

# 1 INSTRUCTIONS TO DEVELOPER

If you are receiving this document, congratulations on reaching the next stage of the interview!

Depending on the role you are applying, you are required to perform the technical assessment. Within this document, you'd find:

|                             | Description   | Why is this Important?   |
|-----------------------------|---|--|
| <b>Business Analysis</b>    | A summary and explanation on what this assignment is for, and what are the objectives needed in this project. | So that you would be able to relate on what you are creating, and why. |
| <b>Backend Development</b>  | Details of the Backend Tasks, and what you would need to work on.   | So that you would be able to plan this task going forward.             |
| <b>Frontend Development</b> | Details of the Frontend Tasks, and what you would need to work on.  | So that you would be able to plan your tasks going forward.            |

## 1.1 What are we looking for?

Other than showing your technical proficiency and capabilities in writing code, we are also looking for key important aspects like logical thinking, managing functionalities and identifying key functionalities that will make coding collaboration a better and fun experience in the team.

## 2 BUSINESS ANALYSIS


### 2.1 User Persona / Background

As a Business Development Manager (Public Sales), my role is to work on Government Tender. I am interested in trying to get more sales for the company and how I would be able to send my bids out successfully.

### 2.2 User Story

| User Stories  |
|---|
| As a <b>Business Development Manager</b> ,<br>I would like <b>to know what the past procurement process by the customer are</b> ,<br>so that <b>I would be able to analyse past bidding of similar nature and understand the past spending habits of the Agency</b> . |
| As a <b>Business Development Manager</b> ,<br>I would like <b>to be able to target specific Suppliers</b><br>so that <b>I would be able to understand their bidding habits, and past track-records</b> .  |
| As a <b>Business Development Manager</b> ,<br>I would like <b>to find Spending Patterns of each Government Agency</b> ,<br>so that <b>I would be able to predict and manage past procurement</b> .  |

### 2.3 Available Data

| Data Sets   | Data  |
|---|---|
| We have a list of data in CSV for past government submission. You can load the data in memory to support the use cases. | <br>government-procurement.zip |

## 3 BACKEND DEVELOPMENT

As a Backend Developer, you are required to build API endpoints to support the project and frontend team. Often, you will get business requirements from the Business Analysis Team, and here are some of the works required. You can choose to use NodeJS, Python, Java or .NET to achieve the following requirements.

### 3.1 API Endpoints

You are required to provide the following API Endpoints, so that the developers would be able to build their frontend, and get data from the Services:

| APIs Needed                | APIs   | Comments  |
|----------------------------|--|---|
| <b>GET Procurements</b>    | Get all Procurement APIs with search parameters like <ul style="list-style-type: none"><li>- <b>Agency,</b></li><li>- <b>Supplier or by</b></li><li>- <b>Keywords on the Contracts</b></li></ul> | You'd need to load the data from the CSV file and manage the data. <ul style="list-style-type: none"><li>• Pagination</li><li>• Filtering Features</li><li>• Search by Keywords</li></ul> |
| <b>GET Suppliers</b>       | Get a Unique List of Suppliers   | A proper algorithm /data structure is important   |
| <b>GET Agencies</b>        | Get a Unique List of Agencies  | A proper algorithm /data structure is important   |
| <b>DELETE Procurements</b> | Based on the criteria search in the GET Procurements (first API requirement in this table), delete the records   | The original CSV data should remain intact and restorable.  |
| <b>POST Restore</b>        | Restore the CSV to its original state  | The main purpose is for you to add on new functionalities to reset the data in store.   |

## 3.2 Additional Points

Understanding that time is limited. Here are suggestions for some ways to better demonstrate your ability:

1. A description how to manage and store the Data in a Database and why.
2. Analysis on how you identify some portions are slow and how you might be able to improve on it.
3. Fuzzy string search on the string fields.
4. Logging to manage the requirements needed in the project.
5. Documentation for the APIs created
6. Create a Docker Build file to manage the deployment

You are welcomed to preferably implement or at least a detailed description on the features of your choice (even out of this list) which you think will be suitable for the business requirements.

## 3.3 What would you need to look out for?

Here are some of the key considerations, when implementing a Backend

1. Performance of the API Endpoints, so that the results can be more responsive
2. Make use of queries or search functionalities to support the functionalities of the project.
3. Proper response code handling, so that the Backend would be able to support this.
4. Proper documentation, so that we know what you had done and how to use it

## 3.4 Submission & Questions

In the event of any questions, please feel free to ask for clarifications through the email addresses.

You are expected to submit your work done by the end of the Week. To submit your work, you would just need to upload the code in a Git repository of your choice and send us the link.

| Personnel       | Code Implementation  | Mobile       |
|-----------------|--|--------------|
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## 4 FRONTEND DEVELOPER ROLES

As a Frontend developer, your role is to build Web Dashboards and Pages so that the Users would be able to interact with the system. Often, you would need with Backend Developers to support the delivery and deployment needed in the projects.

### 4.1 Backend APIs

The following APIs are provided for your needs. If you are game for it, I am not You can find the APIs in the following Postman fields to allow you to use the Backend:



### 4.2 Assignment

You are required to provide a Web Application which would allow Users to view and review data for each of the projects. The following functionalities are required:

1. A Table Component listing the List of Transactions, so that User would be able to:
  - a. Find by Agency
  - b. Find by Year
  - c. Find by Contract Amount
    - i. Less than 100,000
    - ii. 100,001 to 500,000
    - iii. 500,000 to 1,000,000
    - iv. 1,000,001 to 5,000,000
    - v. More than 5,000,000
  - d. Navigate the Transactions through the defined Pages
  - e. Select the number of Records they would like to see:
    - i. 10
    - ii. 20
    - iii. 50
    - iv. 100

## 4.3 Look & Feel

The page can potentially look like this:

**GOV  
PROCUREMENT  
PORTAL**

ProcurementSuppliersAgencies

Search

GOVERNMENT PROCUREMENTS

| CONTRACT          | AGENCY                              | SUPPLIER                       | YEAR | AMOUNT         |
|-------------------|-------------------------------------|--------------------------------|------|----------------|
| BCA000ETT14000079 | Building and Construction Authority | Pico Art International Pte Ltd | 2016 | \$ 450,000,000 |
| BCA000ETT14000080 | Building and Construction Authority | TRANSCENTECH PTE. LTD.         | 2018 | \$ 300,000     |
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Figure 1 : Discussion

## 4.4

## 4.5 What would you need to look out for?

Here are some of the key considerations, when implementing a Backend

1. Use of a Modern Frontend Framework like ReactJS or VueJS
2. Management of CSS and other Elements (Use of Bootstrap preferred)
3. Focus on the delivery of Components, so that we can manage the deployment
4. Proper Component planning to design your applications.

## 4.6 Submission & Questions

### 4.7

In the event of any questions, please feel free to ask for clarifications through the email addresses.

You are expected to submit your work done by the end of the Week. To submit your work, you would just need to upload the code in a Git repository of your choice and send us the link.

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