DSS and BI

CS 459 Business Intelligence

Decision Support System

DSS

Decision Support, BI, Analytics

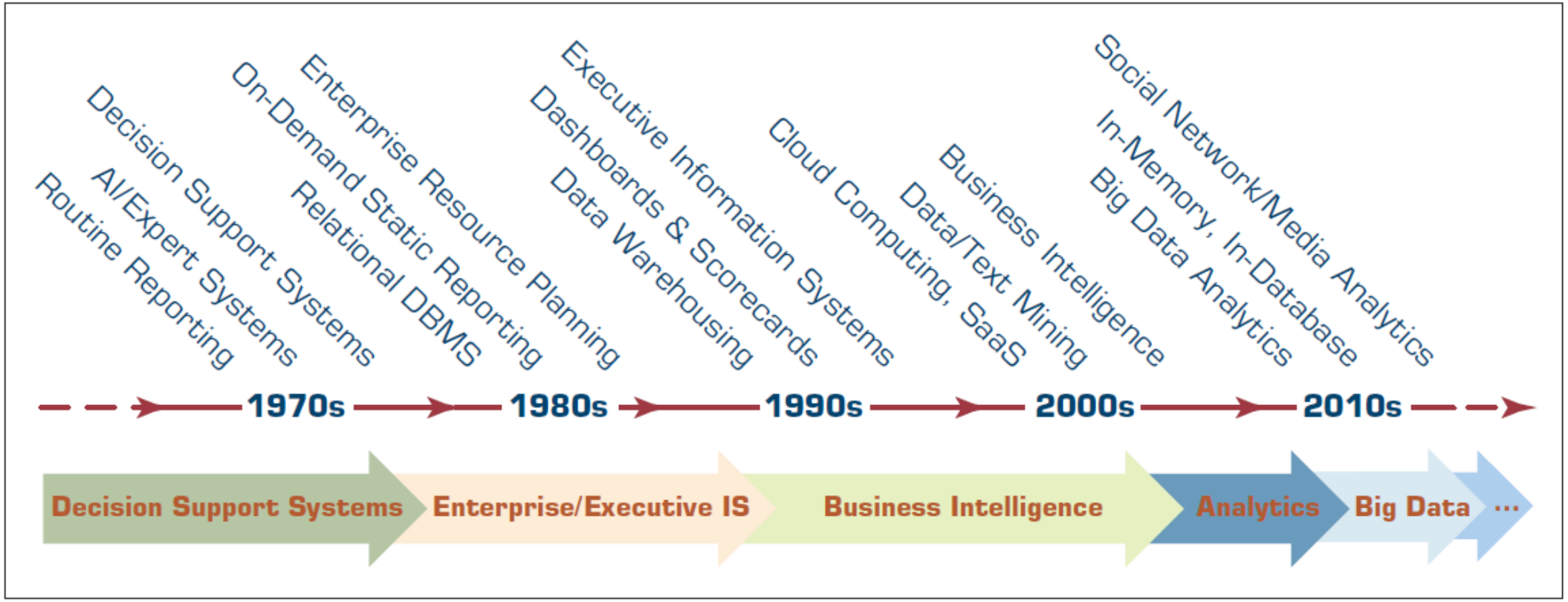


FIGURE 1.8 Evolution of Decision Support, Business Intelligence, and Analytics.

Decision Support Systems (DSS) (Early 1970s)

- **Scott-Morton's Definition:**
  "Interactive computer-based systems, which help decision makers utilize data and models to solve unstructured problems."

- **Keen and Scott-Morton (1978) Definition**:
  "Decision support systems couple the *intellectual resources of individuals with the capabilities of the computer to improve the quality of decisions*. It is a computer-based support system for management decision makers who deal with semi-structured problems.

Principles of Decision Support Systems (DSS)

Data Integration:

- Collects data from multiple sources (structured and unstructured).
- Enables a unified view for analysis and reporting.
- **Example:** Combining sales, customer, and inventory data for better insights.

Principles of Decision Support Systems (DSS)

Analytical Models

- Uses algorithms and statistical techniques for predictions and recommendations.
- Facilitates scenario analysis ("What if?" models).
- **Example:** Predicting sales trends based on seasonal data.

Principles of Decision Support Systems (DSS)

User Interface

- Provides an intuitive interface for non-technical users to interact with data.
- Helps visualize complex information through dashboards, charts, or scorecards.
- **Example:** Dashboards showing key performance indicators (KPIs) at a glance.

Principles of Decision Support Systems (DSS)

Decision-Making Support

- Offers actionable insights to aid decision-making.
- Balances structured data (e.g., reports) and unstructured data (e.g., customer feedback).
- **Example:** Suggesting inventory restocking based on demand forecasts.

DSS Concepts in Action Today

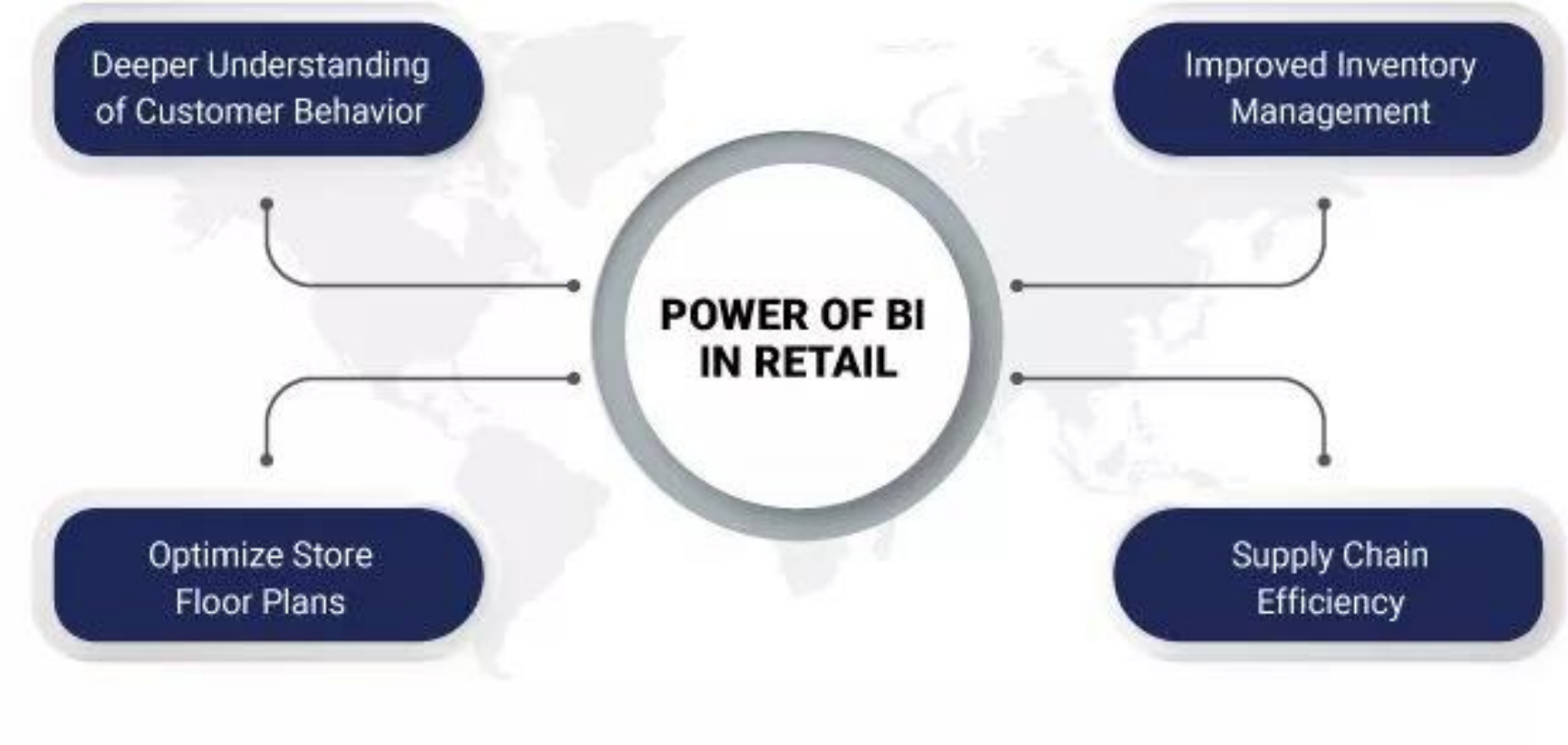
- **Key Features of DSS:**
  - Data Integration: Consolidating structured and unstructured data.
  - Analytical Models: Using AI/ML for predictions.
  - User Interaction: Dashboards and decision-friendly interfaces.

- *"An online store recommends products based on your past behavior. What drives this capability?"*

Let’s see how BI in action is built on these DSS foundations!

BI in the Industry

Retail Industry



Lets break the terms

Retail Industry

- What is Retail?

- *Retail is the process of selling goods or services directly to end consumers for their personal use. It represents the final stage in the distribution process where businesses interact with the ultimate customer.*

Types of Retail We Use Daily

1. Traditional Retail

- Grocery stores (Imtiaz, Naheed, Al-Fatah)
- Shopping malls (Lucky One, Ocean Mall)
- Local markets (kiryana stores)

2. Modern Retail

- E-commerce (Daraz, AliExpress)
- Food delivery (Foodpanda)
- Digital services (Netflix, Spotify)

Behind Every Purchase...

Key Elements:

Products (What you buy)

Price (How much it costs)

Place (Where you buy it)

Promotion (How you learn about it)

Lets break the terms

Customer Behavior

"Like a store's crystal ball!"

- What customers love
- When they shop
- How they spend

It allows businesses to anticipate and predict customer actions.

Lets break the terms

Inventory Management

"Never run out of ice cream again!"

- Right stuff
- Right time
- Right amount

Lets break the terms

Store Layout

"Playing Tetris with store shelves!"

- Smart spacing
- Easy shopping
- Happy customers

Lets break the terms

Supply Chain

"Like tracking your pizza delivery, but bigger!"

- Product journey
- On-time delivery
- No empty shelves

Activity Time

Gear up!

Let's Play: Spot the BI!
Uncover BI Features in Action

- Pull out your phones 
- Visit 2 online stores (of different types)
  (e.g., Amazon, Daraz, Foodpanda, Imtiaz, Naheed, or any other ecommerce site etc.)
- Form groups of 3 or 4
- Graded

1. Find these BI elements

- Personalized Recommendations.
- Search Filters and Sorting Options.
- Product Dashboards (reviews, ratings).
- Dynamic Pricing and Promotions.
- Inventory Indicators (e.g., “Only 2 left!”).

2. Compare & Think

- Traditional vs Digital
- Imtiaz/Naheed/Carrefour layouts
- Kiryana store differences
- Seasonal changes
- Customer patterns

3. Group Discussion

Answer Together:

- Why these recommendations?
- How do they know when to notify?
- What data is collected?
- Why do prices change?

Connecting BI Features to DSS Concepts

- Which BI features did you spot?
- How do these features support users' and businesses' decisions?

Trace these BI features back to DSS principles

- Data Integration:
  - Which BI features rely on gathering data from multiple sources?
- Analytical Models:
  - How do features like product recommendations showcase predictions?
- User Interface:
  - Which features simplify data visualization for decision-making?

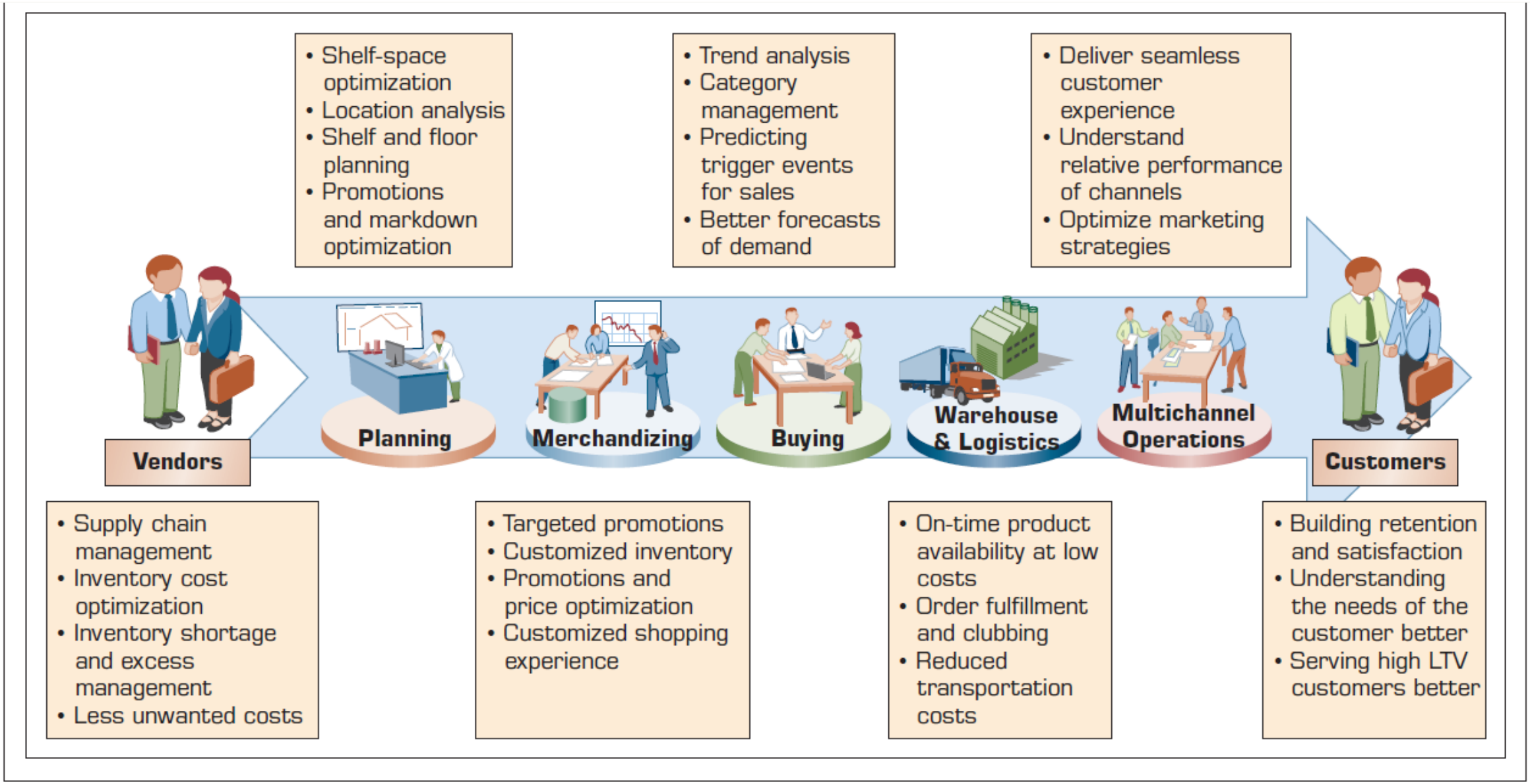


FIGURE 1.12 Example of Analytics Applications in a Retail Value Chain. Contributed by Abhishek Rathi, CEO, vCreaTek.com

Why DSS Still Matters in BI Today

- DSS provides the conceptual backbone for BI systems.
- Modern BI combines DSS principles with advanced analytics (AI, ML) and real-time data.
- BI is about empowering decisions at all levels—individual, organizational, and strategic.

Next time you shop, think about the data and decisions behind what you see!