Title

Date

Page No.

Name → Yash Kumar

Roll.no → 2501660026

BCA(CYBERSECURITY)

Assignment - 1

Date
Page No.
Title

1) Task I: Describe a real world scenario where decisions are made using data (e.g) marketing, education or healthcare.

Marketing

Ans Scenario: Optimizing digital advertising spend.

A company FitFuel that sells protien powder and health supplement through its website. Fitfuel wants to increase sale by spending its monthly digital advertising budget more effectively. Fit fuel collects and analyzes various data sources to make three key decisions: Targeting, creative and Budget allocation.

- Data sources used

→ Internal Data

- Customer Relationship management (CRM) Data: Purchase history, lifetime value (LTV)
- Web analytics data. Conversion rates, bounce rates.

→ External Data

- Ad platform Data (e.g Facebook Ads manager) Cost per click (CPC), Click through rate (CTR) and cost per acquisition for every ad.
- Market trends: Seasonal search interest for supplements and competitor pricing.
- Customer Targeting: CRM Data shows that customers who purchase the "performance" protien powder typically have an LTV 40% higher than average customer.

DELTA®

Title _____ Date _____
Page No. _____

- Ad creative (A/B Testing): An A/B Test of two ad videos showed that Video B (featuring a testimonial) had a 2.5% higher click-through rate (CTR) and 15% lower cost Per acquisition (CPA) than video A (featuring a product shot)
- Budget Allocation: Platform data reveals that google search ads have lowest (CPA) compared to facebook Ads.

By using Data (CRM, Ad platform metrics and A/B test result), Fitfuel moved from relying on opinion to relying on evidence. This led to decision that are measurable, trackable, and optimized for achieving their Business goal.

2) Task 2: Compare and contrast descriptive predictive and prescriptive models using examples.

Ans These three types of models represent a spectrum of data analysis, moving from understanding the past to optimizing the future.

- Descriptive Model

This is the most basic form of analytics. It involves aggregating, grouping and averaging data to tell you what has already occured. Use methods like reporting, data aggregation, and basic visualizations.

DELTA®

Date
Page No.

Example: Analyzing the number of website visits and conversion rate last month to find out that "campaign A generated 3,500 clicks and a 2% conversion rate.

- Predictive model
Forecast future outcomes based on patterns identified in historical data.
This model uses statistical and machine learning techniques to find relationships and trends in the past data, then projects those trend forward. It deals in probabilities. Use techniques like regression analysis, time series forecasting and classification algorithms. Allows business to anticipate future demand, risks.
Example: Predicting whether a customer will buy or not.
Use case: Predicting yes/no outcomes
↳ shopping app uses customer data
  - Age
  - Past purchase
  - Time spent on app
Predicts: will customer buy this product.
- Prescriptive model
This is the most advanced form. It not only predicts what happens but also suggest the best decision to take, often considering multiple constraints.
Uses advanced techniques like optimization

DELTA®

Date
Page No.

algorithms, simulation and decision science.

Example: Delivery route optimization
A delivery company wants to reduce fuel cost.

- Choose route C
- Avoid traffic zones
- Deliver to area 5 first

→ This will save 20% fuel.
→ It recommends what to do, not just what will happen.
* The key difference lies in output and degree of actionability.
→ Descriptive → what happened?
→ Predictive → what will happen?
→ Prescriptive → what should we do?
While descriptive analysis is essential for monitoring and easy to implement, Prescriptive analysis offers highest strategic value because it directly influences decision making.

3) Task 3: list and categorize at least 5 Internal and 5 external data sources for a company of your choice.

Ans Internal data sources (Data generated and owned by the company)

1) Transaction/Sales Records: Customer purchase history, order value, product returns, timestamp of sale.

DELTA®

Date
Page No.

2) Web analytics / clickstream data: website visits, page load time, products ~~, status and correspondence notes.~~ views, bounce rates, cart abandonment rates.

3) Customer relationship management (CRM) Data: Customer contact information, support ticket history, loyalty program status.

4) Inventory & supply chain Data: Current stock levels, warehouse locations, shipping times.

5) Marketing campaign performance: Email open/click through rates (CTR), conversion rates of specific ads, A/B result.

External Data sources

1) Social media sentiment Data: Customer reviews, mentions, and posts about the brand or products on platform like twitter.

2) Competitor Pricing Data: Real time pricing, discounts, and product availability data from rival e-commerce sites.

3) Economic / Demographic: Government census data, regional inflation rates, employment statistics, or disposable income trends for

DELTA®

Date
Page No.

target markets.

4) Weather / Logistic Data: Local weathers forecasts that can impact delivery times or demand for seasonal products (eg Snow gear)

5) Market Research Report: Reports from consulting firms or trade organizations about the growth of specific products categories or consumer behaviour shifts.

Task 4: Reflections on improving decision Quality.

Ans 1) Adopting a data driven approach significantly improves the quality of decisions because it reduces guesswork increases objectivity. When decisions are based on reliable data rather than intution, they become more accurate, consistent and defensible. Data helps identify real pattern and trends that may not be visible through personal judgement alone. This leads to deeper insights into problems, customer behaviour, performance gaps, risks and opportunities.
A data-driven approach also encourages continous learning. As new data comes in, decisions can be revised and improved, making the entire process

DELTA®

Page No.
Date:

Date
Page No.

dynamic and adaptive rather than static. It helps organisations test different strategies through evidence (for example, A/B testing) compare outcomes, and choose the one that performs best. This not only improves effectiveness but also reduces costly mistakes. Moreover, relying on data supports transparency and accountability. Overall, a data-driven approach enhances decision quality by making choices more evidence-based, accurate, efficient and aligned with actual needs rather than assumptions.