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TECHNICAL REPORT FOR TECHSPIRE
GADGETS SALES ANALYTICS (2023–2025)

Introduction

Objective of the Project

The objective of this project is to analyze mobile and laptop sales data to identify key sales trends, evaluate product and brand performance across various regions, and understand customer purchasing behavior. This analysis aims to guide business decisions regarding inventory management, pricing strategy, and regional marketing focus for the year 2025.

Problem Being Addressed

The business needed a clearer understanding of which products are performing best, which regions are generating the most sales, and how customer preferences vary across product specifications. Without this insight, decision-making around stock planning, marketing investment, and sales strategy remains speculative and inefficient.

Key Datasets and Methodologies

Datasets Used

- mobile_sales_data: Contains detailed transaction-level data including product type, brand, price, sale date, customer, and regional information.
- Working Dataset: A cleaned and structured version of the mobile_sales_data, formatted for analysis.

Methods Used in Microsoft Excel

- **Pivot Tables:** Used to summarize total revenue by brand, product type, and region.
- **Charts:** Created for visual insights into brand performance and regional sales distribution.

Story of Data

Data Source

The data originates from a publicly available dataset on Kaggle, curated by Vinothkanna ECE. It includes mobile and laptop sales records used for educational and analytical purposes.

Data Collection Process

While specific collection methods aren't detailed on the Kaggle page, the dataset appears to simulate transactional records, likely generated from synthetic data or aggregated logs meant to mimic real-world retail data. It includes realistic fields such as dates, prices, and customer locations, suggesting a structured and programmatically generated dataset.

Data Structure

The dataset is structured in a tabular format:

1. **Rows:** Represent individual transactions.

2. **Columns:** Include multiple variables:

- Product Type (Mobile Phone, Laptop)
- Brand and Product Code
- Product Specifications (Processor, RAM, ROM, SSD)
- Pricing (Price)
- Timeline (Inward and Dispatch Dates)
- Sales Volume (Quantity Sold)
- Customer Details (Name, Location)
- Regional Info (Region)

Important Features and Their Significance

- **Product Type & Brand:** Help identify category-specific and brand-specific sales performance.
- **Price & Quantity Sold:** Critical for calculating total revenue and profit margins.
- **Dates (Inward & Dispatch):** Support delivery efficiency analysis and seasonality trends.
- **Region:** Facilitates regional market analysis and demand segmentation.
- **Technical Specs (Processor, RAM, ROM, SSD):** Allow exploration of consumer preferences based on hardware configuration, important for targeted marketing and inventory planning.

Data Limitations or Biases

- **Synthetic Data Nature:** Since the dataset is likely simulated, real-world variability and unpredictability (like economic effects or supply chain disruptions) are not represented.
- **Missing Values:** Some records lack technical specs (e.g., SSD, Core Specification), which may affect hardware-specific insights.
- **Lack of Customer Demographics:** The dataset lacks detailed demographic data (age, gender, etc.), limiting consumer profiling.
- **Ambiguous Text Fields:** Fields like Product Specification contain inconsistent or filler text, which may be less useful for direct analysis without extensive cleaning.

Data Splitting and Preprocessing

Data Cleaning

Data cleaning was primarily performed in the "Working Dataset" sheet. Key cleaning steps included:

- **Removing Duplicates:** Duplicate rows were filtered out to ensure each transaction was uniquely represented.
- **Standardizing Column Headers:** Headers were corrected for clarity and consistency

Handling Missing Values

Missing values in fields like SSD, Core Specification, and RAM were handled by:

- Leaving them blank for manual review, or
- Using Excel filters to isolate and exclude them from spec-based analysis. For most analyses (especially using pivot tables), blank entries were omitted to maintain accuracy without skewing results.

Data Transformations

There were no data transformation

Data Splitting

To prepare the dataset for performance and trend analysis:

- **Dependent Variable:** Quantity sold, Price
- **Independent Variables:** Product Type, Brand, Region, Inward Date / Dispatch Date (can be used to compute delivery time), Customer Location, Core Specification, Processor Specification.

Industry Context

The dataset belongs to the Retail & Consumer Electronics Industry. It tracks the sales of laptops and mobile devices — a highly competitive sector where product features, pricing, and regional targeting significantly influence revenue.

Stakeholders

Key stakeholders who benefit from this analysis include:

- **Marketing Team:** Gains insight into high-performing regions and products for targeted campaigns.
- **Inventory/Operations Team:** Understands product demand for optimized stock management.
- **Sales Team:** Identifies trends to refine sales strategy.
- **Senior Management:** Uses strategic insights for investment and expansion planning.

Value to the Industry

Success in this space means delivering innovative, high-demand products efficiently while satisfying all stakeholders—driving revenue, loyalty, and growth in a competitive market.

Pre-Analysis

Key Trends

- **Regional Performance:** Sales volumes are noticeably higher in regions like South Todd, West Todd, and East Woods, suggesting these areas may have a larger customer base or more aggressive sales activity.

- **Brand Dominance:** Certain brands such as Samsung, Apple, and Dell show consistently high sales, indicating strong brand loyalty or preference in the market.

- **Product Type Distribution:** Mobile phones make up a larger portion of sales compared to laptops, implying a higher turnover rate or broader market penetration for mobile devices.

- **Sales Timing:** There are signs of clustered dispatch dates in certain months, which could point to seasonal sales cycles or bulk shipment periods (e.g., holidays or back-to-school periods).

Potential Correlations

- **Price vs. Quantity Sold:** While high-end devices (e.g., Apple) still sell well, there seems to be a sweet spot in mid-range pricing where quantity sold is maximized — especially for brands like Samsung and Vivo.

- **Product Specs vs. Sales**: Devices with moderate RAM (4GB-8GB) and SSD storage show better sales figures, possibly indicating a preference for balanced performance and price.

- **Region vs. Brand Sales:** Some regions appear to favor specific brands — for example, Dell and HP have stronger laptop sales in East Woods, suggesting localized brand strength.

Initial Insights

- The top-selling regions may warrant targeted marketing campaigns or expansion efforts.

- Apple's continued sales despite high pricing raise questions about customer demographics and brand equity — suggesting a potential for premium product focus in select regions.

- The presence of many entries with missing specifications (e.g., no SSD or incomplete RAM details) may hint at either lower-end products or incomplete sales logging — an area worth exploring to assess data quality or inventory accuracy.

- Lower-priced items may not always drive higher quantity—specs and brand might be the real drivers.

- Devices with higher RAM and storage could be preferred, especially in tech-savvy regions.

- Certain areas may show a higher preference for mobile phones or laptops.

- Consistent high quantity sold for a brand across regions signals strong customer loyalty.

- Faster dispatch might correlate with repeat sales or higher volumes.

In-Analysis

Unconfirmed Insights

1. Top-Selling Brands by Unit Sales

The dataset reveals that Google, Nokia, Apple, Samsung, and Toshiba are tied at 2.6K units sold, followed closely by Sony, OnePlus, Acer, Redmi, and Huawei at 2.5K units each. This suggests a highly competitive and balanced tech market with no single brand dominating, although subtle preferences may exist based on regions or product specs.

2. Regional Sales Distribution

Each region—including Central, East, North, and South—contributed approximately $1B in revenue, while the West region slightly exceeded with $1.1B. This points to broad market penetration and a need for regional analysis to tailor future campaigns more precisely.

3. Processor Preferences

MediaTek Dimensity leads in revenue at $376M, trailed closely by Samsung Exynos, Snapdragon, and Apple's A-series processors. These findings suggest consumer preference for performance-oriented mobile processors, although further analysis is needed to confirm price-performance influence.

4. Customer Behavior

The top five customers made 96 high-value purchases totaling $11.7M, with Michael Johnson and Michael Williams leading. This highlights the value of loyal, high-spending customers who may respond well to targeted loyalty programs.

5. Customer Location Trends

Areas like South Michael, North Michael, Lake Michael, and East Michael top the charts in sales, totaling $22.3M. The dominance of "Michael" regions hints at potential brand affinity, market saturation, or demographic concentration worth exploring further.

6. Temporal Sales Trends

Sales quantities steadily increased from 2023 (starting at 96.2K) to 2024 (averaging ~12K/month), with consistent revenue growth peaking in August 2023 ($228.3M) and a slight dip in May 2025. This indicates seasonal buying patterns and healthy year-over-year growth.

7. SSD and RAM Combo Preferences

SSD sizes like 2TB, 1TB, 512GB, and 256GB generated consistent revenue ($0.6B each), with popular RAM sizes from 4GB to 32GB contributing $0.1B each. This consistency suggests standardized tech demand across storage tiers.

Recommendations

1. The sales distribution indicates a highly competitive market, with five leading brands—Google, Nokia, Apple, Samsung, and Toshiba—each achieving slightly higher unit sales (2.6K) than their counterparts. The narrow margin between top and other brands (2.5K units) suggests customer preferences are diverse and no single brand holds a dominant lead. This presents an opportunity for brands to differentiate through marketing, innovation, or customer service to gain a competitive edge and increase market share.

2. Sales are evenly distributed across regions and product types, indicating consistent market demand for both laptops and mobile phones. However, the West region slightly outperforms others, contributing $1.1B in revenue. This suggests a potential growth

opportunity in the West, where targeted marketing or increased inventory could further boost performance in an otherwise balanced market.

3. High-end processors like MediaTek Dimensity, Samsung Exynos, and Snapdragon series lead in revenue, indicating strong consumer preference for performance-oriented devices. Apple A-Series also shows competitive sales, while entry-level processors like i3 and Ryzen 3 generate less revenue. This suggests that investing in devices with advanced processors could drive higher sales, as customers prioritize speed and performance over basic computing power.

4. The top five customers account for a significant $11.7M in revenue from 96 transactions, highlighting their high lifetime value. While Michael Johnson contributes the most in sales, Michael Williams leads in transaction volume, showing consistent purchasing behavior. This group represents a key customer segment, suggesting the need for loyalty programs or targeted offers to retain and further engage these high-value buyers.

5. With $22.3M in total sales, the "Michael" regions dominate, contributing over $18M, led by South Michael at $5.5M. This indicates a concentrated customer base or strong brand presence in these areas. Targeted promotions and expansion in the "Michael" regions could amplify sales further, while New James shows promising potential and may benefit from increased marketing to reach comparable performance levels.

6. There's consistent growth in sales from 2023 to 2024, with a significant jump in total sales from 96.2K to 137.9K. This indicates a positive trend in performance, suggesting improved customer demand or successful strategies. The stability of monthly sales in 2024 further reflects strong market position and demand, maintaining consistent sales levels throughout the first half of the year.

7. There's steady revenue growth from 2023 to 2024, with a notable increase from $1.79B to $2.58B, reflecting successful performance. However, 2025 shows a sharp decline, particularly in May, leading to a reduced total of $765.7M. This suggests that while the business experienced solid growth, there were challenges in 2025 that impacted revenue. The grand total of $5.13B over three years indicates strong overall performance, despite fluctuations.

8. SSDs of 2TB, 256GB, 1TB, and 512GB, paired with RAM combinations like 32GB, 16GB, and 12GB, dominate the market, each generating $0.6B in revenue. This suggests strong demand for higher-capacity SSDs and larger RAM configurations. The consistent $0.1B revenue from smaller RAM sizes indicates a broad market appeal, while the total of $2.6B highlights the overall success of these combinations.

Analysis Techniques Used in Excel

- **Pivot Tables:** Used to aggregate total sales, revenue, and transaction counts by brand, region, processor type, and customer.
- **Data Filters and Slicers:** For quick segmentation by brand, region, and product specifications.

Post-Analysis and Insights

Key Findings

1. Sales distribution across brands like Google, Nokia, Apple, Samsung, and Toshiba shows near-equal unit sales (~2.6K), suggesting intense competition with no clear market leader.

2. Sales are evenly distributed across regions and between laptops and mobile phones, though the West region leads with $1.1B in revenue—highlighting potential for targeted growth.

3. Devices with high-end processors (MediaTek Dimensity, Exynos, Snapdragon) dominate revenue, indicating strong consumer preference for performance over affordability.

4. The top five customers contributed $11.7M from 96 transactions, emphasizing the importance of customer loyalty initiatives to retain these high-LTV individuals.

5. The "Michael" regions, especially South Michael ($5.5M), drive the majority of sales ($18M+), suggesting focused campaigns here could yield higher returns.

6. Total units sold rose from 96.2K to 137.9K, and revenue jumped from $1.79B to $2.58B—indicating strong performance momentum.

7. Despite previous growth, 2025 saw a decline (total $765.7M), especially in May, signaling potential operational or market challenges.

8. SSDs of 256GB–2TB and RAM sizes of 12GB–32GB drove $2.6B in revenue, confirming preference for higher-capacity devices.

Comparison with Initial Findings

Initial assumptions may have suggested brand or product-type dominance, yet analysis reveals a more level playing field with competitive parity among top brands and regions. The dominance of premium processors and large SSD/RAM configurations reinforces expectations around performance-centric consumer behavior.

However, the sharp revenue decline in 2025 stands out as an unexpected shift, pointing to external or internal factors requiring further investigation. Additionally, the concentration of sales in regions labeled "Michael" was a surprising geographic insight, offering new avenues for strategic targeting.

Data Visualizations & Charts

1. Month and Quantity sold
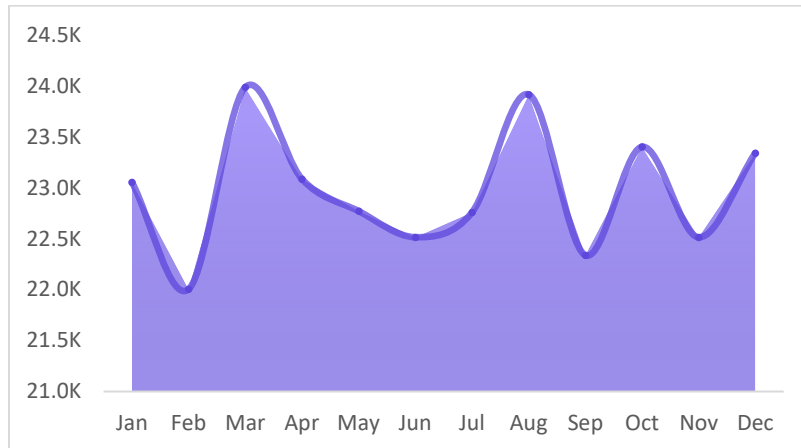
Explanation

This chart shows monthly sales quantities for a year, with values consistently ranging between 22K and 24K units. The key takeaway is the stability of sales volume throughout the year, indicating steady demand with minimal seasonal fluctuation.

2. Monthly Revenue Generated
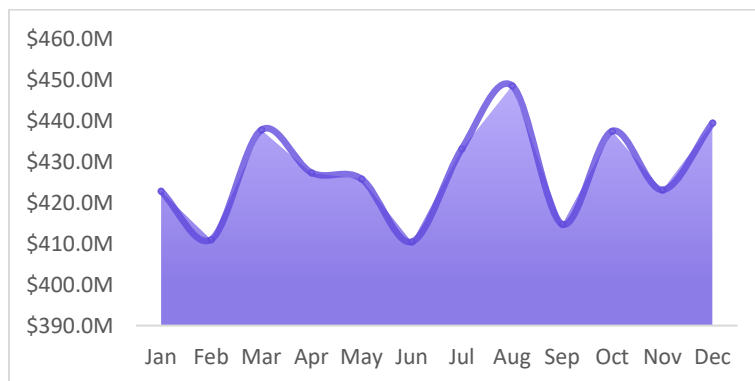
Explanation

This chart presents monthly revenue figures, ranging from $410M to $449M. The key takeaway is the consistently high revenue with a peak in August ($448.62M), indicating strong year-round sales performance and a potential seasonal boost in late summer.

3. Processor Type that sells the most
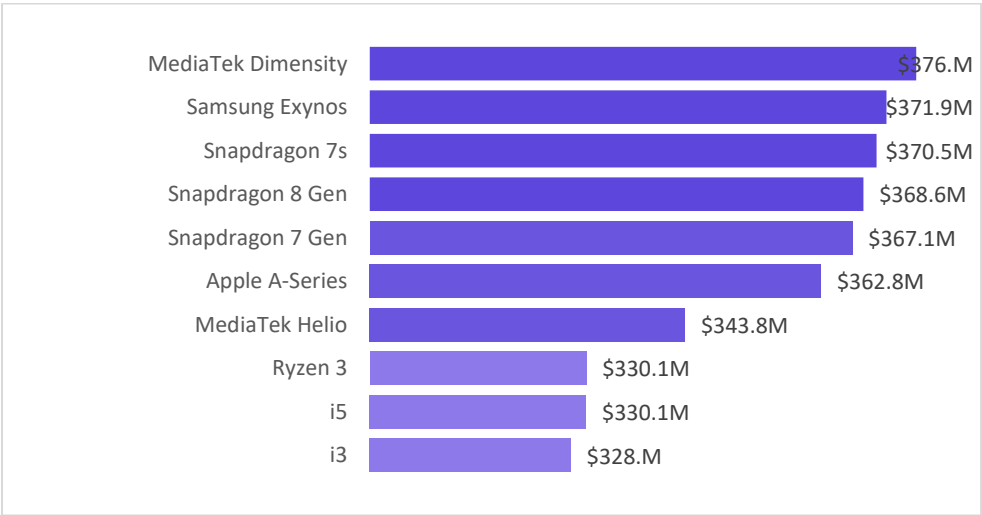
Processor	Revenue
MediaTek Dimensity	$376.M
Samsung Exynos	$371.9M
Snapdragon 7s	$370.5M
Snapdragon 8 Gen	$368.6M
Snapdragon 7 Gen	$367.1M
Apple A-Series	$362.8M
MediaTek Helio	$343.8M
Ryzen 3	$330.1M
i5	$330.1M
i3	$328.M

Explanation

This chart presents monthly revenue figures, ranging from $410M to $449M. The key takeaway is the consistently high revenue with a peak in August ($448.62M), indicating strong year-round sales performance and a potential seasonal boost in late summer.

4. Products that sells the most in a region
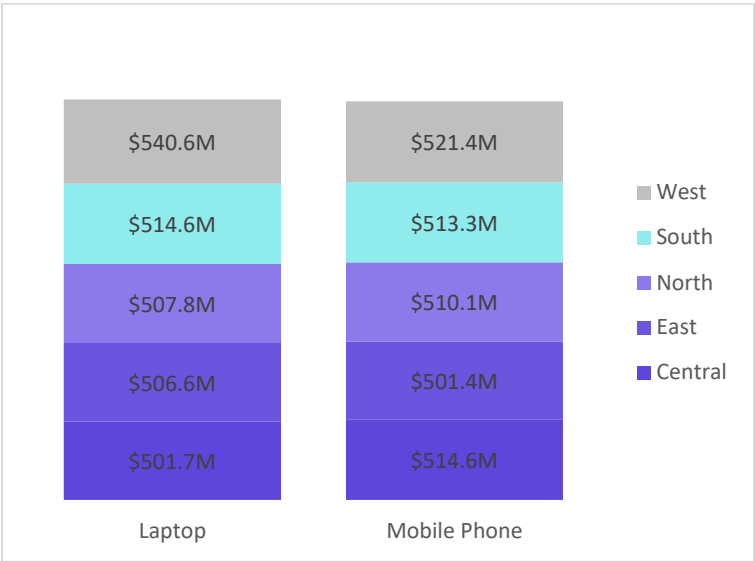
Explanation

The key takeaway is that sales are evenly distributed across regions and gadget types, with both laptops and mobile phones generating around $2.6B each. The West region leads slightly with $1.1B in total sales, indicating a promising area for targeted growth or investment.

5. Brand that sells the most units
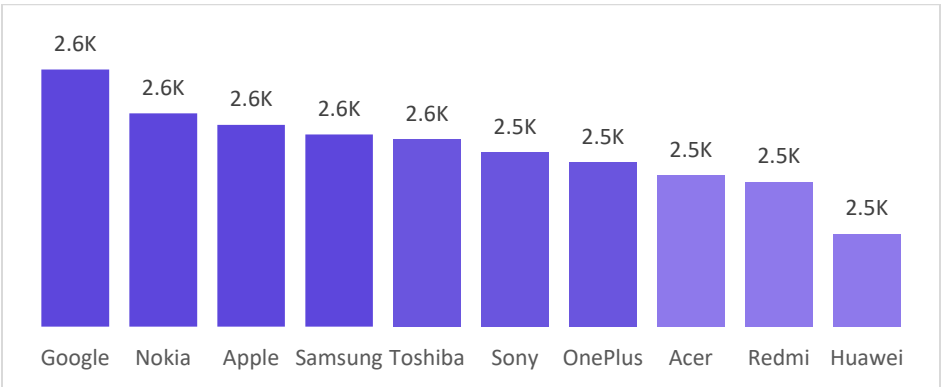
Explanation

Google, Nokia, Apple, Samsung and Toshiba brands have similar quantities sold, signaling that there's a tough competition between these tech giants.

6. SSD &Ram Combination That Sells Best

	32GB	6GB	4GB	16GB	12GB	8GB
512GB	$107.1M	$108.4M	$105.9M	$102.2M	$110.M	$102.4M
1TB	$106.9M	$111.6M	$101.4M	$106.9M	$108.3M	$107.7M
256GB	$109.M	$106.1M	$111.8M	$108.9M	$103.7M	$104.8M
2TB	$115.5M	$109.8M	$111.3M	$107.M	$101.7M	$103.2M

Explanation

The key takeaway from the chart is that the total sum of prices for the SSD categories (2TB, 256GB, 1TB, and 512GB) varies slightly across different column labels (32GB, 6GB, 4GB, 16GB, 12GB, 8GB). The highest total sum is for the 2TB SSD, with $648.4M, while the 512GB SSD has the lowest total sum at $636M.

7. Final Dashboard

Gadgets Sales Analytics (2023-2025)

Ethan Caldwell
Administrator

TechSpire

- Dashboard
- Products
- Analytics
- Recommendation

Brand

Acer	Apple
Asus	Dell
Google	HP
Huawei	iQOO
Lenovo	Microsoft
Motorola	Nokia
OnePlus	Oppo

Customer Location

Aaronmouth
Aaronport
Aaronshire
Aaronstad
Aarontown
Aaronview
Aaronville

Customer Name

Angela Peterson
Angela Petty
Angela Phillips
Angela Pierce
Angela Potts
Angela Pruitt
Angela Ramirez

Fenalytics.com
contact@fenalytics.com

Total Quantity Sold	Top Customer	Brand Best-Seller	Total Sales Revenue
275.69	**Michael Johnson**	**Google**	**$5.13B**

Processor Type That Sells The Most

Processor	Amount
MediaTek Dimensity	$376.M
Samsung Exynos	$371.9M
Snapdragon 7s	$370.5M
Snapdragon 8 Gen	$368.6M
Snapdragon 7 Gen	$367.1M
Apple A-Series	$362.8M
MediaTek Helio	$343.8M
Ryzen 3	$330.1M
i5	$330.1M
i3	$328.M

Monthly Sales By Quantity (2023-2025)

Laptop | Mobile Phone

(Line chart ranging 21.0K–24.5K, Jan–Dec)

Best Selling Product By Region

Laptop	Mobile Phone
$540.6M	$521.4M
$514.6M	$513.3M
$507.8M	$510.1M
$506.6M	$501.4M
$501.7M	$514.6M

Legend: West, South, North, East, Central

SSD &Ram Best Seller

512GB	$107.1M	$102.4M
1TB	$106.9M	$107.7M
256GB	$109.M	$104.8M
2TB	$115.5M	$103.2M

Legend: 32GB, 6GB, 4GB, 16GB, 12GB, 8GB

Highest-grossing Locations By Sales

Location	Amount
South Michael	$5.5M
North Michael	$4.33M
Lake Michael	$4.24M
East Michael	$4.17M
New James	$4.07M

Top 5 Customers With Most Purchases

Name	Amount	No of Transactions
Michael Johnson	$2.59M	21
Robert Johnson	$2.43M	16
Christopher Smith	$2.27M	18
John Smith	$2.22M	19
Michael Williams	$2.14M	22

Monthly Revenue Generated (2023-2025)

Central | East | North | South | West

(Line chart ranging $390.0M–$460.0M, Jan–Dec)

Recommendations and Observations

Actionable Insights

1. Increase marketing efforts for high-performing processors like Ryzen 3 by analyzing sales trends and customer preferences, expanding outreach in regions with the highest demand, and using data insights to optimize pricing and promotional strategies. For lower-performing processors like Ryzen 9, create targeted incentives to boost their sales.

2. Tailor marketing campaigns around MediaTek Dimensity by understanding purchase patterns and customer demographics. Focus on top-performing regions (Western and Central) and promote bundle deals to increase sales of lower-performing models like MediaTek Helio.

3. **Michael Johnson:** Focus marketing efforts around May and June to align with his peak buying period. Promote devices with MediaTek Helio, Apple A-series, and Ryzen 3 processors, while offering targeted incentives for Core i5 laptops to encourage repeat purchases.

4. **Robert:** Tailor promotions to Robert's preferred processor types and configurations. Introduce limited offers to increase interest in Core i3 laptops and 1TB SSD/32GB devices.

5. **Loyalty Programs:** Offer personalized bundles and loyalty perks for high-performance devices, while using incentives to promote Samsung Exynos processors.

6. **Configuration Upselling:** Focus on high-performance configurations and introduce upgrade deals to drive sales for lower-performing configurations like 256GB/6GB and 1TB/12GB.

7. **Redmi Offerings:** Promote premium Redmi devices through personalized bundles, launching a "Redmi Elite" program while boosting sales of lower-performing configurations through targeted incentives.

Optimizations For Business Decisions

- Redirect marketing spend towards regions where high-demand processors, such as Ryzen 3 and MediaTek Dimensity, show the most potential.
- Implement a dynamic pricing model for under-performing products (like Ryzen 9 and MediaTek Helio) to optimize sales performance.
- Leverage customer loyalty programs to boost high-margin sales, while creating bundle promotions to clear out lower-performing configurations.

Unexpected Outcomes

Customer Behavior Insights: The analysis revealed that high-value customers like Michael Johnson tend to purchase during off-peak times. This may indicate a need to re-evaluate seasonal promotions.

Additionally, there's a higher-than-expected interest in premium devices like Redmi, which suggests an opportunity to expand premium offerings and customer exclusivity programs.

Conclusion

Key Learnings

1. Product Performance: High-performing processors like Ryzen 3 and MediaTek Dimensity show strong demand in specific regions, suggesting that focused marketing in these areas can drive sales. However, processors like Ryzen 9 and MediaTek Helio are underperforming, indicating the need for pricing and promotional adjustments to boost their sales.

2. Customer Preferences: Personalized offers and promotions, such as those tailored to Michael Johnson's peak buying period and Robert's preferred configurations, show strong potential for increasing repeat purchases. High-value customers are more likely to respond to loyalty-based campaigns.

3. Configuration Trends: Certain configurations, such as 256GB/6GB and 1TB/12GB, are underperforming, while premium devices like Redmi are gaining traction. Targeted incentives and bundles could help improve sales for the former while continuing to leverage the latter.

Limitations

1. Data Availability: Some regional sales data may be incomplete, making it harder to get a full picture of demand in all markets.

2. Data Quality: There may be discrepancies in customer preference data, especially for less popular processors, which could skew insights into product performance.

3. Scope Constraints: The analysis was limited to a specific set of products and customer segments, which means broader trends across other processors or configurations weren't fully explored.

Future Research

Product Segmentation: Further analysis could explore the performance of other processors not included in the study, such as Intel Core i7 or Snapdragon chips, to understand their market potential.

Customer Behavior: More detailed customer demographic and behavioral data could refine insights into what drives purchasing decisions, especially for high-value customers.

Model Improvement: The current analysis could be enhanced by incorporating external factors like seasonal trends, economic conditions, or competitor performance to get a more holistic view of market dynamics. Additionally, testing various marketing strategies through A/B testing could validate and improve the recommended approach.

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