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# The Art of Knowing How to Leverage Decision Intelligence



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**Roy Schulte**

Distinguished VP Analyst



# The Art of Knowing How to Leverage Decision Intelligence...

- Trends in decision intelligence and why it is growing
- Why you should or should not automate a decision
- Two practices that improve the quality of decision intelligence solutions
- When to use machine learning, optimization or business rule engines

# Trends in decision intelligence

# What is Decision Intelligence?

Decision intelligence (DI) is a practical discipline used to improve decision making by explicitly understanding and engineering how decisions are made and outcomes evaluated, managed and improved by feedback.

# Decision Thinking

- Understand the business problem
- Identify the objectives, processes and decisions to be made
- Decision engineering:
- Model decisions and their subdecisions
  - Determine the input data, decision algorithm and potential outputs
  - Decision algorithm guides the choice of technique(s) (rules, ML, optimization...)
  - Who or what makes each subdecision?
- Implementation, deployment
- Logging, monitoring auditing
- Continuous decision improvement

# Trends

1. Increasing use of decision intelligence
  - Lower cost of data, communications and processing
  - More laws and regulations
  - Spread of machine learning (ML and AI)
  - Faster pace of change in business
2. Gradual migration to the cloud until equilibrium is achieved
3. More use of optimization techniques (operations research/management science)

# Why you should or should not automate a decision

# Most Business Decisions are Already Automated...

- ✓ Banking: Approve credit card transaction, mortgage, personal loan
- ✓ Government: Evaluate welfare eligibility
- ✓ Insurance: Underwrite insurance policy, pay claim
- ✓ Contact center: Select next best offer for this customer
- ✓ E-Commerce: Generate next best content for web site UI
- ✓ Equipment: Configure complicated product
- ✓ Customer engagement: Specify response to service problem
- ✓ Healthcare provider: Calculate medical bill
- ✓ Vehicle manufacturer: Determine warrantee payoff

# Most Business Decisions are Already Automated... But Most Important Decisions are Not

- ☐ Acquire that company?
- ☐ Hire this person?
- ☐ Expand into that country?
- ☐ How to reorganize our departments?
- ☐ What should be pricing policies?
- ☐ Features to include in a product?
- ☐ Outsource or insource that function?

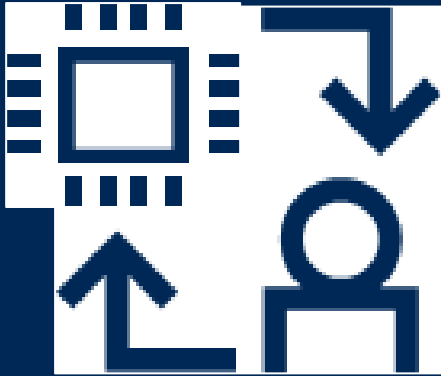
# Well Understood, Repeatable Decisions With Manageable Risk Should Be Automated



## Decision automation benefits:

- Faster, cheaper than human decisions
- Frees staff for more-complex tasks
- More consistent
- Better policy compliance
- More explainable

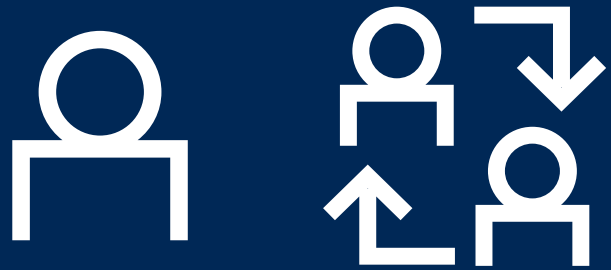
# Most Important Decisions Combine Human Judgment With Rules or Analytics



## Use decision support when:

- Data and analytics provide supporting facts or recommendations
- People provide value judgment, sanity checks, ethics, risk analysis

# Some Decisions Will Always Be Made Entirely by People



**Humans decide without analytics when choice is:**

- Simple, obvious or
- Complicated, too many unknowns to be able to engineer a solution, or
- Based on value judgment at decision time

## **Key Issue Take-Away:**

**Automate repeatable decisions but keep people involved in issues that need decision-time value judgment or are complicated or risky.**

# Two practices that improve the quality of decision intelligence solutions

# Two Practices That Improve Decision-making



More-direct involvement of businesspeople in developing and modifying decision intelligence solutions.

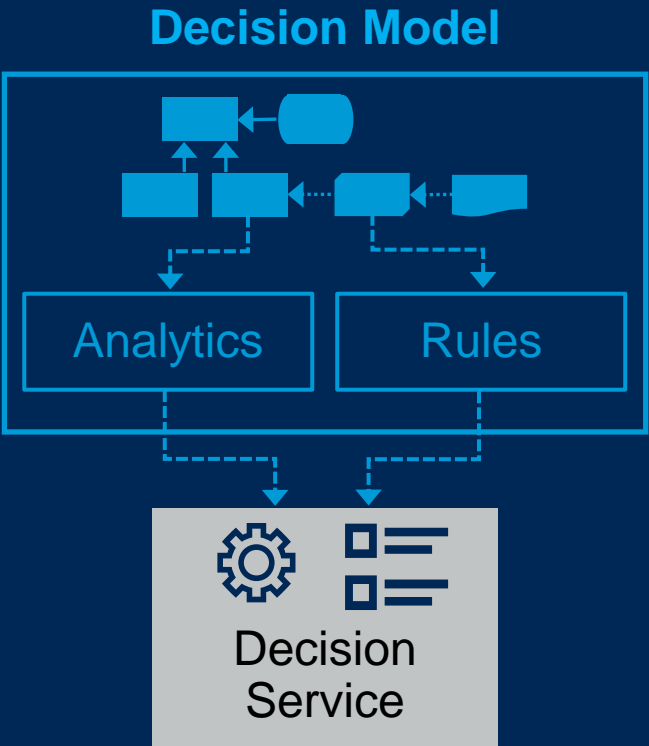


Continuous logging, monitoring and modifying decision intelligence solutions.

# Best Practice: Decision Quality Starts With a Business-Driven Decision Model

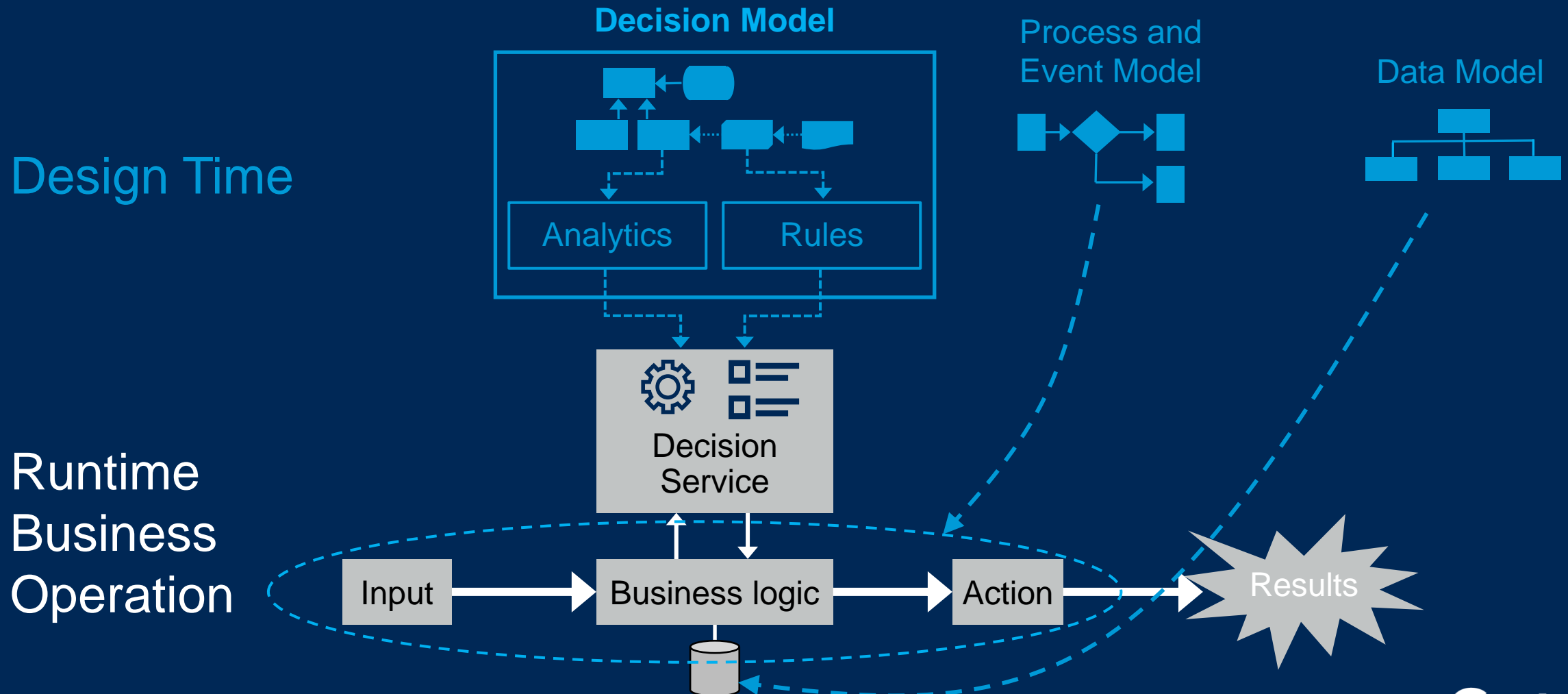
Design Time

Runtime  
Decision



- Decision Model May Specify
- Input data
  - Algorithm
  - Result judgment or action
  - Objectives
  - Constraints

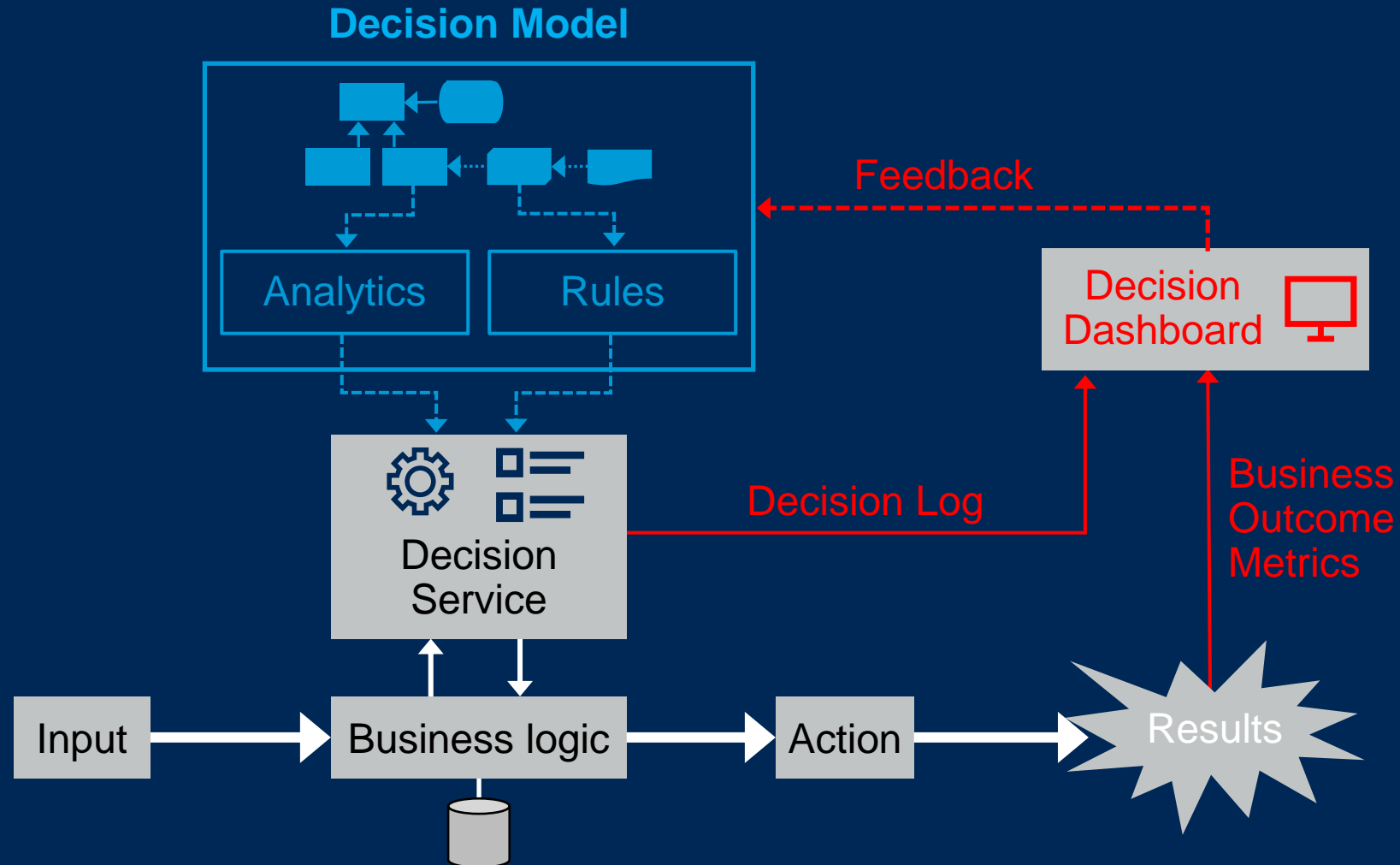
# Best Practice: Develop Decision Models at Design Time as a Peer With Process and Data Models



# Best Practice: Log the Input, Decisions and Results to Enable Continuous Decision Improvement

Design Time  
is Ongoing

Runtime  
Business  
Operation

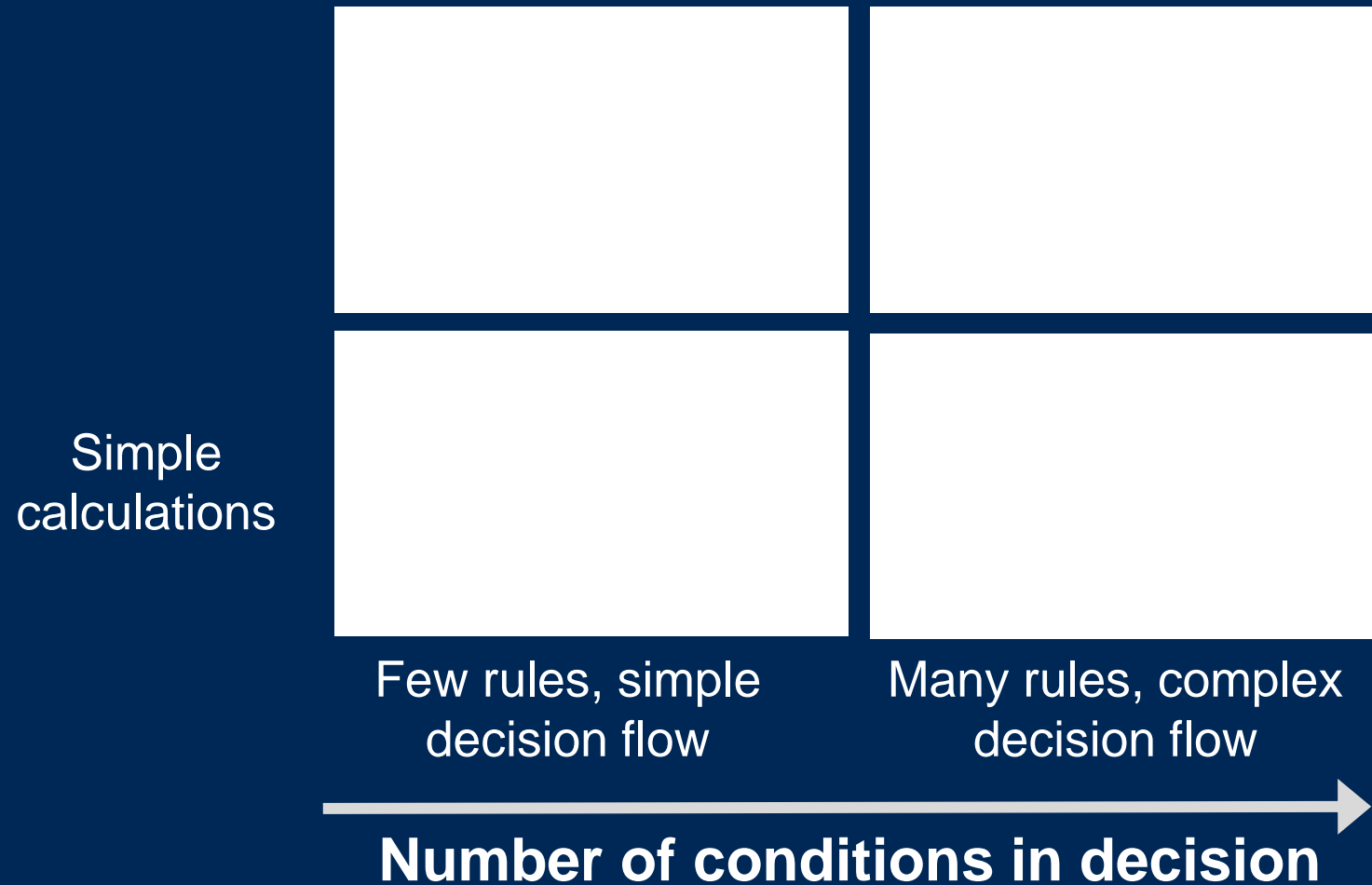


## **Key Issue Take-Away:**

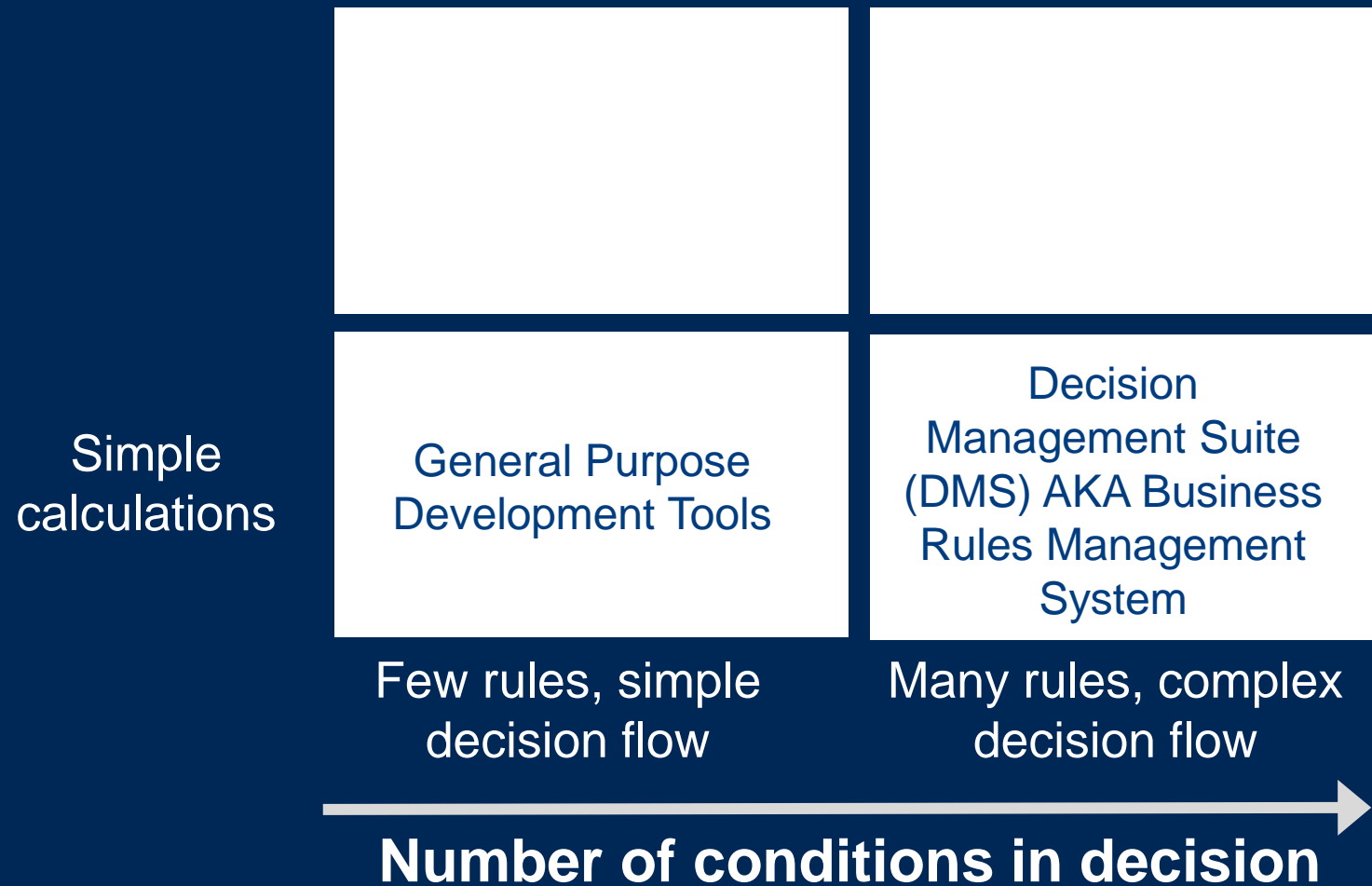
**Decision quality depends on early and ongoing involvement of businesspeople and continuous logging, monitoring and improvement of decision performance.**

When to use  
machine learning,  
optimization or  
business rule  
engines

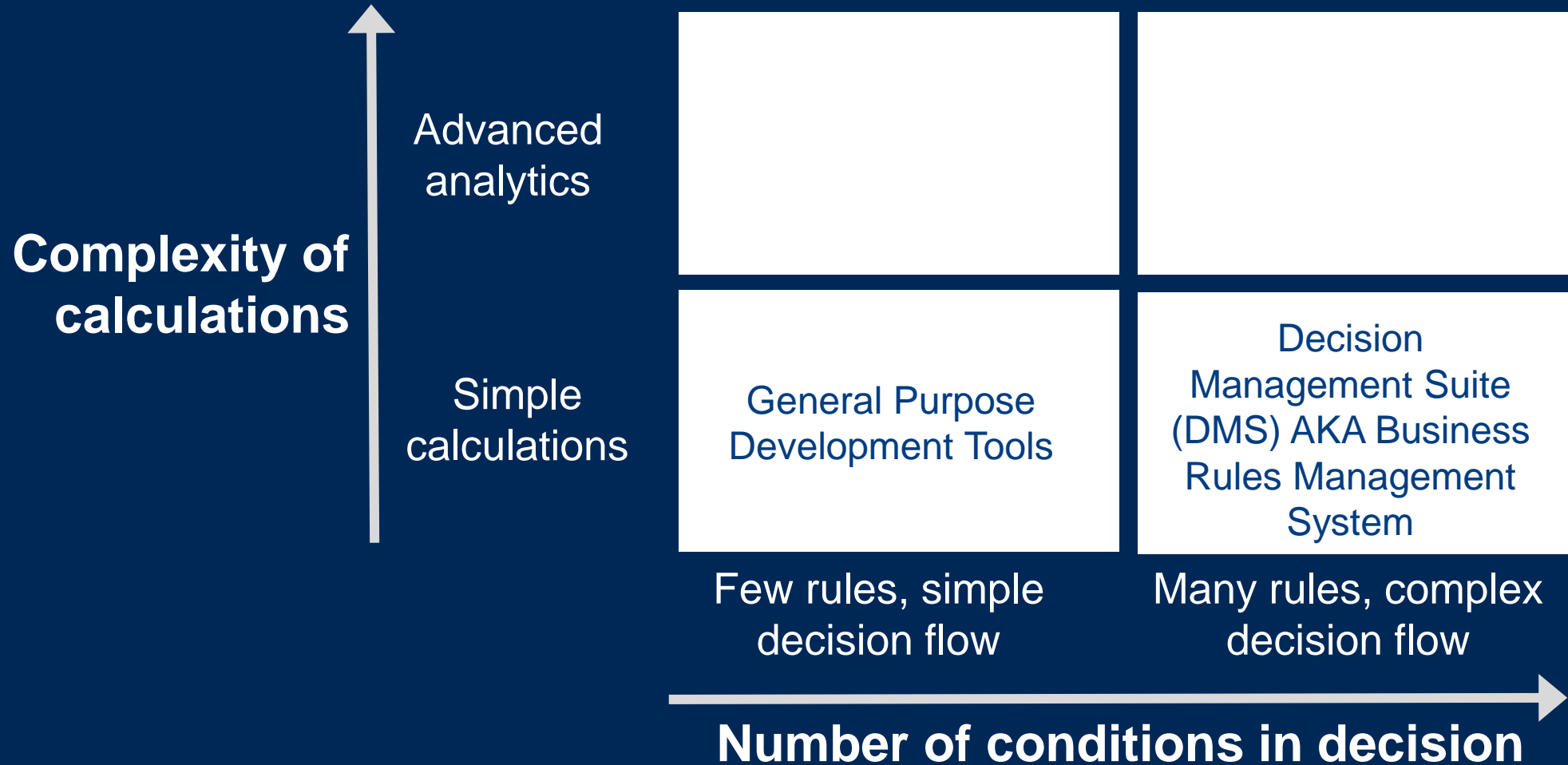
# Two Dimensions of Decision Complexity Affect Technology Selection



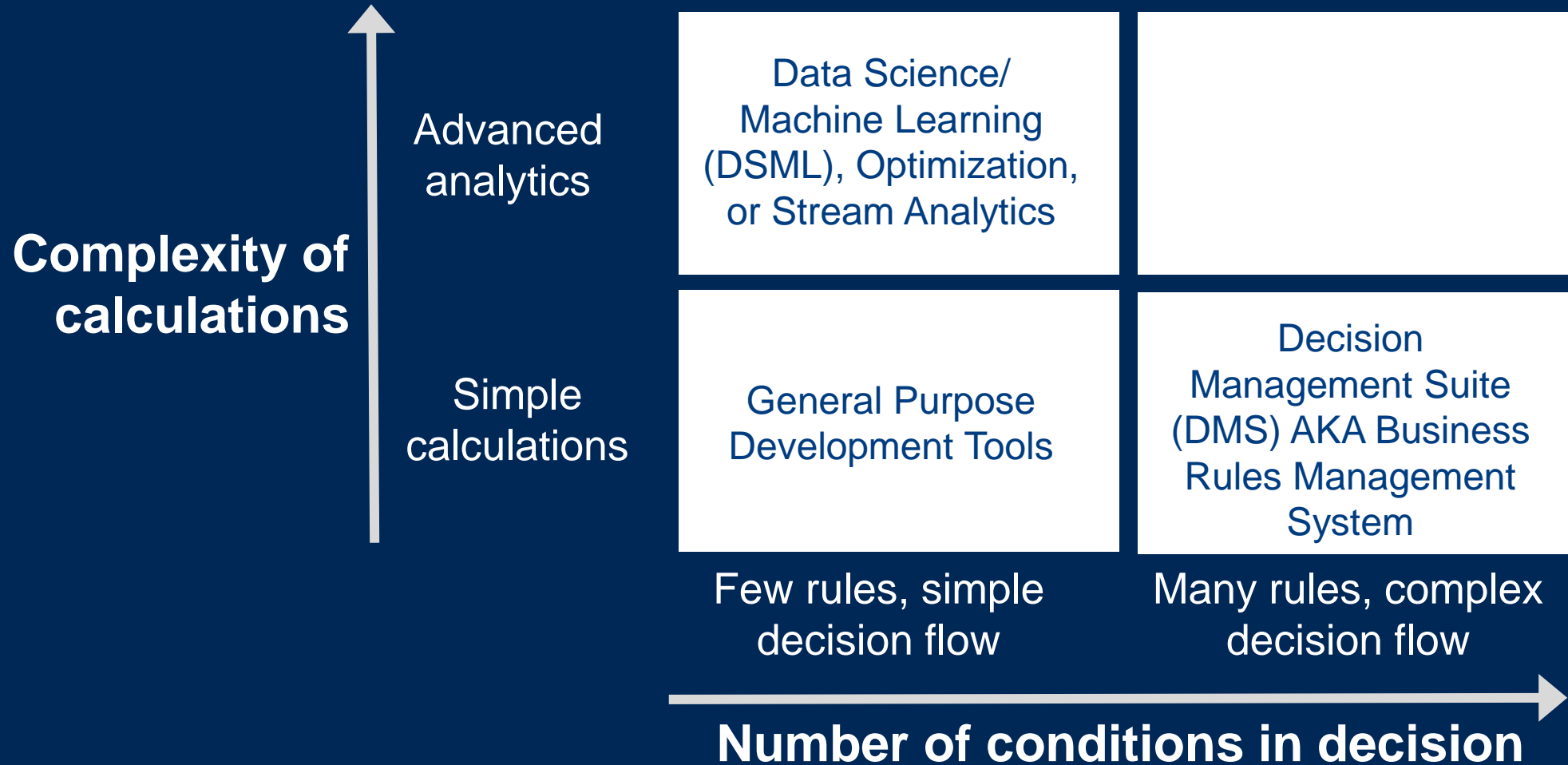
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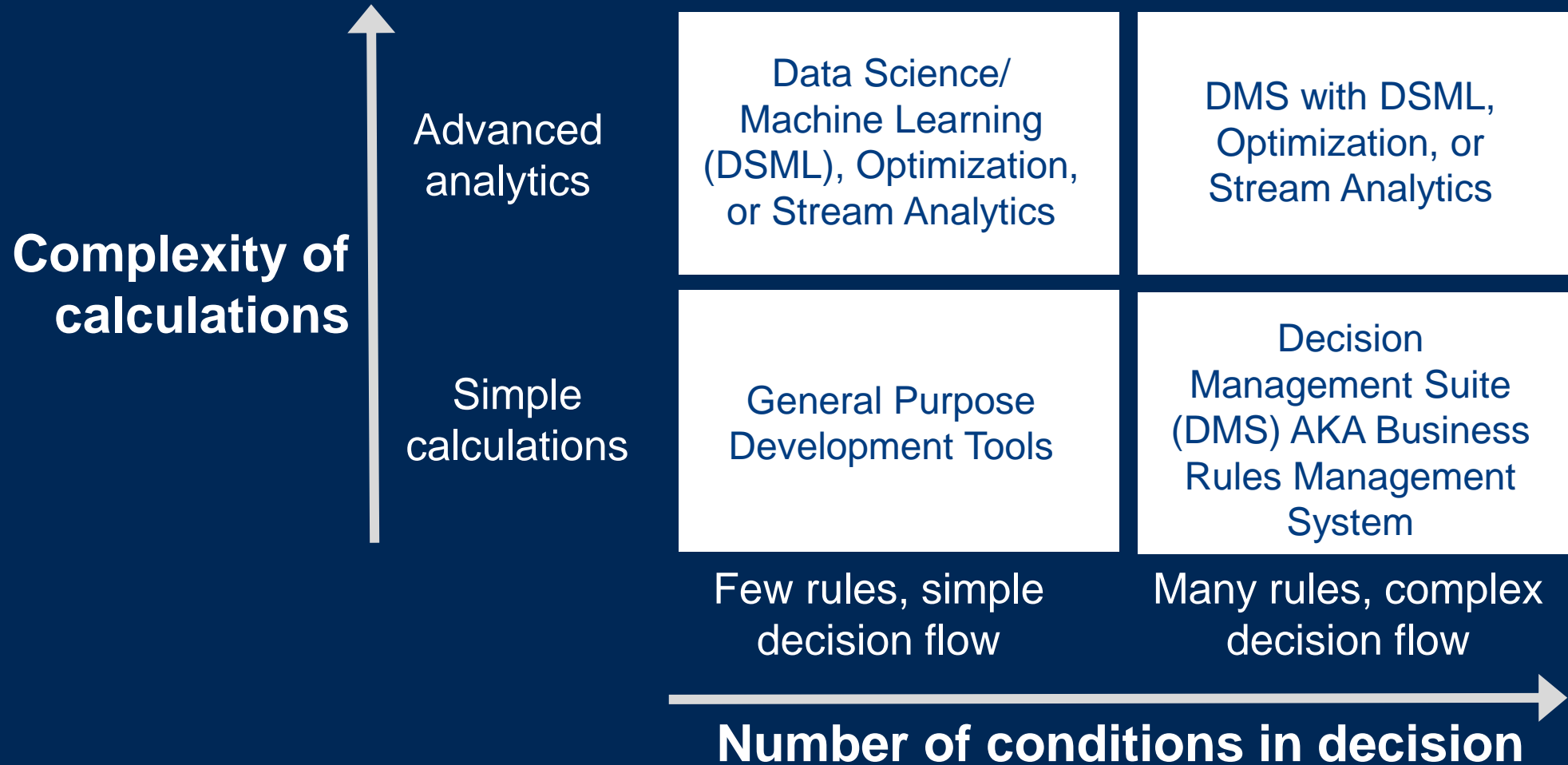
# Two Dimensions of Decision Complexity Affect Technology Selection



# Two Dimensions of Decision Complexity Affect Technology Selection



# Two Dimensions of Decision Complexity Affect Technology Selection



# Analytics and Rules Are Complementary

Where do rules  
come from?

Development time

Runtime

1. Laws, regulations,  
corporate policies



2. Subject matter  
expert judgment



3. Rules derived  
from analytics



4. Rules with runtime ML,  
optimization or  
other analytics



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The screenshot shows a web form titled "Ask a question". At the top, there is a horizontal navigation bar with four tabs: "Ask a question", "Attachments", "Rate this", and "Details". The "Ask a question" tab is highlighted with an orange border and an orange arrow points to it from the left. Below the tabs, the text "Ask a question" is displayed. Underneath is a large text input area with a placeholder "Type your question here...". At the bottom right of the form, there is a "Send Question" button, which is also highlighted with an orange border and an orange arrow points to it from the left.

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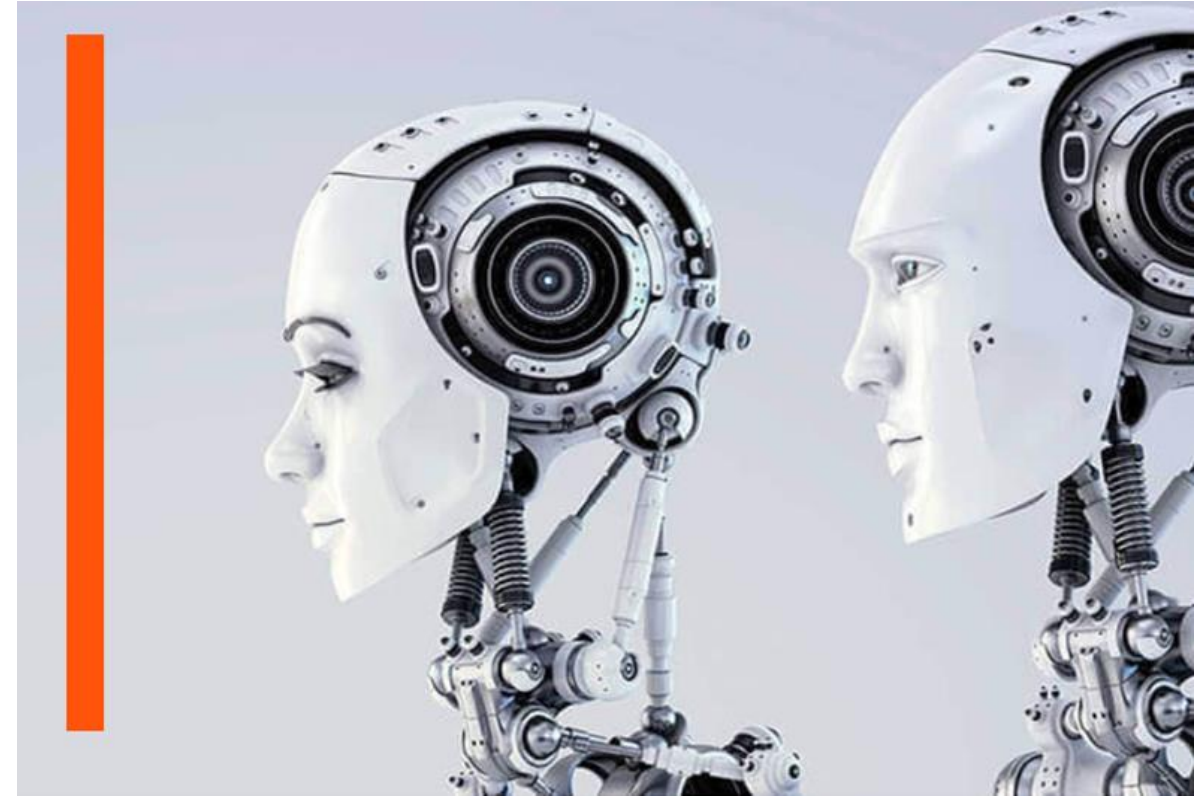


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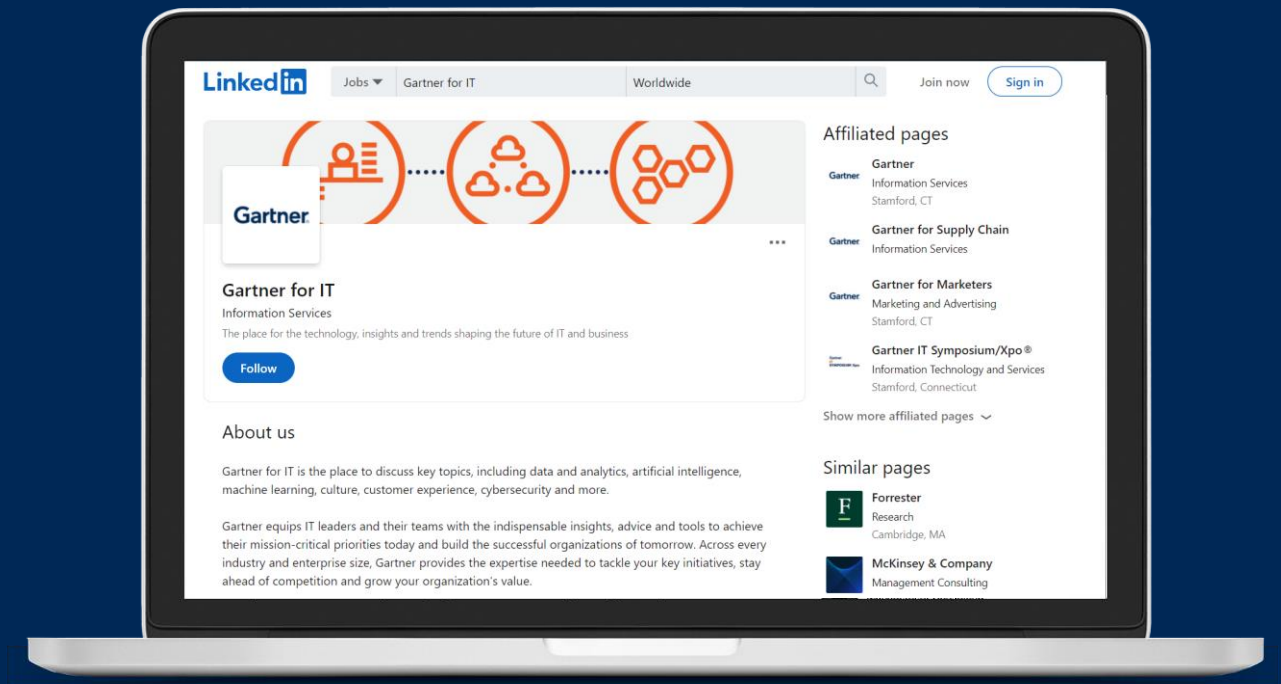
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Russell Morris  
CIO, TransGrid

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