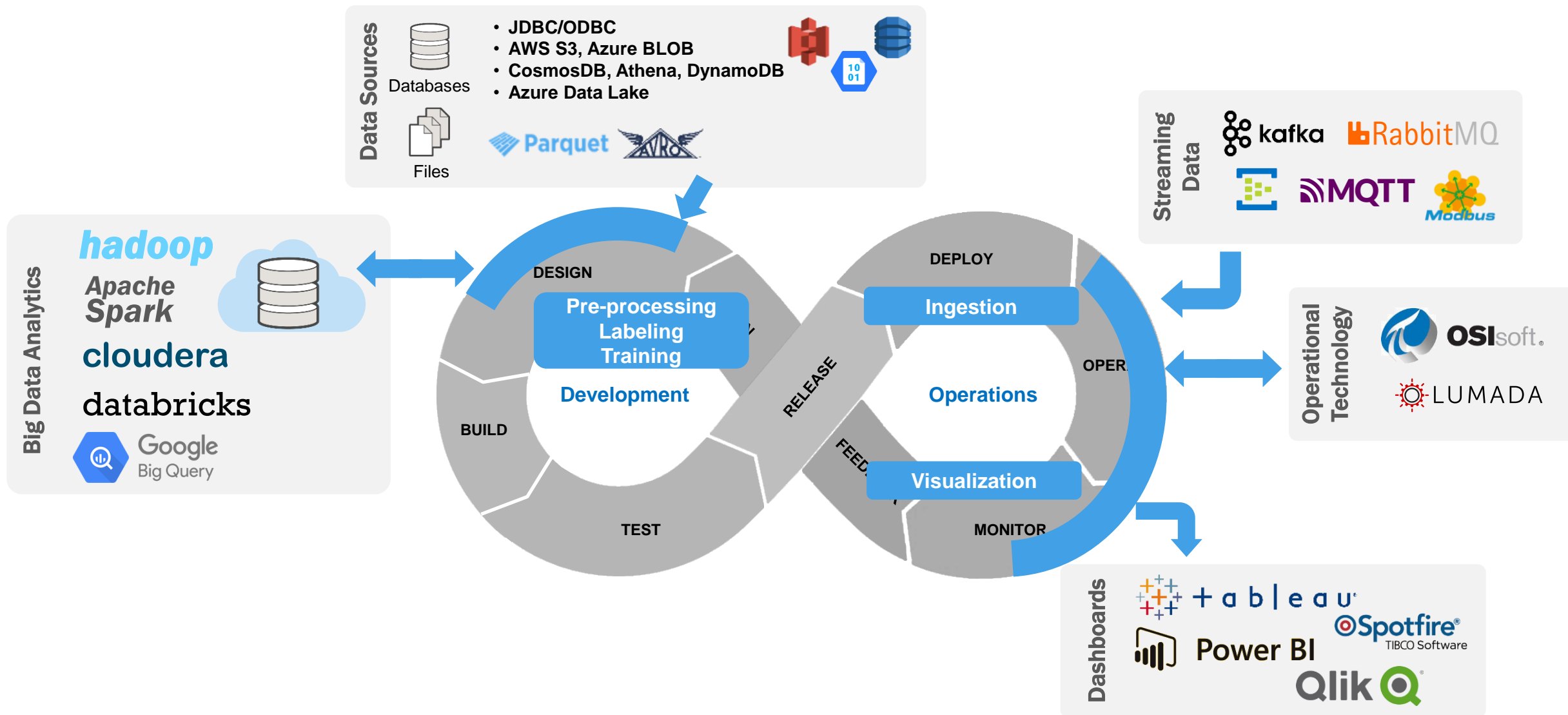




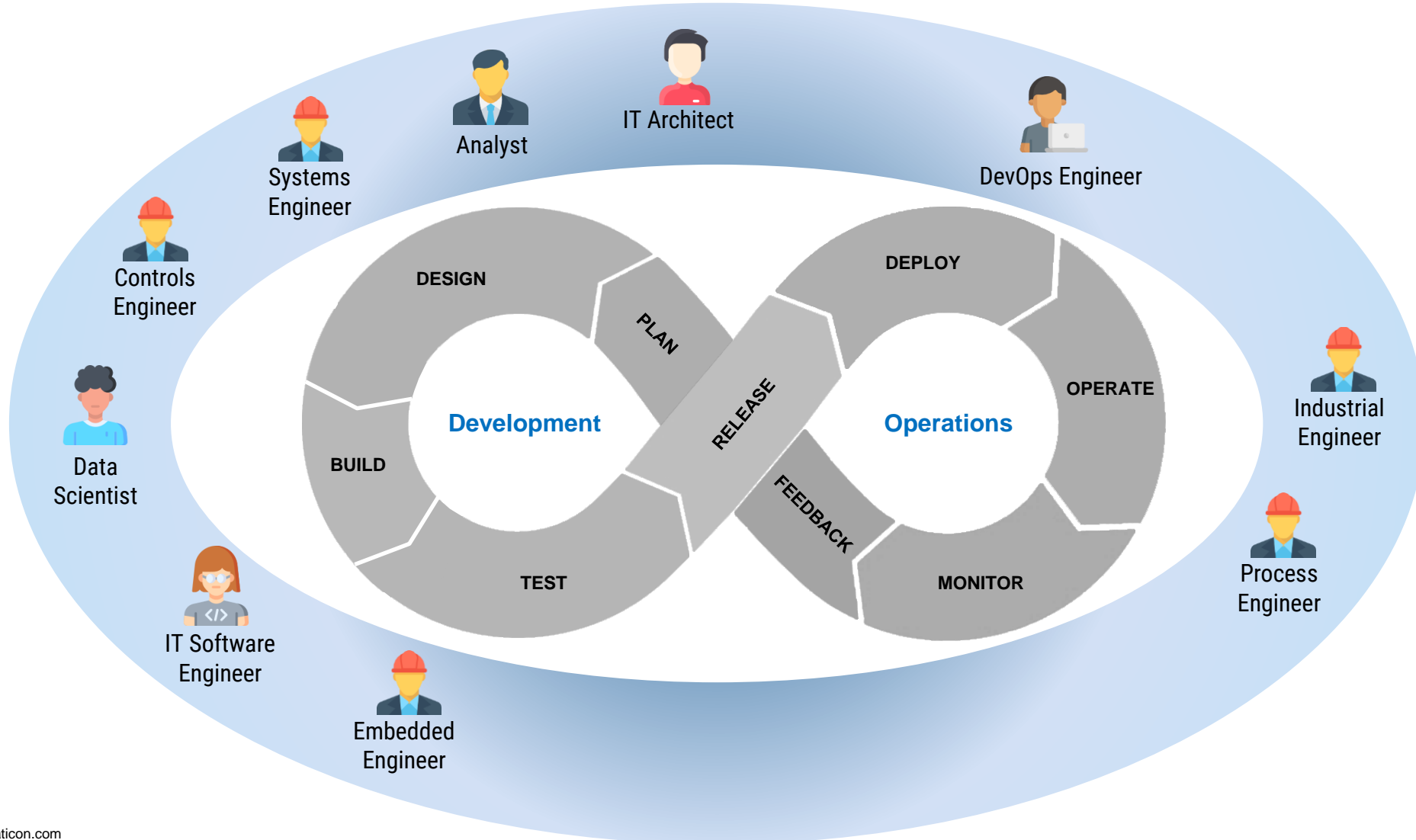
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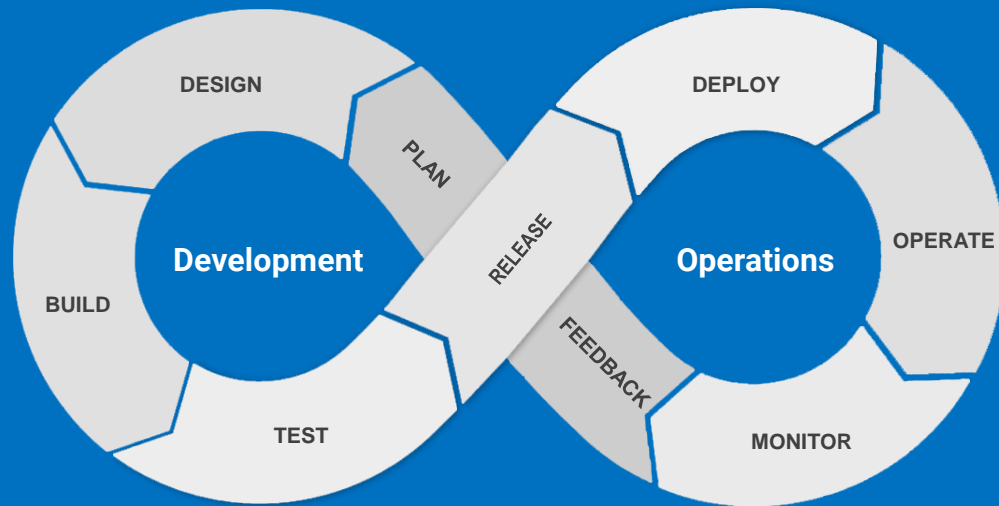
# Data is essential for both development and operations



# Diverse teams across Engineering, IT, Line of Business, and Operations must collaborate to achieve success in Model DevOps



# Summary



## Model DevOps



Engineering, Data Science, IT, and Operations teams must collaborate to ensure success



MATLAB & Simulink can be integrated into your development environment and leverage data from a variety of data sources



MATLAB & Simulink models can be deployed into a variety of platforms: embedded, edge, IT/OT, and cloud



is a **Leader** in the 2021 Gartner Magic Quadrant for Data Science and Machine Learning Platforms for the Second Year in a Row

Figure 1: Magic Quadrant for Data Science and Machine Learning Platforms



Source: Gartner (March 2021)

Gartner Magic Quadrant for Data Science and Machine Learning Platforms, Peter Krensky, Carlie Idoine, Erick Brethenoux, Pieter den Hamer, Farhan Choudhary, Afraz Jaffri, Shubhangi Vashisth, 1st March 2021.

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How can we help you apply Model DevOps into your organization?



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Thank you

