Types of Analytics-
Data Analytics

23MCT305 - Data Analytics in Automation System

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What is Data Analytics?

Process of examining datasets to draw conclusions about information

Why is it Important?

- ✓ Better decision-making

- ✓ Identify trends and patterns

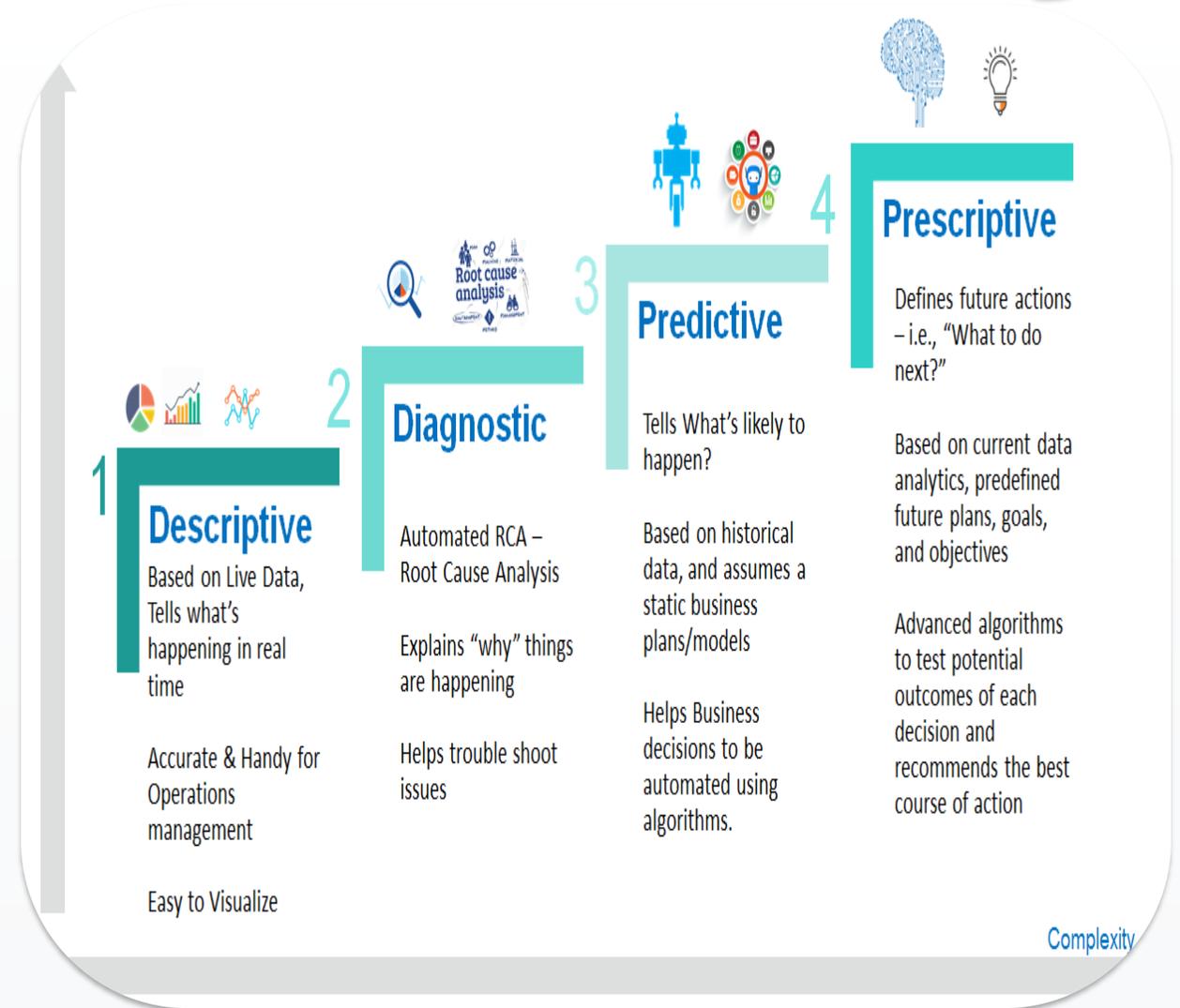- ✓ Improve operational efficiency

- ✓ Gain competitive advantage

Types of Analytics Overview

Four Main Types

1 **Descriptive**

What happened?

2 **Diagnostic**

Why did it happen?

3 **Predictive**

What will happen?

4 **Prescriptive**

What should we do?

Progression from past to future with increasing complexity and value

1 Descriptive

Based on Live Data, Tells what's happening in real time

Accurate & Handy for Operations management

Easy to Visualize

2 Diagnostic

Automated RCA – Root Cause Analysis

Explains "why" things are happening

Helps trouble shoot issues

3 Predictive

Tells What's likely to happen?

Based on historical data, and assumes a static business plans/models

Helps Business decisions to be automated using algorithms.

4 Prescriptive

Defines future actions – i.e., "What to do next?"

Based on current data analytics, predefined future plans, goals, and objectives

Advanced algorithms to test potential outcomes of each decision and recommends the best course of action

Complexity

Descriptive Analytics

What happened in the past?

Analysis of historical data to understand past performance

Key Features

Aggregation   Data Mining   Visualization

Examples

📊 Sales reports

👥 Customer demographics

🏛 Financial statements

Data Analytics Dashboard Example

Date: January 22, 2026 **Topic:** Types of Analytics-Data Analytics **Course:** 23MCT305 - Data Analytics in Automation System **Faculty:** N. KARTHI, AP/MCT

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Why did it happen?

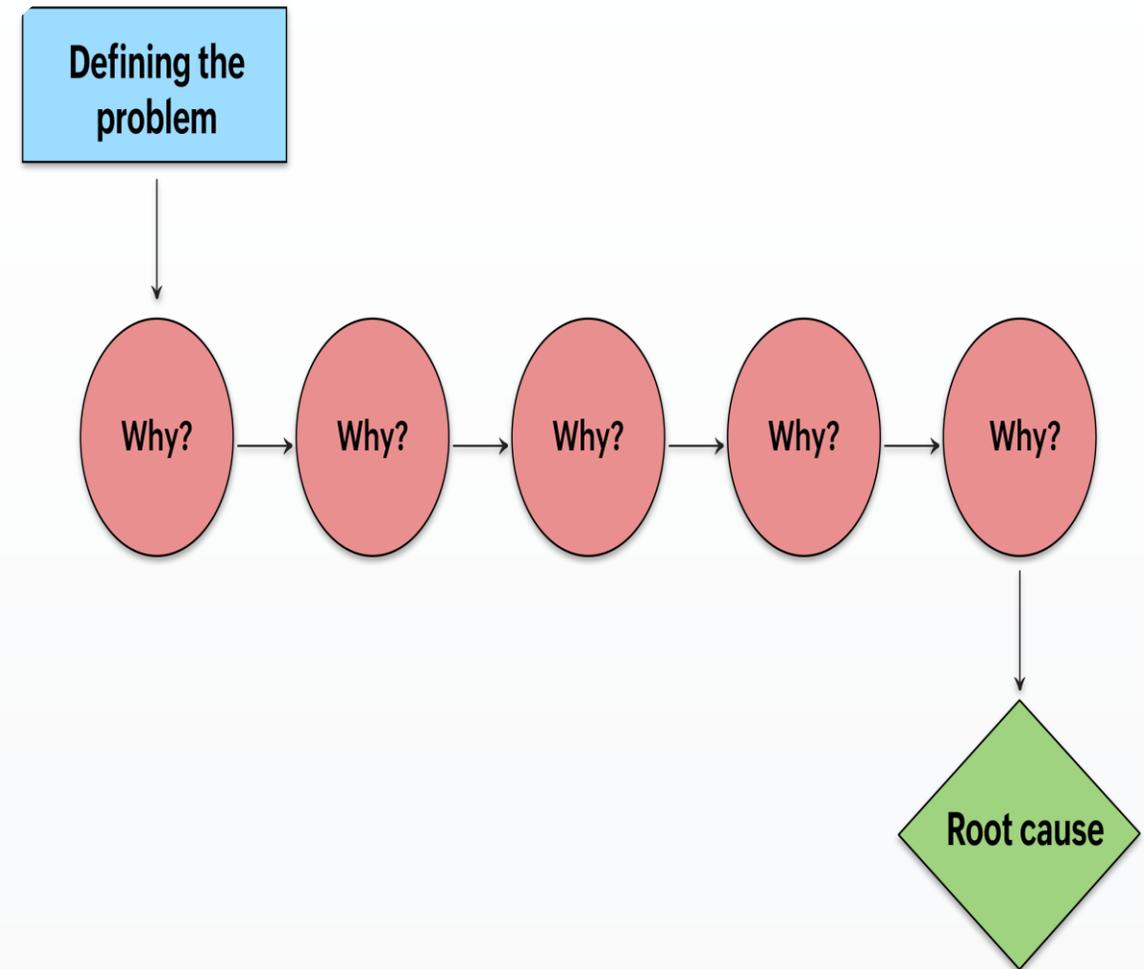Identifying root causes and factors influencing outcomes

Key Features

Drill-down   Correlation   Pattern Recognition

Examples

🔍 Root cause analysis

🔍 Troubleshooting

🐛 Identifying failure points

Defining the problem

Why? → Why? → Why? → Why? → Why?

Root cause

What will happen in the future?

Using statistical models and machine learning to predict future outcomes
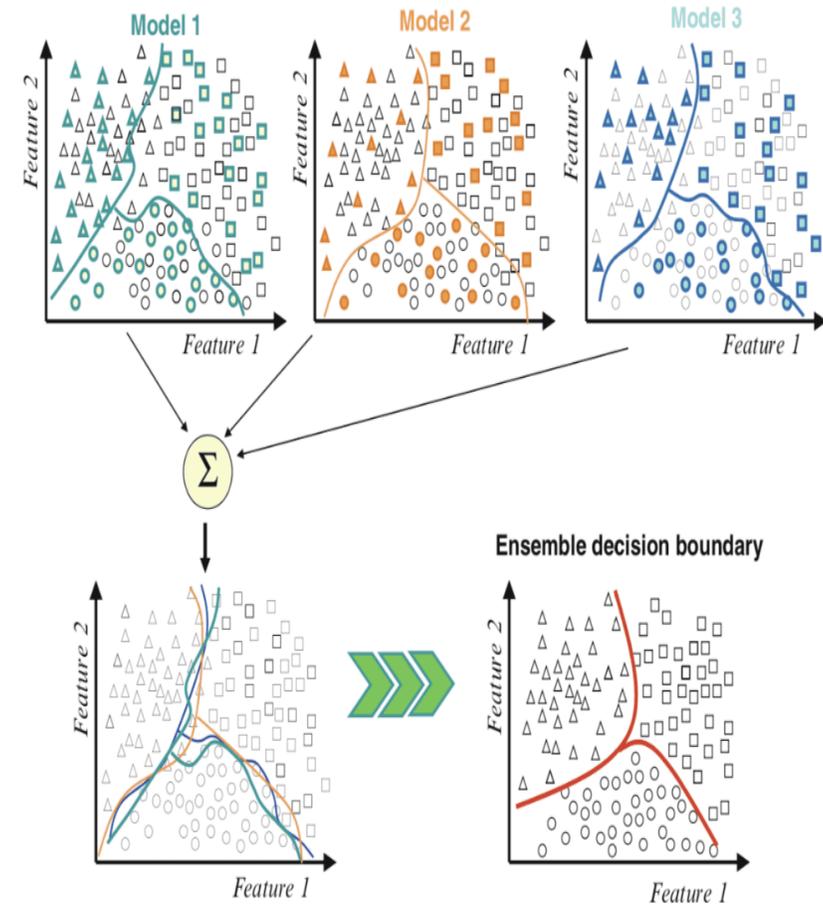
Key Features

Forecasting   Trend Analysis   Predictive Modeling

Examples

📈 Demand prediction

⚠️ Risk assessment

🛒 Customer churn prediction

Source: Ensemble Machine Learning

Prescriptive Analytics

What should we do about it?

Providing recommendations and optimal decisions based on predictive insights

Key Features

Optimization

Decision Models

Scenario Analysis

Examples

Resource allocation

Supply chain optimization

Personalized marketing

Machine learning or AutoML

Dataset
- Structured Data
- Images & Video
- Language

Train — Serve — Deploy

Specific Recommend Actions

Automated Decisions

www.snsgroups.com

Interconnected Analytics Framework

Descriptive

What happened? Past data analysis

Diagnostic

Why did it happen? Root causes

Predictive

What will happen? Future forecasts

Prescriptive

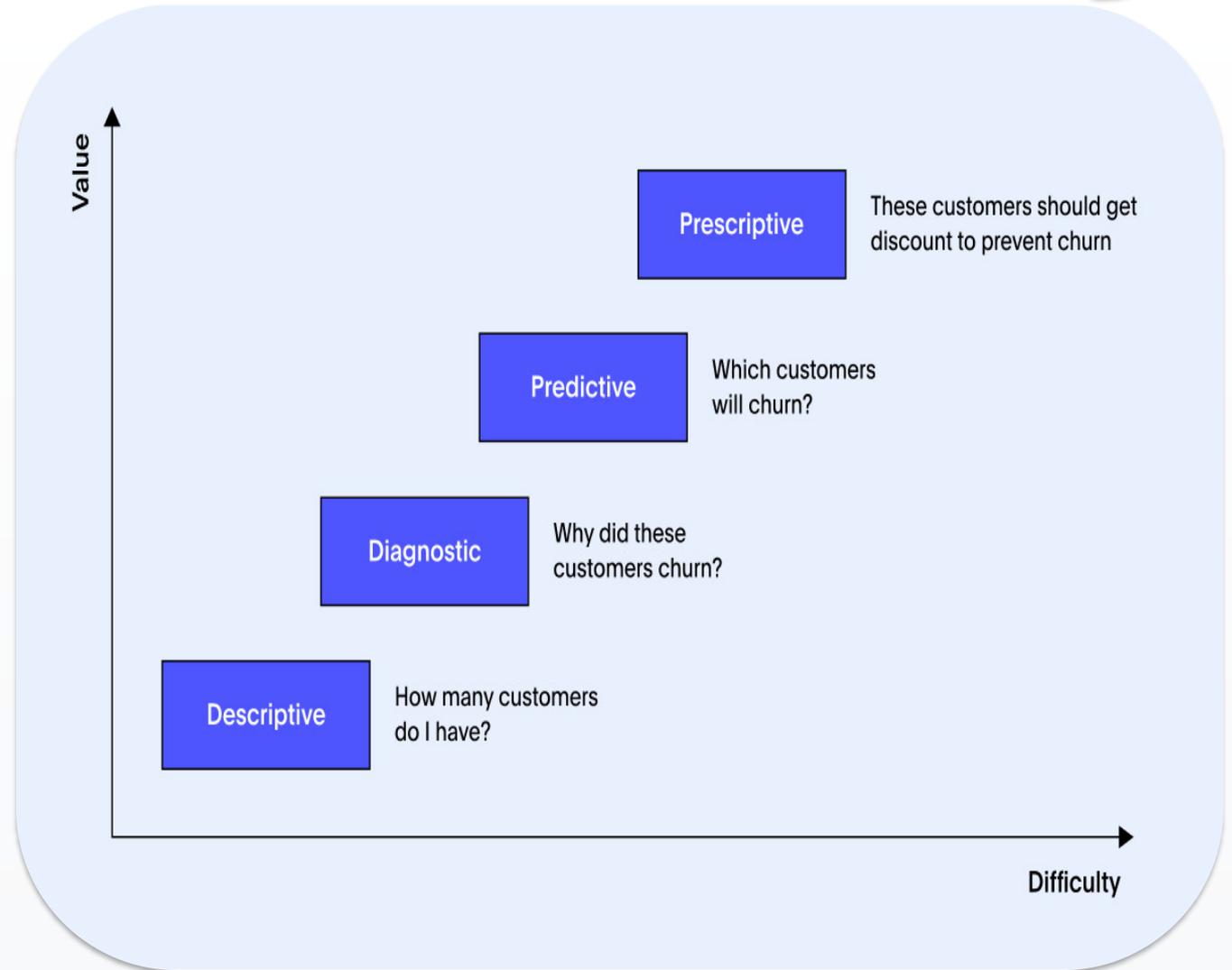What should we do? Recommendations

Progressive Complexity & Value

Key Takeaways

1 **Descriptive**

Historical analysis, past events

2 **Diagnostic**

Root causes, pattern understanding

3 **Predictive**

Future forecasting, probability

4 **Prescriptive**

Decision support, optimization

📈 Progressive Complexity & Business Value

Value / Difficulty chart:

- **Prescriptive** — These customers should get discount to prevent churn
- **Predictive** — Which customers will churn?
- **Diagnostic** — Why did these customers churn?
- **Descriptive** — How many customers do I have?

Conclusion and Summary

Key Takeaways

✓ Understanding all four types enables data-driven decisions

✓ Progressive complexity and business value

✓ Real-world applications across industries

Applications

Healthcare | Finance | Retail | Manufacturing

📈 **Future Outlook**

AI and machine learning integration advancing analytics capabilities

DASCA
DATA SCIENCE COUNCIL OF AMERICA

AN EXCELLENT DATA STORY IS MADE UP OF THREE PARTS:

Data Analysis | Data Visualization | Narrative