

MATLAB EXPO

2021

软件和系统的DevOps: 将算法和模型推向运维

宋登, MathWorks





Meaghan Kosmatka
Senior Engineer at Deere & Company



Arvind Hosagrahara
Chief Solutions Architect at MathWorks

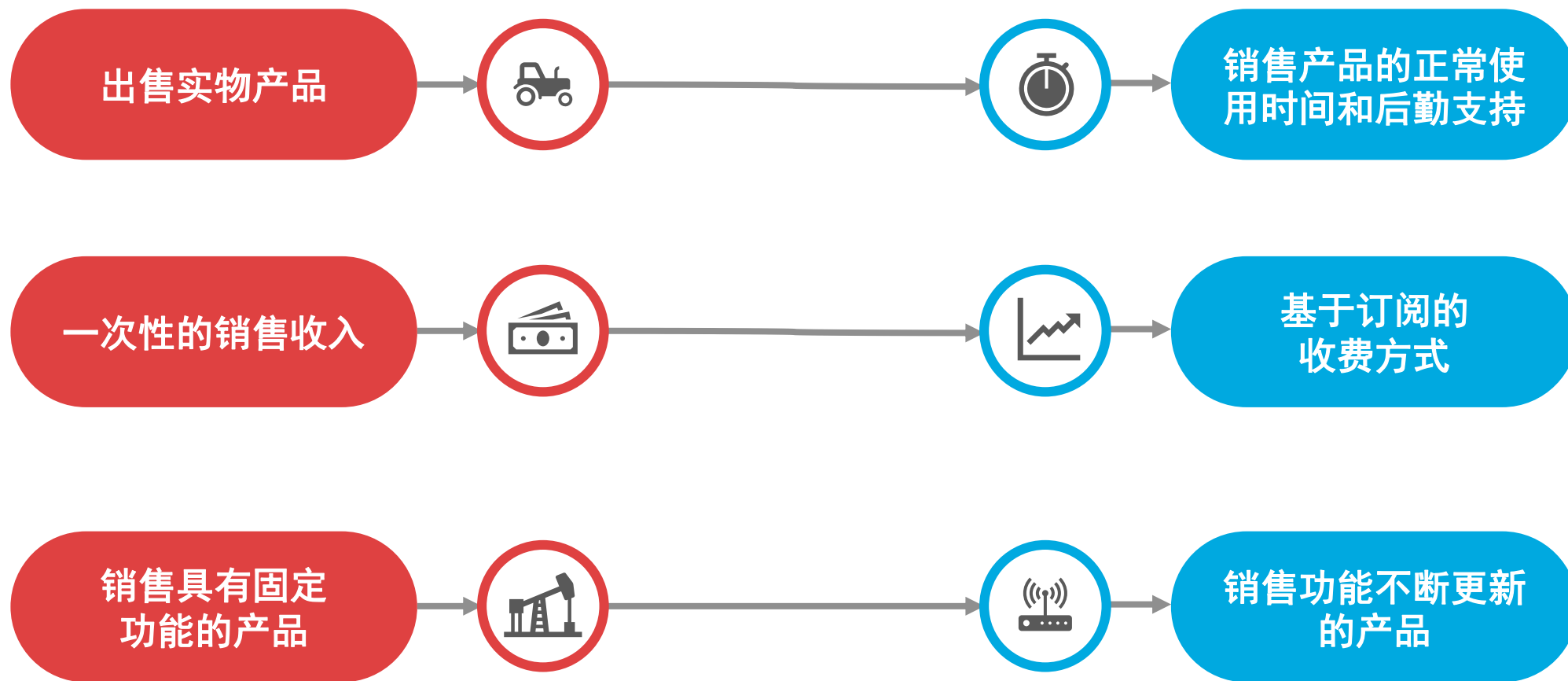


MATLAB EXPO 2021

DevOps case study at John Deere



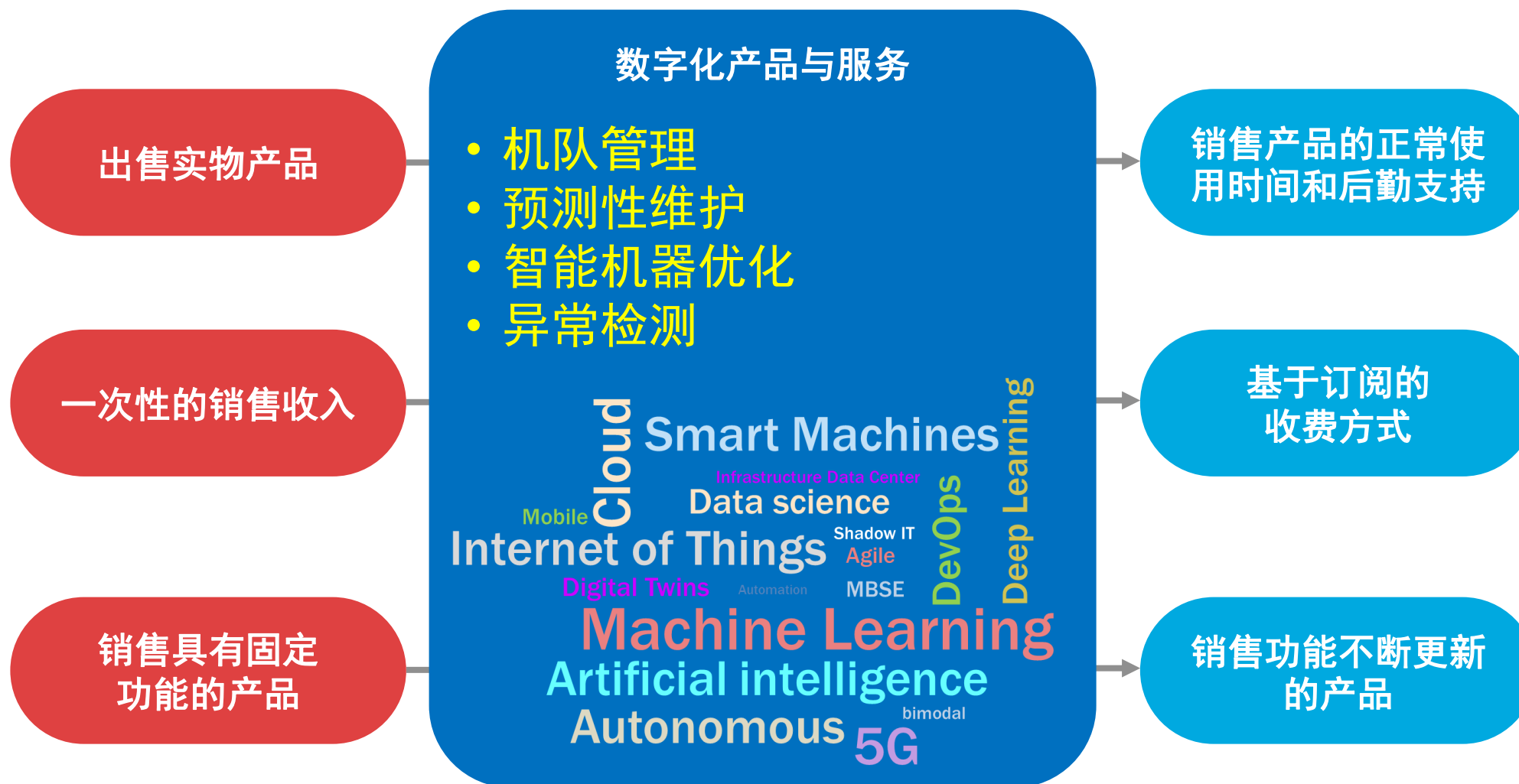
公司业务的数字化转型



公司业务的数字化转型



公司业务的数字化转型

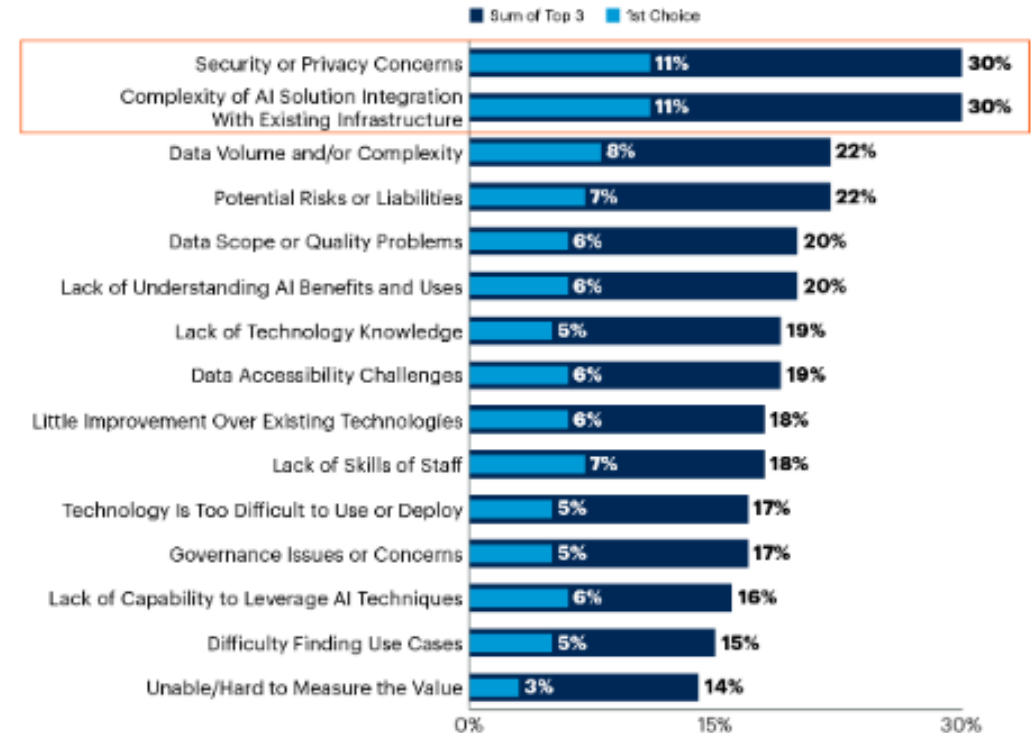


“Approximately half of all AI models never make it into production due to lack of ModelOps”

Gartner®

“由于缺少ModelOps，大约有一半的AI模型从未投入生产”

The Main Barriers to AI Implementation



n = 601 All Respondents, Excluding Not Sure
Q18. What are the top three barriers to the implementation of AI techniques within your organization?
Source: 2019 Gartner AI in Organizations Survey
725627_C

Gartner

DevOps

“一组结合了软件开发（Dev）
和IT运维（Ops）的实践和方法”

Model

“MATLAB算法，数学模型，机器学习，深度学习或Simulink模型”

DevOps

“一组结合了软件开发（Dev）和IT运维（Ops）的实践和方法”

Model + DevOps

“MATLAB算法, 数学模型, 机器学习, 深度学习或Simulink模型”

“一组结合了软件开发（Dev）和IT运维（Ops）的实践和方法”

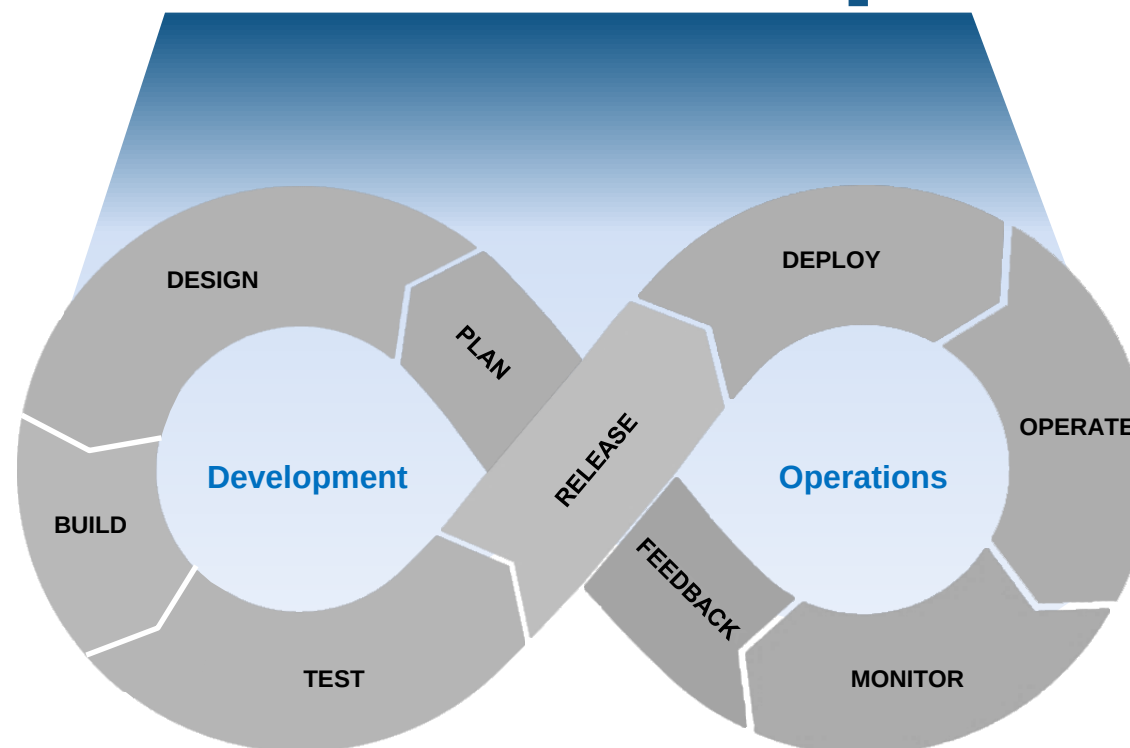


Model DevOps

“一组结合了模型开发和模型运维的最佳实践、工作流和工具”

应用DevOps流程并将其部署到生产环境中来实现模型的业务价值

Model DevOps



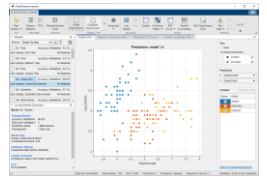
Model DevOps为数据驱动模型和物理模型都实现了敏捷开发

Model DevOps



Code-based:

- Optimization
- Financial



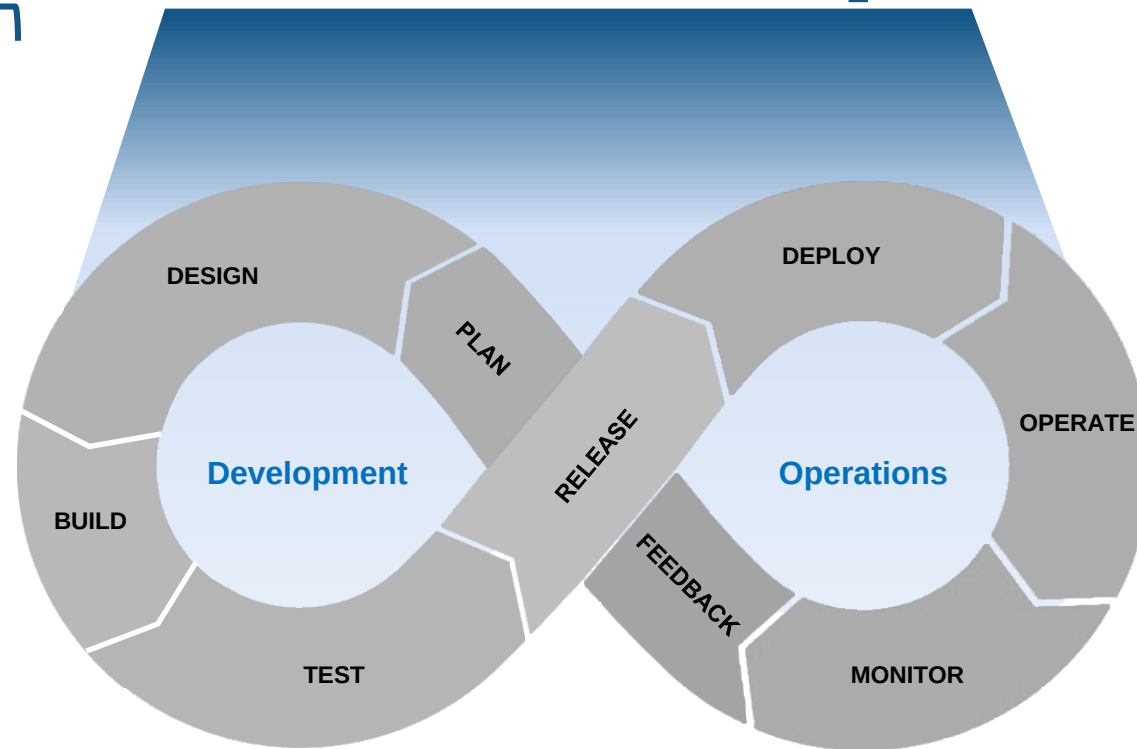
Data-driven:

- Machine Learning
- Deep Learning



Physics-based:

- Mechanical
- Electronic
- Hydraulic



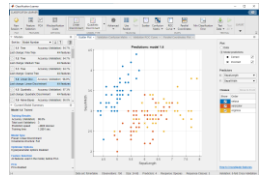
Model DevOps为数据驱动模型和物理模型都实现了敏捷开发

Model DevOps



Code-based:

- Optimization
- Financial



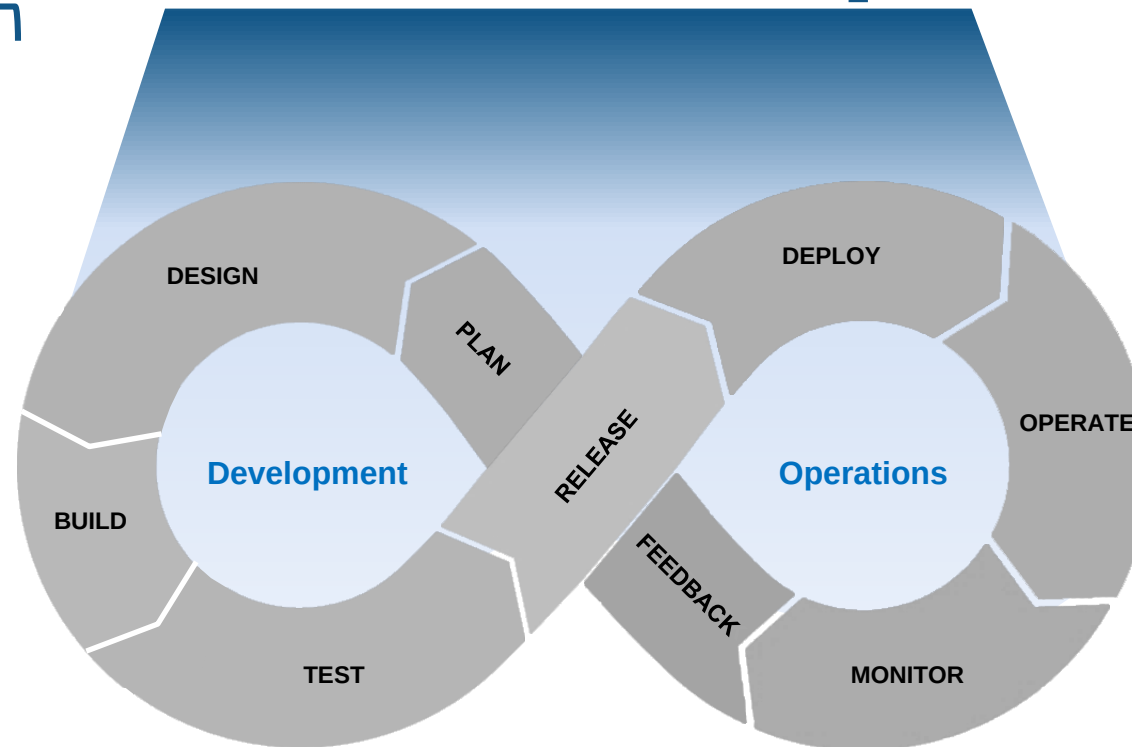
Data-driven:

- Machine Learning
- Deep Learning



Physics-based:

- Mechanical
- Electronic
- Hydraulic



- Docker containers
- Software component



- Edge systems
- Embedded devices

在DevOps中使用模型存在的挑战



将模型集成到您现有的设计、编译、测试和开发工具链中；

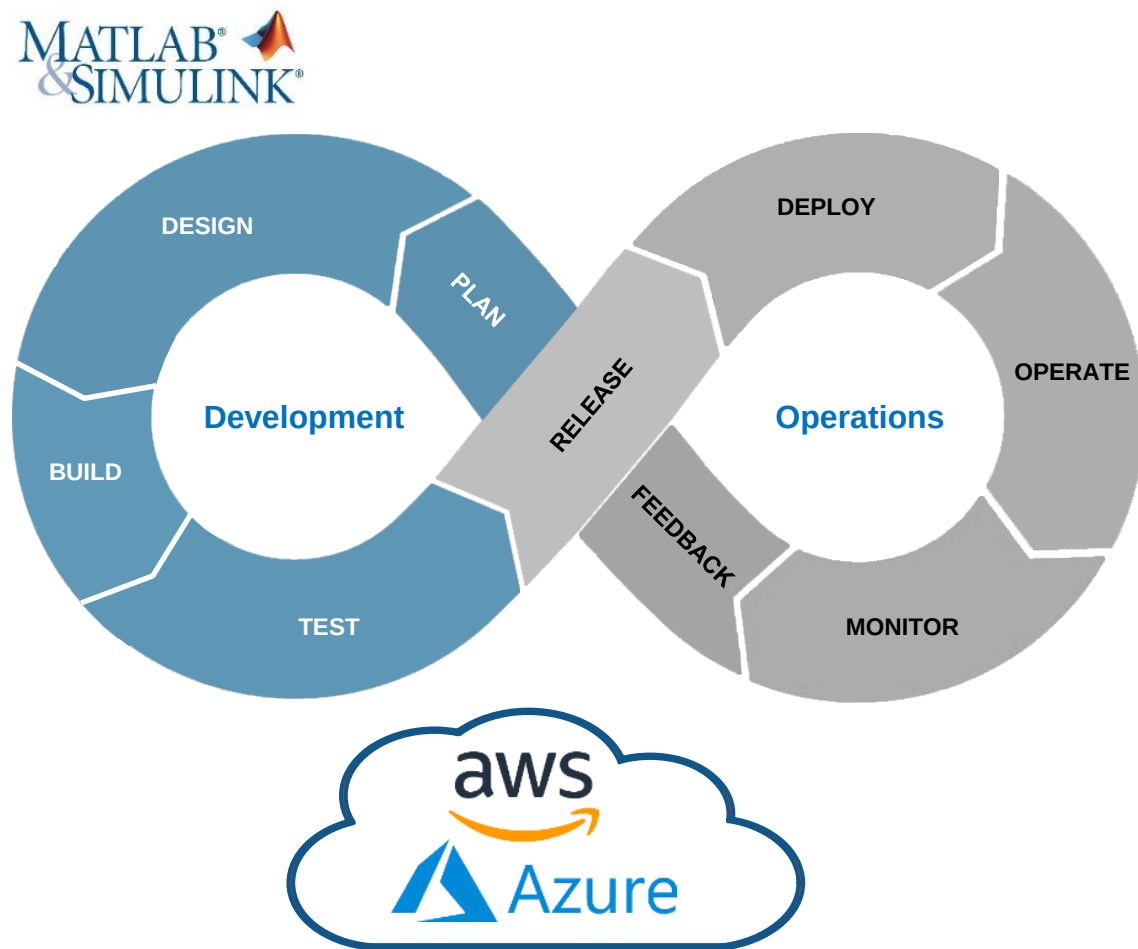


访问本地或云端的数据；

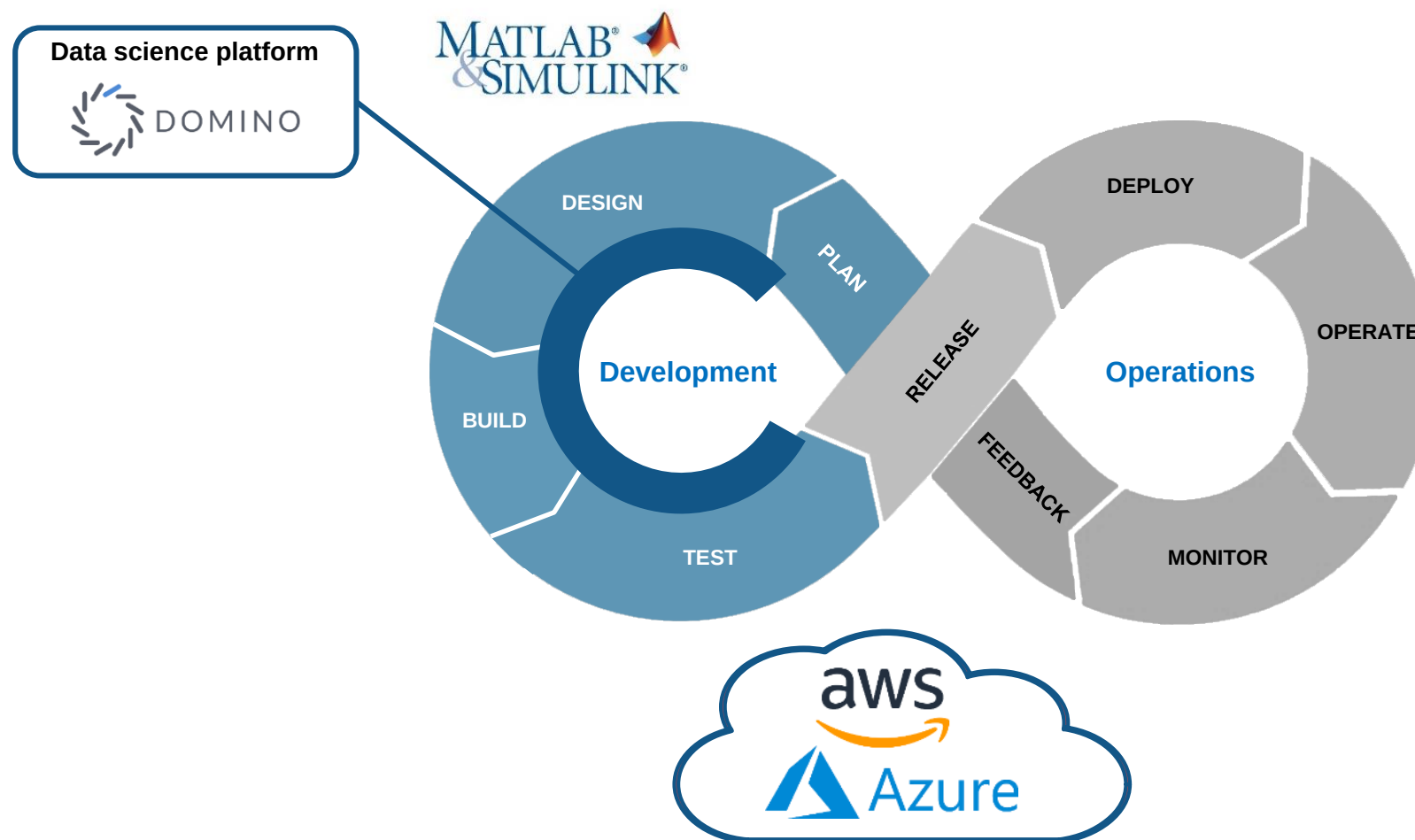


与其他部门协作，比如IT、数据科学家、产品运营团队；

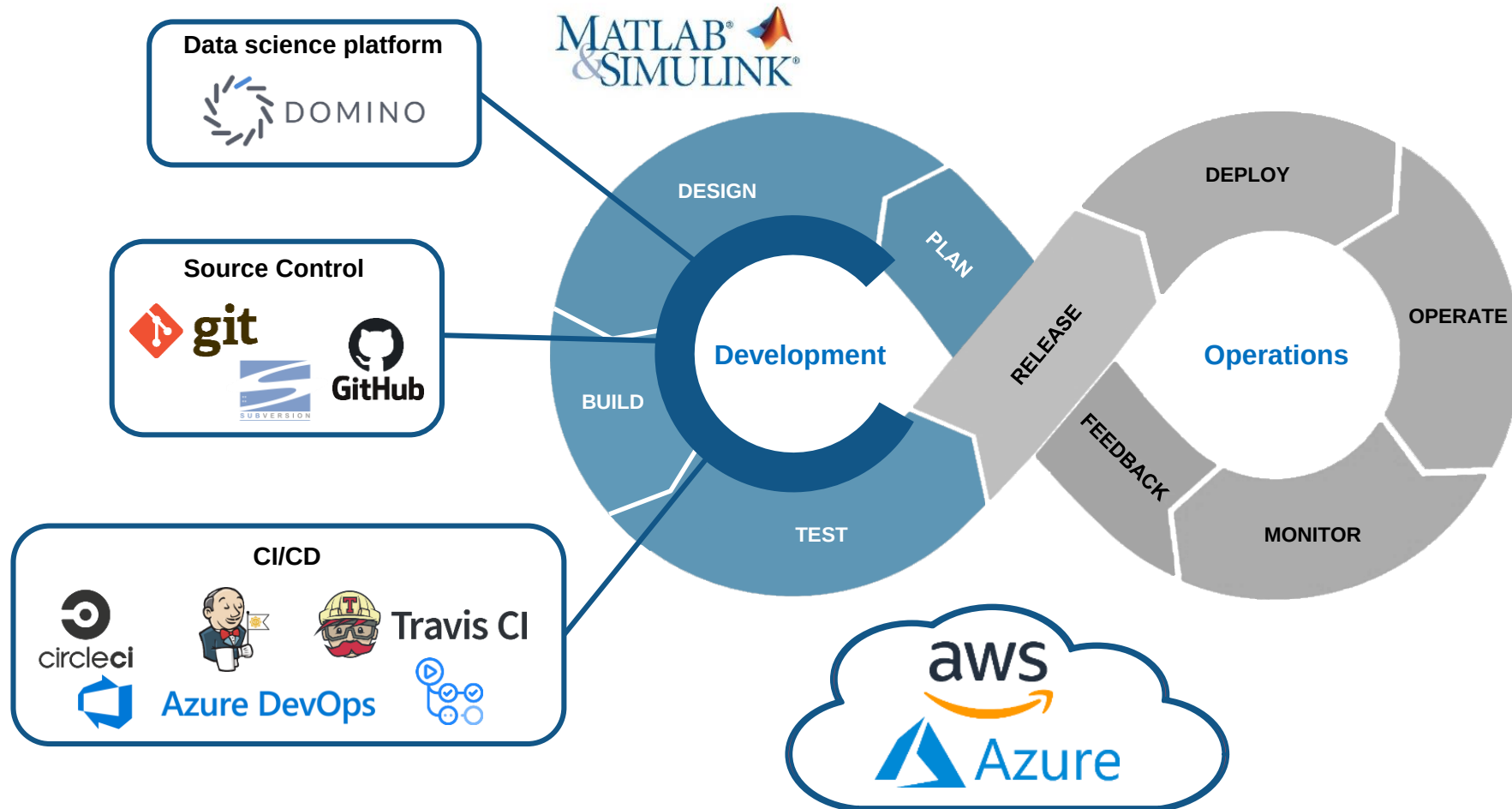
MATLAB和Simulink与团队开发平台和工具链集成



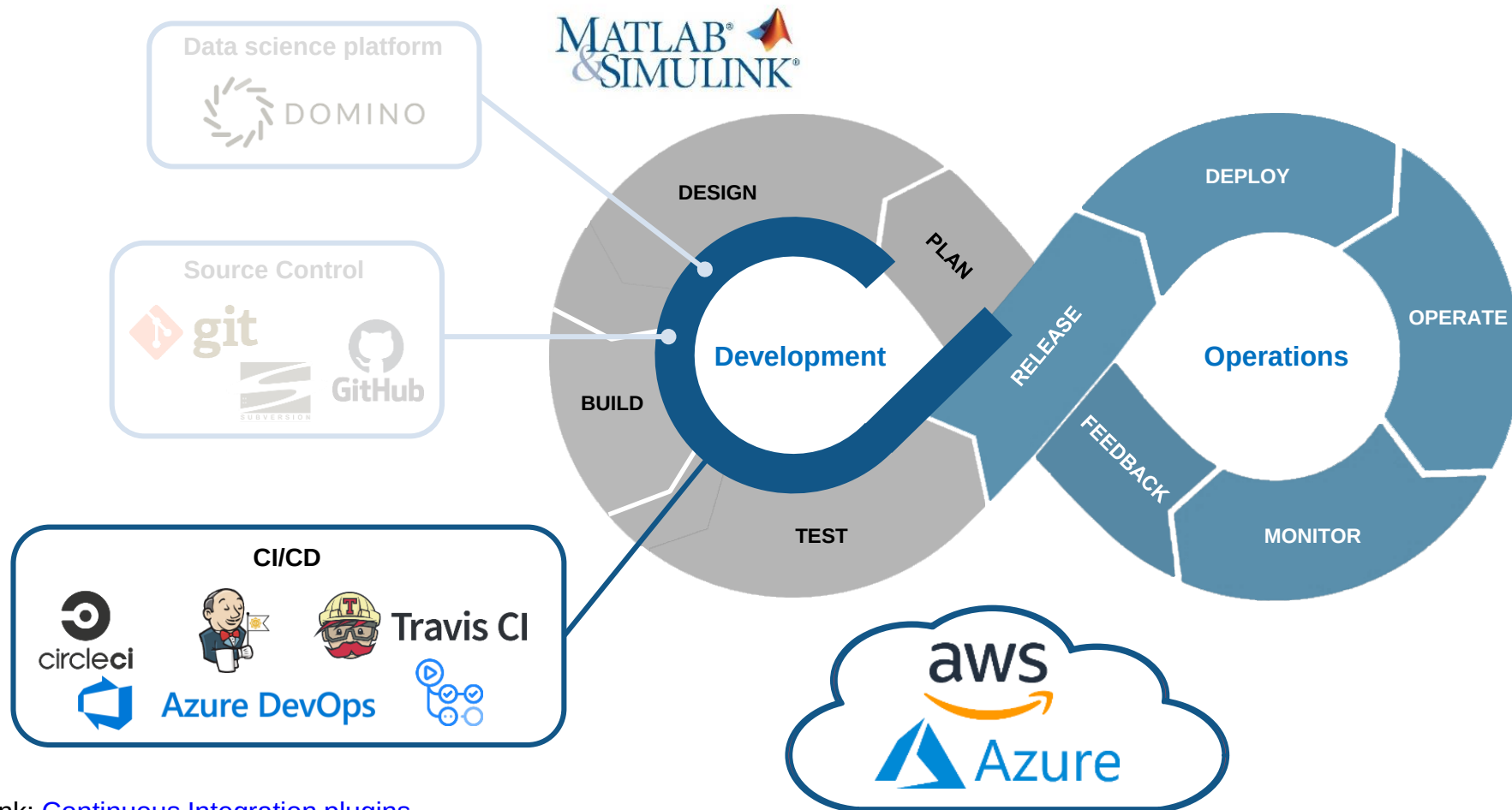
MATLAB和Simulink与团队开发平台和工具链集成



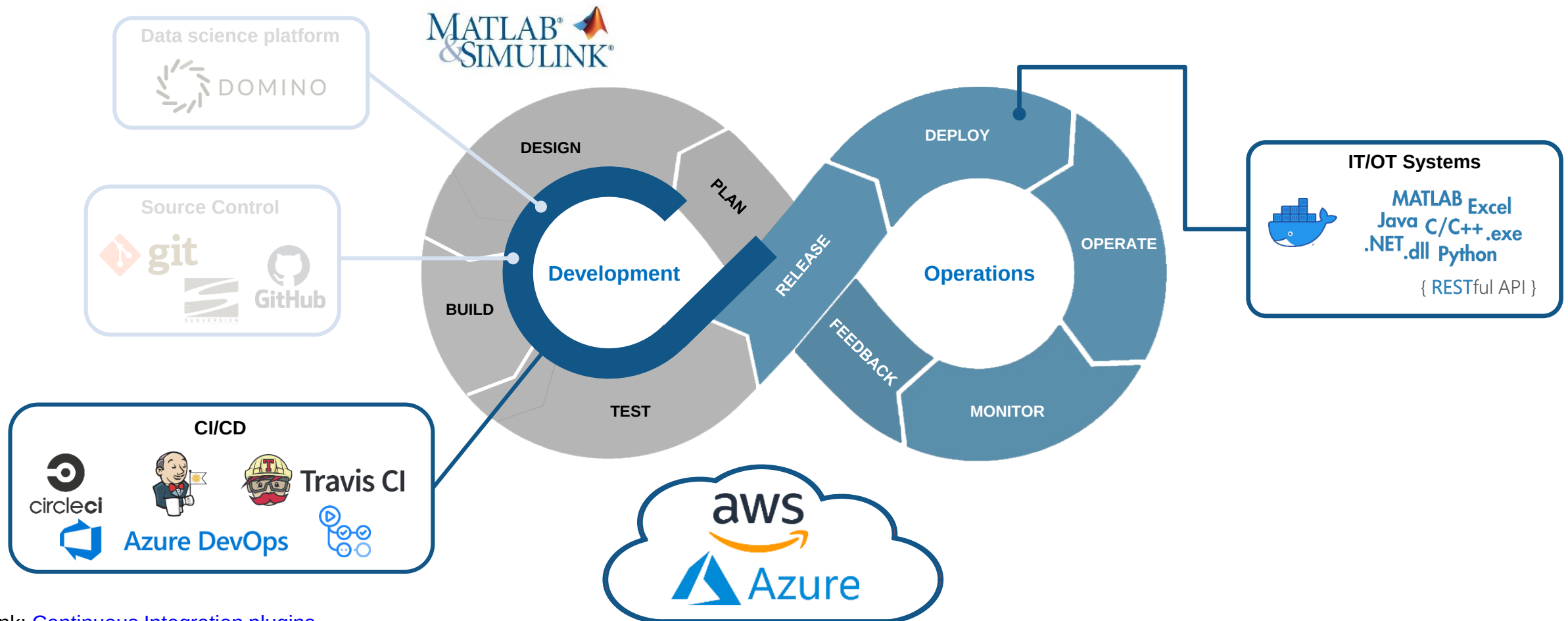
MATLAB和Simulink与您团队开发平台和工具链集成



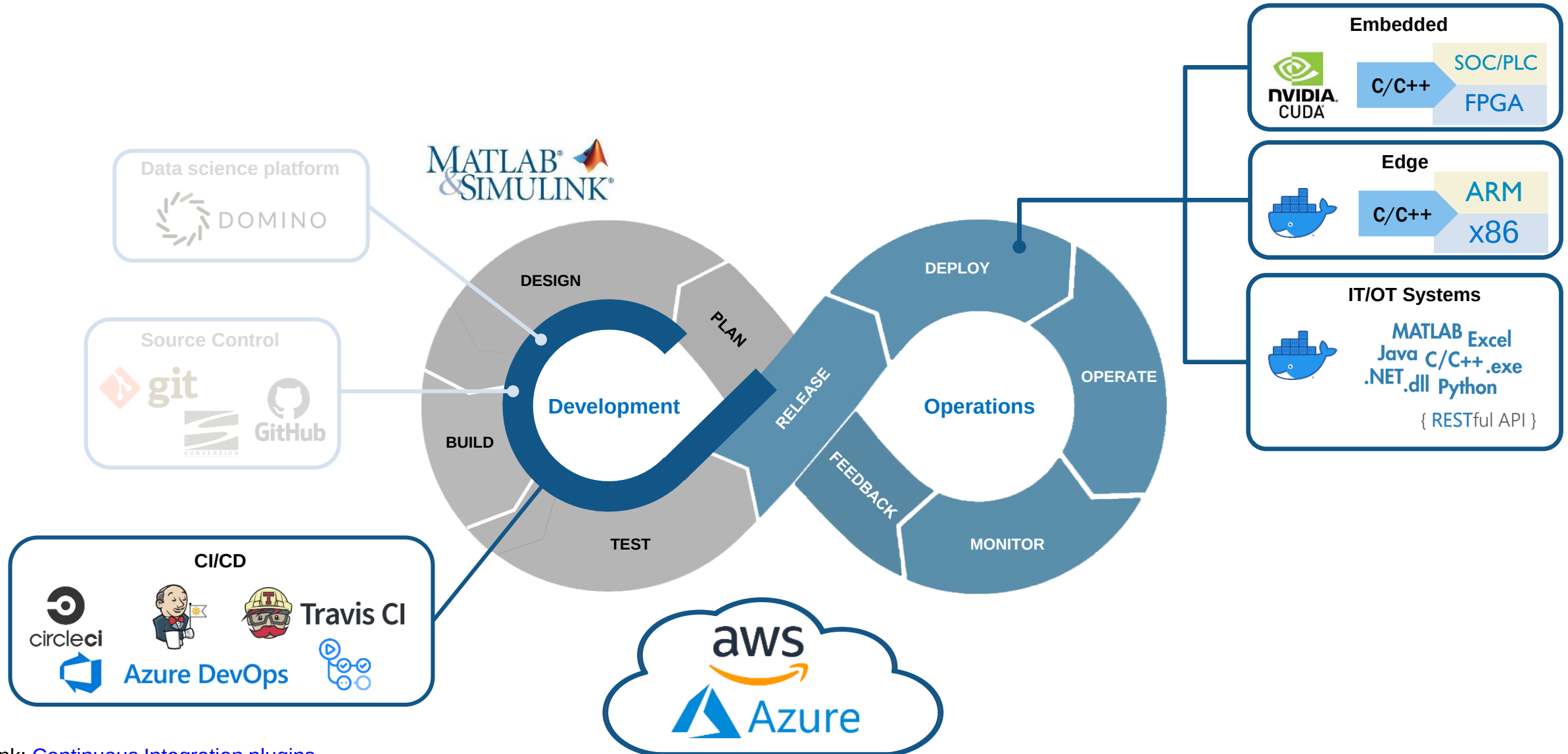
在嵌入式系统、边缘设备或IT系统上运营模型，而不需要重新编码



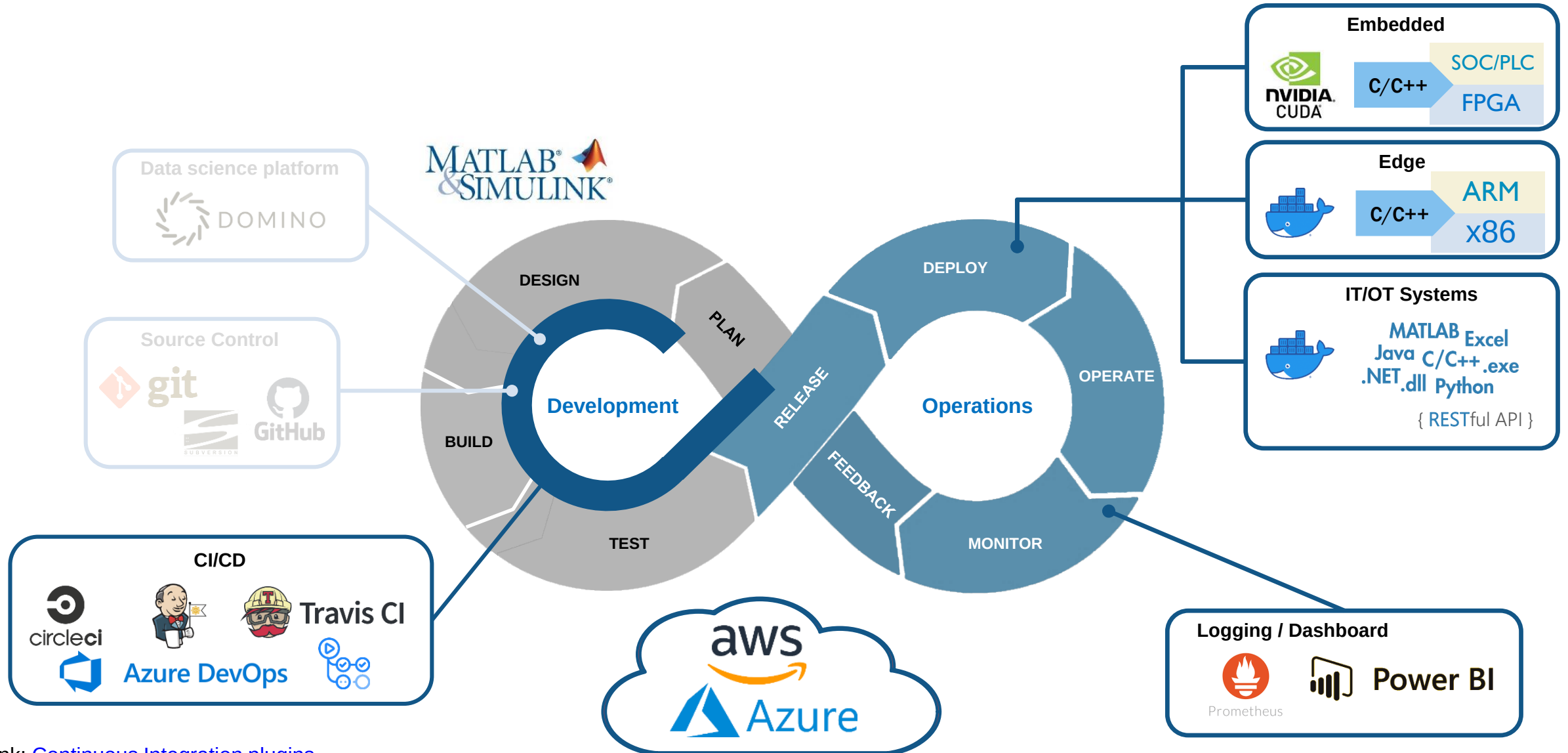
在嵌入式系统、边缘设备或IT系统上运营模型，而不需要重新编码



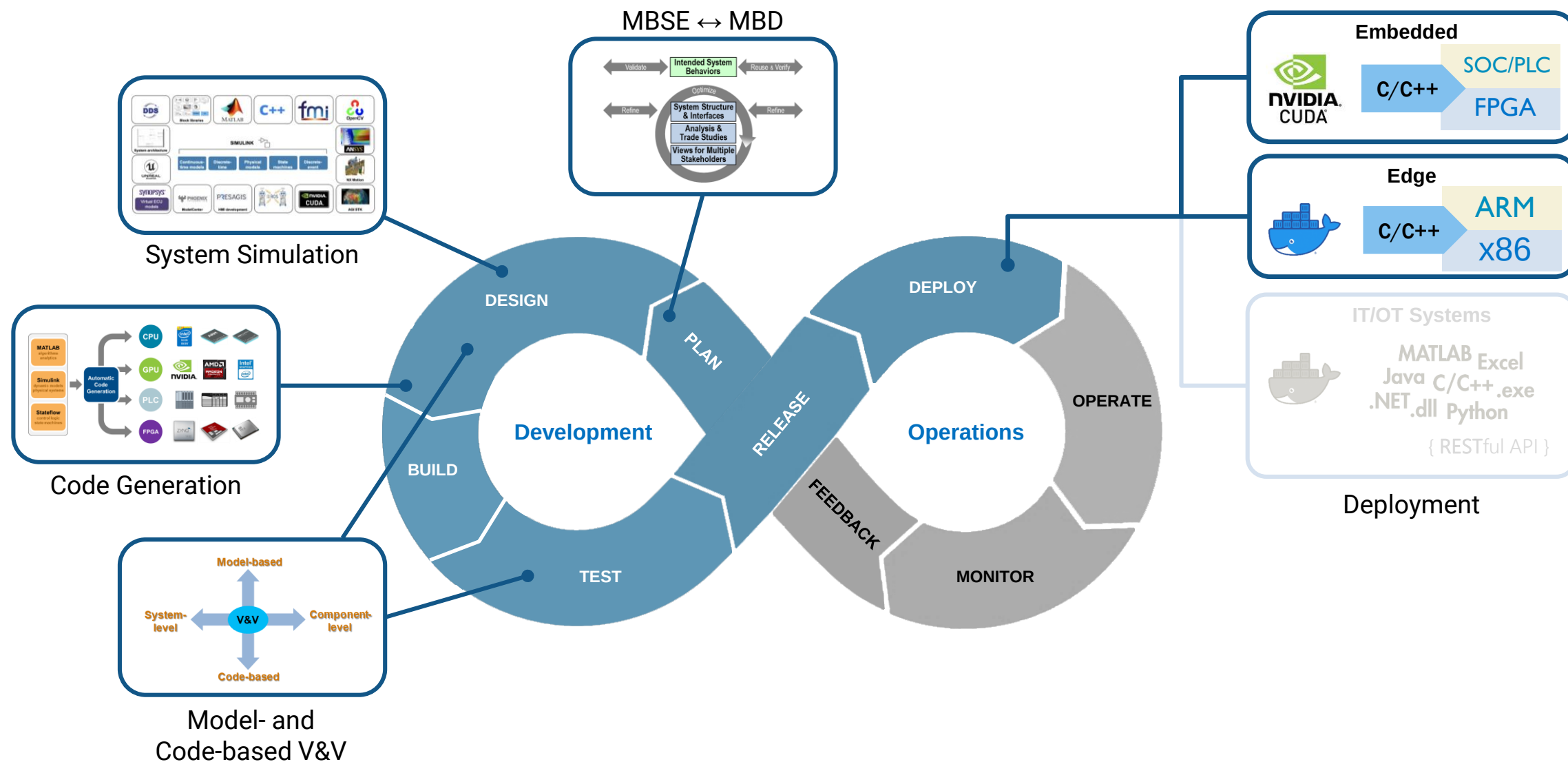
在嵌入式系统、边缘设备或IT系统上运营模型，而不需要重新编码



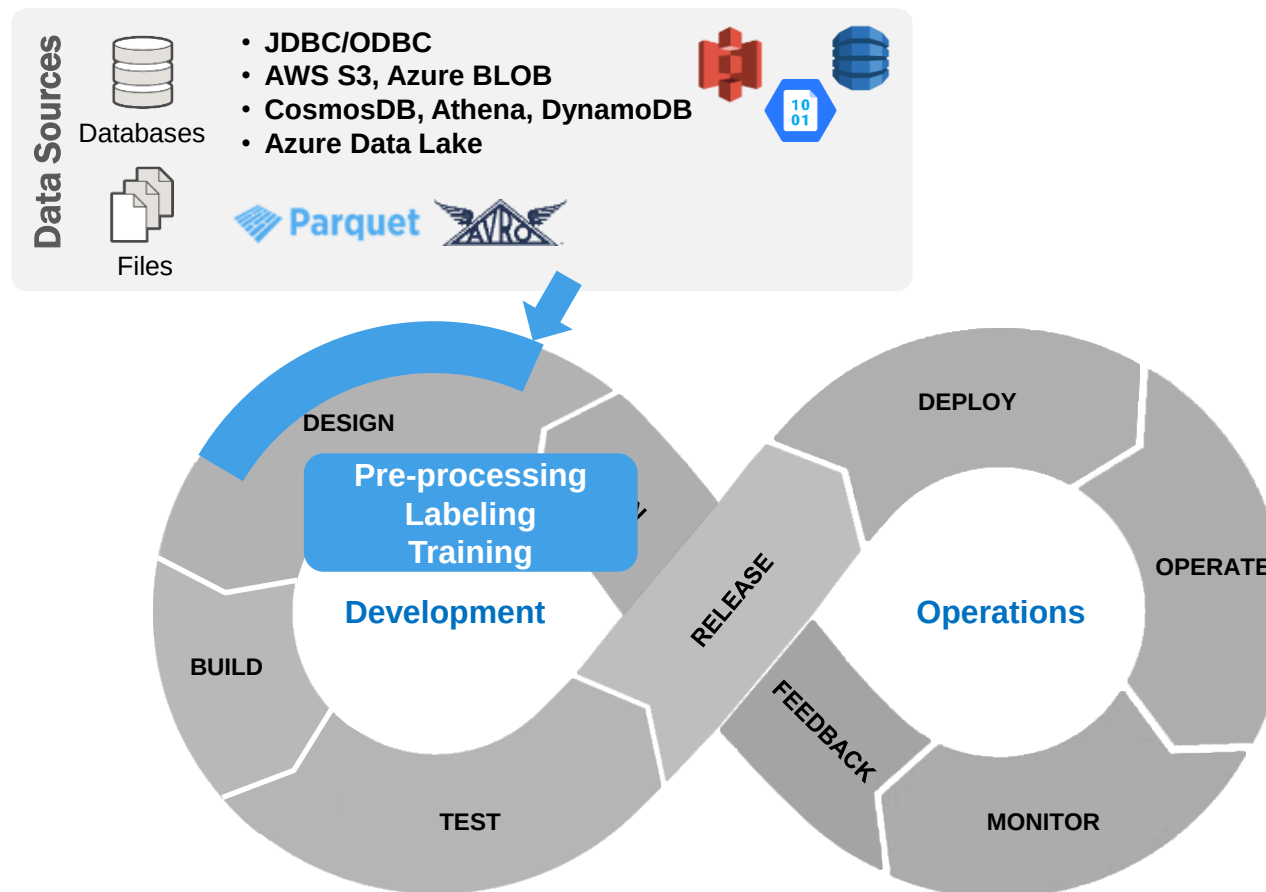
在嵌入式系统、边缘设备或IT系统上运营模型，而不需要重新编码



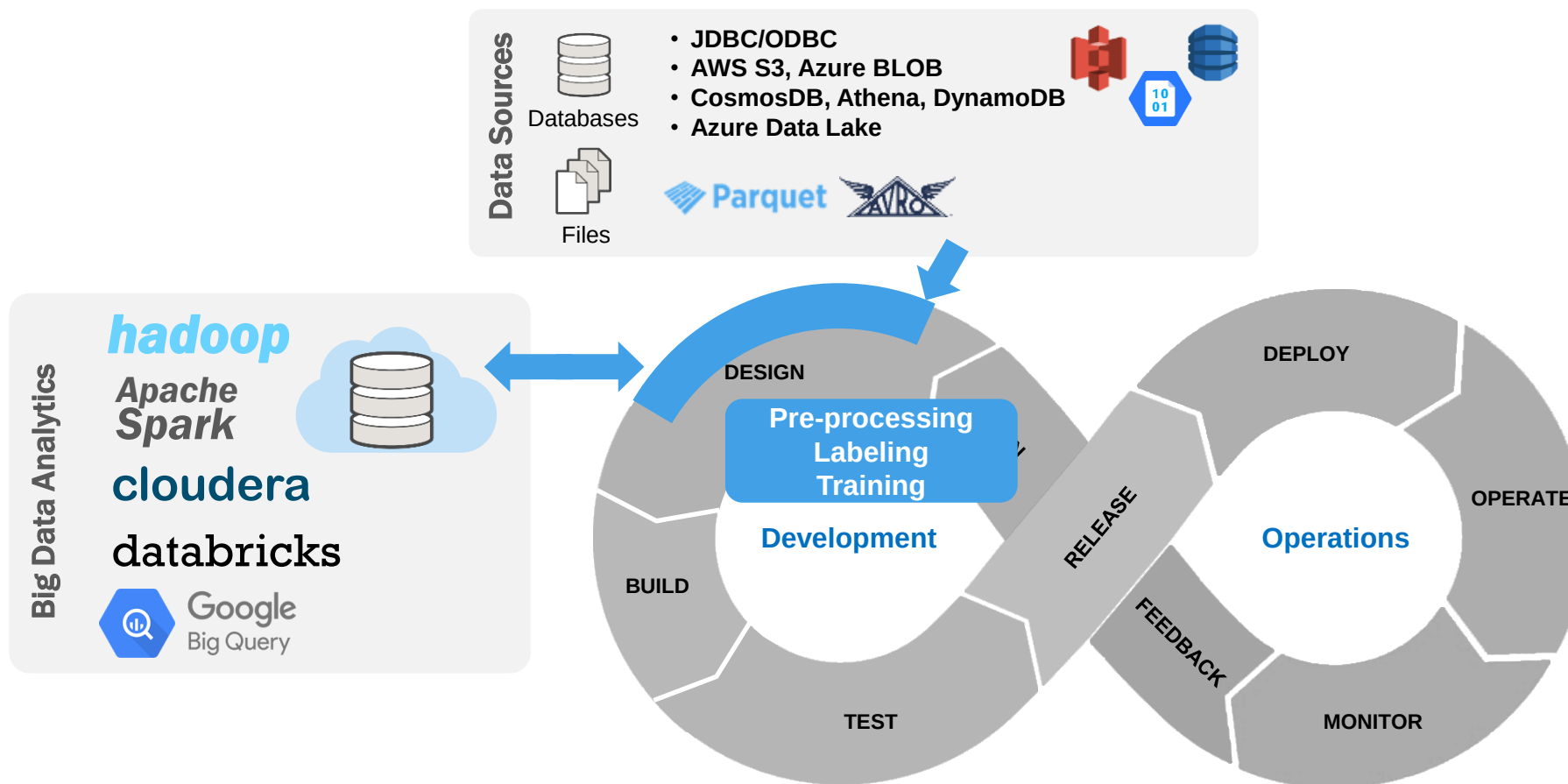
基于模型的设计很好地映射到Model DevOps workflow



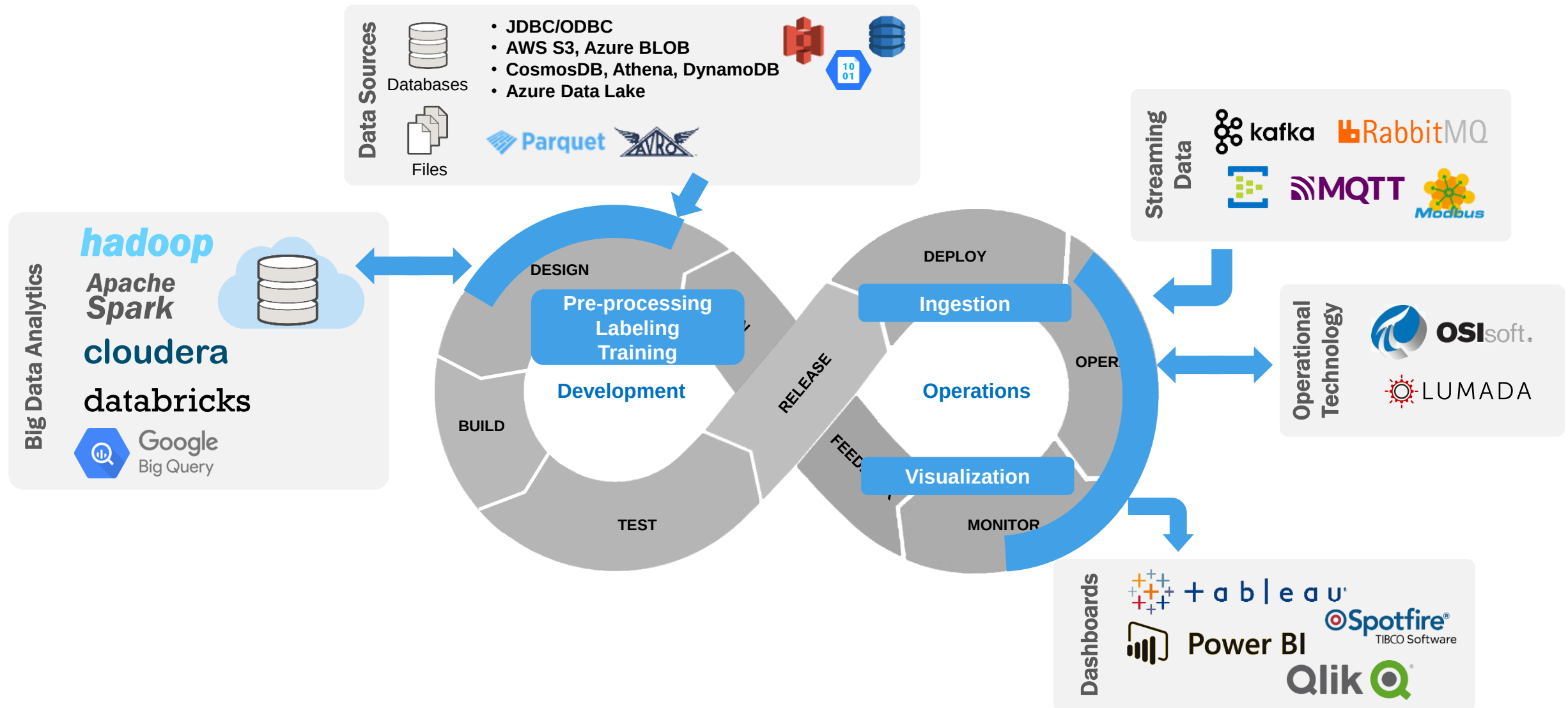
数据对于开发和运营的重要性



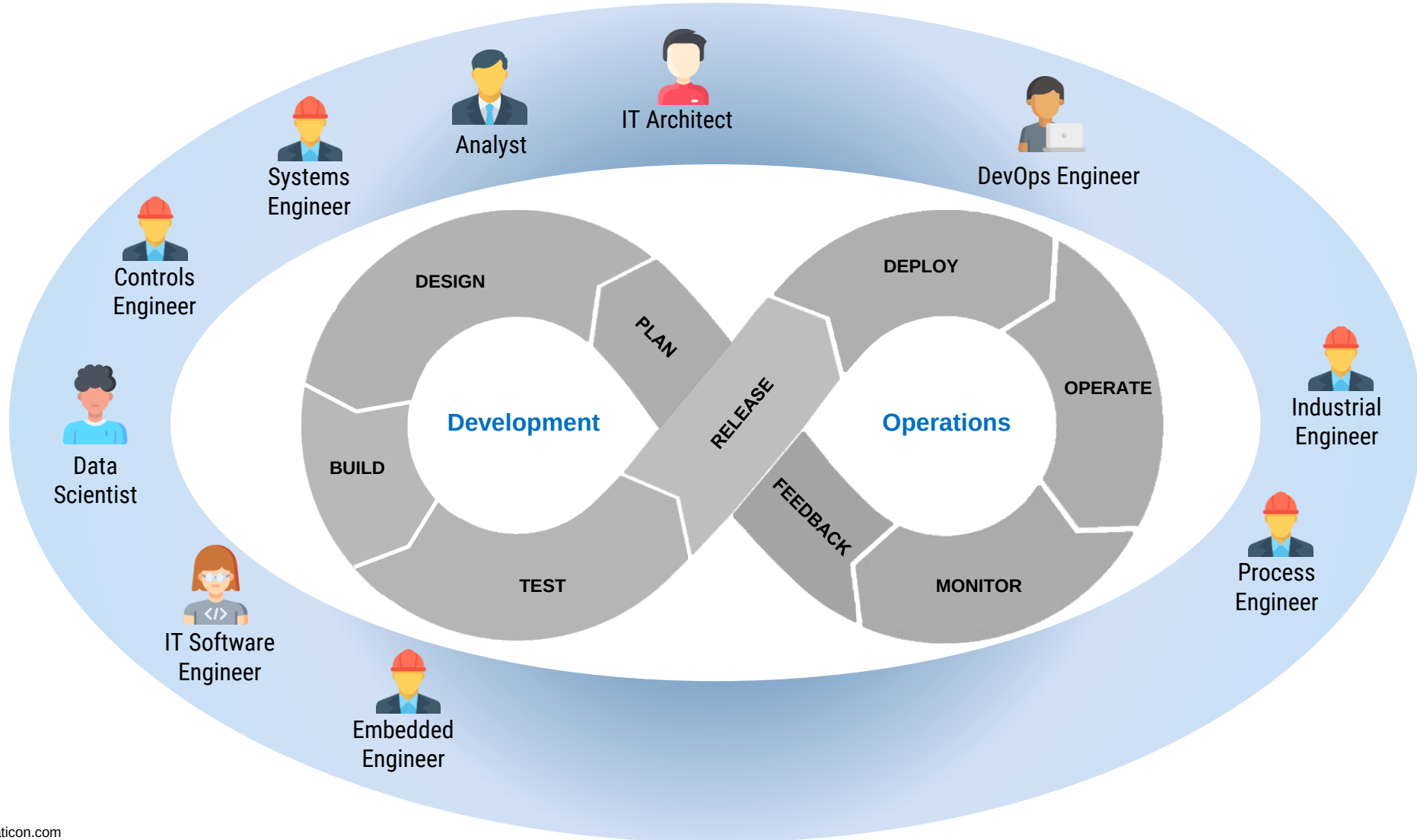
数据对于开发和运营的重要性



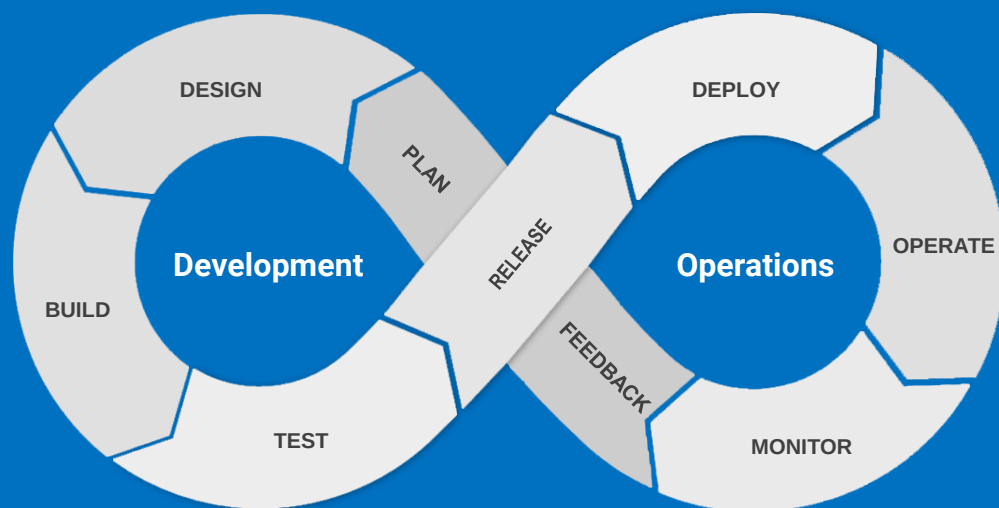
数据对于开发和运营的重要性



工程、IT、业务线和运营团队在Model DevOps协作



总结



Model DevOps



工程师, 数据科学家, IT, 和运维团队必须协同工作, 确保成功;



将MATLAB & Simulink集成到您的开发环境中, 并有效的利用来自不同数据源的数据;



MATLAB & Simulink模型可以部署到各种平台: 嵌入式系统、边缘系统、IT/OT或云端。



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.

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from MathWorks.

Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner research organization and should not be construed as statements of fact. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.



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



MATLAB EXPO 2021

Thank you



© 2021 The MathWorks, Inc. MATLAB and Simulink are registered trademarks of The MathWorks, Inc. See mathworks.com/trademarks for a list of additional trademarks. Other product or brand names may be trademarks or registered trademarks of their respective holders.