**Data-Driven Auction Planning: How to Create a More Competitive Next Auction?**

Dear Executive Team,

We are Jianjun Lei, Jingyi Shao, Jingyang Zhou, Zhen Dong, Tess Li. We are excited to share our analysis with you. Our goal is to provide you with data-driven insights to optimize your next auction—helping you identify the right buyers, enhance seller performance, maximize profits from high-value items, and ensure that the right managers are driving success in key markets. Our **storyline** is structured into five **core sections**:

**Overview:**  The **overview dashboard** provides a comprehensive snapshot of auction performance through three key metrics: **total items sold (196K), total sales ($951M), and total profit ($86.4M)**, with trend lines and state-specific filtering capabilities. A **line chart** illustrates sales trends from 2019 to 2026, highlighting month patterns such as a **December peak and January low**, along with an overall upward trajectory. Additionally, a **bar chart** ranks the top auction categories—**Construction, Vehicles, Agriculture**—while a **pie chart** showcases the most profitable items. To ensure data accuracy, we addressed **duplicate records** in the database (same item ID) by applying a **fixed calculation method**, enhancing the reliability of our insights.

**Buyer:** To maximize auction profitability, we developed a **Buyer Score System** that evaluates buyers based on **profitability (40%)**, **participation rate (30%)**, **bidding frequency (20%)**, and **recency of last bid (10%)**. Our analysis confirms a strong correlation between **Buyer Score and Profitability**, highlighting the importance of engaging high-scoring buyers. Additionally, the heatmap identifies key states for targeted marketing efforts. While increased buyer volume does not always turn to higher profits, our bar chart indicates that **smaller, high-quality buyer groups (<90) yield higher average profits**. To optimize buyer engagement, we recommend **focusing marketing efforts on high-engagement states** and **implementing VIP incentives, loyalty programs, and exclusive bidding opportunities** to retain top-tier buyers.

**Seller:** We also developed a **Seller Score System** based on **average annual profit (40%) , sales count (30%) , and auction participation rate (30%)**, with adjustable weights for optimization. Our analysis confirms a **strong correlation between Seller Score and profitability**.  The **geographical heat map** highlights central regions with **higher seller scores**, guiding strategic auction locations. Additionally, our system **identifies top sellers in each state**, aiding retention efforts. Prioritizing **high-profit industries** further improves performance, as **seller quality outweighs quantity** in driving revenue. We recommend **targeted acquisition, performance-based incentives, and exclusive auction opportunities** to maximize profitability.

**Item:** Our analysis focuses on **Where Items Sell, Why Items Sell, and What Items Sell**, closely tied to our **scoring system**. **Kansas** is the ideal auction location, as states like **LV and UT** have low sales volumes and are considered outliers. States with fewer than **10 items sold** are excluded. **Newer items** with lower usage hours and mileage yield the **highest profit**. A **heat map** highlights the **top 10 most profitable item categories**. Our **scoring system** adjusts for **profit, condition, or sales volume**, confirming a **strong correlation between scores and profits**. We recommend **Kansas**, focusing on **new-condition vans, passenger vehicles, and tractors**.

**Manager:** To optimize auction performance, we conducted a **Manager Analysis** focusing on **distribution, performance, and impact**. First, we identified the **top-performing items** for each **Seller and Buyer Territory Manager** in every state based on **average profit**. Our geographical heat maps reveal **manager distribution patterns**. Lastly, our profit comparison analysis shows that **states without managers generate higher average profits**, suggesting that **simply increasing managers does not guarantee better financial outcomes**. Instead, we recommend **optimizing manager allocation**, **reducing low-performing managers.**

**Conclusion:**  Based on our analysis, **Kansas (KS) emerges as the key target state** for optimizing auction performance. We recommend focusing on **the top 50 buyers in KS**, with a particular emphasis on **Koelpin Group**, a high-value buyer company. On the seller side, targeting **the top 50 sellers in KS** will help drive competitive bidding and ensure a strong supply of auctioned items. For items, **construction equipment** stands out as the most profitable industry, with **vans and vehicles** being the most in-demand item category. Additionally, **Bob McBride** has been identified as the top-performing seller manager, while **Doug Mehner** leads in buyer management. By aligning auction strategies with these key players, industries, and locations, we can create a highly competitive auction environment, increasing both engagement and profitability.

**Sincerely,**

Jianjun Lei, Jingyi Shao, Jingyang Zhou, Zhen Dong, Tess Li