

# AI: The Art of the *Practical*





## George Casey

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## Summary of experience

As the head of RSM's Advanced Analytics practice, George spearheads the delivery of innovative solutions to clients through emerging technologies such as machine learning, predictive analytics, and artificial intelligence.

With a wealth of experience in the industry, George previously held roles as the Chief Marketing Officer and Chief Technology Officer for Junction Solutions. There, he was instrumental in the development of the Multi-Channel Retail software solution which was eventually acquired by Microsoft.

Over his 25-year tenure, George provided invaluable guidance on digital transformation strategy, business intelligence and analytics strategy, and ERP/CRM system design for both B2B and B2C clients.

George's extensive knowledge and expertise have led him to be published in numerous professional and trade journals. He is also a sought-after seminar and keynote speaker. George is a Microsoft Certified Azure Data Scientist and has authored several manuals for Microsoft on Reporting and Business Analytics.

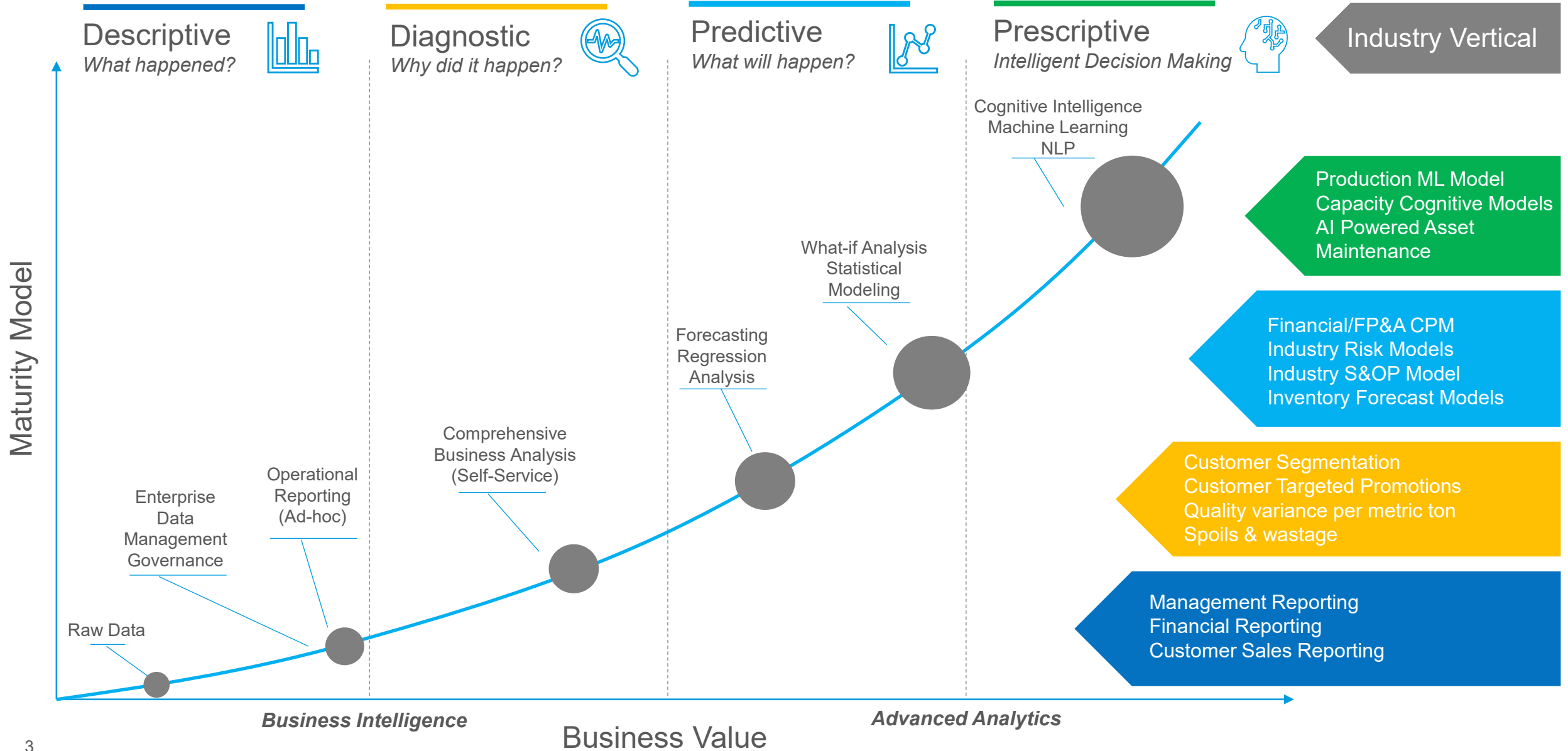
## Education

Master's of Science, Predictive Analytics, Northwestern University

Master's of Business Administration, Kellogg School of Management, Northwestern University

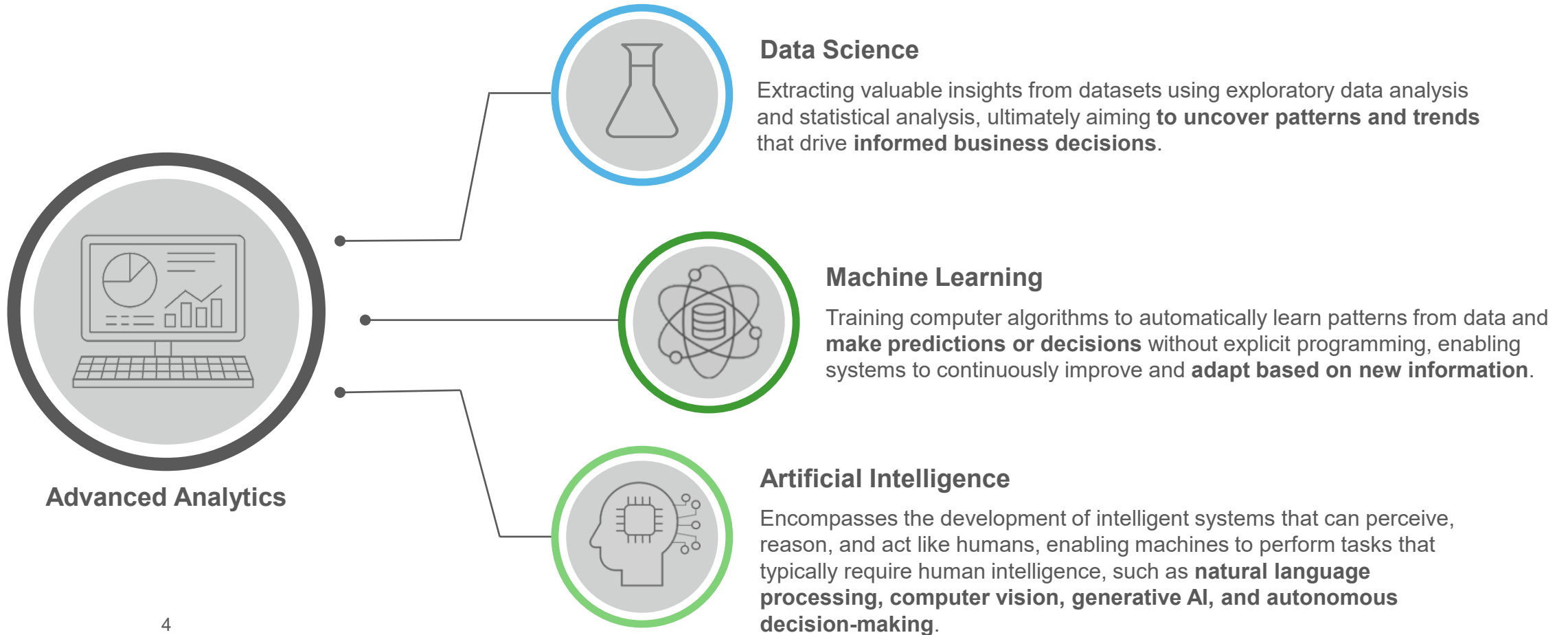
Bachelor of Science, University of Illinois, Major: Information Systems

# Data Analytics Maturity Model



# What is Advanced Analytics?

**Advanced analytics** is the application of advanced techniques and technologies, such as machine learning and artificial intelligence, to **gain insights** from data. This enables organizations to make **data-driven decision**, improving outcomes, accelerating processes, and reducing costs. The following are **3 main components** to advanced analytics:



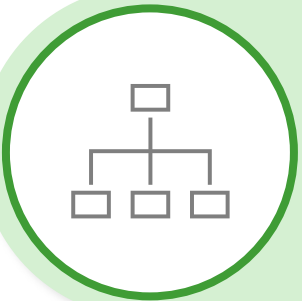
## Supervised



### Regression

Predicts the numeric value of an outcome.

*What is the value of A?*



### Classification

Answers simple two-choice question like yes/no.

*Is this A or B?*



### Time-Series

Estimates the value for future time periods.

*What's the value of A in the next periods?*

## Un-Supervised



### Clustering

Makes groups of data based off similar characteristics.

*Which group does A most likely belong to?*



### Association

Groups data from tendencies of co-occurrence.

*Which items are usually bought together?*

## Supervised



### Natural Language Process

Uses text-only data types to classify new texts with user set labels.

*Is this text A, B, C...?*



### Computer Vision

Uses image-only data types to classify new images with user set labels.

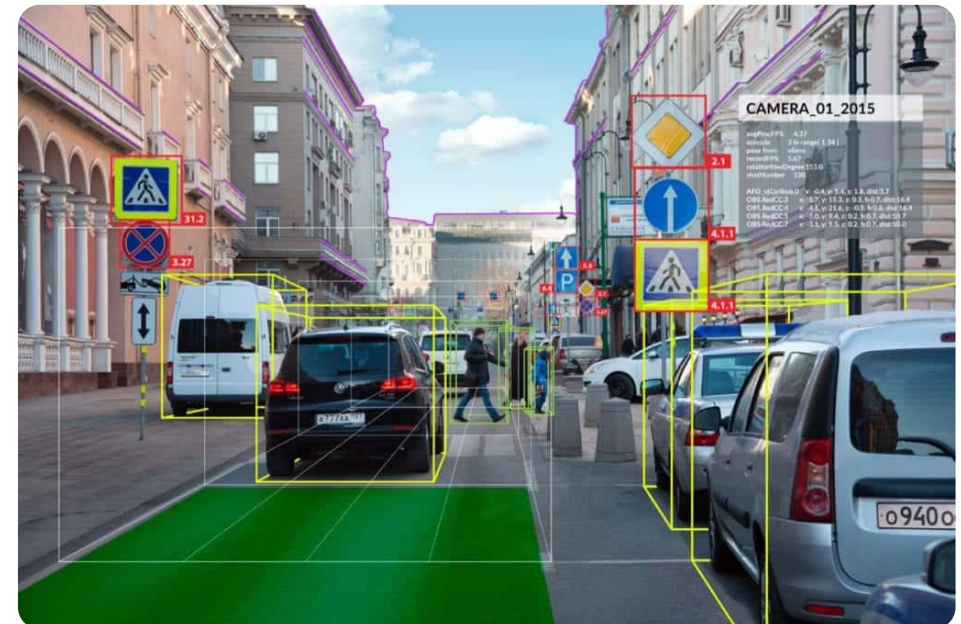
*Does this image contain A, B, C...?*

Terrible Service - I ordered a brand new computer from the web store. I'm furious to find out that the tracking number doesn't work and my order might be lost. Please respond ASAP.

Order Issue

Negative

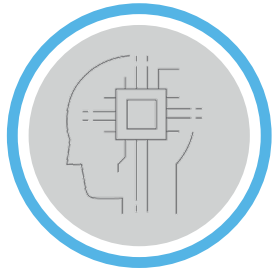
Urgent





# GENERATIVE AI OVERVIEW

# Potential Impact – OpenAI Research



80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of GPTs



19% of workers may see at least 50% of their tasks impacted



About 15% of all worker tasks in the US could be completed significantly faster, at the same level of quality



Influence spans all wage levels, with higher-income jobs potentially facing greater exposure



# Generative AI Application

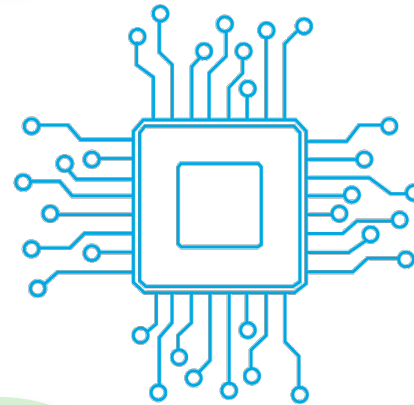
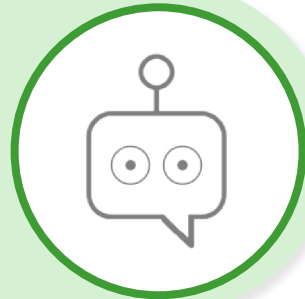
**Text Generator** produces natural language text, ranging from simple sentences to entire articles.



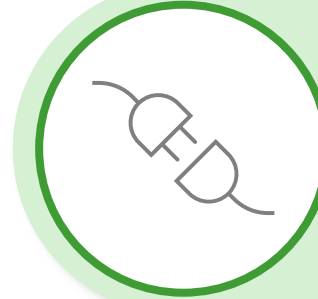
**Image Generator** can generate new images based on input parameters, turning text prompts into images and artworks.



**Chatbot** can engage in conversations with users in a friendly interface, providing relevant responses based on learned knowledge.



**Plugins** (such as those deployed by OpenAI), can be integrated into other software products, allowing for powerful capabilities within applications.



**Summarization** automatically generates a concise and coherent summary of any text or document.



**Code generation** can create and explain functional code in multiple programming languages based on user input.



# What is ChatGPT?

ChatGPT is an AI chatbot powered by an **advanced large language model (LLM)** developed by OpenAI. The model powering the chatbot is called a **Generative Pre-trained Transformer (GPT)**, which is based on architecture known for its ability to effectively process and generate natural language text. It has been specifically fine-tuned for generating human-like responses in conversational contexts.

## Enhancing Client Services



Quick access to information, insights, and perspectives



Accelerated idea generation and research



Enhanced productivity through automation

## Common Use Cases



Writing Agendas



Building Approaches



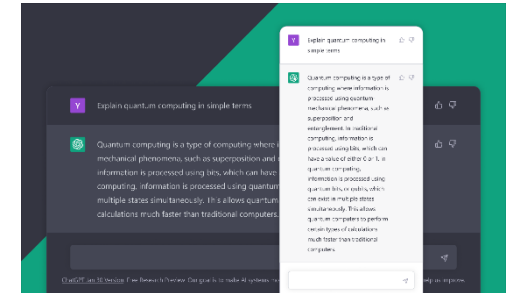
Writing Proposals



High-level Benchmarking

## Key Capabilities

- Answering Questions
- Providing Explanations
- Generating Ideas
- Offering Suggestions



## Risks and Considerations

**Outdated Data:** Current data feeding algorithm is only up to 2021


**Data Variability:** No guarantee on accuracy


**Privacy Concerns:** All information typed into ChatGPT is part of the database (client privacy, sensitivity, IP issues, etc.)

# ChatGPT Examples


The following are two examples of how a law firm can use ChatGPT. Example A demonstrates how AI can quickly draft due diligence criteria. Example B shows how a law firm can draft a contract by refining outputs and asking clarifying questions to make the output more useable.

## Example A: Drafting Due Diligence Criteria


 YO draft a list of due diligence questions for a teachers union with regards to employment law?


 Certainly! Here is the list of due diligence questions for a teachers union with corrected numbering:


1. Employment Contracts:
  - 1.1 Are written employment contracts provided to all teachers?
  - 1.2 Do the contracts comply with applicable employment laws and include essential terms and conditions?
  - 1.3 Are there any variations in contract terms based on job positions or levels of seniority?
2. Compensation and Benefits:
  - 2.1 Are teachers' salaries and wages in line with industry standards and employment regulations?
  - 2.2 Are teachers receiving all legal benefits as vacation pay, overtime pay, ...


 Regenerate response

## Example B: Drafting a Contract


 YO can you give me a list of subheadings and content that I would include in an employment contract?

 YO can you draft a template of an employment contract based on this information in accordance with the Employment Standards Act in Ontario?

 YO thank you. can you add a clause that covers equity-based compensation?

 Certainly! Below is an additional clause covering equity-based compensation that you can include in the employment contract:

1. Equity-Based Compensation:
  - a) Stock Options: Subject to the terms of the Company's Stock Option Plan, you may be eligible to receive stock options as part of your compensation package. The grant, vesting, and exercise of stock options will be governed by the terms of the Stock Option Plan and any applicable agreements between you and the Company.

 Regenerate response

# Intelligent Forecasting



## CHALLENGE

- National organization *needed hourly refreshes of data* while balancing large data volumes and inputs
- *Struggled* with proper *sales forecasting and planning*, held back by *manually intensive processes* focused only on *internal company data*



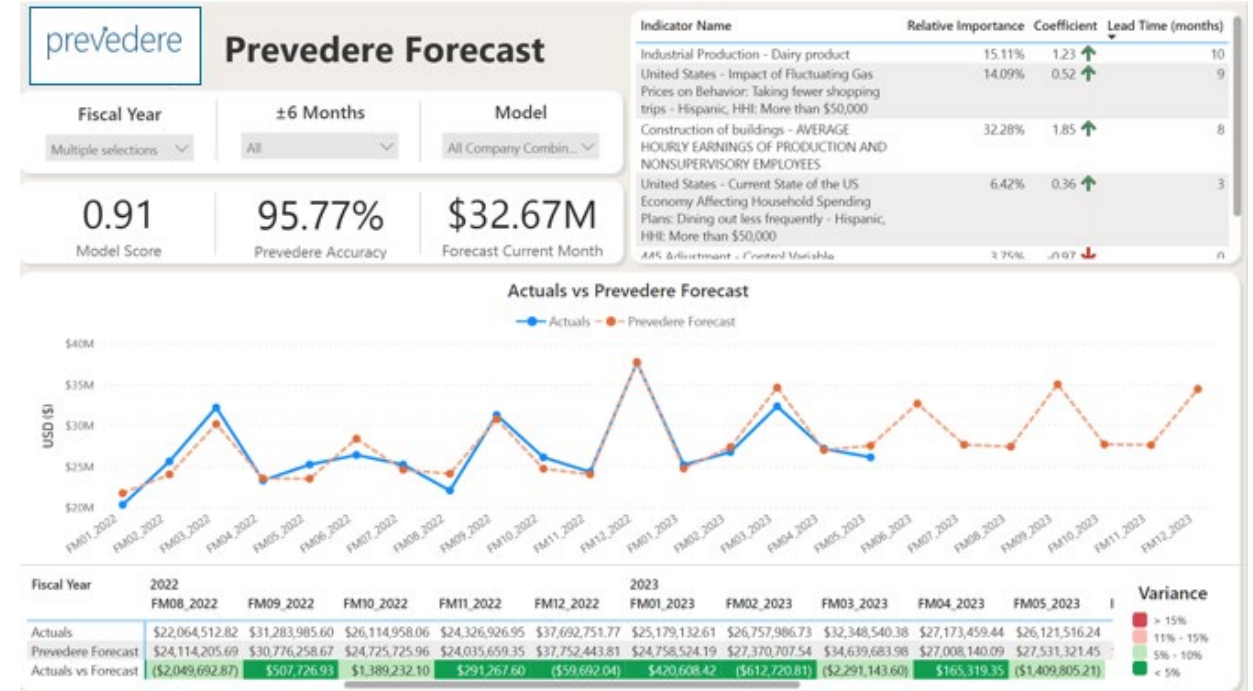
## SOLUTION

- Automated forecasting models covering sales, costs, and commodities, while leveraging millions of external datasets
- Detailed forecasting model with drill-down capability on customers and products at a weekly level



## RESULTS

- *Hourly data refreshes enabled, reducing time to make decisions*
- *10% improvement in forecast accuracy*, resulting in ~\$27M of sales protected through boosted planning processes
- *Macroeconomic leading indicators* greatly enhance forecasting capabilities



# Hyper Personalized Campaign Outreach – Generative AI



## CHALLENGE

- Struggle to generate **high-quality** content while maintain a **consistent voice** across campaigns
- Manually creating campaign outreach is **time-consuming**



## SOLUTION

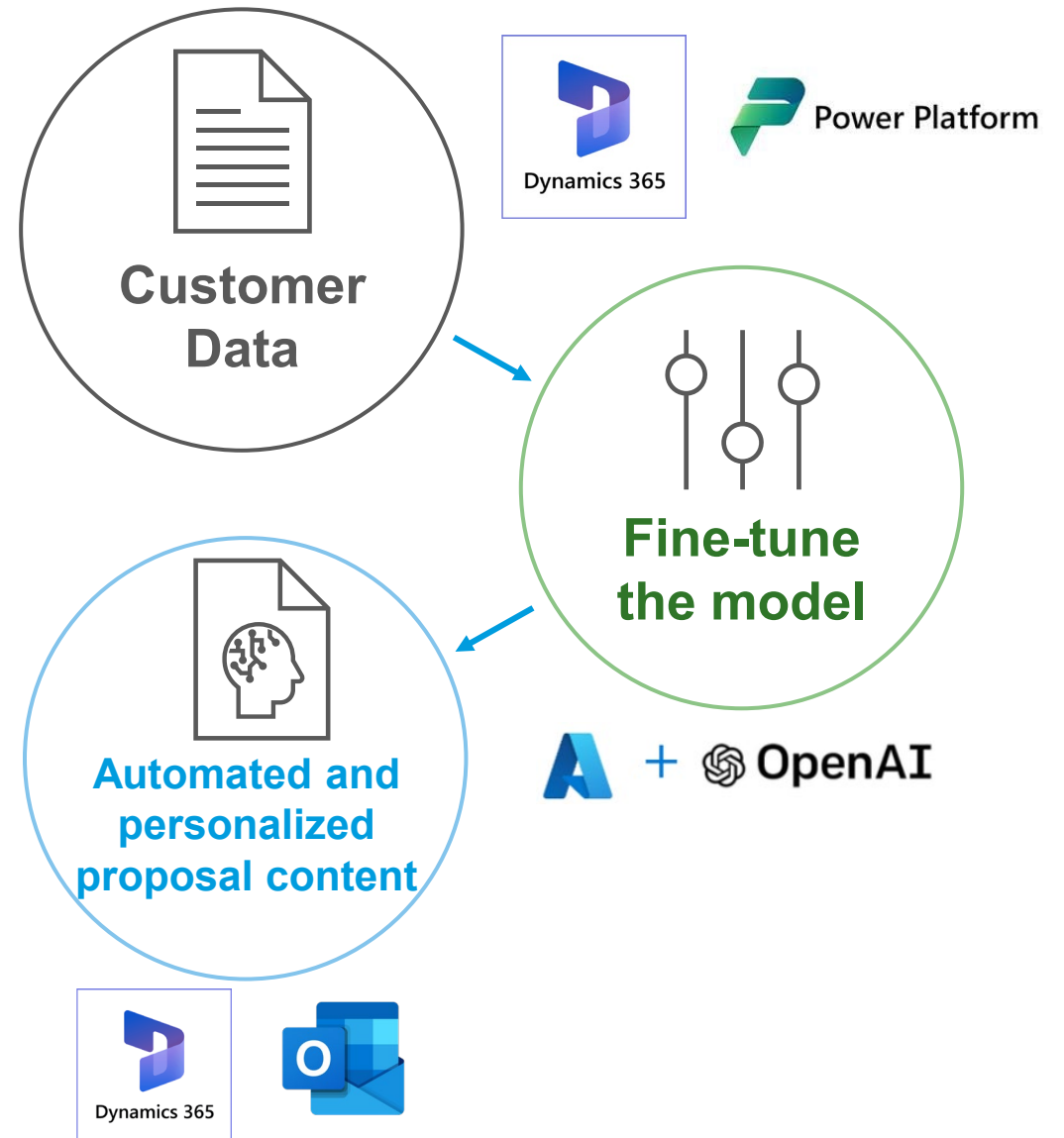
- Leverage generative AI to generate **new material** based on previous successful campaign outreach and specific customer criteria
- Capable of analyzing information and **accurately** formulating a **high-quality** campaign message



## RESULTS

- Increased **efficiency** in the content generation (writing) process
- Improved **quality** of content
- **Consistent** messaging and **voice** across proposals leads to **increased success rates**
- **Reduction** in time spent creating content, allowing for **more time** to focus on other aspects of the proposal

## Workflow – Proposal Content Generator





## CHALLENGE

- The client was experiencing **high customer churn**
- Did not have a strong understanding of which customers were churning
- Client wanted to take ownership of the machine learning process and **empower** the “**citizen data scientist**” across the organization



## SOLUTION

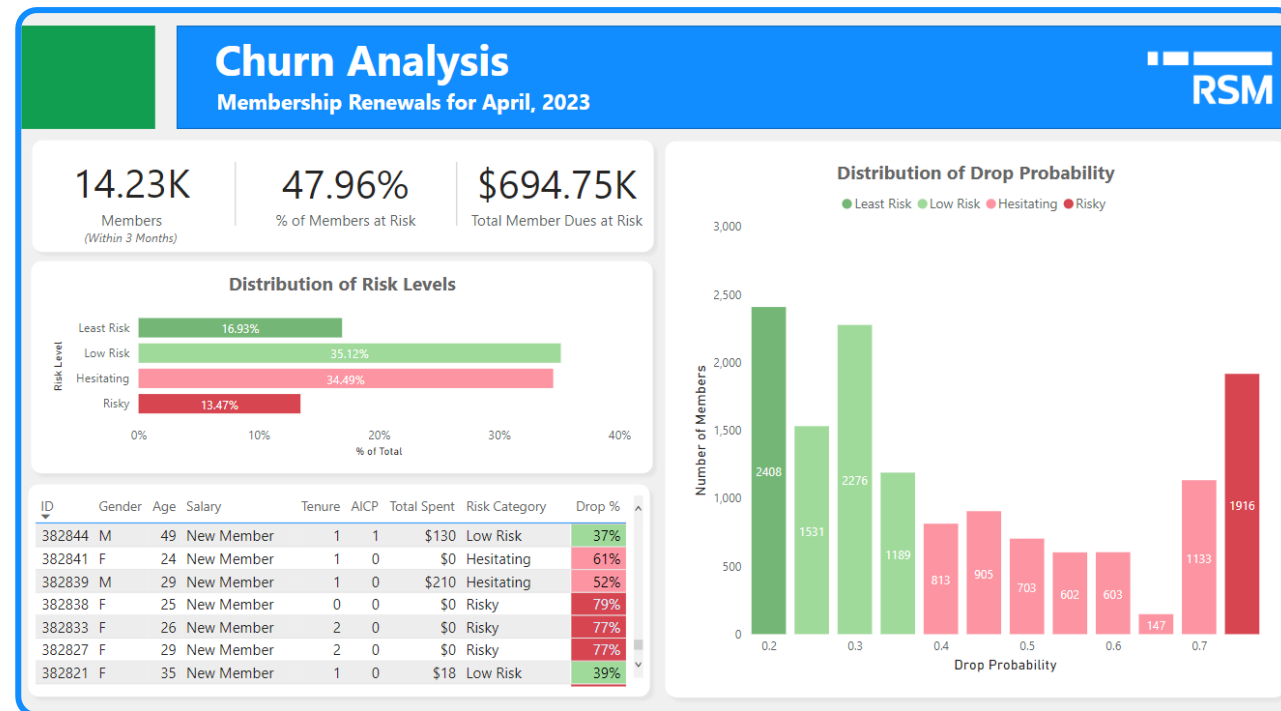
- The RSM team performed **Exploratory Data Analysis (EDA)** to find patterns, trends, and correlations in customer demographics and historic member interactions
- Developed a model with **+85% accuracy** and **deployed to production**



## RESULTS

- The client is now able to **proactively identify customers** at risk of churning and can **plan intervention activities** accordingly
- EDA activities provide **insight and documentation** into **model creation** and **bias observed** (if any)
- **Increased customer retention** and **revenues**

## Churn Analysis Dashboard



Dashboard to visualize ML model output and facilitate decision making

# Lead Scoring



## CHALLENGE

- Looking to effectively **generate growth** towards revenue goals and **improve win rates**



## SOLUTION

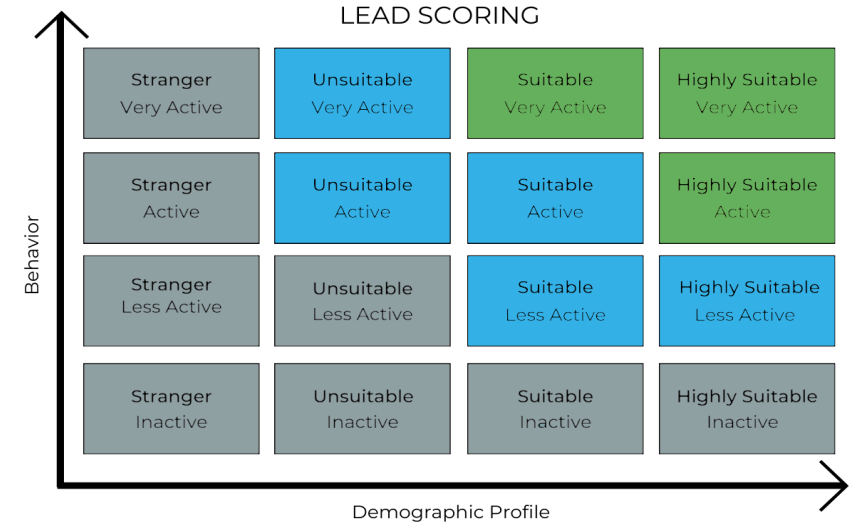
- Perform Lead Scoring** with a regression model to assess the probability to win an opportunity based on Encounter/Interaction timelines and profiles, additional demographic data, whether the client's proposal fall in line with past solutions
  - To enhance lead scoring: Churn Analysis could be conducted as an additional experiment to understand whether a client would stay after an initial service



## RESULTS

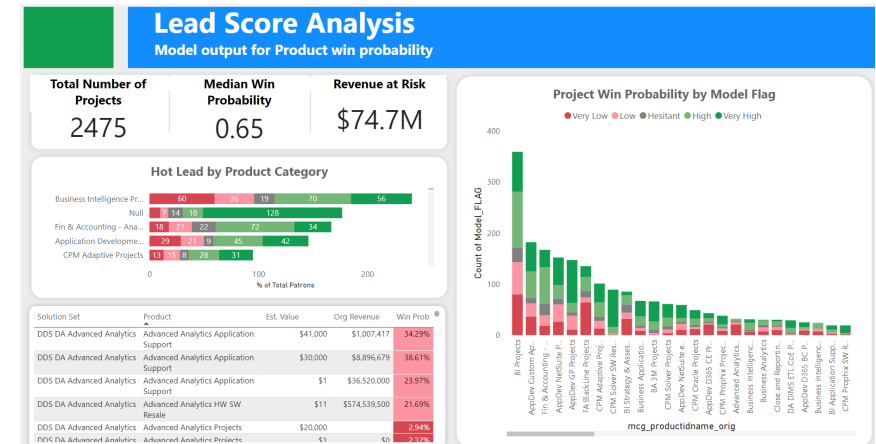
- Increase lead progression and conversion rates** through a consistent and quantifiable model that **improves yields and win rates**
- Improve clarity and consistency** in lead quality in all stages
- Increased customer retention and revenues**

## Lead Scoring Variable Relationship



Dashboard to visualize Lead Scoring inputs to facilitate decision making

## Lead Scoring Analysis Dashboard

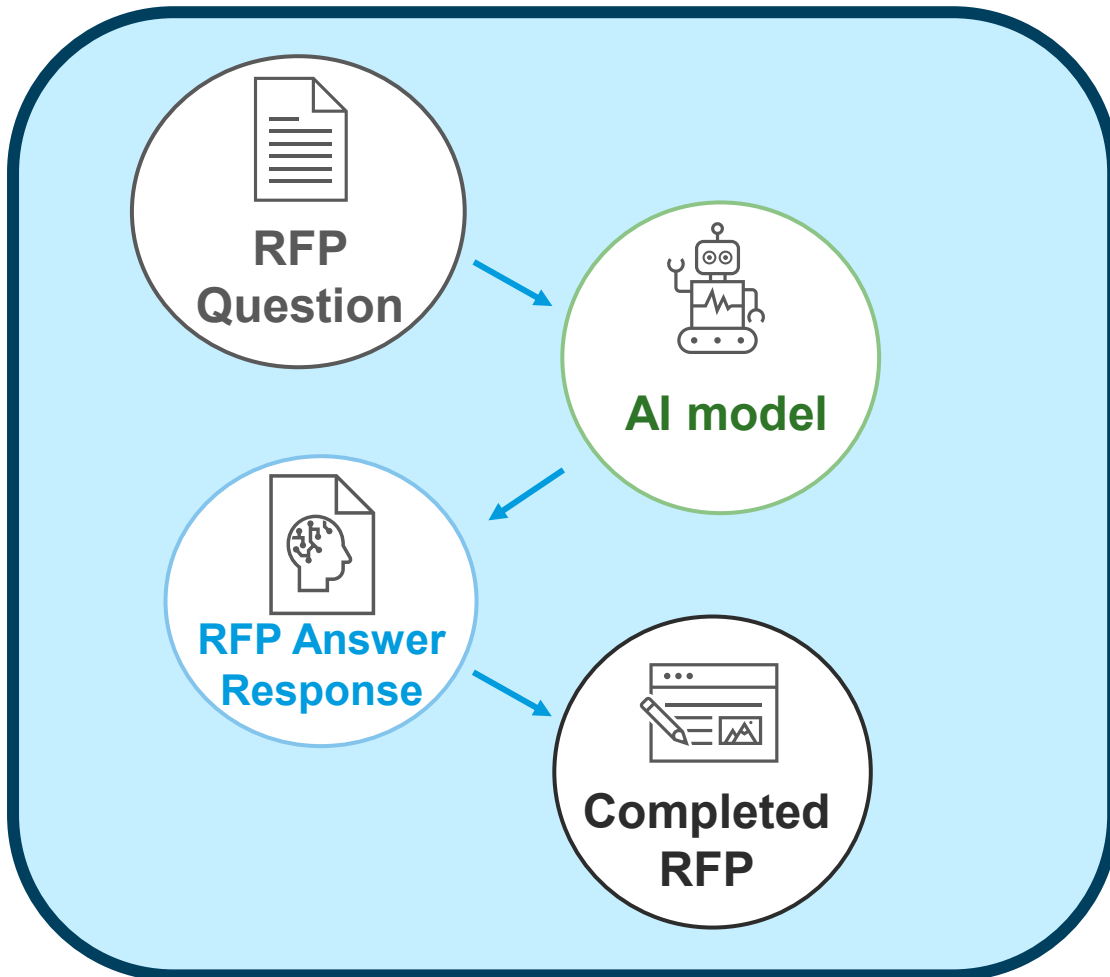


Dashboard to visualize Lead Scoring outputs to facilitate decision making

\*Subject to change

# Request for Proposal (RFP) Response App – Generative AI

## Workflow – RFP Response App



## CHALLENGE

- **High volume** of RFP's received are **not able to be responded to** in a proper manner-
- Completing an RFP is a **manual** and **time-consuming process**
- Technical team members are not skilled RFP narrative writers



## SOLUTION

- Utilize generative AI to generate **responses to RFP questions** with **built-in governance controls**
- Leverage historical question responses and user context to develop **high quality answers**
- Friendly user interface to facilitate a **positive user experience**



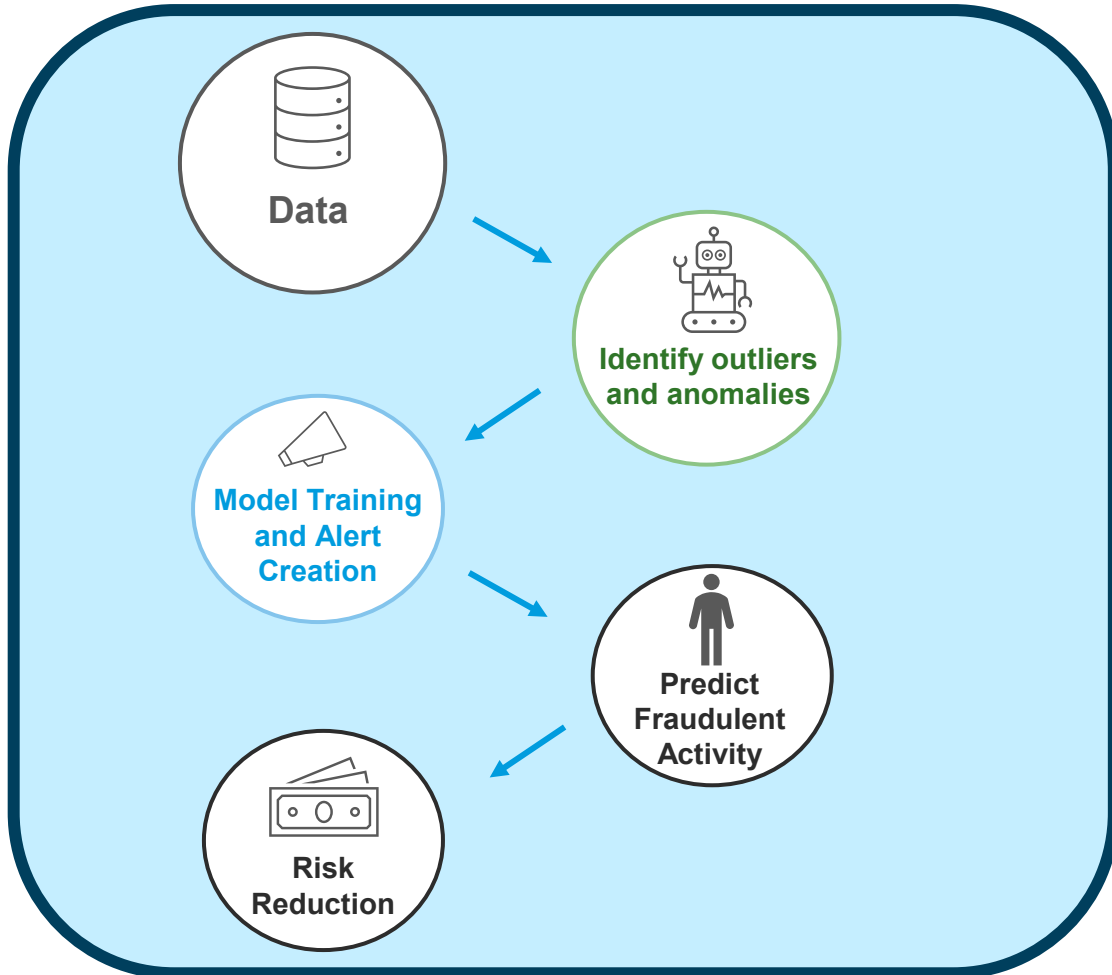
## RESULTS

- **Higher RFPs response rate**
- **15-25+ hours saved per RFP**
- Increased **efficiency** in the RFP writing and response process
- **Higher volume of services** able to be proposed on and completed



# Decreasing Risk through Fraud Detection and Prevention

## Workflow – Fraud Detection



## CHALLENGE

- Fraudulent and improper activities such as fraud, theft, and anomalous transactions create risks for the business



## SOLUTION

- Anomaly and outlier detection analysis
- Model training and alert creation to flag risky transactions



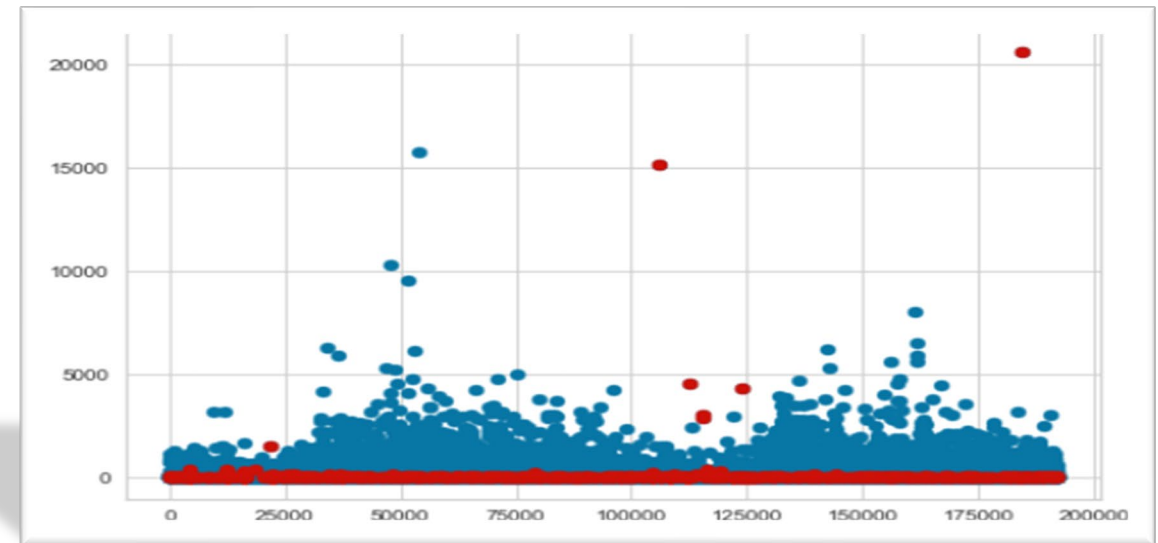
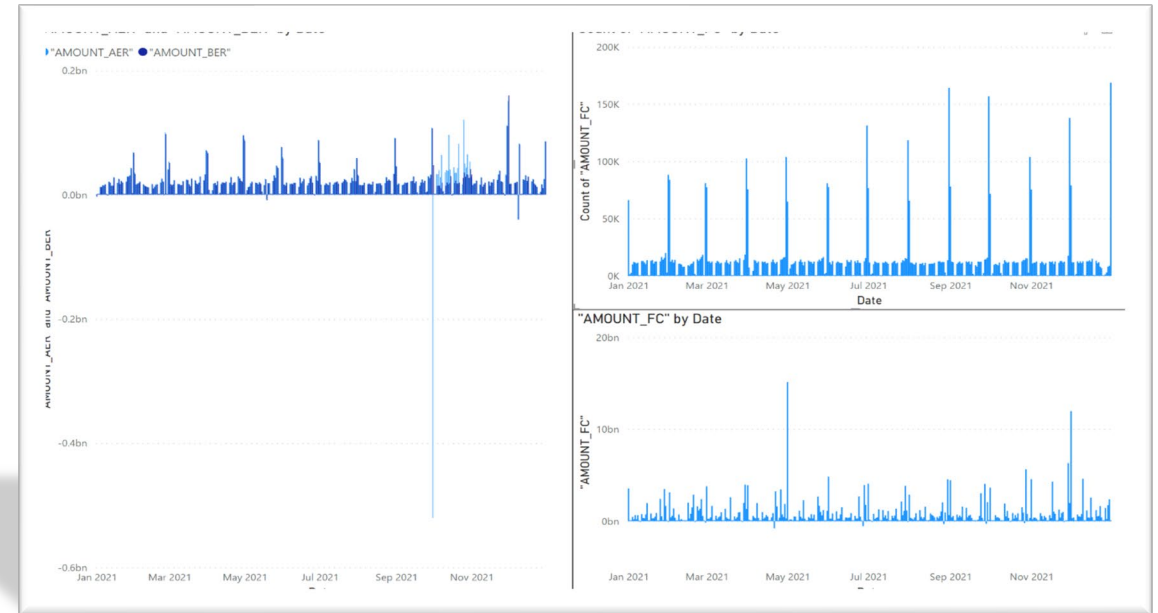
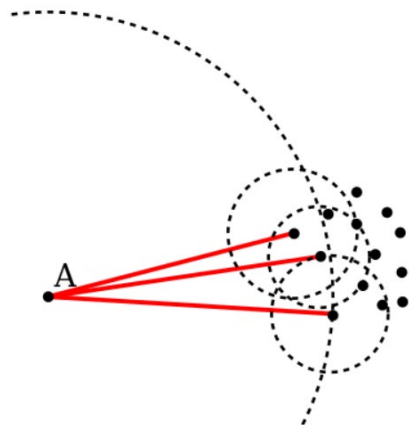
## RESULTS

- Proactively identify and mitigate risks, protect customer assets, and maintain trust in the institution's services

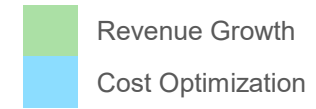
# Outlier/Anomaly Detection in Finance

Local outlier factor (LOF) allows to define outliers by doing density-based scoring. Four aspects contribute to the algorithm:

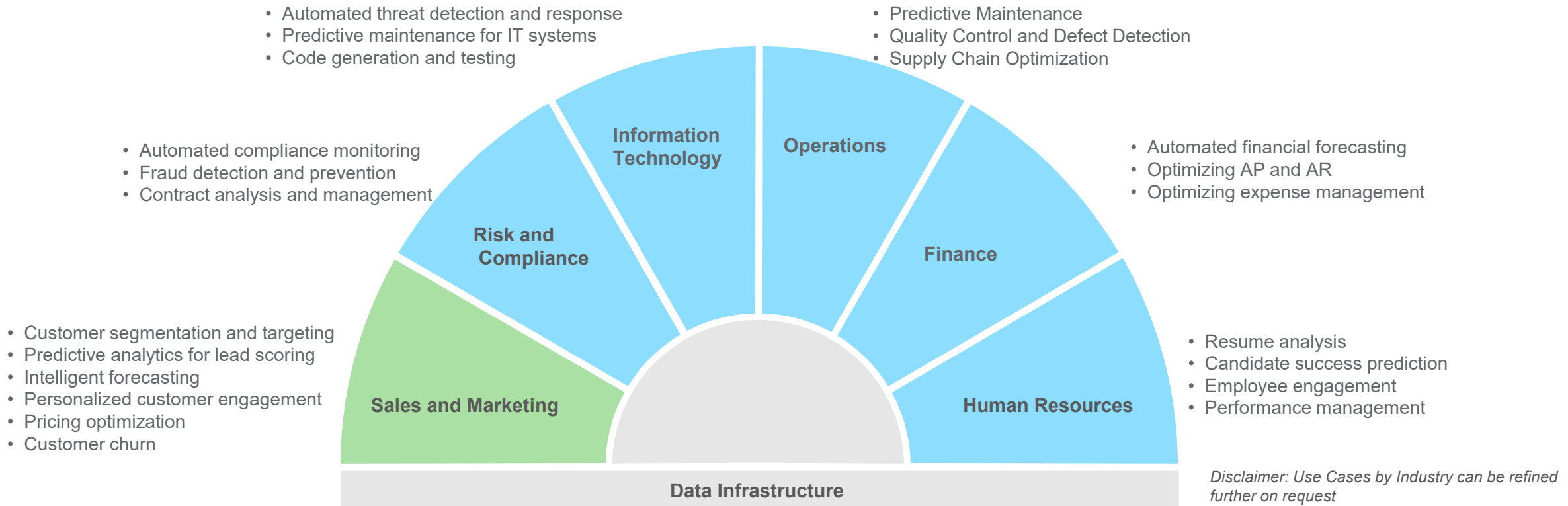
- K-Distance and K-Neighbors
- Reachability Distance
- Local Reachability Density
- Local Outlier Factor Calculation



# EBIDTA Levers Improved by Data and AI



This diagram identifies common Data and AI use cases aligned to key functional areas within an organization. It is followed by the impact these use cases have on EBITDA



Industry Specialization									
Technology, Media & Telecom	Industrials	Business & Professional Services	Consumer Products	Real Estate & Construction	Financial Services	Healthcare	Life Sciences	Non-Profit Organization	Government

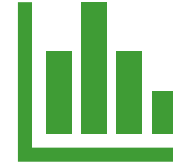
# Be Curious!



Outcomes



Dimensions (“By  
Analysis”)



Correlations



Explanatory  
Variables



Research Agenda



**Type I:** mundane, redundant tasks

**Examples:** data entry, file organization, formatting documents, online research

**Solved by:** automation, generative AI



**Type II:** repetitive tasks that take some focus

**Examples:** copy/paste of data, monthly reconciliations, reviewing documents

**Solved by:** automation, generative AI



**Type III:** requires human thought and focus, would take time hands on keyboard

**Examples:** writing content, web scraping, responding to messages, emails (text generation), coding

**Solved by:** Generative AI

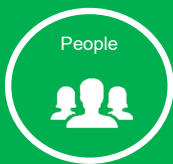
# Q&A

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## FOCUS INDUSTRIES

Retail	Food & Beverage	Life Science
Manufacturing	Distribution	Hospitality
Consumer Products	Industrial Products	
Nonprofits	Financial Services	



# RSM's Advanced Analytics Team

Organizations today face a myriad of complex business challenges — leveraging technology, managing risk, and effectively executing their goals within financial and operational constraints.

To help address these challenges, the Advanced Analytics team at RSM offers the ability for your organization to start using data as the strategic asset that it is. It can transform the mountains of raw data within your organization into actionable information and makes previously unattainable insights available regarding financial health, operational efficiency and who your buyers really are.



### Deliverable Summary

<p><b>Current-State Analysis Report</b> Summary of current technology, sources, reporting landscape</p>	<p><b>Future-State Vision Document</b> Desired reporting &amp; analytics capabilities</p>	<p><b>Phased Implementation Roadmap</b> Capabilities enabled, major activities, required resources</p>	<p><b>Findings &amp; Recommendations</b> Support future state vision</p>
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### Notable Service Offerings:

- Advanced Analytics Planning and Design
- Exploratory Data Analysis
- ML/AI Forecasting
- Lead Scoring
- Customer Segmentation/Clustering
- Customer Churn prediction
- IoT Analytics

<p><b>1st</b> First Choice Advisor to Middle Market Companies</p>	<p><b>5th</b> Largest audit, tax and consulting firm in US</p>	<p><b>90+</b> Data Consultants</p>	<p><b>141%</b> DDS Team Growth in Last 3 Years</p>
		<p><b>5,800+</b> Consulting Clients</p>	

### Example Adv. Analytics Benefits

- Extract Key Influential Variables
- Pattern and Trend Detection
- Summarize / Detect Characteristics of Data
- Validate assumptions with statistics and advanced methods
- Detect Outliers and Anomalies
- Determine Optimal Operating Conditions
- Promotes consistent and common understanding of your data

### Gold Microsoft Partner

