MEASI
Institute *of* Management

MARKETING ANAYTICS

534ECO

COMPILED BY:

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Institute *of* Management

VISION & MISSION STATEMENTS

Vision: To be an oasis of knowledge to the seeker, to nurture one's creativity and research acumen, and to instil a unique blend of leadership, innovative spirit and empathy in response to the ever-evolving business ecosystem.

Mission

- Provide a pedagogy that blends academic rigor and experiential learning. (PEO1)
- Inculcate an entrepreneurial mindset through curated activities. (PEO2)
- Establish a conducive environment for research. (PEO3)
- Foster a culture of innovation and collaboration to progress in a dynamic business landscape. (PEO2, PEO4)
- Promote humanistic values to produce socially responsible leaders. (PEO5)

Program Educational Objectives (PEOs)

PEO 1 – Employability:
To develop students with industry specific knowledge & skills to meet the industry requirements and also join public sector undertaking through competitive examinations.

PEO 2 - Entrepreneur:
To create effective business service owners, with a growth mindset by enhancing their critical thinking, problem solving and decision-making skills.

PEO3 – Research and Development:
To instil and grow a mindset that focusses efforts towards inculcating and encouraging the students in the field research and development.

PEO 4 – Contribution to Business World:
To produce ethical and innovative business professionals to enhance growth of the business world.

PEO 5 – Contribution to the Society:
To work and contribute towards holistic development of society by producing competent MBA professionals.

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LIST OF PROGRAM OUTCOMES

Regulation	2023-2024
Batch	2023-2025
PO1	**Problem Solving Skill:** Application of tools and techniques relevant to management theories and practices in analysing & solving business problems
PO2	**Decision Making Skill:** Fostering analytical and critical thinking abilities for data-based decision making
PO3	**Ethical Value:** Ability to develop value-based leadership attributes.
PO4	**Communication Skill:** Ability to understand, analyse and effectively communicate global, economic, legal and ethical aspects of business
PO5	**Individual and Team Leadership Skill:** Ability to be self-motivated in leading and driving a team towards achievement of organisational goals and contributing effectively to establish industrial harmony
PO6	**Employability Skill:** Foster and enhance employability skills through relevant industry subject knowledge
PO7	**Entrepreneurial Skill:** Equipped with skills and competencies to become a global entrepreneur
PO8	**Contribution to Society:** Strive towards becoming a global influencer and motivating future generations towards building a legacy that contributes to overall growth of humankind

Program Specific Outcomes (PSO)

PSO1: Finance: The students should demonstrate proficiency in analysing financial statements, evaluating investment opportunities and making financial decision to maximize shareholders' value.

PSO2: Marketing: Students should be able to create a comprehensive marketing plan that integrates effective communication strategies, leading to customer success and the accomplishment of marketing objectives.

PSO3: Logistics: Students will acquire knowledge of inventory management for domestic and global supply chains, thereby developing problem solving skills in logistics to optimise supply chain efficiency

PSO4: Business Analytics: The students should be able to analyse data, communicate insights, take data-driven decisions and solve business problems efficiency

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
534ECO	**Marketing Analytics**	Elective	Y				3	3	25	75	100

Course Objectives	
C1	To familiarize the students to the basic concepts of Marketing analytics.
C2	To provide insights on Business Strategies.
C3	To throw light on Product and Price analytics.
C4	To elucidate on distribution analytics.
C5	To create awareness and importance of sales analytics.

UNIT	Details	No. of Hours	Course Objectives
I	**Marketing Analytics Framework:** Introduction to Marketing Analytics and Models. Market Insight - Market Data Source – treatment of outliers, Market sizing, PESTLE Market analysis, Porter Five Force Analysis Market segment identification, targeting and positioning - Tools and Techniques: Regression, Cluster Analysis, and Perceptual Mapping Techniques.	9	C1
II	**Business Strategy and Operations:** Analytics based strategy selection with strategic models - Strategic Scenarios, Strategic Decision Models, and Strategic Metrics. Business Operations: Forecasting - Predictive Analytics - Data Mining - Balanced Scorecard - Critical Success Factors.	9	C2
III	**Product and Price Analytics:** Product analytics: Conjoint Analysis model - Decision Tree Model - Portfolio Resource Allocation - Product/ service Metrics, Attribute Preference testing. Price Analytics: Pricing Techniques - Pricing Assessment - Profitable pricing - Pricing for Business Markets - Price Discrimination.	9	C3
IV	**Distribution and Promotions Analytics:** Distribution Analytics: Distribution Channel Characteristics - Retail Location selection, Channel Evaluation and Selection - Multi-channel Distribution. Promotion Analytics: Promotion Budget estimation - Promotion Budget Allocation – Ad value equivalence	9	C4

	model - Promotion Metrics for traditional Media - Promotion Metrics for social media.		
V	**Sales Analytics:** E commerce sales model, sales metrics, profitability metrics and support metrics - Rapid decision models - data driven presentations - contemporary issues and opportunities in application of marketing analytics in different sectors.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Understand the basic concepts of Marketing analytics.	P01, PO3, PO7
CO2	Analyse and Implement Business Strategies.	PO1, PO2, PO7, PO8
CO3	Use differential Product and Price analytics.	PO1, PO3, PO6
CO4	Compare and employ on distribution analytics.	PO2, PO5, PO7
CO5	Use appropriate sales analytics.	PO1, PO3, PO8

Reading List	
1.	Marketing analytics: Methods, practice, implementation, and links to other fields SL France, S Ghose - Expert Systems with Applications, 2019 - Elsevier
2.	Marketing analytics for customer engagement: a viewpoint S Nagaraj - International Journal of Information Systems and Social …, 2020 - igi-global.com
3.	Journal of Marketing Analytics - Palgrave Macmillan
4.	Applied Marketing Analytics | Henry Stewart Publications

References Books	
1.	Stephen Sorger, (2013), MARKETING ANALYTICS, Strategic Models and Metrics, First Edition, Admiral Press.
2.	Gary L. Lilien and Arvind Rangaswamy (2014), Marketing Engineering: Computer Assisted Marketing Analysis and Planning, 2nd edition, Trafford Publishing UK.
3.	Wayne L. Winston (2014), Marketing Analytics: Data-Driven Techniques with Microsoft Excel, First Edition, Wiley, Indianapolis.
4.	Paul W. Farris, Neil T. Bendle, Phillip E. Pfeifer, David J. Reibstein (2010), Marketing Metrics, 2nd Edition, Pearson USA.
5.	Mike Grigsby (2018), Marketing Analytics: A Practical Guide to Improving Consumer Insights Using Data Techniques, 2nd Edition, NY: Kogan Page Limited, New York.
6.	Rajkumar Venkatesan, Paul W. Farris, Ronald T. Wilcox, Marketing Analytics Essential Tools for Data-Driven Decisions, University of Virginia Press, 1st Edition, 2021.

Methods of Evaluation		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks

	Total	100 Marks
Methods of Assessment		
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions	
Understand/ Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, Short summary or overview	
Application (K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain	
Analyze (K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge	
Evaluate (K5)	Longer essay/ Evaluation essay, Critique or justify with pros and cons	
Create (K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations	

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Unit I: Marketing Analytics Framework

Marketing Analytics is the use of data, statistical techniques, and business insights to guide marketing strategy and decision-making. This unit provides foundational concepts, analytical frameworks, and practical applications with real-world examples.

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1. Introduction to Marketing Analytics and Models

Marketing Analytics is a critical function for data-driven marketing decisions. It helps businesses:

- Understand customer behavior
- Optimize marketing spend
- Forecast trends and opportunities
- Evaluate marketing effectiveness

Analytics Models:

Model Type	Purpose	Example
Descriptive	Explains past performance	Monthly sales trends analysis
Predictive	Forecasts future outcomes	Predicting customer churn
Prescriptive	Suggests optimal actions	Recommending marketing campaigns to maximize ROI

Example: Using predictive analytics, BigBasket identified customers likely to churn and implemented personalized interventions, reducing churn from 35% to 18%.

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2. Market Insight

Market insight involves collecting, analyzing, and interpreting data to understand the market environment.

Market Data Sources

- **Primary Data:** Surveys, interviews, focus groups — collected firsthand.
- **Secondary Data:** Industry reports (Gartner, McKinsey), government databases (NSO, RBI), competitor websites, market portals (Statista,

IBISWorld).

Treatment of Outliers

Outliers can distort analysis. Approaches include:

- Removing erroneous data
- Transforming data using logarithms or normalization
- Analyzing separately for actionable insights

Market Sizing

Methods:

- **Top-down:** Start with overall industry size, then segment.
- **Bottom-up:** Aggregate individual or product-level sales potential.
- **Triangulation:** Combine multiple approaches for better accuracy.

Example: Myntra estimated market potential for regional fashion trends using sales, social media data, and competitor insights.

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3. PESTLE Market Analysis (Macro Environment Analysis)

PESTLE helps businesses analyze external factors influencing operations:

Factor	Key Considerations	Example from Indian Market
Political	Government policies, trade regulations, political stability	E-commerce regulations for online sales, data protection laws
Economic	GDP, inflation, interest rates, disposable income	Inflation impacting consumer buying power
Social	Demographics, lifestyle, cultural trends	Regional fashion preferences influencing Myntra product lines
Technological	Automation, digital infrastructure, innovation	Domino's route optimization using GPS and ML
Legal	Labor laws, IP rights, compliance	Compliance with e-commerce taxation laws
Environmental	Sustainability, climate change, emissions norms	Eco-friendly packaging for BigBasket deliveries

Application: PESTLE analysis helps companies anticipate risks, adapt marketing strategies, and leverage opportunities in the macro environment.

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4. Porter's Five Forces Analysis (Industry Competitiveness)

Porter's Five Forces is a framework for assessing industry structure and profitability potential:

1. **Threat of New Entrants** – How easily new competitors can enter.
    - Low entry barriers = high threat.
    - Example: Online grocery in India faces moderate barriers; logistics and technology investment are required.
2. **Bargaining Power of Suppliers** – Suppliers' ability to influence prices or terms.
    - High concentration of suppliers = higher bargaining power.
    - Example: Domino's relies on multiple ingredient suppliers to reduce dependency risk.
3. **Bargaining Power of Buyers** – Customers' influence on price, quality, or service.
    - Price-sensitive buyers = high bargaining power.
    - Example: BigBasket customers can switch easily to competitors like Grofers or Amazon Fresh.
4. **Threat of Substitutes** – Availability of alternative products or services.
    - More alternatives = higher threat.
    - Example: Meal delivery apps and local grocery stores are substitutes for BigBasket.
5. **Competitive Rivalry** – Intensity of competition among existing players.
    - High competition reduces profitability.
    - Example: Myntra competes with Amazon, Flipkart, and Ajio in fashion e-commerce.

Illustration with Case Studies:

- **BigBasket:** Managed competitive rivalry by personalized campaigns and predictive analytics for retention.
- **Myntra:** Differentiated with trend forecasting and inventory optimization.
- **Domino's:** Reduced delivery time using data-driven route optimization.

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5. Market Segment Identification, Targeting, and Positioning (STP)

Segmentation

Dividing a market into smaller, homogeneous groups:

Type	Definition	Example
Demographic	Age, gender, income, education	BigBasket targeting young urban families
Geographic	Region, city, climate	Myntra regional campaigns based on city-specific trends
Behavioral	Usage rate, loyalty, purchase occasions	Domino's loyalty program targeting frequent customers
Psychographic	Lifestyle, values, attitudes	Health-conscious buyers targeted with niche health drinks

Targeting

Selecting the most valuable segments:

- BigBasket targets high-risk churn customers with predictive offers.
- Myntra targets young fashion-savvy consumers with trend analysis.

Positioning

Crafting a distinctive market message:

- Domino's positioned itself on fast, reliable delivery ("30 mins or free").
- Myntra positioned as a trend-driven fashion e-commerce platform.

STP Integration:

STP allows marketers to **identify the right audience**, **focus resources efficiently**, and **communicate a unique value proposition**.

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6. Tools and Techniques in Marketing Analytics

Regression Analysis

- Examines relationships between dependent and independent variables.
- Example: Predicting sales based on ad spend or promotions.

Cluster Analysis

- Groups customers with similar behavior or characteristics.
- Example: Segmenting BigBasket customers for targeted retention campaigns.

Perceptual Mapping

- Visual representation of products relative to competitors based on customer perceptions.
- Example: Myntra mapping brands by style vs price to identify market gaps.

Other Techniques:

- **Conjoint Analysis:** Understands customer preference for product attributes.
- **A/B Testing:** Tests different marketing strategies to identify best-performing options.
- **Time Series Analysis:** Predicts future trends like sales or demand patterns.

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7. Case Studies

Case Study 1: BigBasket – Customer Retention

- **Challenge:** 35% monthly churn
- **Analytics Approach:** Predictive analytics to identify at-risk customers, personalized offers
- **Results:** Churn reduced to 18%, revenue increased to ₹140 crores, marketing ROI improved

Case Study 2: Myntra – Fashion Trend Prediction & Inventory Optimization

- **Challenge:** 25% unsold inventory
- **Analytics Approach:** Machine learning to analyze trends, optimize inventory, dynamic pricing
- **Results:** Unsold inventory reduced to 12%, quarterly revenue increased to ₹1,050 crores, profit margin improved to 15%

Case Study 3: Domino's India – Delivery Time Optimization

- **Challenge:** Average delivery time 35 minutes, inconsistent service
- **Analytics Approach:** GPS analytics, ML for route optimization, staff scheduling
- **Results:** Average delivery time reduced to 22 minutes, free pizza deliveries reduced to 2%, monthly orders increased by 40%

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8. Summary

Unit I introduces students to:

- Marketing analytics models (descriptive, predictive, prescriptive)
- Market insights: data sources, outlier handling, market sizing
- Macro-environmental analysis (PESTLE)

- Industry competitiveness (Porter's Five Forces)
- STP framework for segmenting, targeting, and positioning customers
- Analytical tools and techniques: regression, clustering, perceptual mapping
- Real-world application through BigBasket, Myntra, and Domino's case studies

By understanding these concepts and techniques, students can **apply marketing analytics to real business scenarios** effectively.

Unit II: Business Strategy and Operations

Business Strategy and Operations focus on using **analytics to guide strategic decisions and optimize business processes**. Analytics helps managers evaluate alternatives, plan for uncertainties, and monitor performance systematically.

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1. Analytics-Based Strategy Selection

Organizations use analytics to **identify, evaluate, and select strategies** that maximize long-term value. Analytics-based strategy selection combines **quantitative models, predictive insights, and scenario analysis** to make informed strategic choices.

1.1 Strategic Models

Strategic models provide structured frameworks to **analyze alternatives and select optimal strategies**:

- **SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats)**: Identifies internal capabilities and external market opportunities or threats.
- **BCG Matrix (Boston Consulting Group)**: Helps allocate resources across product portfolios (Stars, Cash Cows, Question Marks, Dogs).
- **Porter's Generic Strategies**: Guides strategic positioning based on **cost leadership, differentiation, or focus**.

Example:

A retailer may choose a **differentiation strategy** by leveraging predictive analytics to identify emerging fashion trends and stock unique products ahead of competitors.

1.2 Strategic Scenarios

Scenario analysis is used to **anticipate possible futures** and prepare strategic responses:

- **Definition:** Examining alternative scenarios (best-case, worst-case, and most likely) for market conditions, demand, or competitive moves.

- **Application:** Retail chains may simulate the impact of economic downturns, new competitors, or sudden demand surges.

Benefit: Organizations can **develop contingency plans** and avoid costly surprises.

1.3 Strategic Decision Models

Strategic decision models **quantify trade-offs and evaluate options**:

- **Decision Trees:** Visualize possible actions and outcomes with probabilities.
- **Linear Programming:** Optimizes resource allocation under constraints.
- **Simulation Models:** Predict outcomes of different strategic choices.

Example: A logistics company may use linear programming to minimize distribution costs while maintaining service quality across regions.

1.4 Strategic Metrics

To measure the effectiveness of strategies, organizations track **strategic metrics**:

- Revenue growth rate
- Market share change
- Return on Investment (ROI)
- Customer lifetime value (CLV)
- Operational efficiency metrics

These metrics help ensure **strategies are aligned with business objectives** and can be monitored over time.

Strategic metrics are **quantitative indicators that help organizations measure whether their strategies are successful**. They act as a "compass" for decision-makers, ensuring that strategic goals are being met and providing early warnings if adjustments are needed.

Key Strategic Metrics Explained

1. **Revenue Growth Rate**
    - **Definition:** The percentage increase in revenue over a specific period (monthly, quarterly, or yearly).
    - **Purpose:** Measures whether the company's strategic initiatives are driving sales growth.
    - **Formula:**

$$\text{Revenue Growth Rate (\%)} = \frac{\text{Revenue in Current Period} - \text{Revenue in Previous Period}}{\text{Revenue in Previous Period}} \times 100$$

- **Example:**
  A company implements a new marketing strategy and revenue rises from ₹100 crores to ₹120 crores.

$$\text{Growth Rate} = \frac{120 - 100}{100} \times 100 = 20\%$$

  This indicates the strategy successfully boosted sales.

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2. **Market Share Change**
   - **Definition:** Measures the company's share of total industry sales relative to competitors.
   - **Purpose:** Indicates competitive positioning and whether the company is gaining or losing ground in its market.
   - **Formula:**

$$\text{Market Share (\%)} = \frac{\text{Company Sales}}{\text{Total Market Sales}} \times 100$$

- **Example:**
  If a company's sales are ₹50 crores in a market worth ₹500 crores, market share = 10%.
  After a successful product launch, sales increase to ₹70 crores while the market grows to ₹520 crores:

$$\text{Market Share} = \frac{70}{520} \times 100 \approx 13.46\%$$

  This demonstrates the company captured more market share.

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3. **Return on Investment (ROI)**
   - **Definition:** Measures how efficiently a company generates profit from investments.
   - **Purpose:** Evaluates whether resources (capital, time, or effort) invested in a strategy are producing desired results.
   - **Formula:**

$$\text{ROI (\%)} = \frac{\text{Net Profit from Investment}}{\text{Investment Cost}} \times 100$$

   - **Example:**
     A marketing campaign costs ₹5 crores and generates an additional

profit of ₹12 crores.

$$\text{ROI} = \frac{12 - 5}{5} \times 100 = 140\%$$

A high ROI indicates a highly effective strategic investment.

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4. **Customer Lifetime Value (CLV)**
   - **Definition:** Predicts the total revenue a business expects from a single customer over the entire relationship.
   - **Purpose:** Helps organizations **focus on long-term customer relationships**, prioritize retention, and make data-driven marketing decisions.
   - **Formula (simplified):**

$$CLV = (\text{Average Purchase Value} \times \text{Number of Purchases per Year}) \times \text{Customer Lifespan}$$

Example:

A customer buys ₹2,000 worth of products 3 times per year for 5 years:

$$CLV = 2000 \times 3 \times 5 = ₹30,000$$

CLV helps companies decide **how much to invest in acquiring or retaining this customer**.

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5. **Operational Efficiency Metrics**
   - **Definition:** Measure how effectively a company uses its resources to produce goods or deliver services.
   - **Purpose:** Ensures that business operations are cost-effective, timely, and high-quality.
   - **Examples of Operational Metrics:**
     - **Cycle time:** Time taken to complete a process.
     - **Inventory turnover:** Number of times inventory is sold and replaced.
     - **Order fulfillment rate:** Percentage of orders delivered on time.
   - **Example:**
     A manufacturing plant reduces production cycle time from 10 days to 7 days, improving **operational efficiency by 30%**.

Why Strategic Metrics Matter

- **Alignment:** Ensure strategies are supporting overall business goals.
- **Monitoring & Control:** Track progress in real-time and make timely adjustments.
- **Decision Support:** Provide quantitative evidence to prioritize initiatives or reallocate resources.
- **Communication:** Help stakeholders understand the impact of strategic initiatives.

Example Integration:

A retail chain launches an analytics-driven marketing strategy. They monitor:

- Revenue growth rate → Increased by 15%
- Market share → Gained 2%
- ROI → 120%
- CLV → Increased for top 10% of customers
- Operational efficiency → Inventory turnover improved

This integrated view helps management **assess strategy success comprehensively**.

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2. Business Operations Analytics

Operations analytics helps **forecast, optimize, and monitor day-to-day business activities**, ensuring efficiency and goal achievement.

2.1 Forecasting

Definition: Forecasting predicts future demand, sales, or operational needs based on historical data.

Techniques:

- **Time Series Analysis:** Uses historical patterns to predict future trends.
- **Moving Averages & Exponential Smoothing:** Simple methods for short-term forecasting.
- **Predictive Analytics:** Leverages machine learning to capture complex patterns.

Example:

An e-commerce company forecasts weekly demand for popular products to optimize inventory and reduce stockouts.

Forecasting is the process of **predicting future business events**—such as demand,

sales, revenue, or operational requirements—by analyzing historical data and identifying trends or patterns. Accurate forecasting is essential for **resource planning, inventory management, marketing campaigns, and strategic decision-making**.

Key Concepts in Forecasting

1. **Purpose of Forecasting**
    - Helps businesses plan production, staffing, and inventory efficiently.
    - Reduces costs by preventing overproduction or stockouts.
    - Supports strategic decision-making and budget planning.
    - Improves customer satisfaction by ensuring products/services are available when needed.

Forecasting Techniques

1. **Time Series Analysis**
    - **Definition:** A method that uses historical data points collected at regular intervals (daily, weekly, monthly) to predict future trends.
    - **Key Components:**
        - **Trend:** Long-term increase or decrease in data.
        - **Seasonality:** Repeated patterns over specific periods (e.g., holiday sales).
        - **Cyclic Patterns:** Fluctuations due to economic or market cycles.
        - **Random Noise:** Unpredictable variations in data.
    - **Example:**
      An e-commerce platform analyzes past 2 years of weekly sales to identify seasonal spikes (like Diwali or Christmas) and predict next year's demand.
2. **Moving Averages**
    - **Definition:** A simple method that smooths out short-term fluctuations by averaging data over a fixed number of periods.
    - **Purpose:** Helps detect underlying trends without being affected by random variations.
    - **Formula (Simple Moving Average for n periods):**

$$SMA_t = \frac{D_{t-1} + D_{t-2} + \cdots + D_{t-n}}{n}$$

- **Example:**
  An online retailer uses a 4-week moving average to forecast weekly sales of a product, reducing the impact of a single week's unusual spike or drop.

3. **Exponential Smoothing**
   - **Definition:** A weighted moving average method that gives **more weight to recent observations** to improve accuracy.
   - **Formula (Simple Exponential Smoothing):**

     $$F_{t+1} = \alpha \cdot D_t + (1 - \alpha) \cdot F_t$$

     Where α\alphaα = smoothing constant (0 < α ≤ 1), DtD_tDt = actual demand, FtF_tFt = forecast for current period.
     Example:
     A fashion retailer uses exponential smoothing to forecast next month's demand for trendy apparel, giving more importance to recent sales patterns rather than older data.
4. **Predictive Analytics (Advanced Forecasting)**
   - **Definition:** Uses machine learning algorithms to **capture complex, non-linear patterns** in historical data, often including external variables like weather, social trends, or promotions.
   - **Common Techniques:** Regression analysis, decision trees, random forests, neural networks.
   - **Example:**
     An e-commerce company predicts weekly demand for smartphones using machine learning. The model factors in past sales, social media trends, competitor pricing, and seasonal events. This allows them to **optimize inventory and reduce stockouts**, ensuring popular products are always available.

Applications of Forecasting

- **Inventory Management:** Avoid stockouts and overstocking by predicting future demand.
- **Workforce Planning:** Schedule staff based on predicted customer footfall or call volumes.
- **Financial Planning:** Forecast revenue and expenses for budget allocation.

- **Marketing & Promotions:** Predict which products will be popular to plan campaigns effectively.
- **Supply Chain Optimization:** Align procurement and logistics with anticipated demand to reduce costs.

Example Scenario for Students

Scenario:

An e-commerce company sells 10,000 units of a product monthly on average. During festival seasons, sales spike by 50%. By analyzing **past 3 years of sales data**, the company can:

- Use **time series analysis** to identify seasonal spikes.
- Apply **moving averages** for smooth trend detection.
- Use **exponential smoothing** to account for recent changes in trends.
- Implement **predictive analytics** to incorporate social media trends, competitor pricing, and weather effects to forecast demand for the next 6 months.

Result:

The company can **stock the right quantity**, **plan promotions**, and **reduce storage costs**, leading to higher efficiency and revenue.

2.2 Predictive Analytics

Predictive analytics **uses statistical models and machine learning** to anticipate outcomes and guide decision-making:

- **Applications:**
  - Predict customer churn
  - Forecast demand for seasonal products
  - Identify high-risk supply chain disruptions

Example:

A subscription-based service uses predictive models to identify customers likely to churn and proactively targets them with retention campaigns.

Predictive Analytics is the use of **historical data, statistical algorithms, and machine learning techniques** to **forecast future events, behaviors, or outcomes**. Unlike descriptive analytics, which explains what has happened, predictive analytics anticipates what **is likely to happen** and helps organizations

take proactive decisions.

Key Concepts

1. **Purpose of Predictive Analytics**
    - Anticipates customer behavior, market trends, or operational risks.
    - Supports **data-driven decision-making** and strategic planning.
    - Enables proactive measures to **reduce costs, increase revenue, or improve customer experience**.
2. **Data Inputs**
    - Historical data: past sales, customer interactions, website activity.
    - External data: social media trends, economic indicators, competitor activity.
    - Real-time data: current transactions, IoT devices, app usage.
3. **Core Techniques**
    - **Regression Analysis:** Predicts numerical outcomes (e.g., sales next month).
    - **Classification Models:** Predicts categorical outcomes (e.g., whether a customer will churn: Yes/No).
    - **Time Series Forecasting:** Captures trends, seasonality, and cyclical patterns.
    - **Decision Trees / Random Forests / Neural Networks:** Handles complex patterns and interactions in large datasets.

Applications in Business

1. **Customer Churn Prediction**
    - **Objective:** Identify customers likely to leave a service.
    - **Example:** A subscription service (like Netflix) analyzes viewing history, app usage, and complaint patterns to predict churn.
    - **Action:** Target at-risk customers with personalized offers, reminders, or loyalty campaigns to **retain them**.
2. **Demand Forecasting**
    - **Objective:** Predict future demand for products or services.
    - **Example:** A retail company uses predictive models to forecast demand for winter jackets, incorporating past sales, weather forecasts, and social media trends.
    - **Action:** Optimize inventory, reduce stockouts, and minimize overstock

costs.

3. **Supply Chain Risk Management**
    - **Objective:** Identify potential disruptions in supply chains before they occur.
    - **Example:** A manufacturing firm analyzes supplier reliability, transport routes, and global events to anticipate delays.
    - **Action:** Adjust procurement schedules, find alternative suppliers, or stock critical components in advance.
4. **Marketing Campaign Optimization**
    - **Objective:** Target the right customers with the right offers.
    - **Example:** An e-commerce platform predicts which users are likely to respond to a discount email, based on past purchase behavior.
    - **Action:** Improve ROI on marketing spend by focusing campaigns on high-potential customers.

Example Scenario

Scenario:

A subscription-based online learning platform has 50,000 active users. Historical data shows that users who haven't logged in for 14 days are likely to churn.

Process using Predictive Analytics:

1. Collect historical usage data, demographics, and subscription history.
2. Build a predictive model (e.g., logistic regression) to classify users as "likely to churn" or "not likely to churn."
3. Score all current users and identify the top 5% at risk.
4. Implement retention campaigns: personalized emails, special discounts, or reminders.

Outcome:

- Reduces churn rate by 20–30%.
- Increases customer lifetime value (CLV).
- Provides insights into why users churn and how to improve the platform.

Benefits of Predictive Analytics

- **Proactive decision-making:** Take action before issues arise.
- **Improved customer retention and satisfaction.**
- **Optimized inventory and operations.**

- **Better allocation of marketing and business resources.**
- **Enhanced competitive advantage through data-driven insights.**

2.3 Data Mining

Data mining extracts hidden patterns from large datasets to **improve decision-making**:

- **Techniques:**
  - Classification (categorizing customers)
  - Clustering (segmenting customer groups)
  - Association Rule Mining (identifying purchase patterns)
- **Example:** A retail chain discovers that customers who buy baby diapers are also likely to buy baby wipes, enabling targeted cross-selling.

Definition:

Data mining is the process of analyzing large datasets to discover **hidden patterns, trends, correlations, and actionable insights**. It transforms raw data into meaningful information that supports strategic decisions.

Key Concepts

1. **Purpose of Data Mining**
   - Identify customer behavior patterns.
   - Detect anomalies and fraud.
   - Predict future trends.
   - Support marketing, operations, and strategic planning.
2. **Techniques Used in Data Mining**
   - **Classification:** Assign data into predefined categories (e.g., segmenting customers as high-value or low-value).
   - **Clustering:** Group similar data points without predefined labels (e.g., identifying customer segments).
   - **Association Rules:** Discover relationships between variables (e.g., customers who buy product A also buy product B).
   - **Regression Analysis:** Predict numerical outcomes (e.g., sales volume, revenue).
   - **Anomaly Detection:** Identify unusual patterns that may indicate errors or fraud.

Applications in Business

1. **Customer Analytics**
    - Example: An e-commerce website mines purchase histories to recommend products and identify high-value customers.
2. **Risk Management**
    - Example: Banks analyze transaction data to detect fraudulent activity in real-time.
3. **Operational Efficiency**
    - Example: Manufacturing companies detect machine failure patterns to schedule predictive maintenance.

2.4 Balanced Scorecard

Balanced Scorecard (BSC) is a **performance management framework** that translates strategy into measurable objectives across four perspectives:

1. **Financial:** Revenue growth, profitability, cost reduction
2. **Customer:** Satisfaction, loyalty, retention
3. **Internal Processes:** Operational efficiency, quality, cycle time
4. **Learning & Growth:** Employee training, innovation, knowledge management

Application Example:

A manufacturing company implements BSC to monitor plant performance, customer satisfaction, and employee productivity, ensuring alignment with strategic goals.

Definition:

The Balanced Scorecard is a **strategic performance management tool** that translates an organization's vision and strategy into **measurable objectives** across multiple perspectives.

Four Perspectives of BSC

1. **Financial Perspective**
    - Measures profitability, revenue growth, and cost management.
    - Example Metrics: ROI, revenue growth, profit margin.
2. **Customer Perspective**
    - Measures customer satisfaction, retention, and acquisition.
    - Example Metrics: Customer satisfaction score, Net Promoter Score (NPS), market share.
3. **Internal Business Processes Perspective**

   - Evaluates operational efficiency and process improvements.
   - Example Metrics: Cycle time, defect rates, inventory turnover.
4. **Learning and Growth Perspective**
   - Focuses on employee skills, innovation, and organizational development.
   - Example Metrics: Employee training hours, skill acquisition, innovation rate.

Applications in Business

- **Strategic Alignment:** Ensures business activities align with organizational goals.
- **Performance Monitoring:** Tracks performance beyond financial results, incorporating customer and internal process perspectives.
- **Decision Support:** Guides resource allocation for improvement initiatives.

Example:

A retail chain uses BSC to track financial growth, customer loyalty, inventory turnover, and employee training. This helps ensure **strategic objectives are met holistically**, not just financially.

2.5 Critical Success Factors (CSFs)

CSFs are **key areas that must be managed successfully to achieve strategic objectives**:

- **Examples:**
   - High-quality product delivery
   - Efficient supply chain management
   - Strong customer engagement
   - Effective innovation capability

Role in Analytics: Analytics helps identify and monitor CSFs, providing **actionable insights** to prevent operational failure.

Definition:

Critical Success Factors are the **key areas or activities that must go well for an organization to achieve its mission and strategic goals**.

Key Concepts

1. **Identification of CSFs**
   - Derived from business strategy, industry standards, and internal

capabilities.
    - Focused on what **truly drives success** rather than every operational task.
2. **Characteristics of CSFs**
    - Few in number (typically 3–7).
    - Measurable and actionable.
    - Directly linked to strategic objectives.

Applications in Business

1. **Example in Retail Business:**
    - High-quality product sourcing.
    - Efficient inventory management.
    - Customer service excellence.
    - Effective digital marketing campaigns.
2. **Example in E-commerce:**
    - Fast delivery.
    - Website and mobile app usability.
    - Personalized recommendations.
    - Customer retention and loyalty programs.

Benefits of Identifying CSFs

- Focus resources on areas that impact success most.
- Improves decision-making and operational priorities.
- Provides measurable benchmarks for monitoring progress.
- Aligns the team with strategic objectives.

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3. Integration of Strategy and Operations

- Analytics ensures **strategic plans are data-driven** and operational execution is optimized.
- Forecasting, predictive analytics, and BSC are used to **monitor progress and adjust strategies dynamically**.
- Critical Success Factors guide organizations to focus on **what matters most**, ensuring effective strategy implementation.

Example:

A retail company integrates demand forecasting, predictive analytics, and BSC to optimize inventory, reduce costs, and enhance customer satisfaction—all aligned

with strategic growth objectives.

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4. Key Takeaways

- Business strategy selection benefits from **analytical models, scenario planning, and strategic metrics**.
- Operations analytics optimizes processes through **forecasting, predictive modeling, and performance measurement**.
- Balanced Scorecards and Critical Success Factors ensure strategies translate into actionable operational goals.
- Integration of analytics in strategy and operations provides **competitive advantage, risk mitigation, and improved organizational performance**.

Unit III: Product and Price Analytics

Product and Price Analytics involves understanding **customer preferences, product performance, and pricing strategies** using data-driven insights. These analytics help organizations **maximize profitability, enhance customer satisfaction, and gain a competitive edge**.

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1. Introduction to Product and Price Analytics

Product and Price Analytics examines how products are designed, priced, and positioned to meet customer needs and business goals. It relies on structured data analysis to make decisions on:

- Which product features are most valuable
- How to price products for maximum revenue and profit
- How to allocate resources across product portfolios

Significance: Companies like Amazon, Netflix, and Apple use product and price analytics to **optimize offerings, reduce market risk, and personalize customer experiences**.

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2. Product Analytics

Product Analytics is the process of analyzing **how customers interact with**

products and **how product features influence purchase decisions**. It is essential for product development, feature prioritization, and resource allocation.

2.1 Conjoint Analysis

Definition:

A statistical technique that breaks down customer preferences into individual product features, helping identify which attributes are most important for purchase decisions.

Applications:

- **Product Design:** Identify features customers value most. *Example:* Smartphone features like camera quality, battery life, and price.
- **Pricing Bundles:** Determine optimal combinations of features and price points.
- **Feature Prioritization:** Focus development resources on high-value features.

How it Works:

1. Identify product attributes (e.g., Brand, Battery, Price, Storage).
2. Create different product combinations (profiles).
3. Collect customer preferences through surveys or voting.
4. Analyze to determine the relative importance of each attribute.

Example:

Students ranked smartphone profiles, revealing that camera quality was most valued, followed by battery life, and price.

2.2 Portfolio Resource Allocation

Organizations must decide **how to allocate resources across multiple products** for maximum ROI.

Techniques:

- **BCG Matrix:** Categorizes products as Stars, Cash Cows, Question Marks, or Dogs based on market share and growth. *Example:* A high-growth, high-market-share smartphone model is a Star; allocate more resources.
- **Linear Programming:** Optimizes resource allocation mathematically within constraints.

Outcome: Helps companies focus investments on high-potential products while divesting or reallocating low-performing ones.

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3. Price Analytics

Price Analytics involves **strategically setting prices to maximize profitability and market impact** while considering customer behavior and market conditions.

3.1 Pricing Strategies

Different pricing strategies align with business objectives:

Strategy	Description	Example
Cost-based	Add a fixed markup to production cost	Manufacturing companies pricing electronics
Value-based	Price based on perceived customer value	Apple pricing iPhones based on brand value
Competition-based	Benchmark against competitors	Myntra adjusting fashion product prices against Flipkart
Skimming	High initial price, gradually reduced	New tech gadgets
Penetration	Low initial price to gain market share	Launching health drinks to attract first-time buyers
Psychological Pricing	Pricing like ₹9.99 instead of ₹10 to influence perception	Retail product pricing

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3.2 Price Discrimination

Charging different prices for the same product to different segments:

- **First-degree:** Individualized pricing (e.g., negotiated B2B contracts)
- **Second-degree:** Volume-based pricing (bulk discounts)
- **Third-degree:** Segment-based pricing (student discounts, senior citizen rates)

Example: Amazon adjusts prices based on browsing history, location, and demand.

3.3 Key Metrics in Price Analytics

1. **Price Elasticity of Demand:** Measures sensitivity of demand to price changes.
2. **Customer Lifetime Value (CLV):** Evaluates long-term revenue contribution of customers.
3. **Profit per Unit:** Measures product profitability.

Application Example:

Myntra uses elasticity and CLV to determine optimal discounts and pricing strategies

for different segments, maximizing profit while maintaining customer satisfaction.

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4. Tools and Techniques for Product and Price Analytics

4.1 Regression Analysis

- Used to predict demand based on pricing, promotions, or other factors.
- *Example:* Estimate how a 10% price reduction affects sales volume and total profit.

4.2 Conjoint Analysis

- Determines which product features drive purchase decisions and their relative importance.

4.3 Simulation and Scenario Analysis

- Test different pricing or product configurations before actual launch.
- *Example:* Simulate the impact of launching three flavors of a new health drink at different price points.

4.4 A/B Testing

- Compare two versions of a product or pricing strategy to identify which performs better.

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5. Real-World Case Examples

Case Study 1: BigBasket

- Challenge: High customer churn
- Analytics Application: Predictive analytics and targeted offers
- Outcome: Churn reduced, revenue increased, improved ROI

Case Study 2: Myntra

- Challenge: Unsold inventory and optimizing pricing
- Analytics Application: Machine learning for trend prediction, inventory and dynamic pricing optimization
- Outcome: Reduced unsold inventory, increased revenue and profit margin

Case Study 3: Domino's India

- Challenge: Delivery efficiency and customer satisfaction
- Analytics Application: GPS-based route optimization, real-time demand forecasting
- Outcome: Reduced delivery time, decreased free pizza losses, increased

orders

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6. Key Takeaways

- Product analytics allows companies to **design products that meet customer needs** and allocate resources efficiently.
- Price analytics ensures **profit maximization while maintaining market competitiveness**.
- Tools like regression, conjoint analysis, and A/B testing help **make data-driven decisions**.
- Real-world applications (BigBasket, Myntra, Domino's) demonstrate how analytics **improves operational efficiency, revenue, and customer satisfaction**.
- Combining product and price insights enables businesses to **strategically position offerings and create competitive advantage**.

Unit IV: Distribution and Promotions Analytics

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1. Distribution Analytics

Distribution analytics focuses on **optimizing the movement of products from manufacturers to customers**. It ensures that products are available at the right place, time, and quantity, while minimizing costs and maximizing customer satisfaction.

1.1 Distribution Channel Characteristics

Distribution channels are the **paths products take from manufacturer to end customer**. Each channel has unique characteristics that impact reach, efficiency, and costs.

Key Characteristics:

1. **Length of Channel**: Number of intermediaries (wholesalers, distributors, retailers).
    - Short channels: Manufacturer → Retailer → Customer (e.g., FMCG brands).
    - Long channels: Manufacturer → Distributor → Wholesaler → Retailer → Customer.

2. **Width of Channel**: Number of intermediaries at each level.
    - Wide channels: High product availability, more retail coverage.
    - Narrow channels: Focused coverage, lower operational costs.
3. **Cost Efficiency**: Includes logistics, storage, and handling costs.
4. **Market Reach**: Ability to access target customers across regions or segments.
5. **Control and Service Level**: The manufacturer's ability to influence pricing, product placement, and customer experience.

Example:

A smartphone brand may use **exclusive channels** for premium models (high control, narrow channel) and **mass channels** for budget models (wide channel, high reach).

1.2 Retail Location Selection

Retail location analysis ensures **stores are placed strategically to maximize footfall and sales**.

Key Factors:

- **Demographics:** Age, income, occupation, and lifestyle of local consumers.
- **Accessibility:** Roads, public transport, parking availability.
- **Competition:** Nearby competitor presence and market saturation.
- **Footfall Patterns:** High pedestrian or vehicular traffic areas.
- **Store Size and Layout:** Determines inventory and operational capacity.

Example:

A fashion retailer selects a shopping mall in an urban area with high income and frequent foot traffic rather than a residential area with low footfall.

1.3 Channel Evaluation and Selection

Businesses evaluate channels to choose **the most effective way to reach customers**.

Evaluation Criteria:

- **Cost vs. Coverage:** Balance between investment and market reach.
- **Speed and Reliability:** How quickly products reach customers.
- **Flexibility:** Ability to adapt to seasonal demand or market changes.
- **Customer Experience:** Consistency and convenience across channels.

Example:

A FMCG company may choose supermarkets and e-commerce platforms for high

reach, while using direct sales for specialized industrial products.

1.4 Multi-Channel Distribution

Multi-channel distribution uses **multiple channels simultaneously** to reach customers.

Benefits:

- Wider market coverage.
- Convenience for different customer segments.
- Risk mitigation if one channel underperforms.

Challenges:

- Managing channel conflicts.
- Ensuring consistent pricing and branding.
- Integrating data from multiple channels for analytics.

Example:

A consumer electronics brand sells through offline stores, online marketplaces, and its own website to maximize reach and flexibility.

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2. Promotion Analytics

Promotion analytics evaluates the **effectiveness of marketing communications** and guides optimal allocation of promotional budgets.

2.1 Promotion Budget Estimation

Promotion budget estimation determines **how much to spend on marketing activities** based on business goals.

Methods:

1. **Percentage of Sales Method:** Budget is a fixed % of previous or projected sales.
2. **Objective-and-Task Method:** Define objectives (awareness, sales), calculate cost to achieve them.
3. **Competitive Parity Method:** Match competitors' promotional spending.

Example:

A beverage company may allocate 8% of projected annual sales to promotions to drive brand awareness and trial campaigns.

2.2 Promotion Budget Allocation

Allocation divides the total budget across channels and campaigns.

Key Considerations:

- Channel effectiveness (ROI per channel).
- Target audience reach.
- Timing of campaigns (seasonal, launch periods).
- Media costs (TV vs digital vs social media).

Example:

A product launch may allocate 40% to social media, 30% to TV, and 30% to in-store promotions based on reach and cost-effectiveness.

2.3 Ad Value Equivalence Model

Ad Value Equivalence (AVE) estimates the **monetary value of media coverage** in terms of advertising cost.

Example:

If a positive article in a magazine reaches the same audience as a paid ad costing ₹2 lakh, its AVE = ₹2 lakh.

Limitations:

- Doesn't measure engagement or actual impact.
- Should be complemented with other metrics.

2.4 Promotion Metrics for Traditional Media

Traditional media includes **TV, radio, print, and outdoor ads**.

Common Metrics:

1. **Reach & Frequency:** Number of people exposed to the message and how often.
2. **Gross Rating Points (GRP):** Reach × Frequency (used in TV campaigns).
3. **Cost Per Thousand (CPM):** Cost to reach 1,000 audience members.
4. **Sales Lift:** Incremental sales due to the campaign.

Example:

A TV campaign for a detergent brand shows a GRP of 300, indicating strong exposure.

2.5 Promotion Metrics for Social Media

Social media metrics measure **engagement, reach, and conversion**.

Key Metrics:

- **Engagement Rate:** Likes, shares, comments per follower.
- **Click-Through Rate (CTR):** % of users clicking on the promoted link.

- **Conversion Rate:** % of users completing desired action (purchase, signup).
- **Sentiment Analysis:** Positive/negative reactions to campaigns.
- **Influencer ROI:** Revenue generated per influencer campaign.

Example:
A brand posts a new product video on Instagram:

- Views: 100,000
- Likes: 10,000 (Engagement Rate = 10%)
- Purchases via link: 500 (Conversion Rate = 0.5%)

Summary:
Unit IV equips students to:

- Analyze **distribution channels** and select optimal retail locations.
- Implement **multi-channel strategies** effectively.
- Estimate, allocate, and measure **promotion budgets**.
- Evaluate performance using **traditional and digital promotion metrics**.

Unit V: Sales Analytics

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1. E-Commerce Sales Model
E-commerce sales models describe **how online businesses generate revenue** by selling products or services via digital platforms.
Key Components of E-Commerce Sales Models

1. **Revenue Streams:**
    - **Direct Sales:** Products sold through the brand website or app.
    - **Marketplace Sales:** Using platforms like Amazon, Flipkart, or Myntra.
    - **Subscription Models:** Recurring revenue for memberships, e.g., Netflix or Amazon Prime.
    - **Advertising Revenue:** Monetizing website traffic through ads.
2. **Customer Interaction:**
    - Personalized recommendations based on browsing and purchase history.
    - Dynamic pricing based on demand, competition, and customer segments.
3. **Fulfillment & Logistics:**

- Real-time inventory management.
- Efficient order processing and delivery systems.

Example:

An online grocery store uses predictive analytics to forecast demand, optimizes stock, and delivers orders within 24 hours to reduce stockouts and enhance customer satisfaction.

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2. Sales Metrics

Sales metrics track performance and help optimize strategies.

Key Sales Metrics

1. **Total Sales Volume:** Total revenue generated over a period.
2. **Average Order Value (AOV):** Revenue per transaction = Total revenue ÷ Number of orders.
3. **Conversion Rate:** % of website visitors who make a purchase.
4. **Customer Acquisition Cost (CAC):** Cost to acquire a new customer.
5. **Customer Retention Rate:** % of repeat customers over time.

Example:

If an e-commerce store has ₹10 lakh revenue from 2,000 orders, the **AOV = ₹10,00,000 ÷ 2,000 = ₹500 per order**.

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3. Profitability Metrics and Support Metrics

3.1 Profitability Metrics

1. **Gross Margin:** (Revenue − Cost of Goods Sold) ÷ Revenue × 100.
2. **Net Profit Margin:** Net income ÷ Revenue × 100.
3. **Return on Sales (ROS):** Measures efficiency of converting sales into profits.

Example:

A fashion e-commerce store generates ₹50 lakh revenue and spends ₹30 lakh on inventory:

- **Gross Margin = (50−30)/50 × 100 = 40%**

3.2 Support Metrics

Support metrics evaluate **operations, customer service, and efficiency**.

- **Order Fulfillment Rate:** % of orders delivered correctly and on time.
- **Return Rate:** % of products returned by customers.
- **Customer Support Response Time:** Average time to resolve customer queries.

Example:
If a store fulfills 9,500 orders out of 10,000 successfully, **Order Fulfillment Rate = 95%**.

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4. Rapid Decision Models
Rapid decision models help managers make **quick, data-driven decisions** using real-time analytics.
Applications:

1. **Inventory Replenishment:** Automatic alerts for low stock items.
2. **Dynamic Pricing:** Price adjustments in response to competitor pricing and demand changes.
3. **Promotional Campaign Optimization:** Evaluate which campaigns drive sales most effectively.

Example:
An online electronics retailer uses dashboards to adjust laptop prices hourly based on competitor pricing and customer demand.

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5. Data-Driven Presentations
Data-driven presentations **communicate insights effectively** to stakeholders.
Best Practices:

- Use **visualizations** like bar charts, line graphs, and heat maps.
- Highlight **KPIs** like sales growth, conversion rates, and ROI.
- Include **actionable recommendations** based on analytics.

Example:
A dashboard shows weekly sales trends, top-selling products, and regions with low performance to guide marketing and inventory decisions.

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6. Contemporary Issues and Opportunities in Marketing Analytics
6.1 Issues

- **Data Privacy Concerns:** Collecting customer data while complying with regulations (e.g., GDPR, India's Data Protection Bill).
- **Integration Challenges:** Combining data from multiple channels (website, app, social media).
- **Data Quality:** Handling missing, inconsistent, or duplicate data.

6.2 Opportunities

- **AI & Machine Learning:** Personalization, churn prediction, demand forecasting.
- **Real-Time Analytics:** Quick adjustments to promotions, pricing, and inventory.
- **Cross-Channel Insights:** Understanding the complete customer journey from awareness to purchase.
- **Predictive Insights:** Anticipating trends to launch products and campaigns proactively.

Example:
Using predictive analytics, an online retailer identifies products likely to go out of stock in the next week and restocks proactively to avoid lost sales.

Summary
Unit V provides tools and frameworks to:

- Understand **e-commerce sales models**.
- Measure **sales performance and profitability**.
- Use **rapid decision models** for real-time business optimization.
- Deliver insights through **data-driven presentations**.
- Identify **current challenges and opportunities** in marketing analytics across sectors.