1. Mini Project - Head / VP of Engineering Candidates

Problem Statement:

For this case, let's attempt to build a pricing engine that can determine the optimal price for our products, balancing our need for profitability with the need to remain competitive in the market. Let's assume that we are obtaining our cost of goods sold (COGS) data from supplier price lists and reverse bids, where suppliers submit multiple bids to secure contracts by offering the lowest possible prices. You are the Engineer that is tasked to lead the development of this pricing engine.

The Engineer will be responsible for developing a solution that can analyze historical sales data, understand the competitive landscape, and conduct market research to identify pricing trends and customer preferences. The pricing engine should be able to generate pricing recommendations based on real-time data and market conditions and be integrated into existing systems.

To achieve this, we will need to develop algorithms that can analyze the data and optimize pricing strategies to maximize profitability. They will need to build the pricing engine, test and refine it to ensure that it is accurate and effective, and implement it into the company's sales and marketing systems. Finally, they will need to monitor the pricing engine's performance over time and make adjustments as needed to optimize the pricing strategy.

The goal is to create a scalable and adaptable solution that can evolve over time to meet the changing needs of the business and the market. The Engineer in the actual setting will work closely with cross-functional teams, including product, BD, sales, and finance, to ensure that the pricing engine aligns with the overall business strategy and goals. For this study case, you just need to take into account what other cross-functional teams need.

Note: the goal of the pricing engine is to maximize profit for Bababos, but still offer competitive prices in the market (which are slightly lower or at par with the market's best price).

Objective:

Based on the problem statement above, please create a proposed solution with:
- A clear and detailed description of your flow of the logic (you can use Miro or Google Slide or any other tools that you are comfortable with)
- You are showcasing your logic in your coding. It doesn't have to be a full-fledged tool/system, as long as we can try and run sets of data to check the algorithms, it's enough.

The project should be built with security, performance, and scalability in mind, and the code should be well-organized, well-documented, and follow industry best practices. This mini project is designed to be able to be done within no more than 3 days of work.

Dataset:

You will be given a set of data (🟩 Dataset 1) that contains these information:
- Customer data
- Supplier data
- Logistic data
- RFQ customer data
- Current price data
- Historical price data (accepted by customer)

Technical Requirements:

- Backend should be built using a modern programming language such as Python or Node.js
- Use of any suitable backend framework such as Flask, Django or Express.js is allowed
- Use a Relational database management system (RDBMS) such as MySQL or PostgreSQL.
- Create database tables for storing data related to problems and any other relevant information.

Evaluation Criteria:

- Quality of the code: The code should be well-organized, readable, maintainable, and follow industry best practices.
- Overall Quality of output: The final product should work as expected and have all the required functionalities implemented.
- Intellectual Aptitude: A brief discussion will be conducted to understand the logic of the code that the candidate has implemented.

The candidate is asked to create several artifacts as part of the mini project. The MAIN ARTIFACTS should include:

1. Code repository: The candidate to set up a Git repository to store the project's source code. The repository should be well-organized, with a clear structure and appropriate documentation.
2. Documentation: The candidate to provide documentation that explains the design choices, architecture, and implementation details of the project. This documentation should be detailed enough to allow other developers to understand the code and replicate the project.
3. Presentation slides: The candidate creates a set of presentation slides that describe the design choices, architecture, and implementation details of the project. These slides should be clear, concise, and visually appealing, with the aim of providing a high-level overview of the project to stakeholders.
4. Demo: Lastly, the candidate provides a live demo of the project. This demo should showcase and demonstrate how the code works in practice. The candidate should run a different set of data to ensure that the code functions run as expected.

By providing these artifacts, the candidate can demonstrate their technical skills, communication skills, and attention to detail, all of which are critical qualities for a successful engineering team.
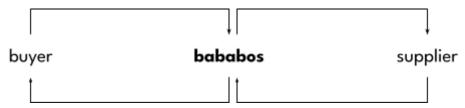
2. Case Study for Head / VP of Engineering

For this case study, assume a role as Head / VP of Engineering who is leading the delivery of the many requirements of Technology development from the point of view of Business, Product and Engineering.

Context:

Bababos is a supply platform provider that provides raw materials for SMEs manufacturers.
We offer best price raw materials with flexible payment terms to the buyers.

Our business model: managed marketplace

buyer	**bababos**	supplier

Buyer does the transaction with bababos, from request for quotation, submitting the Purchase Order and does the goods handover with bababos.

Bababos getting the raw materials from the suppliers. Bababos submit Purchase Order to the supplier based on the Purchase Order we get from the buyer. Payment and goods handover happen between bababos and supplier.

Business Point of view:

- Business needs Engineering to have the ability to deliver product development fast and on time. In the triangle of Project Management (Scope, Quality, and Time), we can only achieve two out of the three. In our case, we can't sacrifice Quality nor Time. Better to release something than nothing. But, when we release something (regardless of how small it is), it will be high quality and on time.
- The company will only hire a handful of engineers, but the company will look into the best of the best Engineers and are willing to pay a premium. The small number of engineers is important to minimize the many communication and inefficient workflow, and are more resilient in tough times and can always leverage vendors and freelance in good times.
- Most business requirements will revolve around best practices in B2B supply chain management (by which the software solution should be available somewhere already), although some high-tech and bespoke innovations will be developed from scratch.

Product Point of View:

- We will always maintain simplicity for the customers, i.e. minimum features, only those that matter to customers. This is to minimize complexity for the customers and ease up the onboarding. This is important as the customers are using the Application we created because we asked them to, for security and transparency, at least at the beginning. Hence, we need to make it as painless as possible. The carrot of the Application will be in the business benefit we give to them such as Lower than Market price and Access to Working Capital
- On the contrary, the features and capabilities of internal processes are fairly complex. It will include a myriad of exception handlings as well as complex risk mitigations and solutions.
- Last but not least, the product team will only handover any development project to the engineering team only after the product is proven to work in some kind of test pilot

From a Quality Point of view:

- If we are to rank what kind of quality is the most important, it will be accuracy, since in the B2B sector, a single-digit error can cause havoc and reputation damage.
- Further security and audit are also important factors as business, operation, and risk processes will be complex and may require rapid changes

Having understood the above, You are asked to come up with a strategy on how to create an Engineering team that delivers. That's the keyword, DELIVERS.

Specifically:

1. <u>WHAT</u>. Draw the System Architecture that you think is the most makes sense based on your current understanding of the bababos business. Also, what kind of infrastructure and monitoring you would put in place? Explain your reasoning.

2. <u>WHO</u>. Draw a team mix that would be required in the first year. This includes the internal team, vendor, and freelancer.

3. <u>HOW</u>. How to recruit the above team, including what are the step by step in building those. What kind of engineering Process would you suggest following? Please elaborate on your reasoning. Also take into consideration the cost associated with it.

Candidates Requirements:

Candidates should submit both mini project and case study results within **1 week** (If for any reason you need additional time to complete your responses, please don't hesitate to reach out to febriani@bababos.com).

Subsequently we will arrange the candidate to do an online live demonstration of the outputs, as well as do a verbal presentation. The date and time will be arranged separately.

Thank you!