

GA100 Capstone Project

Submission by: [Aw Meiqin, Irene]

Question 1

Given the case study, which part of the existing manual workflow can be improved using Generative AI?

The manual search and typing of replies to the email queries from customers can be improved using Generative AI. This can be done so by implementing a **Retrieval Augmented Generation (RAG) model**, which draws relevant information from documents provided to automatically generate specific and accurate replies. This can significantly cut down on the time required to search and draft the replies, which is 15 minutes on average currently.

Question 2

A previous team tried to integrate Generative AI. This was their workflow:

1. Customer Email Received
 - Example: “Hi, can you tell me what the minimum deposit is for the HeiFinance SavingsPlus Account, and whether I can get bonus interest if I only spend \$400 monthly on my credit card?”
2. Copy Email → LLM Prompt
 - A CSO pasted the entire email into ChatGPT and typed: “Answer this customer query.”
3. LLM → Draft Response
 - ChatGPT generated the following response: “The minimum deposit is \$200, and yes, you will still qualify for bonus interest even if you only spend \$400 per month on your card.”
4. CSO Sends Response
 - Due to the large number of email enquiries, the officer trusted the generated reply and copied it straight back to the customer.

The initiative was scrapped after the bank received many complaints from unhappy customers who were given the wrong information. Why did ChatGPT not give the correct answer?

As the customer’s query is about a specific product from HeiFinance, ChatGPT may not have access to the details of this product. However, instead of replying to say that it doesn’t know/it doesn’t have the details, ChatGPT hallucinated, i.e. fabricating a wrong answer and presenting it as a right answer in response to the user’s prompt.

Question 3

Given the case study and additional information featured in Question 2, describe two improvements to the n8n workflow that addresses the issues faced.

Workflow Improvement 1:

(Describe Improvement 1)

The first improvement will be to provide the relevant document containing details on the various products offered by HeiFinance Bank to the AI chat model, so that it can extract and generate accurate replies to the customers, instead of hallucinating as seen in Question 2. In this case, the document will be the pdf file **HeiFinance Bank Product Fact Sheet**.

We can make use of Pinecone Vector, which can convert the text data from the PDF file into vectors, enabling fast, low-latency searches for conceptually related content. These vectors can then be fed into the AI chat model for the generation of replies regarding specific product details.

Workflow Improvement 2:

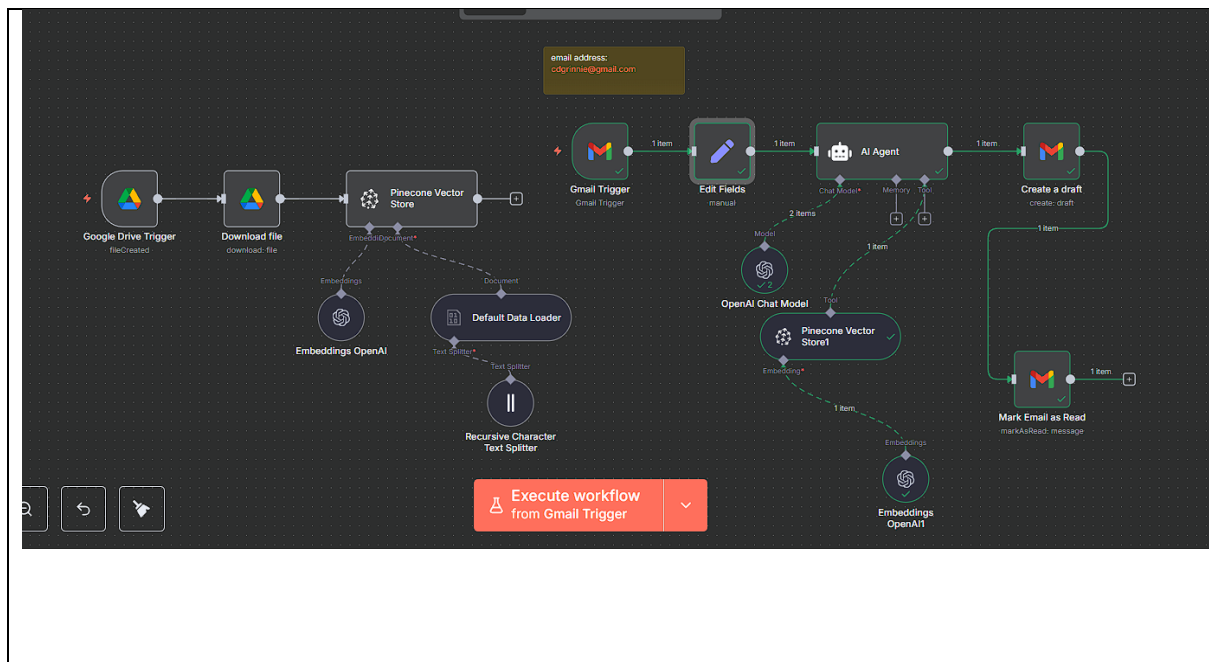
(Describe Improvement 2)

The second improvement will be to generate draft replies automatically once an email query is received, instead of having the CSO manually insert a prompt into the chat model and manually pasting the answer into the email reply.

We can start the workflow by using an email trigger, have the AI chat model pick out the relevant information from the embeddings in Pinecone Vector and automatically generate a draft reply in gmail that is ready to be sent to the customer. The manual steps of typing a prompt and pasting the reply are eliminated.

Question 4

Create the proposed workflow on n8n. Take a screenshot of your final workflow and include it here:



Note: You need to download the final workflow (in .json format) and submit it on Canvas as well!

Question 5

Calculate the time savings with your n8n workflow:

As mentioned in the case study, the average time taken to search for the relevant information and drafting a reply is about 15 minutes. A total of 5 sample queries with varying degrees of complexity were submitted and replies were generated within 24 to 59 seconds using the proposed n8n workflow. This represents an average time savings of about 14 minutes.

Query 1:

Query

What is the minimum deposit for heifinance saving plus account?

Reply

Dear Irene Aw,

Thank you for reaching out to HeiFinance Bank. The initial deposit requirement for the SavingsPlus account is SGD 500.

If you have any further questions, please do not hesitate to contact us again.

Warm regards,
Rinnie
HeiFinance Bank

Time Taken: 24.086 seconds

Query 2:

Query

Hi, can you tell me what the minimum deposit is for the heifinance savingsplus account and whether i can get bonus interest if i only spend \$400 monthly on my credit card?

Reply

Dear Irene Aw,

Thank you for reaching out to HeiFinance Bank. The Initial Deposit Requirement for the SavingsPlus account is SGD 500. The account pays a base interest of 0.05% p.a., and bonus interest up to 2.00% p.a. Bonus tiers include 0.75% p.a. for eligible debit or credit card spending of at least SGD 500 and 0.50% p.a. for monthly salary credit of at least SGD 2,000. Because your monthly credit card spend of \$400 is below the SGD

500 spending threshold, it would not qualify for the 0.75% p.a. bonus; you would still earn the base 0.05% p.a. If you'd like, I can help review other eligible transactions or options to meet the bonus criteria.

If you have any further questions, please do not hesitate to contact us again.

Warm regards,
Rinnie
HeiFinance Bank

Time Taken: 59.848 seconds

Query 3

Query

How much cashback on the visa platinum card can i get if i spend 1000 on groceries, 800 on dining and 900 on online purchases?

Reply

Dear Valued Customer,

Thank you for reaching out to HeiFinance Bank. Based on the HeiFinance Visa Platinum Credit Card fact sheet, the card provides 3% Cashback on dining and supermarket spend, 1% Cashback on all other retail transactions, and a Monthly Cashback Cap of SGD 80; cashback is automatically offset against the following month's bill. Applying these rates to your spending: SGD 1,000 on groceries (3%) = SGD 30, SGD 800 on dining (3%) = SGD 24, SGD 900 on online purchases (1%) = SGD 9, for a total of SGD 63. This is below the SGD 80 cap, so the full amount will be credited.

If you have any further questions, please do not hesitate to contact us again.

Warm regards,
Rinnie
HeiFinance Bank

Time Taken: 32.673 seconds

Query 4

Query

What is the difference between floating and fixed loan rate offered by heifinance

Reply

Dear Irene Aw,

Thank you for reaching out to HeiFinance Bank. Fixed and floating loan rates differ in how the interest is set and the predictability of repayments. The fixed option has the interest rate fixed for first 3 years and then reverts to the HeiFinance Board Rate (currently 3.5% p.a.) minus customer discount, which provides certainty in monthly instalments; lock-in period 2 years; prepayment penalty 1.5% of prepaid loan amount if made within lock-in. The floating option is pegged to 3M SORA plus a spread ranging between 0.80% and 1.20%, with rates reset quarterly, which may offer lower costs but comes with rate variability; lock-in period 1 year; prepayment penalty 1.5% of prepaid loan amount if made within lock-in.

Additional relevant loan terms include up to 75% loan-to-value for first housing loan and 55% if you have existing outstanding housing loans; tenure up to 30 years or until borrower reaches 65 years old; monthly reducing balance instalments via GIRO deduction; processing fee waived for applications submitted by 31 December 2025; late payment fee SGD 80 per month; refinancing subsidy up to SGD 2,000.

If you have any further questions, please do not hesitate to contact us again.

Warm regards,
Rinnie
HeiFinance Bank

Time Taken: 36.057 seconds

Query 5

Query

If i refinance my existing mortgage, what is my estimated monthly repayment under the homeflex loan floating package?

Reply

Dear Irene Aw,

Thank you for reaching out to HeiFinance Bank. Under the HomeFlex floating package, the interest rate is pegged to 3M SORA plus a spread ranging between 0.80% and 1.20%. Rates reset quarterly, and repayments are monthly reducing balance instalments via GIRO deduction. Relevant loan terms that affect your estimated monthly repayment include: Loan-to-Value (LTV) Limit: Up to 75% for first housing loan, 55% if customer has existing outstanding housing loans; Tenure: Up to 30 years or until borrower reaches 65 years old, whichever is earlier; Lock-In Period: Floating rate: 1 year; Prepayment Penalty: 1.5% of prepaid loan amount if made within lock-in. Additional points: Processing Fee: Waived for applications submitted by 31

December 2025, Late Payment Fee: SGD 80 per month, Refinancing Subsidy: Up to SGD 2,000 legal and valuation fee subsidy for refinancing customers.

To provide an estimated monthly repayment, please let me know:

- the loan amount you wish to refinance (or outstanding loan balance and property value)
- the desired repayment tenure in years
- whether you have existing outstanding housing loans (affects LTV)
- if you want the estimate based on a specific 3M SORA rate (please provide the rate) or if we should use the current market 3M SORA.

If you provide those details, I will calculate an estimated monthly repayment for you.

If you have any further questions, please do not hesitate to contact us again.

Warm regards,
Rinnie
HeiFinance Bank

Time Taken: 46.851 seconds