***Capstone Project – Blinkit Data Analytics – PowerBI***

***📝 Problem Statement:***

Blinkit, a leading quick-commerce grocery delivery platform, seeks to optimize its end-to-end business operations by analyzing customer purchasing behavior, delivery performance, inventory management, marketing effectiveness, and customer satisfaction metrics. The goal is to identify growth levers, improve operational efficiency, personalize customer engagement, and build predictive models for delivery time estimation, customer segmentation, and sales forecasting to drive profitable and scalable growth.

**Dashboard 1: Customer Behavior & Segmentation**

* Total customers by segment
* Orders and average order value by customer segment
* Registration trends over time
* Customer distribution by area and pincode
* High-value customers identification (filterable)

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**🟩 Key Findings**

**1️⃣ Overall Performance**

* **Total Revenue:** ₹4.97 million
* **Average Order Value (AOV):** ₹994.5
* **Total Orders:** 5,000
* **Total Customers:** 2,500

➡️ This means, **on average, each customer places 2 orders**, showing moderate repeat purchase behavior.

**2️⃣ Customer Segmentation**

* **Inactive:** 24%
* **New:** 25.12%
* **Regular:** 25.56%
* **Premium:** 25.32%

➡️ The distribution is **fairly balanced**, but **24% inactive** customers indicate potential churn risk.  
➡️ Premium and Regular customers together make up ~51% — **key contributors** to revenue.

**3️⃣ Customer Area Insights**

* Top performing areas: **Faridabad, Durgbhai, Kaliana, Baludhandhar**  
  ➡️ Indicates these locations have the **highest order volumes** and engagement.

**4️⃣ Registrations Trend**

* Peak registrations observed in **March** and **November**.  
  ➡️ Could be linked to **seasonal offers, festivals, or campaigns**.
* Drop in **December** → possible year-end fatigue or reduced promotions.

**5️⃣ Order Value by Segment**

* **Regular & Premium** customers show **highest total orders and AOV (~₹1.3K – ₹1.2K)**
* **Inactive** group’s order value is lowest (~₹1.0K)  
  ➡️ Indicates **premium and loyal customers drive higher spending.**

**🟨 Strategic Recommendations**

**💡 1. Reactivation of Inactive Customers**

* Launch **“Come Back” offers** or **personalized discounts** for the 24% inactive users.
* Use **push notifications** or emails with last ordered items or special coupons.

**💡 2. Loyalty and Rewards Program**

* Create a **Blinkit Rewards Club** to retain **Regular & Premium customers**.
* Offer **cashbacks, free delivery, or priority slots** for frequent buyers.

**💡 3. Boost New Customer Conversion**

* Since ~25% are new, design **first-order discounts** or **referral programs**.
* Use welcome campaigns to convert them into **Regular** users.

**💡 4. Seasonal Marketing Campaigns**

* Registration spikes in **March & November** → replicate **successful promotional patterns** (e.g., festival offers, flash sales).

**💡 5. Geographic Targeting**

* Focus ads, inventory, and fast delivery services on **top-performing areas (Faridabad, Durgbhai)**.
* Analyze underperforming areas for potential **logistics or demand issues.**

**💡 6. Increase Average Order Value**

* Introduce **bundle offers** or **minimum order discounts** (e.g., “Get ₹100 off on ₹1200+ orders”).
* Cross-sell or upsell during checkout (suggest complementary items).

**💡 7. Data-Driven Personalization**

* Use insights from **AOV and customer segments** to personalize app banners, offers, and push notifications.
* Example: “Hey [Name], your favorite product is on 10% off!”

**Dashboard 2: Order and Delivery Performance**

* Total orders vs. late deliveries over time
* Average delivery time by delivery partner and area
* Delivery delay reasons breakdown
* On-time vs. delayed delivery rate KPIs

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**🟩 Key Findings**

**1️⃣ Overall Delivery Performance**

* **Total Deliveries:** 5,000
* **On-Time Deliveries:** 3,470 → **69.4% on-time rate**
* **Late Deliveries:** 1,530 → **30.6% delay rate**
* **Average Delivery Time:** **4.44 mins**
* **On-Time Delivery Rate:** **0.69**, **Delayed Rate:** **0.31**

➡️ Around **1 in 3 orders** are delayed — a major area for improvement.

**2️⃣ Delay Reasons**

* 50% of delays caused by **traffic issues**.
* 50% due to **other factors** (likely operational or partner-related).

➡️ Traffic management and route optimization are key improvement areas.

**3️⃣ Monthly Trends**

* **Late deliveries** peaked between **May to September**, remained high until October.
* Improvement noted in **November–December**.

➡️ Possibly linked to **seasonal demand**, **rainy weather**, or **higher order volumes** during mid-year.

**4️⃣ Delivery Status Breakdown**

* **On-Time:** 69.4%
* **Slightly Delayed:** 20.7%
* **Significantly Delayed:** 9.8%

➡️ Majority of delays are **minor**, showing potential for easy improvement with better scheduling.

**5️⃣ Area-wise Delivery Insights**

* Fastest average delivery times:  
  ✔ Ahmedabad (3.33 min), Ajmer (4.08 min), Allahabad (4.13 min)
* Slowest delivery times:  
  ❌ Agra (7.19 min), Aligarh (6.27 min)

➡️ Delivery efficiency varies widely by city → suggests uneven logistics performance.

**6️⃣ Total Orders vs Late Deliveries by Month**

* Total orders remain fairly consistent throughout the year.
* Late deliveries follow the same pattern, indicating **demand pressure directly affects delivery performance**.

**🟨 Strategic Recommendations**

**💡 1. Optimize Route & Traffic Management**

* Integrate **real-time traffic tracking** for delivery partners.
* Use **AI-based route planning** to avoid congested areas.
* Collaborate with **local traffic authorities** in high-delay cities.

**💡 2. City-Specific Logistics Audit**

* Conduct audits in **slow-delivery cities (Agra, Aligarh)** to identify causes — could be **staff shortage or poor route design**.
* Replicate best practices from **fast cities (Ahmedabad, Ajmer)** across others.

**💡 3. Delivery Partner Efficiency**

* Provide **training and performance incentives** for on-time deliveries.
* Introduce **bonus system** for consistently punctual riders.

**💡 4. Time-Slot and Load Balancing**

* During high-demand months (May–September), add **temporary delivery partners** or **adjust order slots**.
* Use **predictive demand analytics** to pre-plan capacity.

**💡 5. Customer Communication**

* Notify customers in advance if delivery might be delayed (especially during peak traffic hours).
* Offer **discounts or coupons** for significantly delayed orders to maintain satisfaction.

**💡 6. Monitor and Reduce Slight Delays**

* Since 20.7% are *slightly delayed*, minor changes (better shift scheduling, faster order dispatching) can push the on-time rate above 80%.

**💡 7. Data Integration**

* Combine this dashboard with **Customer Behavior data** (previous one) → analyze if **delays reduce customer retention or order frequency**.

**Dashboard 3: Product & Inventory Management**

* Stock received vs. damaged stock trends by product and date
* Products below minimum stock level
* Top-selling products by quantity and revenue
* Margin percentage vs. price analysis
* Shelf life and stock rotation insights

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**🟩 Key Findings**

**1️⃣ Overall Inventory Overview**

* **Minimum Stock Level:** 5,464 units
* **Products Below Minimum Stock:** 268
* **Total Stock Received:** 176K
* **Stock Rotation Ratio:** 0.54
* **Current Stock:** 95K
* **Damaged Stock:** 81K

➡️ Almost **46% (81K/176K)** of total stock is damaged — a serious concern for operational efficiency and cost control.  
➡️ Stock rotation ratio (0.54) indicates **slow-moving inventory**, meaning goods are not replenished or sold fast enough.

**2️⃣ Stock Received vs Damaged Stock (By Month)**

* Both stock received and damaged stock show **a similar pattern**, peaking mid-year.
* High damaged stock levels persist from **April to October**.

➡️ This suggests **storage, handling, or packaging issues** during high-demand months.

**3️⃣ Damage Rate Trend**

* Damage rate fluctuates between **45%–50%**, peaking around **August–September**.
* Slight improvement observed in **November–December**.

➡️ Indicates need for **better quality control, packaging, and warehouse handling**.

**4️⃣ Revenue by Product**

* Top revenue contributors:  
  ✔ Bread  
  ✔ Toilet Cleaner  
  ✔ Cough Syrup  
  ✔ Pet Treats  
  ✔ Vitamins

➡️ Revenue is dominated by **fast-moving consumer goods (FMCG)** and **healthcare items**, which have steady demand.

**5️⃣ Price by Category & Margin**

* Highest prices in: **Pharmacy & Grocery items**
* Highest margins in: **Cold Drinks & Snacks/Milk** (25%–35%)
* Lower margins in **Household Care** and **Personal Care** categories.

➡️ **High-margin categories** (snacks, beverages) should be prioritized for promotions and visibility.

**6️⃣ Shelf Life Insights**

* Most perishable items (Bananas, Carrots, Mangoes) have **3–5 days shelf life**.
* Packaged items like **Biscuits, Chips, Chocolates** have **up to 90 days**.

➡️ Indicates a **mix of short-life and long-life products**, requiring careful **inventory rotation and storage planning**.

**🟨 Strategic Recommendations**

**💡 1. Reduce Damage & Improve Handling**

* Conduct a **root-cause analysis** on why 81K items are damaged (e.g., packaging, transport, temperature).
* Train warehouse staff on **storage, stacking, and delivery handling**.
* Use **barcode scanning and IoT sensors** to track fragile or temperature-sensitive items.

**💡 2. Optimize Stock Levels**

* Review **268 items below minimum stock** → potential out-of-stock risk.
* Automate **reorder alerts** when stock reaches threshold.
* Apply **ABC analysis** to focus on high-value or fast-moving items.

**💡 3. Increase Stock Rotation Ratio**

* Current ratio (0.54) is low. Improve by:
  + **Discounting slow-moving items**
  + **Bundle offers** with popular products
  + **Dynamic pricing** to clear aging inventory faster.

**💡 4. Balance Perishable vs Long Shelf-Life Products**

* For perishable goods (fruits, vegetables):
  + Implement **daily freshness audits**.
  + Ensure **FIFO (First-In-First-Out)** system is followed.
* For long shelf-life products:
  + Increase **promotion frequency** to prevent overstocking.

**💡 5. Boost High-Margin Categories**

* Run **marketing campaigns** around high-margin categories (Cold Drinks, Snacks).
* Introduce **combo offers** (e.g., “Buy 2 get 1 free” on snack packs).
* Highlight these items on the app homepage.

**💡 6. Improve Supplier Management**

* Identify suppliers contributing to high damage rates and **renegotiate contracts or packaging quality.**
* Reward reliable suppliers with **performance incentives.**

**💡 7. Tech & Data-Driven Improvements**

* Use **predictive analytics** to forecast stock demand and avoid over-ordering.
* Link customer purchase trends to **inventory decisions** for real-time balance.

**Dashboard 4: Marketing Campaign Performance**

* Campaign-wise impressions, clicks, conversions, and spend
* Revenue generated and ROAS by campaign
* Conversion rate trends over time
* Performance by marketing channel (App, Email, SMS)
* Target audience segment-wise campaign effectiveness

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**📊 Key Findings**

1. **Overall Spend & Results**
   * Total Spend: ₹16.32M
   * Cost per Click (CPC): ₹5.5
   * Total Impressions: 29M
   * Total Clicks: 3M
   * Conversion Rate: **1.01%**, leading to **298K conversions**.
2. **Performance Trends**
   * Conversion Rate peaked in **February–March** (~1.1%) and dropped afterward, suggesting seasonality or campaign fatigue.
   * December showed one of the **lowest conversion rates**, possibly due to less engaging end-of-year offers.
3. **Channel Performance**
   * **Top Revenue Channels:** App (₹8.08M), Email (₹8.19M), Social Media (₹7.99M), SMS (₹7.94M).  
     → All channels are performing *similarly*, indicating balanced multichannel ROI.
   * **ROAS** (Return on Ad Spend) appears consistent across campaigns (~2x), but none stand out as extraordinary performers.
4. **Campaign Insights**
   * **Top Performing Campaigns (by revenue):**
     + Referral Program
     + New User Discount
     + Email Campaign
   * **Weaker Campaigns:** Flash Sale and Category Promotion show slightly lower revenues and returns.
5. **Target Audience**
   * Conversion rates are *fairly uniform* across audience types, but **New Users** and **Premium Users** slightly outperform others — indicating potential in loyalty and onboarding programs.

**🧠 Strategic Recommendations**

1. **Double Down on High-ROAS Campaigns**
   * Scale **Referral** and **New User Discount** campaigns—they already drive strong results with lower acquisition costs.
   * Test variations of these campaigns across other channels (especially app & email).
2. **Revisit Low-Performing Campaigns**
   * Analyze **Flash Sale** and **Category Promotions**—low ROAS may indicate weak creative, poor targeting, or timing mismatches.
3. **Optimize by Month**
   * Focus larger ad spends around **Feb–Mar**, when conversion rates historically peak.
   * During low months (June–Dec), test new creatives, audiences, or retargeting flows to lift performance.
4. **Channel Strategy**
   * Maintain a **diversified mix** across App, Email, SMS, and Social Media—but explore more automation/personalization in Email (since it’s both low-cost and high-performing).
   * Use **push notifications** more strategically—ROAS seems moderate, but engagement can be boosted with better timing and segmentation.
5. **Audience Focus**
   * Strengthen **retention** among Premium users and **activation** for New users with tailored offers.
   * For Inactive users, consider reactivation campaigns via Email + Push, with limited-time offers.

**Dashboard 5: Customer Feedback & Sentiment Analysis**

* Feedback count and average rating by category
* Sentiment distribution over time
* Text analysis word cloud or top feedback themes (optional)
* Link feedback sentiment to delivery performance or order value
* Negative feedback customers and resolution tracking

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**📊 Key Findings**

1. **Overall Performance**
   * **Average Delivery Time:** 4.44 minutes (pretty good — under 5 minutes).
   * **Average Rating:** 3.34 / 5 → indicates a **neutral-to-slightly-negative** overall sentiment.
   * **Total Feedback Count:** 5000, with **1642 negative reviews** (~33%), which is high.
2. **Feedback by Category**
   * **Highest Feedback Volume:**
     + Delivery
     + Customer Service
     + Product Quality
     + App Experience  
       → Suggests customers are vocal about both operational and digital experiences.
   * Delivery & Product Quality have similar feedback counts — key areas to watch.
3. **Sentiment Analysis**
   * **Negative sentiment** has higher average delivery times (4.64 mins vs. 4.37 for neutral).  
     → Even small delays may sharply affect customer perception.
   * **Positive sentiment** lags behind neutral and negative in total count → signals room for improvement in customer delight.
4. **Monthly Trends**
   * Feedback peaks around **May–August**, coinciding with higher negative sentiment volume.  
     → Could relate to summer demand spikes or operational strain.
   * Toward year-end, both total feedback and negatives decline — possibly due to lower order volume.
5. **Category-wise Sentiment**
   * **Delivery** and **Customer Service** dominate negative mentions across months.
   * **App Experience** and **Product Quality** have mixed but improving sentiment toward later months.

**🧠 Strategic Recommendations**

1. **Reduce Delivery Time Variability**
   * Even small timing differences (4.6 vs. 4.3 min) impact sentiment.  
     → Prioritize **last-mile optimization** and **real-time tracking accuracy** to maintain consistency.
2. **Customer Service Training & Automation**
   * Since it’s one of the top feedback areas, strengthen customer service responsiveness — use **chatbots for FAQs** and **agent performance analytics**.
3. **Quality Assurance Focus**
   * Product quality drives repeat use and positive sentiment.  
     → Introduce **“Freshness Guaranteed”** or **“Replacement within 10 mins”** policies to build trust.
4. **Leverage Positive Feedback**
   * Encourage satisfied customers to **rate the app** and **share reviews publicly** — this can balance sentiment ratios and support organic marketing.
5. **App Experience Enhancement**
   * Continue improving app usability, particularly checkout speed and refund processes — these often drive negative feedback in quick-commerce apps.
6. **Proactive Peak Season Planning**
   * Prepare extra staffing and inventory management for **summer months** to reduce operational strain and negative sentiment spikes.

**Dashboard 6: Financial & Operational KPIs**

* Total revenue and order totals over time
* Payment method distribution and trends
* Average order value trends by segment
* Cost analysis: damaged stock cost vs. revenue
* Profit margin overview by product category

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**📊 Key Findings**

1. **Overall Financials**
   * Total Amount (Revenue): ₹4.97M
   * Profit: ₹1.36M → Profit Margin = 0.27% (very low, suggesting high costs or losses elsewhere).
   * Average Order Value: ₹2.2K
   * Total Orders: 11.01M
   * Damaged Stock Cost: ₹39.72M — alarmingly higher than total revenue! This indicates major inefficiencies or potential reporting issues.
2. **Order Trends**
   * Both Order Amount and Order Count peak between May–August, similar to the sentiment data, likely due to higher seasonal demand.
   * Drop-off observed after October, consistent with year-end slowdowns.
3. **Payment Methods**
   * UPI and Card dominate transactions, with Cash slightly behind.
   * Digital payments (UPI, wallet, card) form the majority → indicates growing digital adoption and faster processing.
4. **Damaged Stock**
   * Highest costs in Dairy & Beverages and Fruits & Vegetables, followed by Pet Care and Personal Care.  
     → These are perishable or fragile categories — clear opportunity for supply chain optimization.
5. **Profit Margin by Category**
   * Highest margins: Cold Drinks & Juices and Instant/Frozen Food.
   * Lowest margins: Snacks & Munchies and Baby Care, indicating price sensitivity or high competition.

**🧠 Strategic Recommendations**

1. **Address Damaged Stock Crisis**
   * With damaged stock exceeding ₹39M, immediate actions needed:
     + Improve cold chain logistics for perishables.
     + Strengthen vendor packaging standards and warehouse handling.
     + Implement AI-based demand forecasting to reduce overstocking.
2. **Boost Profit Margins**
   * Reassess pricing or promotions in low-margin categories (Snacks, Baby Care).
   * Negotiate better supplier terms in high-cost segments like Dairy and Fruits.
   * Promote cross-selling of higher-margin items like Frozen Foods or Beverages.
3. **Operational Efficiency**
   * Since May–Aug are high-demand months, ensure inventory ramp-up and additional delivery capacity during that window.
   * Focus on reducing operational waste and return logistics costs.
4. **Encourage Digital Payments**
   * Strengthen incentives for UPI/Card usage — lower handling costs and improve order tracking accuracy.
   * Offer small discounts or loyalty points for digital payment users.
5. **Data Reconciliation**
   * The mismatch between Damaged Stock Cost (₹39.7M) and Revenue (₹4.97M) suggests possible data integrity or recording issues — conduct an audit to validate entries.