

Explore how to automate anything, anywhere, anytime

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February 2021

Automation with AI transforms business operations

Automation with AI
will deliver
\$134B
in labor value
in 2022

90%

of COOs whose
organizations *are scaling*
intelligent automation tell
us it creates higher-value
work for their employees.

84%

of global executives say
they won't achieve
their growth objectives
without scaling AI.

Automating AI-Powered Digital Decisions

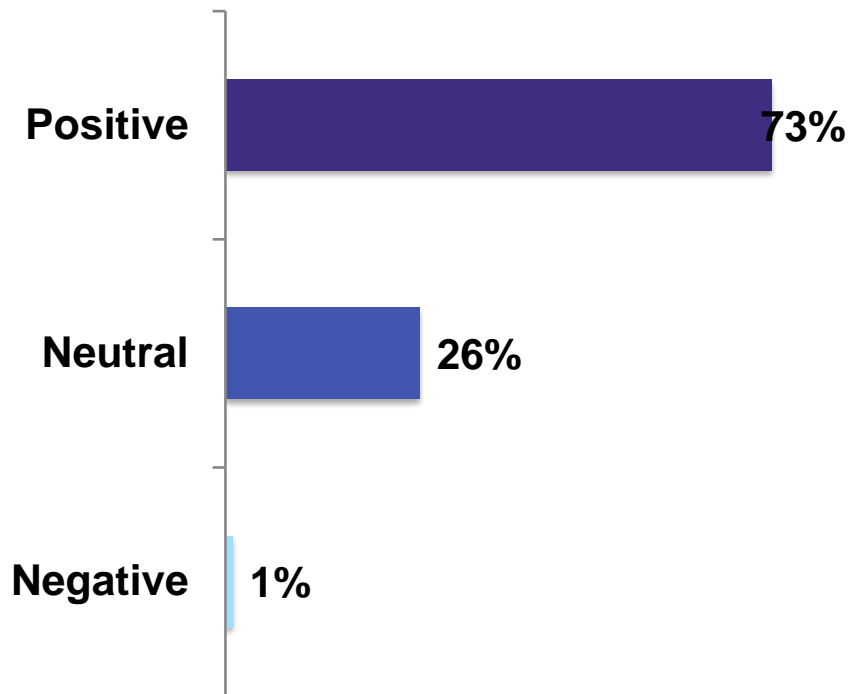
Mike Gualtieri, VP & Principal Analyst

February 2021



Organizations that
implement AI get results.


**What type of impact has AI
adoption had on your organization?**



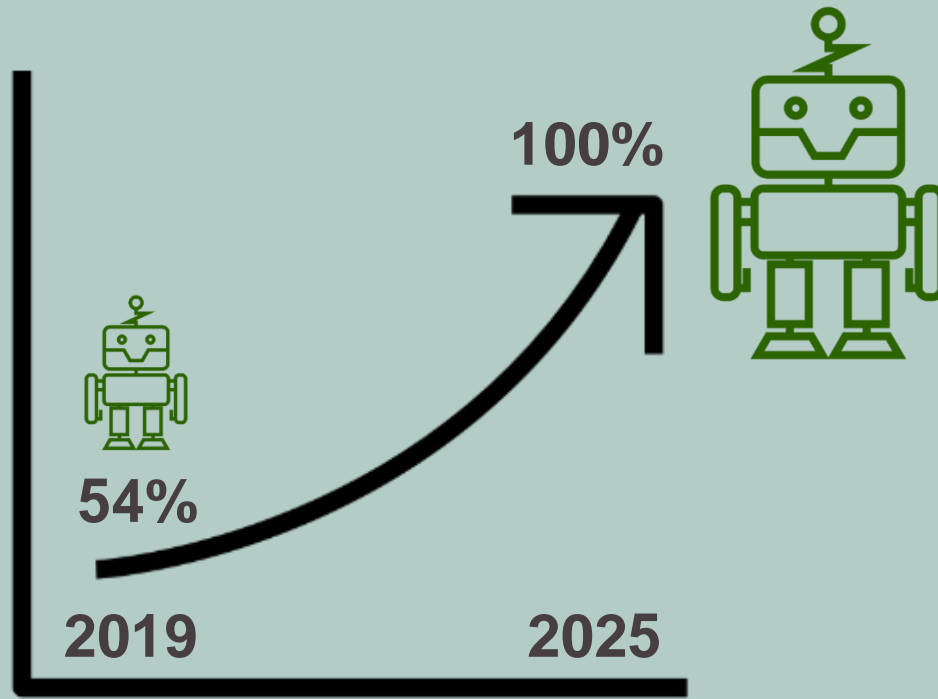
Source: Business Technographics Data And Analytics Survey, 2020
Base: 1466 Data and analytics decision-makers whose firm is implementing or expanding use of AI



AI is real and ready because . . .



. . . enterprises use it today to create millions in value even with a single use case.



We estimate that nearly 100% of enterprises will use AI within five years because . . .

? Decisions

A nighttime photograph of a city skyline, likely London, featuring several prominent skyscrapers. The buildings are illuminated with various lights, and the sky is a deep blue with some clouds. A semi-transparent dark grey rectangular box is overlaid across the middle of the image, containing the text "Enterprises rise or fall...".

Enterprises rise or fall...



**...based on the collective efficacy of all
the decisions made...**



...by leaders, employees, and

```

private void transactTAMWithdrawals(TAMAnalyzer tam) throws ServiceException
{
    // Now it is time to make withdrawals
    Date withdrawalDate = tam.getCurrentDate();

    TAMAnalyzerEvaluation ae = tam.getCurrentAnalyzerEvaluation();

    // make sure we can withdraw on this date
    if (DateHelper.isBetweenInclusive(withdrawalDate, ae.getFirstPaymentDate(), ae.getLastPaymentDate()) == false)
    {
        return;
    }

    int periodicity = 12;

    TradeOrderService tos = new TradeOrderService(tam.getAccount());
    // cycle through this puppy and create the tradeorders
    for (int p=0; p < ae.getTamPositions().size(); p++)
    {
        TAMEvaluationPosition ep = (TAMEvaluationPosition)ae.getTamPositions().get(p);

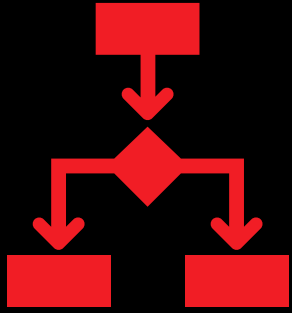
        // create a TradeOrder for this investment choice
        TradeOrder to = new TradeOrder();

        double withdrawalAmount = 0.0;
        switch (ep.getTamPurposeKind())
        {
            case TAMPurposeKinds.INCOME:
                withdrawalAmount = ep.getIncomeContributionAmount()/periodicity;
                break;
            case TAMPurposeKinds.WRINKLE:
                withdrawalAmount = ep.getWrinkleContributionAmount()/periodicity;
                break;
        }

        to.setAmount(withdrawalAmount);
        to.setDate(withdrawalDate);
        to.setSymbol(ep.getTamSymbol());
        tos.create(to);
    }
}

```

...by decision logic embedded in applications.



Decisions

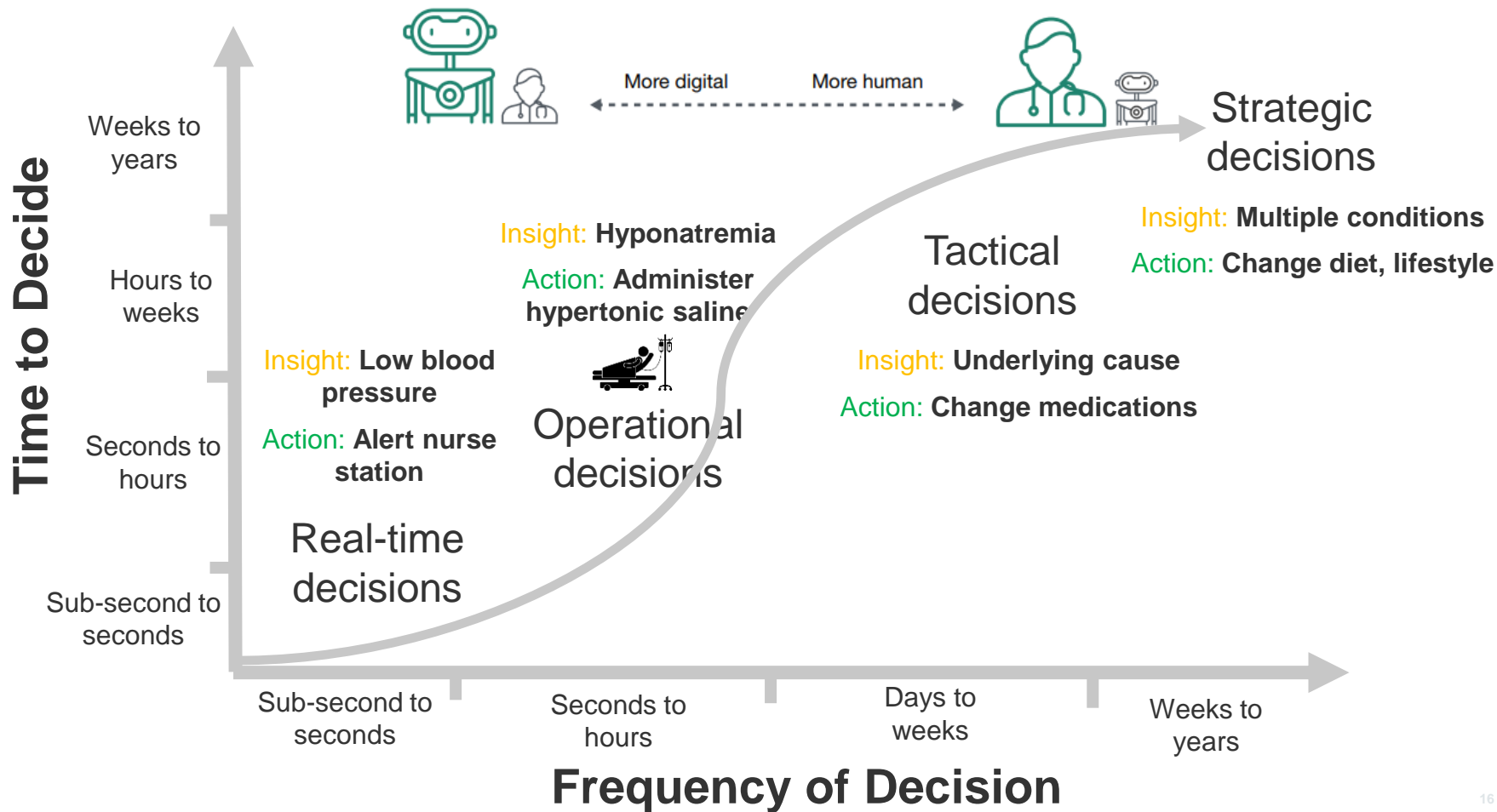
DIGITAL

A subset of business logic, defined by business experts, informed by analytics, and embedded in applications to make routine, repeatable operational and/or customer decisions in real-time.

DECISIONS

Digital Decisions

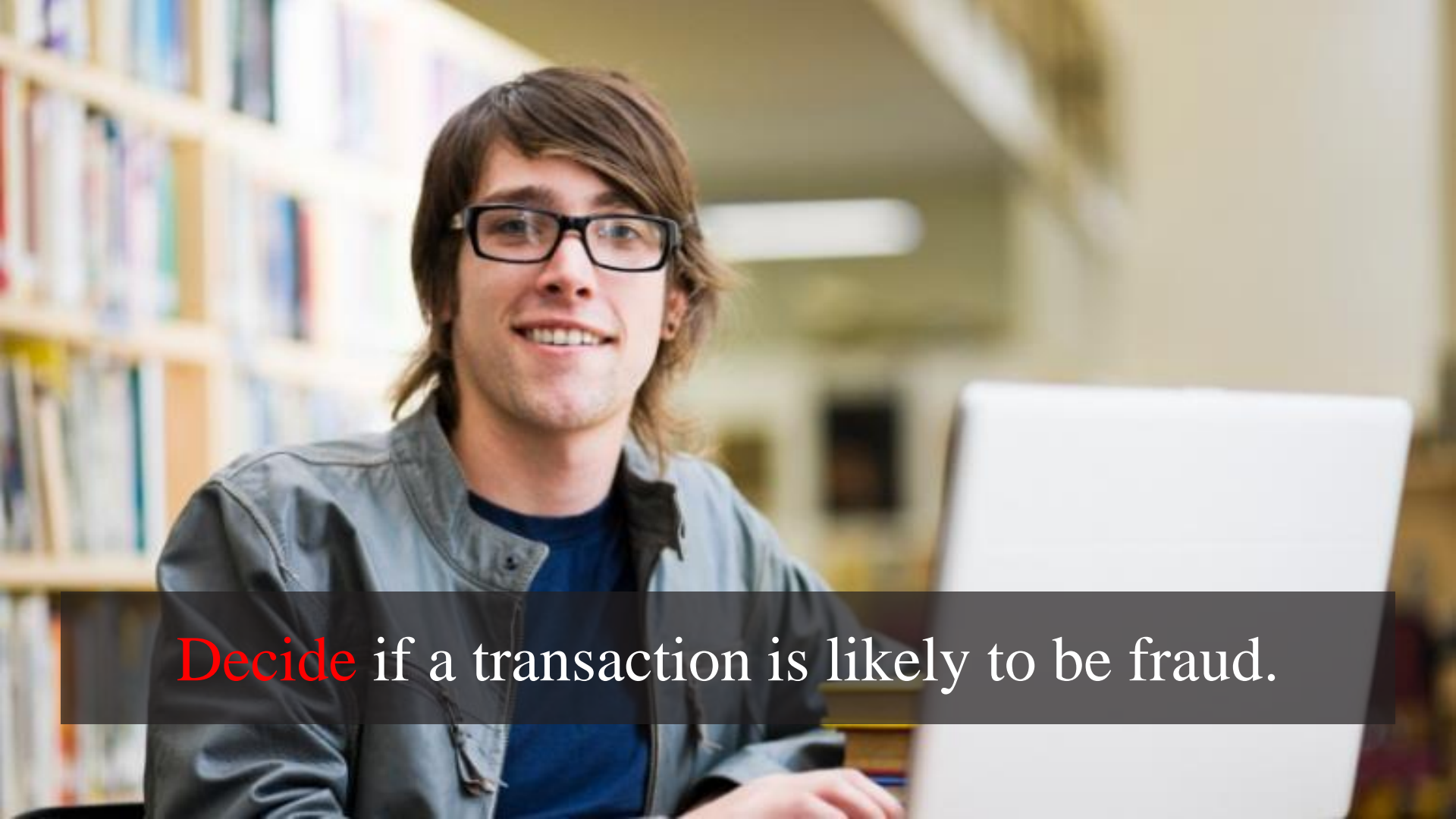
Business Insights



A white semi-truck is stopped at a toll booth. A red and white striped barrier is lowered across the road, preventing the truck from passing. The truck is facing the camera, and its license plate is visible. In the background, there are other vehicles and a cityscape. The scene is set during the day.

Decide carrier assignment to meet customer delivery promises at the lowest cost.





Decide if a transaction is likely to be fraud.



Decide how to prioritize utility maintenance.



Decide what actions will prevent customer churn.

A photograph of a modern industrial factory floor. Several large, yellow robotic arms are visible, some in the foreground and others in the background, working on assembly lines. The environment is filled with metal structures, pipes, and various industrial equipment. The lighting is bright, typical of a large indoor facility.

Decide when to service machines before they
breakdown.

A young man and woman are smiling and posing in front of a brick house. The man is wearing a red polo shirt, and the woman is wearing a light blue denim jacket. She is holding up a set of keys. The background shows a clear blue sky and green trees.

Decide whether to approve a loan based on the likelihood of default and regulatory requirements.



Decide what add-ons customers are likely to buy.



Decide best discount to gain customer loyalty.

Digital decisions take many forms

Decision	Description
Fact	Establish a fact
Identity	Recognize a pattern, object, condition, state,...
Choice	Make a choice based on a set of defined outcomes
Process	Trigger a process or branches within a process
Policy	Determine policy compliance
Event	Route an event to an application
Advice	Surface knowledge from an expert knowledge base



There are 5, 50, 500, and perhaps 5,000 enterprise use cases for digital decisions...

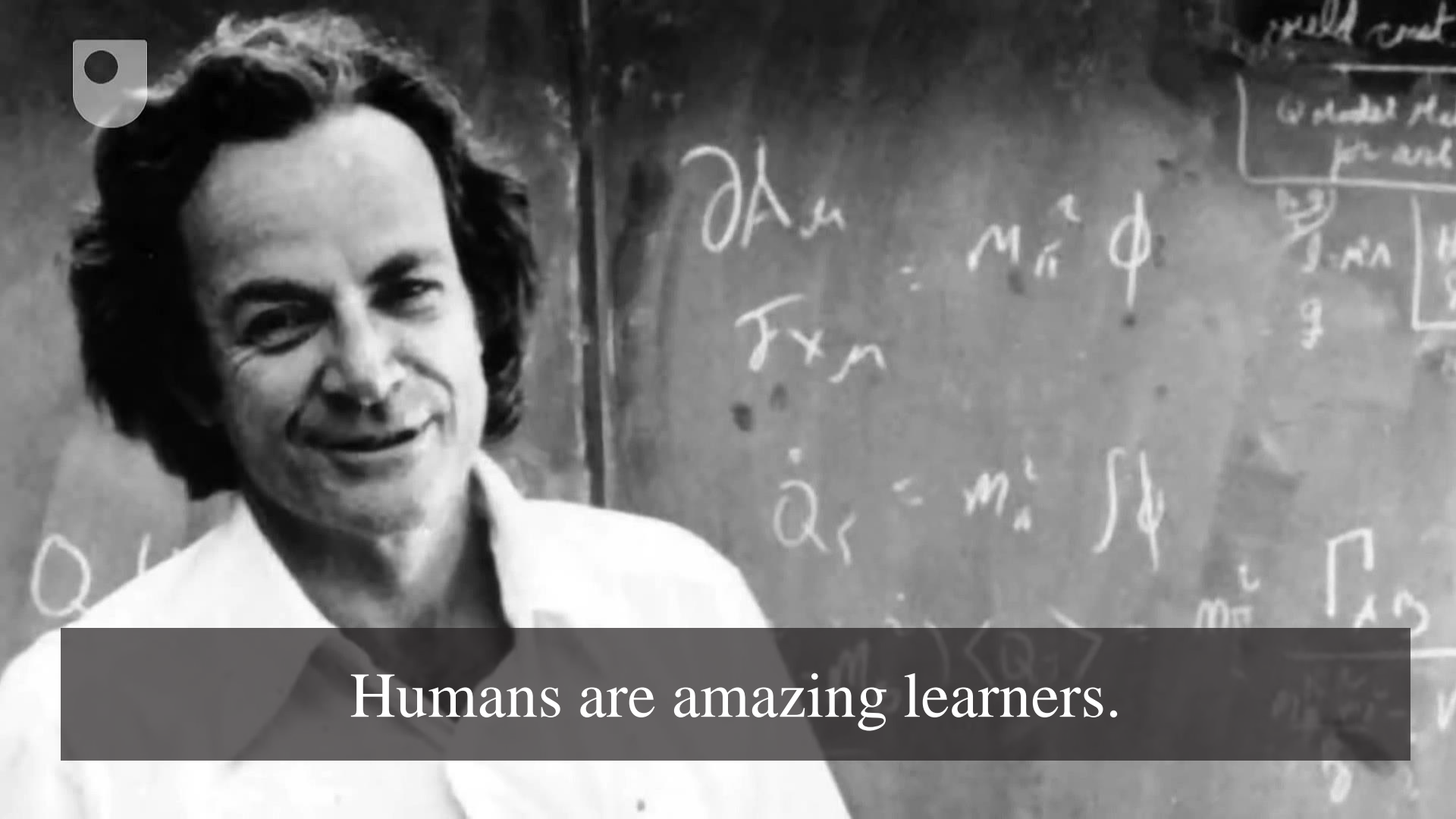
A man and a woman in business attire are silhouetted against a large, curved glass window. They are standing on a polished floor, and the man is holding a tablet. The window looks out onto a modern building with multiple floors and glass railings. The scene is brightly lit, creating a high-contrast silhouette effect.

...especially for enterprises undergoing digital transformation.

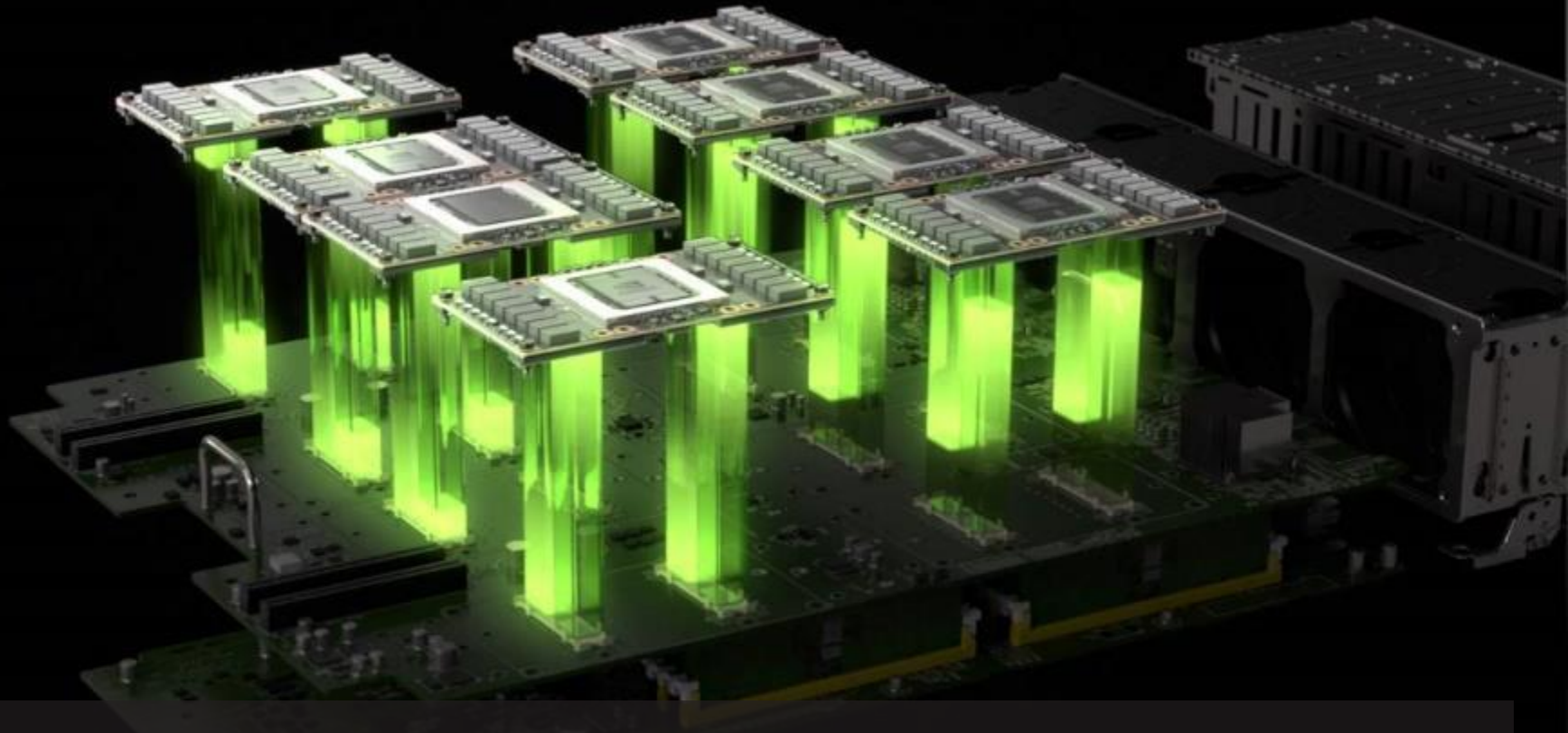
? Decisions

A conceptual image with a blue tint. In the foreground, a hand is moving a black chess piece on a checkered board. In the background, a large, shiny silver trophy is being placed on top of a white chess piece. The scene is set against a light blue background.

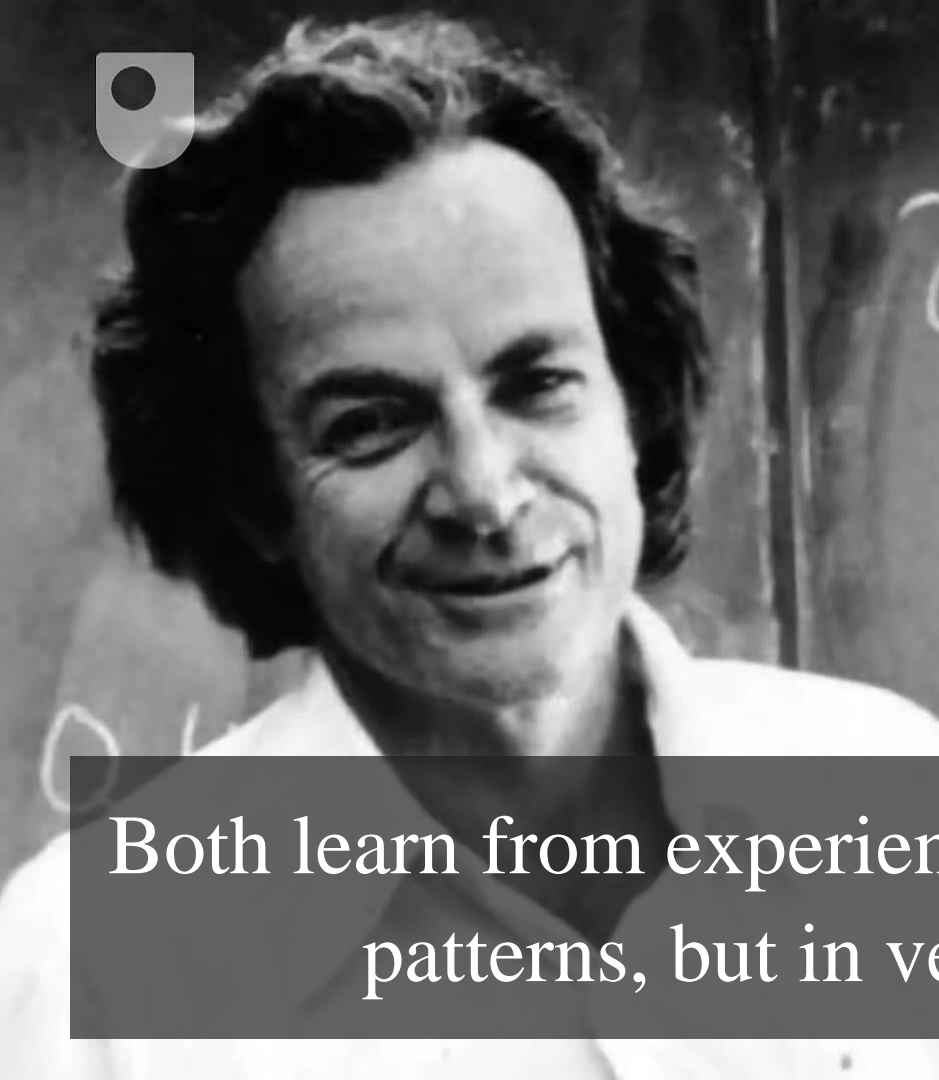
How can enterprises make the smartest digital decisions?



Humans are amazing learners.



Machines are amazing learners.



Both learn from experience, training, and inferring patterns, but in very different ways.

Humans and machine learning have strengths and weaknesses.

Human

- › **Strength:** understand decision logic in the absence of large amounts of data.
- › **Strength:** adapt to sea changes.
- › **Weakness:** unable to analyze large data sets
- › **Weakness:** cognitive biases can lead to poor decisions.

Computer

- › **Strength:** can analyze huge amounts of data to find signals and patterns.
- › **Strength:** models can relearn quickly from new data
- › **Weakness:** poor adaptability to sudden change
- › **Weakness:** subject to mistakes by data scientists



The most effective AI solutions will combine the best of human intelligence with the best of artificial intelligence to make decisions.

```

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    TAMAnalyzerEvaluation ae = tam.getCurrentAnalyzerEvaluation();

    // make sure we can withdraw on this date
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    {
        return;
    }

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    // cycle through this puppy and create the tradeorders
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    {
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        // create a TradeOrder for this investment choice
        TradeOrder to = new TradeOrder();

        double withdrawalAmount = 0.0;
        switch (ep.getTAMPurposeKind())
        {
            case TAMPurposeKinds.INCOME:
                withdrawalAmount = ep.getIncomeContributionAmount()/periodicity;
                break;
            case TAMPurposeKinds.WRINKLE:
                withdrawalAmount = ep.getWrinkleContributionAmount()/periodicity;
                break;
        }

        to.setAmount(withdrawalAmount);
        to.setSymbol(ep.getSymbol());
        to.setOrderType(TradeOrderType.MARKET);
        tos.createOrder(to);
    }
}

```

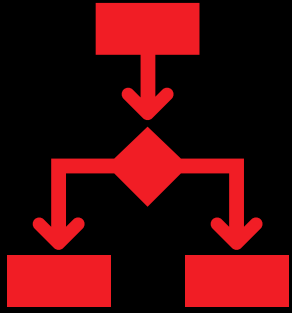
Most enterprise decision logic is
hardcoded...



...expense and difficult to change...



..and, absent analytics and AI.



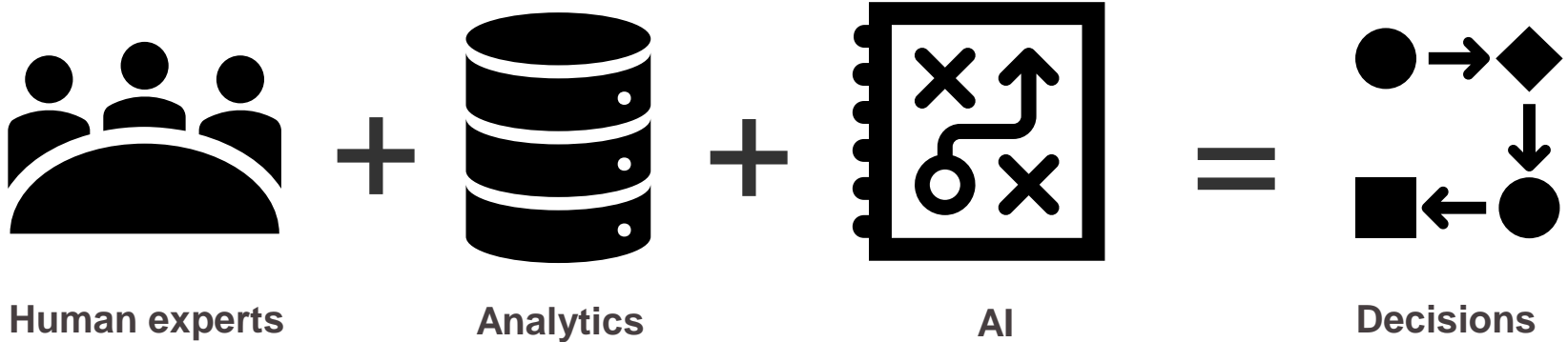
Decisions

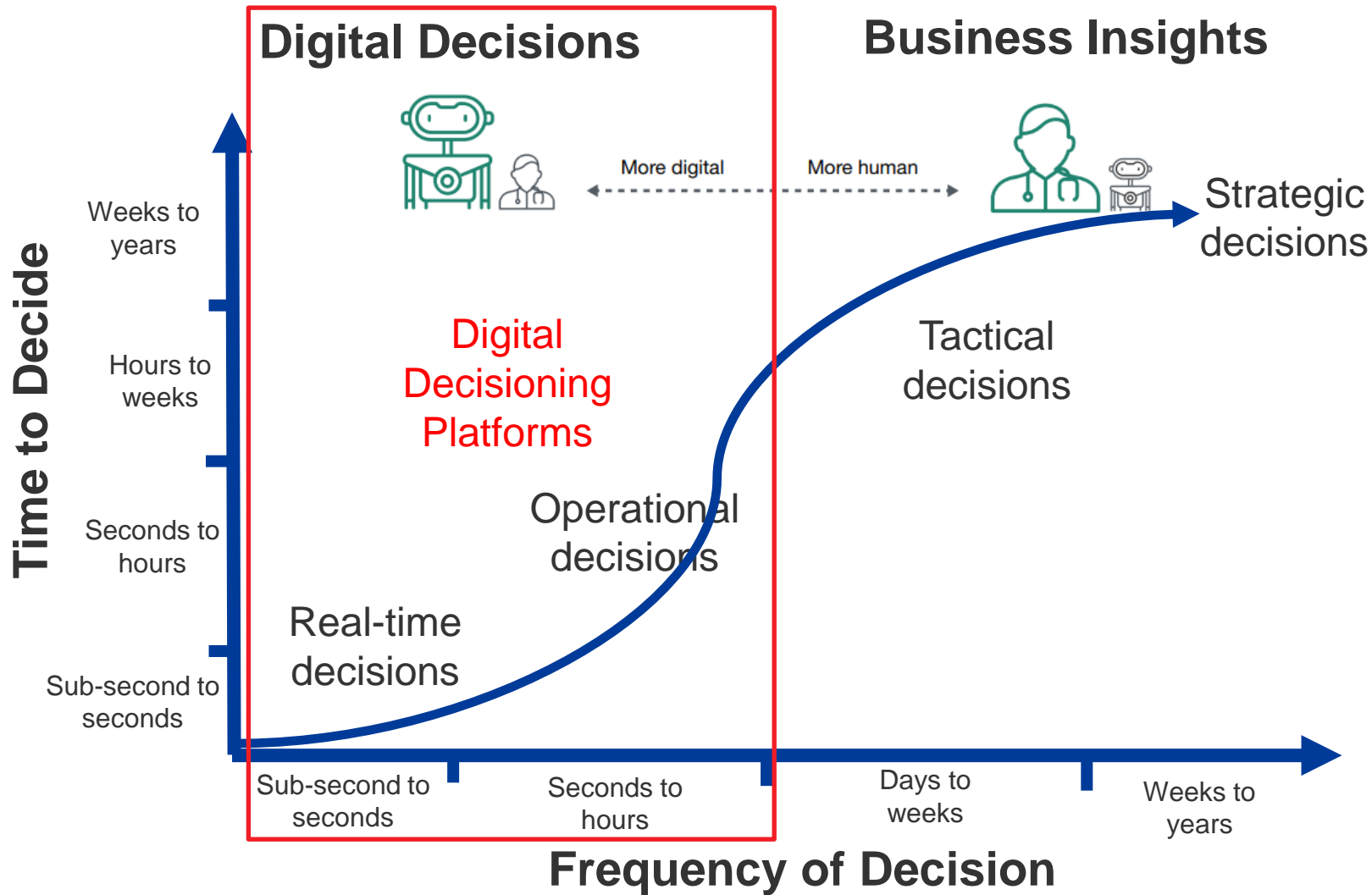
DIGITAL

Software that allows technology and business pros to define and execute real time, operational decision logic and embed it within applications, by providing tools to author and/or integrate decision logic, analytics, and AI models.

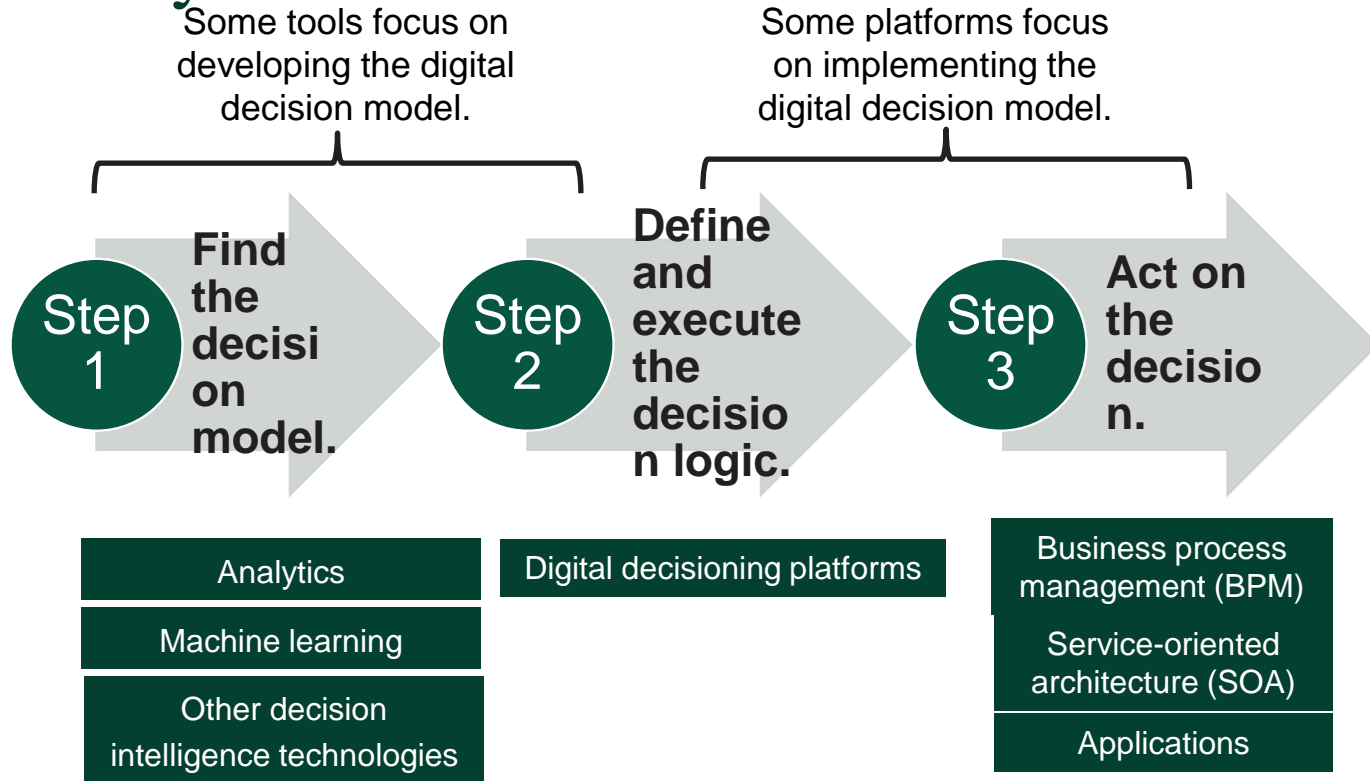
DECISIONING

Digital decisioning platforms bring the best decision intelligence technologies together.





Digital decisioning platforms bring together insight to action lifecycle



Digital decisioning
platform
requirements



USABILITY

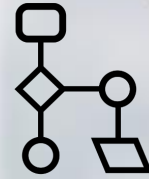
VISUAL
DESIGN

INTERDESIGN

Decision logic design tools designed for business users.



Provide or integrate with predictive analytics & machine learning (PAML).



Developer integration tools to embed or use digital decisions in applications.

Security

1100100110111

Transactions

0100110011

Historical

01001001

Customer data

010

Connect to data sources needed by decision logic.

A woman with dark hair and glasses is shown in profile, looking intently at a series of computer monitors. The monitors display various data visualizations, including bar charts, line graphs, and small video feeds of people. The scene is dimly lit, with the primary light source being the screens themselves, creating a professional and focused atmosphere.


Digital decision lifecycle management tools to enable collaboration, reproducibility, versioning, and change management.



ModelOps to govern, deploy, monitor digital decisions in production.



Execute digital decisions wherever applications need them – mobile, edge, public cloud, and private cloud.



Enterprise qualities: scalability, high-availability,
and security.



Decisions




Humans have knowledge.

A medium shot of Spock from the Star Trek franchise. He is wearing a blue Starfleet uniform with a black turtleneck and a gold Starfleet insignia on the chest. He has his characteristic dark hair and pointed ears. He is looking slightly to the right with a serious, logical expression. The background is a dark, futuristic interior with some glowing yellow lights on the left and colorful lights on the right.

Computers have logic.



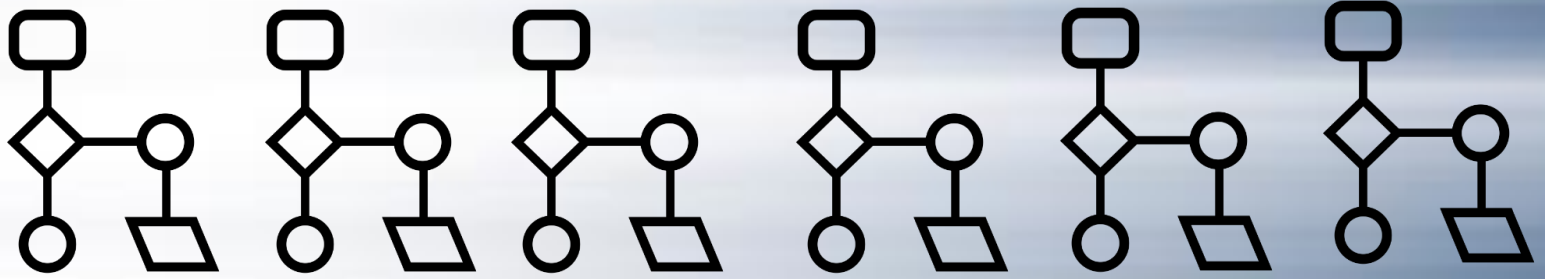
The best decisions combine both.

A conceptual image with a blue tint. In the foreground, a hand is moving a black chess piece on a checkered board. A large, shiny silver trophy is being placed on top of a white chess piece. The background is a solid light blue.

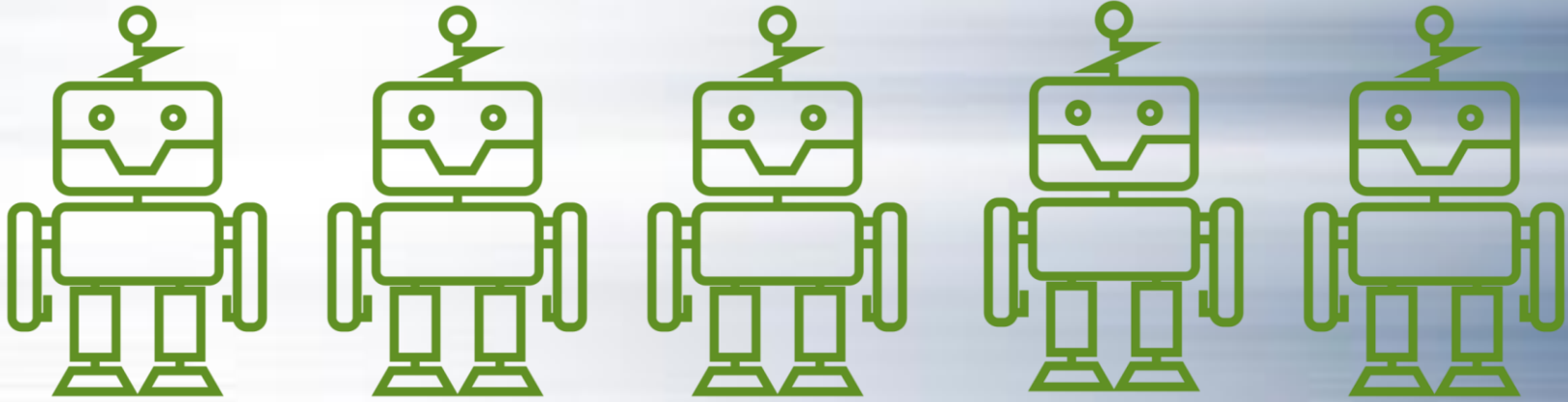
Digital decisioning platforms make it happen.



Recommendations



1. Build a pipeline of high-ROI use cases.



2. Join forces with AI but be the boss.

```
private void transactTAMWithdrawals(TAMAnalyzer tam) throws ServiceException
```

```
{  
    // Now it is time to make withdrawals
```

```
    Date withdrawalDate = tam.getCurrentDate();
```

```
    TAMAnalyzerEvaluation ae = tam.getCurrentAnalyzerEvaluation();
```

```
    // make sure we can withdraw on this date
```

```
    if (DateHelper.isBetweenInclusive(withdrawalDate, ae.getFirstPaymentDate(), ae.getLastPaymentDate()) == false)
```

```
{  
    return;  
}
```

```
int periodicity = 12;
```

```
TradeOrderService tos = new TradeOrderService(tam.getAccount());
```

```
// cycle through this puppy and create the tradeorders
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```
for (int p=0; p < ae.getTamPositions().size(); p++)
```

```
{
```

```
    TAMEvaluationPosition ep = (TAMEvaluationPosition)ae.getTamPositions().get(p);
```

```
    // create a TradeOrder for this investment choice
```

```
    TradeOrder to = new TradeOrder();
```

```
double withdrawalAmount = 0.0;
```

```
switch (ep.getTamPurpose())
```

```
{
```

```
    case TAMPurposeKinds.INCOME:  
        withdrawalAmount = ep.getIncomeContributionAmount() / periodicity;  
        break;
```

```
    case TAMPurposeKinds.WRINKLE:  
        withdrawalAmount = ep.getWrinkleContributionAmount() / periodicity;  
        break;
```

```
}
```

3. Stop the hardcoding madness.



4. Adopt a digital decisioning platform.



Decide to decide digitally.

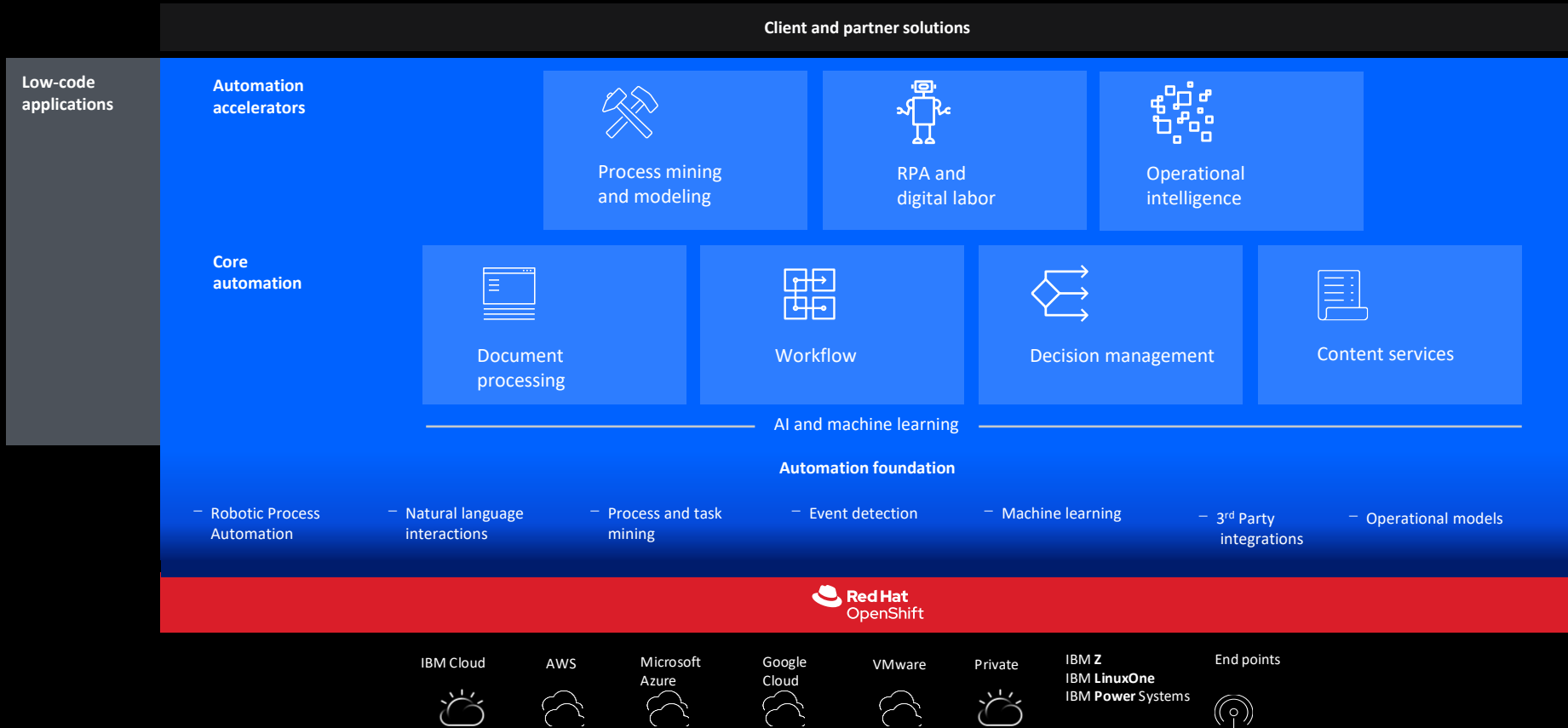
Thank You.



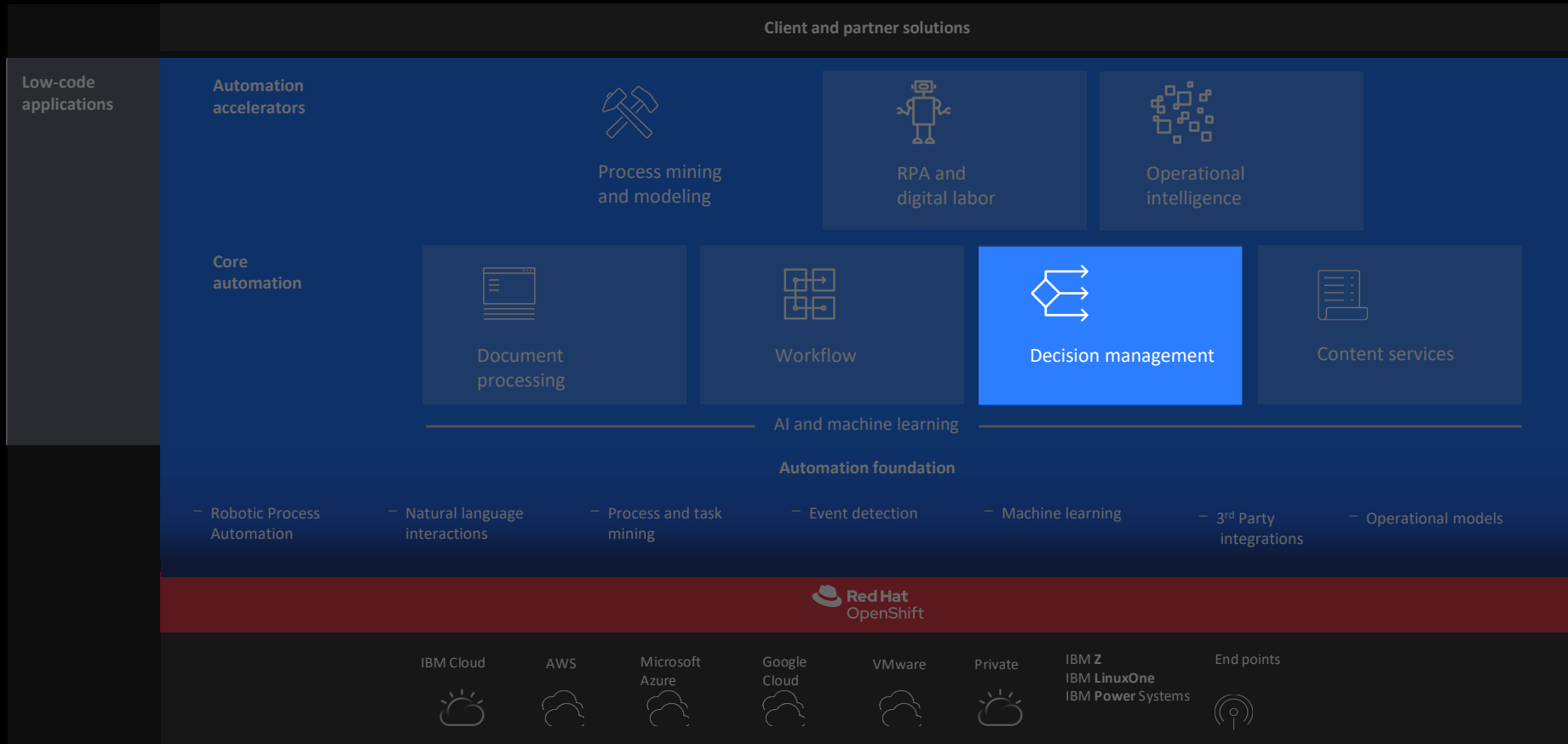
Mike Gualtieri

VP & Principal Analyst

IBM Cloud Pak for Business Automation



IBM Cloud Pak for Business Automation





Decision management

Decisions are the repeatable rules and policies made as part of day-to-day business operations.

Decision management is the software used to gather, manage, execute and monitor decisions.

Why IBM?

- Comprehensive business rules lifecycle management
- Business-friendly capabilities for development, testing and governance



Define

- No-code decision modeling
- Graphical guided tools to model and validate decisions
- Integrates business rules with machine learning



Execution and testing

- Test and simulate decisions
- Execute decisions with speed and consistency
- Highly scalable micro services architecture
- Execution tracing for auditability



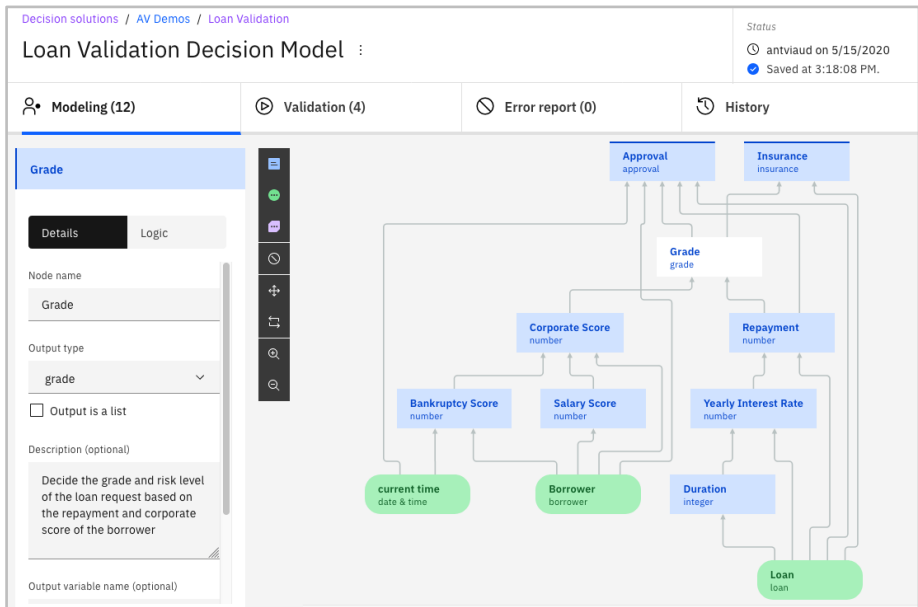
Governance and lifecycle management

- Release management and versioning
- Role-based permission management



Business-friendly tooling for decision management

- Intuitive business-friendly tooling to model repeatable decisions
- Business experts create and edit rules using natural language
- Test and govern decisions within a business environment
- Integrated capability for decision automation



Low-code editors provide easy-to-use tools to graphically model business decisions



Scalable and secure decision automation

Testing and simulation

- Step-by-step debugging with value inspectors
- Test suite definition, simulation and rule analysis

Centralize decisions

- Centralize and externalize business knowledge
- Simple effective governance and security

Execution at scale

- High performance and scalability for the most demanding enterprise deployments
- Supports transactional and batch rule execution

	Repayment		Corporate Score		Grade	
	min	max	min	max	grade	message
1	0	10,000	≥ 900		A	Very low risk loan
2	0	10,000	600	900	A	Very low risk loan
3	0	10,000	300	600	B	Low risk loan
4	10,000	30,000	≥ 900		A	Very low risk loan
5	10,000	30,000	600	900	B	Low risk loan
6	10,000	30,000	300	600	C	Average risk loan
7	30,000	60,000	≥ 900		B	Low risk loan
8	30,000	60,000	600	900	C	Average risk loan
9	30,000	60,000	600	900	D	Risky loan
10	30,000	60,000	900	900	C	Average risk loan
11	30,000	60,000	900	900	D	Risky loan
12	30,000	60,000	600	600	E	Very risky loan

```
if
  all of the following conditions are true :
  - ('Repayment' * 12 is at least 30000 and less than 60000 )
  - ('Corporate Score' is at least 900 ) ,
then
  set 'decision' to a new grade where
  the grade is "B",
  the message is "Low risk loan" ;
```

Highly scalable environment to manage millions of business rules

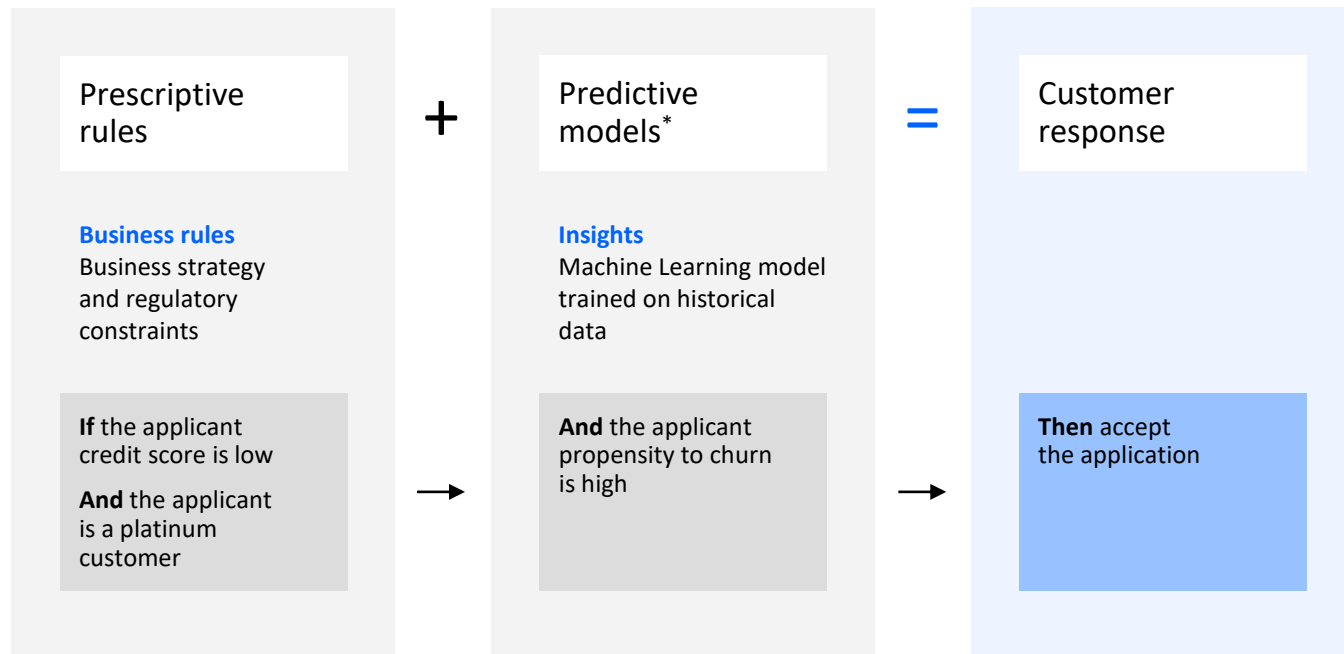
Enterprise decision capabilities with scalability to execute over 1 billion decisions per day



Integrated machine learning for better decisions

Built-in integration of business rules and machine learning

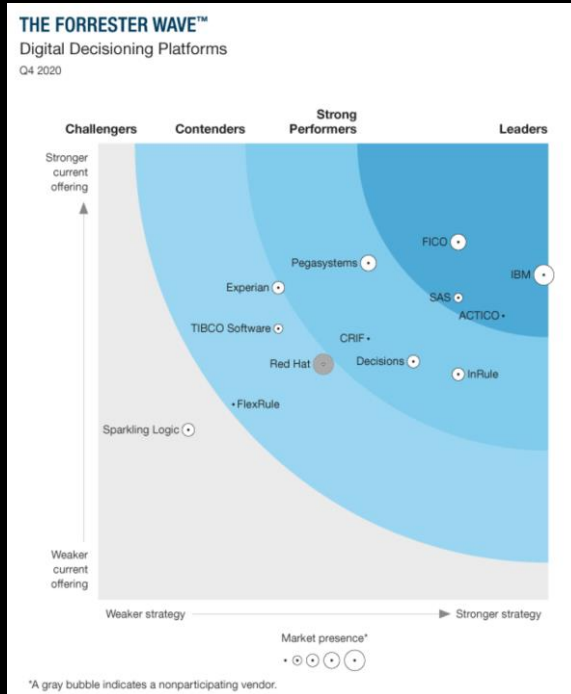
- Machine learning models accessible to business analysts in a low-code environment
- Extend rules-based decisions by incorporating machine learning models
- Native integration with Watson Machine Learning predictive analytics
- Extensive framework for third-party machine learning providers



*Native integration with
Watson Machine Learning

Why IBM?

IBM leads the market



IBM has been named a leader by Forrester in The Forrester Wave™:
Digital Decisioning Platforms, Q4 2020



Blood and Transplant



ControlExpert

BROWNELLS®

Thank you

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—

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ibm.com/cloud/cloud-pak-for-business-automation

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