

# Advanced Data Analytics for Business Impact

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Chief of Digital Sustainability Practice

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# NUS-ISS

## 1981

## Vision

Accelerating Digital  
Excellence



## Mission

Developing digital  
talent through  
education, applied  
research, consulting  
and career services



Trained over

# 188,000

Digital Leaders &  
Professionals



# 8,230

Graduate  
Programmes Alumni

# 8,740

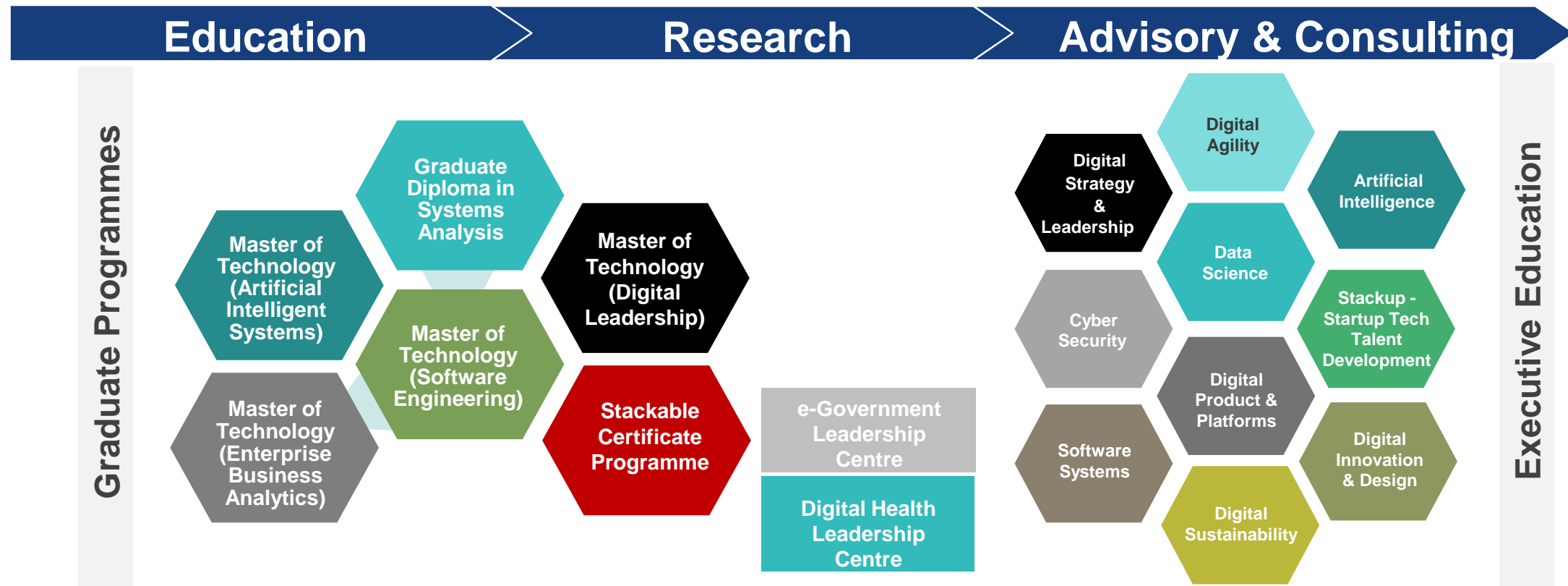
Corporate Client  
Organisations



Previously known as Institute of Systems Science, we rebranded to NUS-ISS in 2023.

# NUS-ISS leads Practice-based Pedagogy

- Learner Success
- Practice-oriented & Application-focused
- Through flexible learning pathways



# 3 Topics Today

Analytics &  
Techniques  
with AI

Tariffs

Data  
Leaders'  
Actions

1st

Analytics &  
Techniques with  
AI

# AI supercharges Data Science & Analytics

**HALF  
FULL**



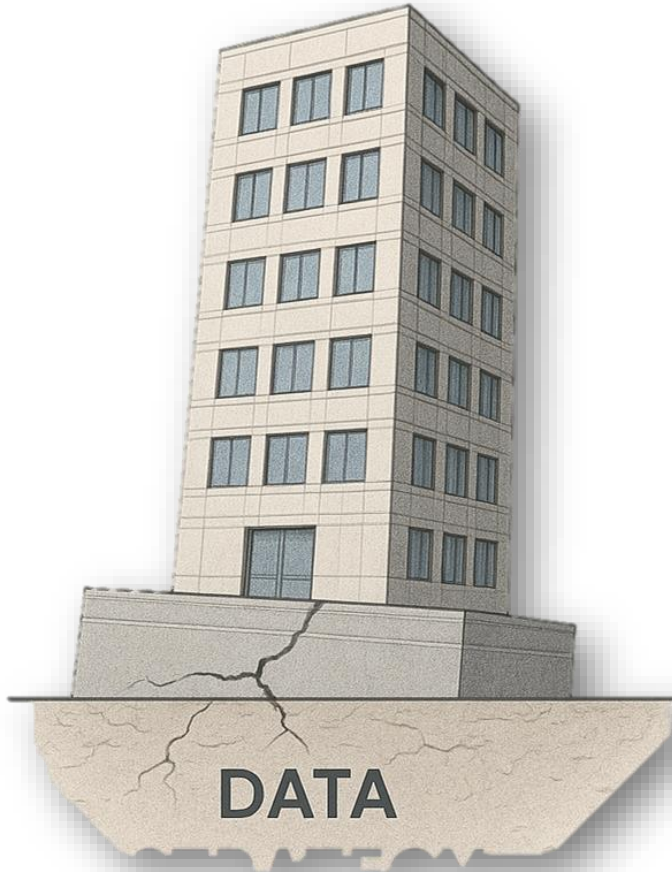
# AI replaces Data Science & Analytics

**HALF  
EMPTY**





## AI Strategy



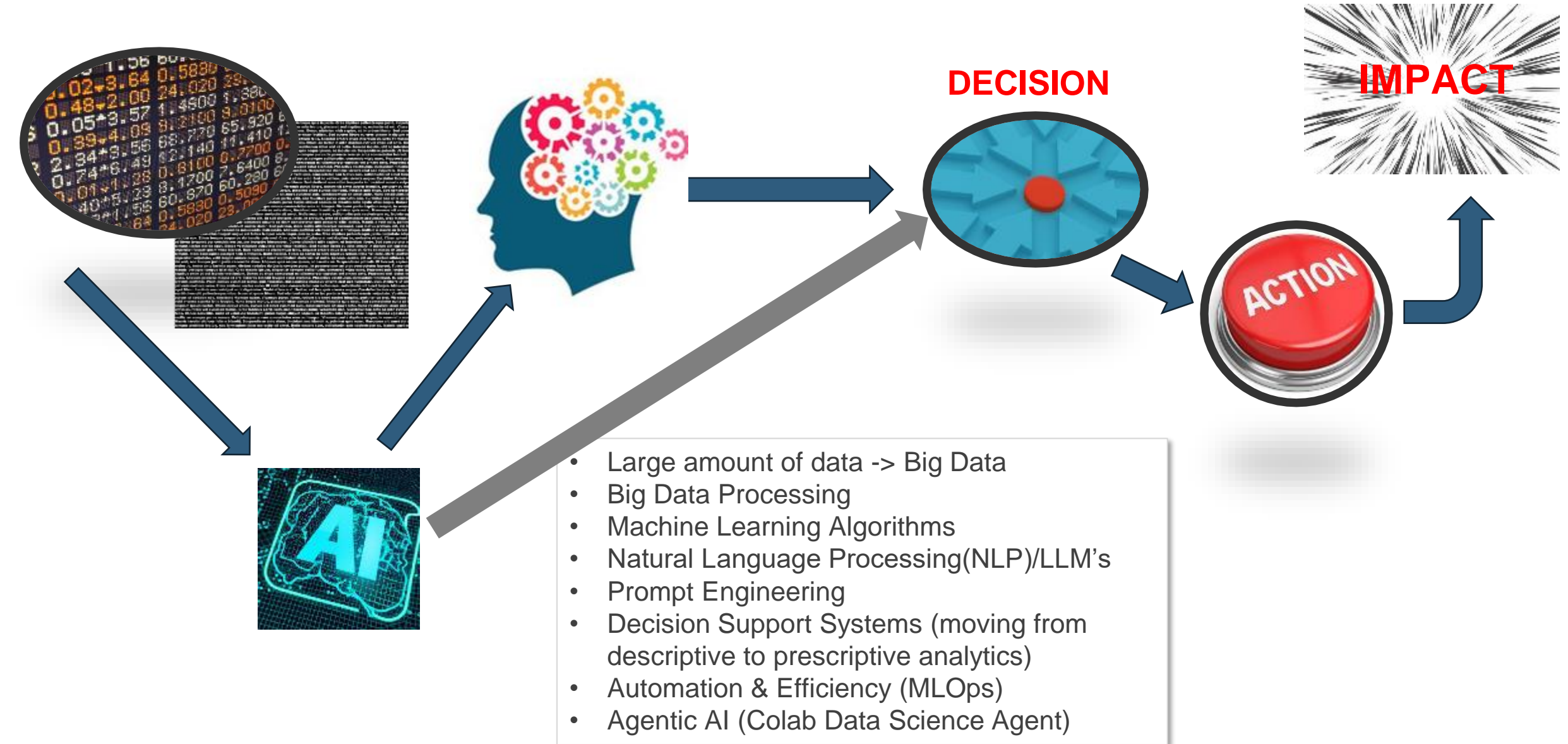
No Data Strategy,  
No AI Strategy

Your AI is only as  
smart as your worst  
data source

## AI Strategy

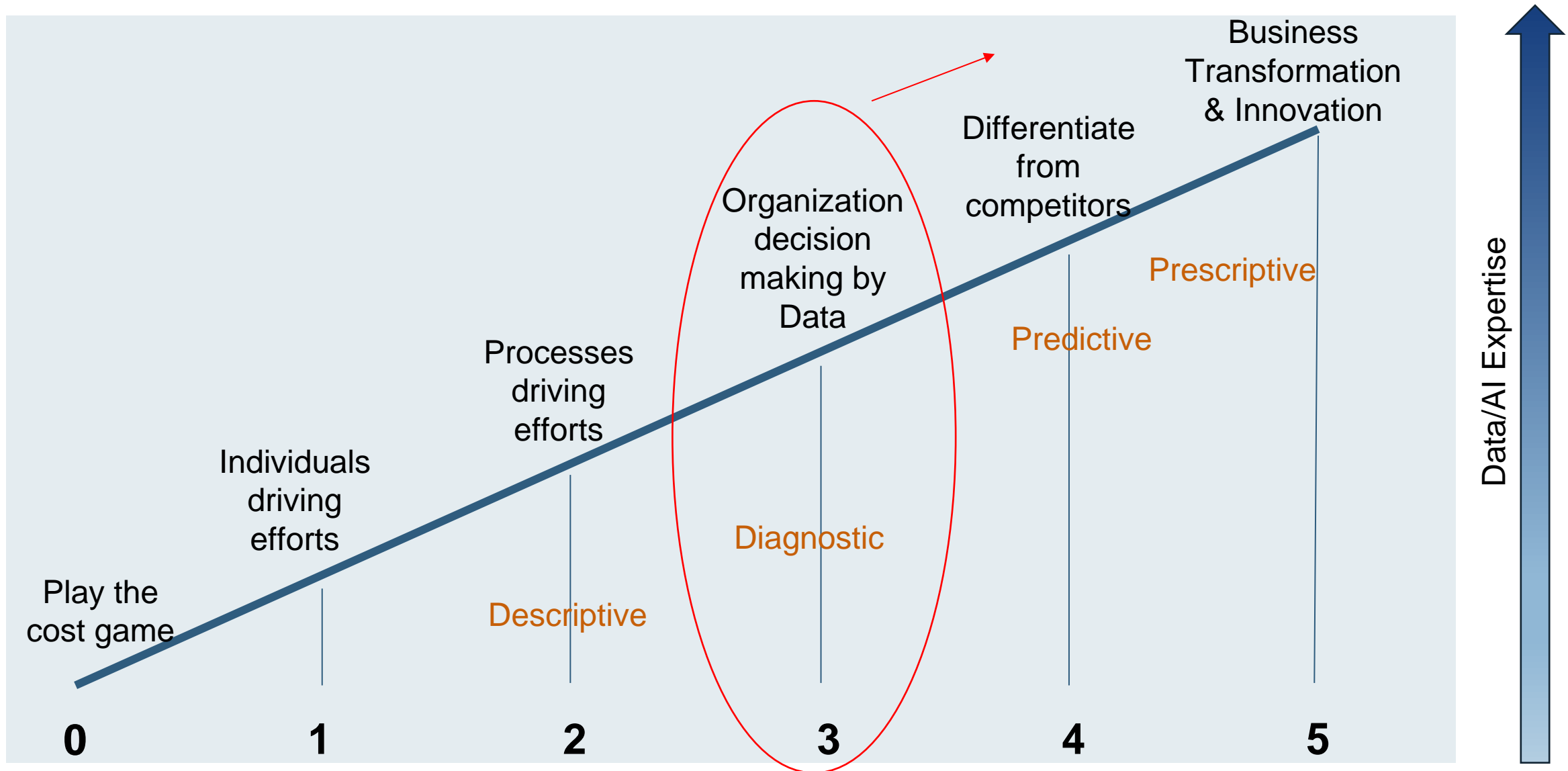


# Business Impact with Data & AI





# Data and Analytics Maturity



# Data Value Chain, AI Applications

| Data stages            | Data Collection  | Data Processing   | Data Storage   | Data Analysis & Insights   | Predictive & Prescriptive Models  | Decision Making  |
|------------------------|--|---|--|--|---|--|
| Use of AI (Agentic AI) | <ul style="list-style-type: none"><li>Automate data extraction</li><li>Data Quality Check</li><li>Real time data streaming</li></ul> | <ul style="list-style-type: none"><li>Data Cleaning</li><li>Schema Mapping</li><li>AI-ETL</li></ul> | <ul style="list-style-type: none"><li>AI-Indexing</li><li>Data Compression</li><li>Data compliance</li></ul> | <ul style="list-style-type: none"><li>Data Discovery</li><li>Natural language query</li><li>Data Visualization</li></ul> | <ul style="list-style-type: none"><li>Predictive analysis</li><li>Prescriptive analysis</li><li>Model automation</li><li>Hyperpersonalization</li></ul> | <ul style="list-style-type: none"><li>Chatbot</li><li>AI decision engines</li><li>Intelligent process automation</li></ul> |

Roles

Data Engineers

Data Scientist

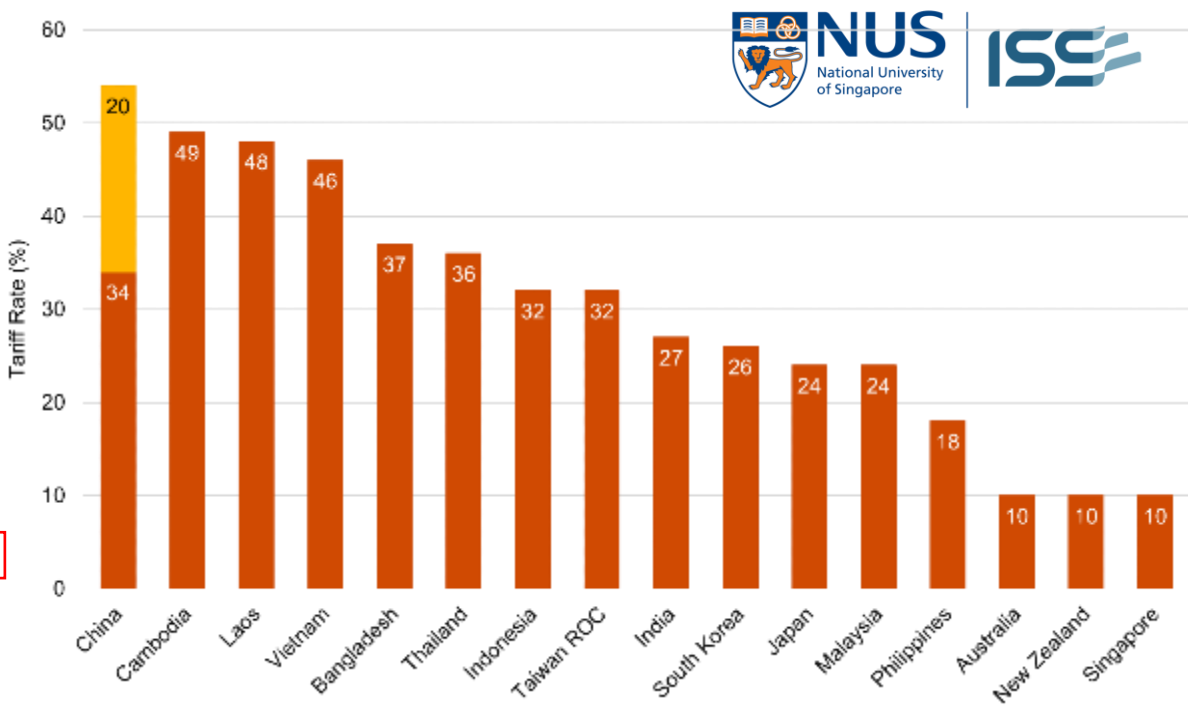
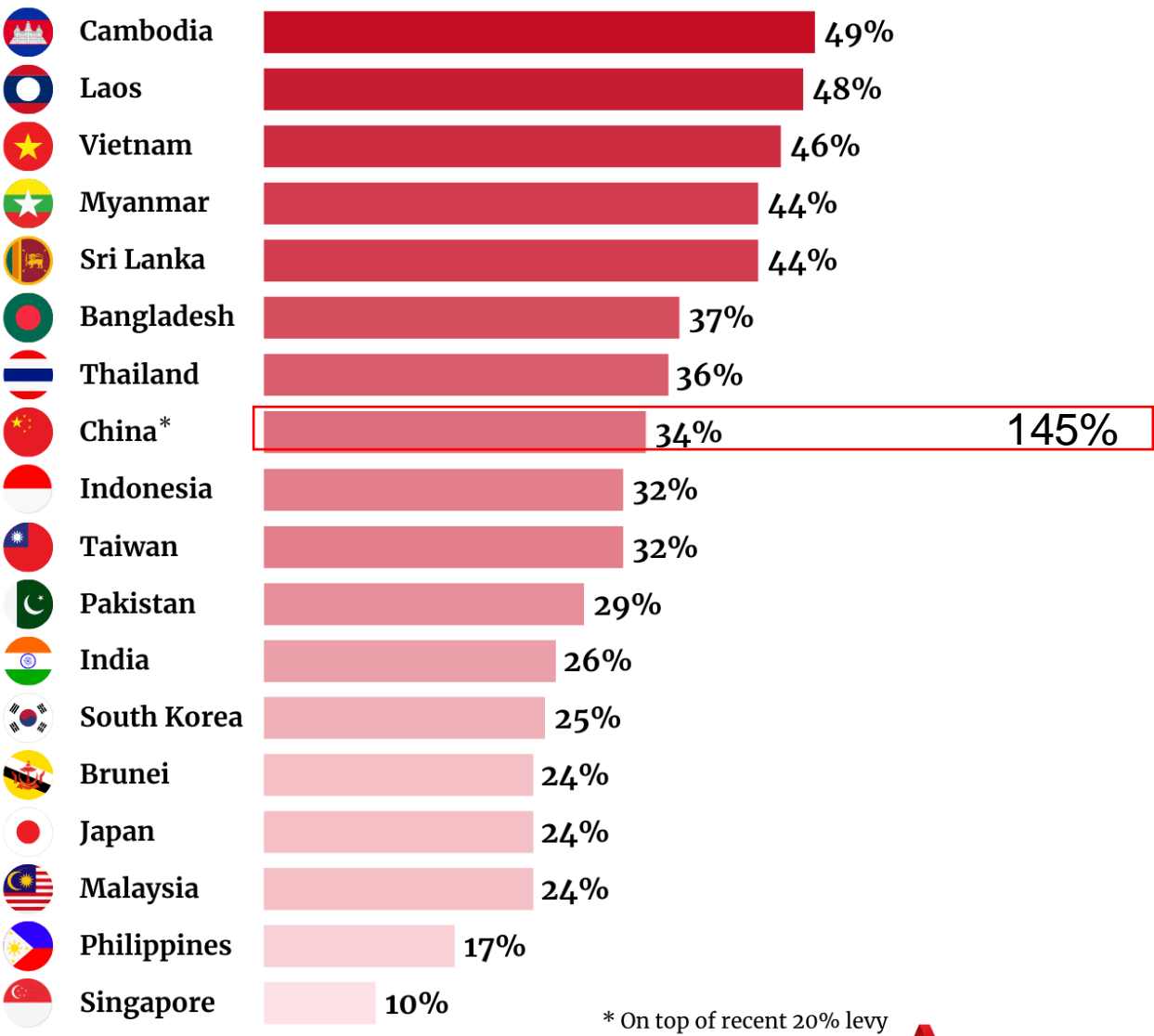
(Applied)  
Data/Business Analysts  
Business Leaders

2nd



Tariffs

# New tariffs imposed by the US on selected trading partners: Asia



Infographic: Clara Ho

Source: The White House, Apr 3, 2025



# What are the reactions of your organizations?

**Shock!**



**Worried!**



**I have a plan!**





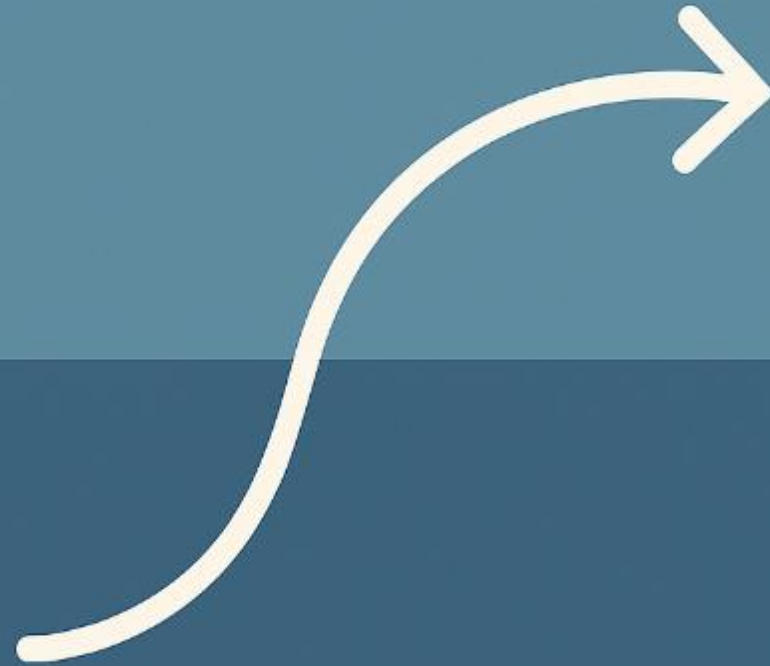
# What will likely happen?







# Uncertainties



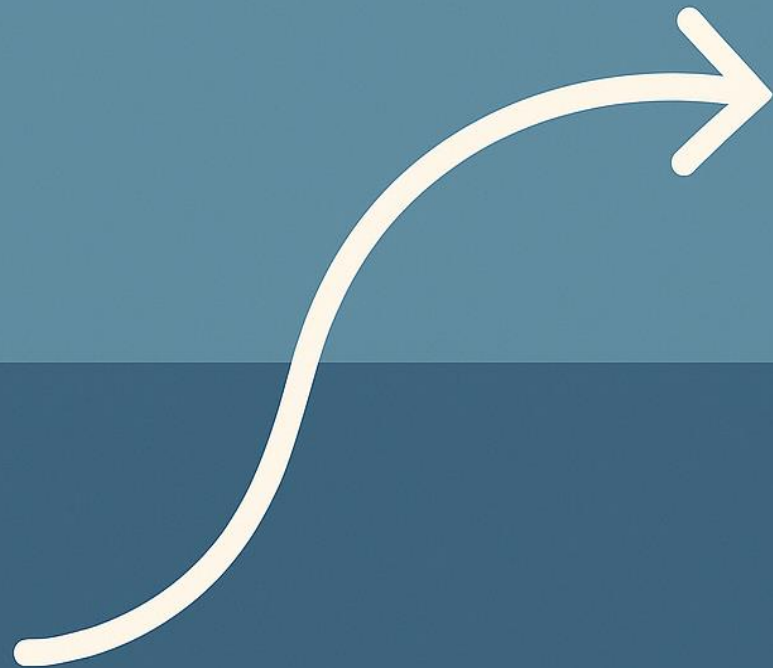
# Agility

3rd



Data Leaders'  
Actions

# Uncertainties



# Agility

Simulations

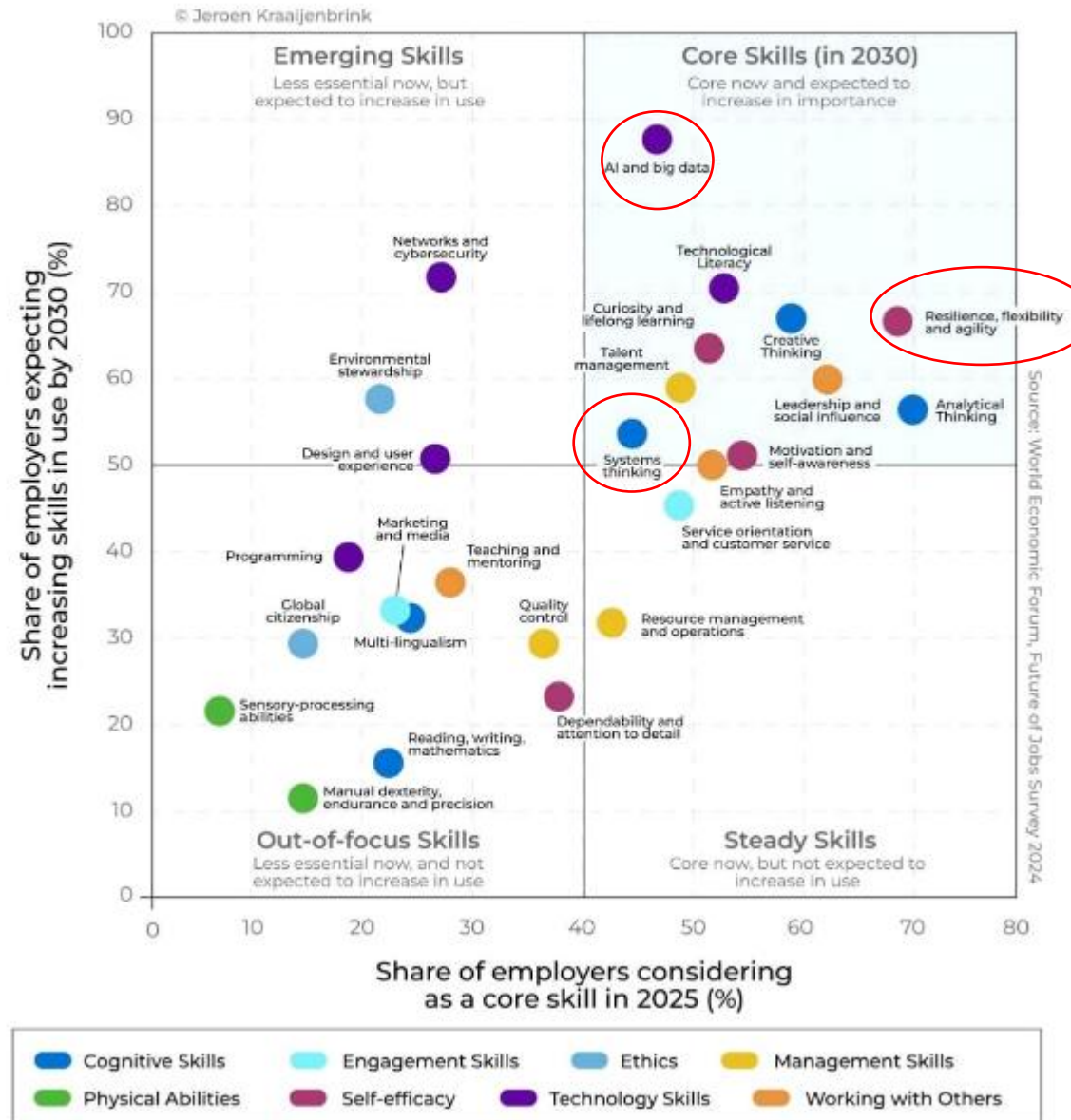
**Systems  
Dynamic  
Business  
Planning**

Experimentations

Evaluation



# The Core Skills for 2030



**Systems thinking** is a holistic approach to problem-solving that views business challenges as **interconnected systems** rather than isolated parts

- **Decode complexity** (e.g., why "quick fixes" often fail)
- **Leverage data more effectively** (by asking better questions)
- **Lead with adaptability** in volatile markets



**Systems thinking + data** turns reactive decision-making into proactive strategy

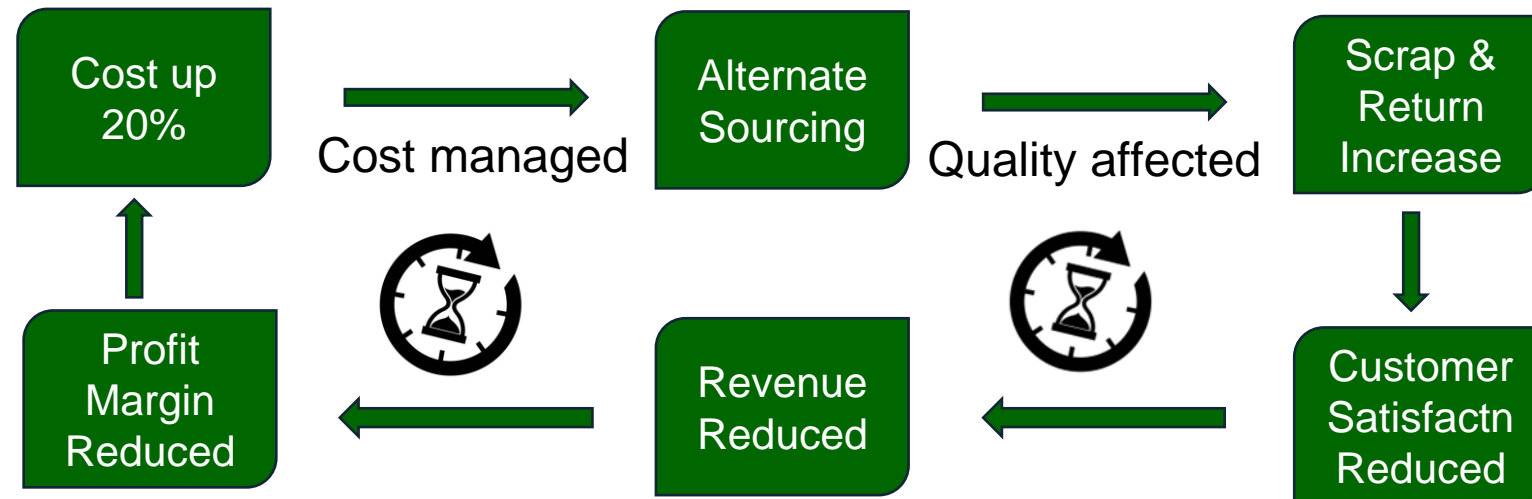


Problem: Your company faces a sudden 20% cost increase for a critical component. Margin squeezed.

Common  
Approach:



Systems  
Thinking:



# Delays & Unintended Consequences

Problem

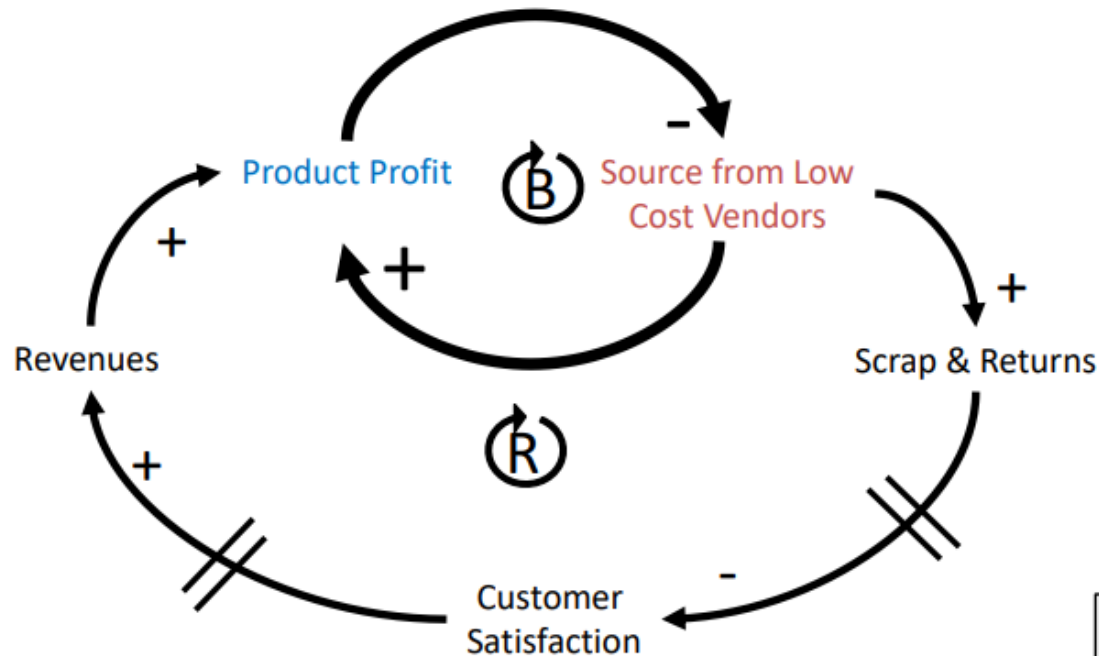
Myopic Fix

Unintended Consequence

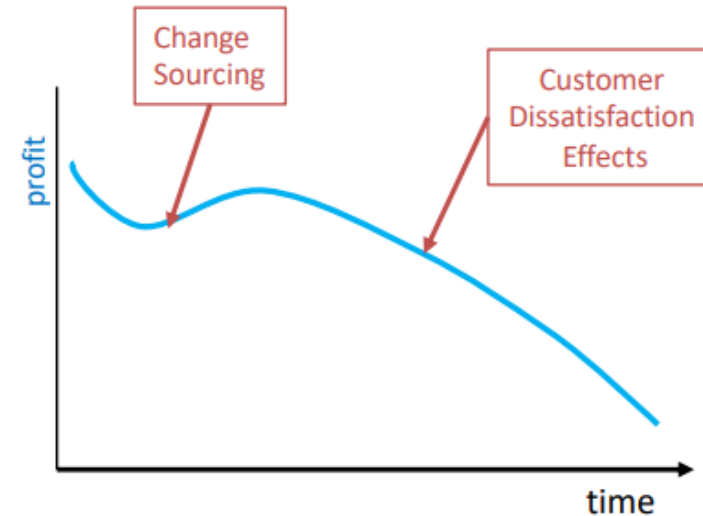
High Raw  
Material Costs

Source from low-price vendors

Increased scrap and returns;  
lower customer satisfaction



Often the unintended consequences have delays!



Need to determine which is stronger:

- Balancing loop reducing costs or
- Reinforcing loop reducing revenue.

**Problem:** Your company faces a sudden 20% cost increase for a critical component. Margin squeezed.



## Step 1: Map the System

- Suppliers (cost, reliability, alternatives)
- Inventory (buffer stock, lead times)
- Production (yield, downtime, substitutes)
- Customers (price sensitivity, demand elasticity)
- Competitors (their sourcing strategies, pricing)

## Step 2: Data-Driven Insights

- Analyze **supplier performance data**: Are cost hikes industry-wide or supplier-specific?
- Model **demand forecasts**: Will passing costs to customers reduce sales volume?
- Simulate **inventory scenarios**: Can we reduce stockouts without overordering?



**Problem:** Your company faces a sudden 20% cost increase for a critical component. Margin squeezed.



### Step 4: Simulate Outcomes

- What if we switch suppliers but face quality delays?
- What if competitors absorb cost hikes to gain market share?

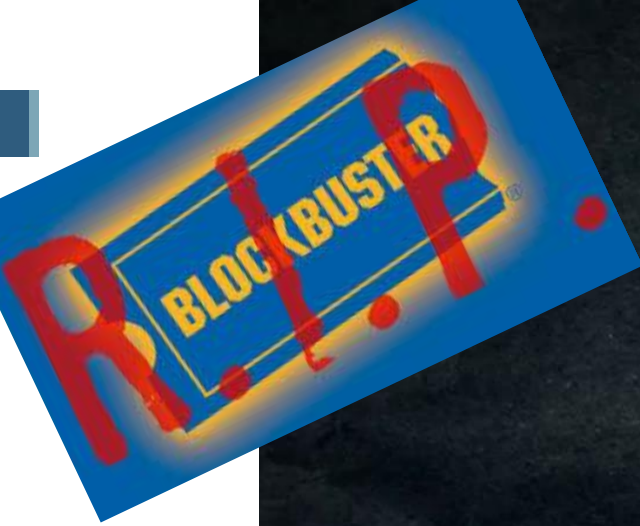
### Step 3: Identify Leverage Points

- a. Use data analytics to test alternative materials
- b. Adjust pricing strategically using customer segmentation data
- c. Supplier Collaboration by share demand forecasts with key suppliers
- d. Use machine learning to reduce safety stock where possible



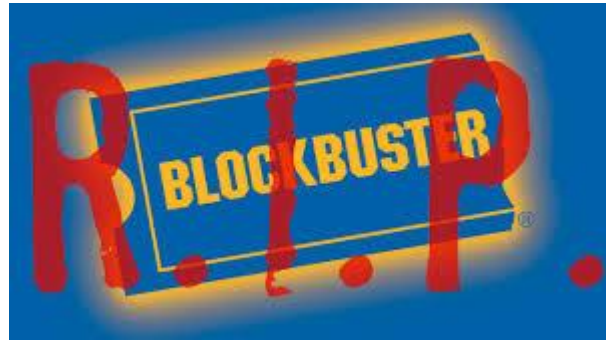
### Step 5: Monitor Feedback Loops

Track **supplier reliability**, **customer churn**, and **inventory turnover** in real-time dashboards.



So lucrative, in fact,

[https://www.youtube.com/watch?v=s0qcG-g\\_Jk0](https://www.youtube.com/watch?v=s0qcG-g_Jk0)



## Because of ?



|                     | Late Fees = Customer Exodus  | Doubled Down on Physical Stores                  | Rejected Netflix for \$50M (2000)                            | Copypat Strategy, Too Late (2004)                                  | Ignored Streaming Tipping Point (2007+)                   |
|---------------------|--|--|--|--|---|
| <b>Systemic:</b>    | Relied on late fees (16% of revenue)                                     | Opened more stores despite rising costs          | Prioritized short-term profits over disruptive tech          | Launched a DVD-by-mail service but kept stores                     | Held onto DVDs while Netflix locked in streaming licenses |
| <b>Missed Data:</b> | Netflix's subscriber growth correlated with Blockbuster's fee complaints | Rising broadband adoption signaled digital shift | Netflix's doubling subscriber growth was a leading indicator | Netflix's retention rates proved subscription models worked better | Streaming traffic eclipsed physical rentals by 2010       |



# Advanced Data Analytics for Business Impact



Advanced  
Thinking  
Skills



Advanced  
Techniques





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# Thanks!