

# **Generative AI**

## **Opportunities and Risks for TWE in the Indian Market**

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# 1. What is generative AI?

Generative AI is a use case of machine learning - the use of algorithms, grounded in statistics, to attempt to understand the functions governing complex systems (in this case, language).

Humans have been modelling for aeons. The tools and strategies might change, but the desire to understand our environment - and make it predictable - has not.

But the systems we traditionally model are simple - they have few degrees of freedom. Where the most difficulty lies is in problems involving unconstrained actors that have so many variables governing their behaviour, it's too difficult to come up with an equation that describes it.

This is where machine learning shines. Systems that we previously couldn't model accurately, because they're too complex for our usual methods, can now be modelled. And we can use these models to understand the past and predict the future.

Some problems, though, are so complex, they need huge data inputs for their models to be accurate. Language is one such problem - sophisticated algorithms can only take us so far.

But in recent years, computer hardware has become powerful enough to process the gigantic datasets that generative AI models rely on. Organisations like TWE are perfectly positioned to explore what's possible from this technology, because it already produces the required volumes of data on a daily basis.

Generative AI can be used to both "push" messages out to market, and "pull" messages in. It also reduces the lead time required to tailor unique messages to different market segments. In short, TWE can leverage AI to become more nimble in response to emerging opportunities and risks.

That said, there is a risk of complacency due to overconfidence - the misconception that generative AI is intelligent. Unfortunately, it's not. It has no semantic understanding of language. It simply returns the response it thinks will please the user the most. TWE would need to monitor the outputs of any models deployed to production, to ensure they are enhancing, not damaging, TWE's brand.

## 2. Desi X Penfolds

This is a bot that responds to prompts by generating advertising copy for Facebook posts. These posts are intended for the Indian market, which has always been dominated by spirits and beer.

Desi means Indian.

Penfolds means luxury.

What might Desi X Penfolds mean for TWE?

## 2.1 Benefits for TWE

The absence of a substantial presence in India is evident in TWE's annual report. India is traditionally a heavy consumer of spirits.

In India, there are multiple drivers of this preference for spirits and, to a lesser extent, beer:

- While imports are popular, India has a long history of producing its own spirits and beer, but is not known for producing wine.
- Spirits are seen as efficient and economical. A bottle of wine can satisfy two people who have two glasses each, but a bottle of spirits goes a lot further, especially if mixers are involved.
- Certain brands of liquor, like Chivas Regal and Johnnie Walker Blue Label, signify high social status among Indians. These are consumed - and served - conspicuously. The continual appearance of these brands in social settings is a self-perpetuating machine.

It may seem like the manufacturers of Scotch have the Indian market locked up; however, there are emerging opportunities for TWE:

1. Young Indians are not as brand-loyal as their elders. They are willing to switch brands and try new products.
2. Most Indian women do not drink alcohol, for cultural and religious reasons. But this is slowly changing. At the same time, India is reckoning with a growing crisis of lifestyle diseases like diabetes; thus Indians are becoming more conscious of their consumption of discretionary food and drink products. This presents an opportunity for TWE to enter the market with health-conscious alternatives to beer and spirits, and to intercept the emerging market of women consumers before their product preferences become entrenched.
3. As suggested earlier, Indians are conspicuous consumers. Typically, Indians are concerned with how they are regarded by their communities. One lever for social confidence is the appearance of success and financial freedom, which manifests itself in multiple ways:
  - The purchase of expensive consumer goods.
  - Heavy expenditures at events like weddings.
  - Social proximity to public figures and celebrities.

Given the growing middle class in India, and the increased influence and fame of even the children of celebrities, there are significant opportunities for TWE to present its luxury and premium products as a way for status-conscious Indians to differentiate themselves from their acquaintances.

## 2.2 Things to consider before deployment by TWE

OpenAI is, by far, the most popular LLM currently available. It also has a very low barrier to entry for organisations seeking to build their capabilities in generative AI. However, it is important to note that the original OpenAI model was trained on a corpus of literature that is heavily skewed towards European experiences and perspectives. Much of the literature it has ingested originated in the West.

This means that OpenAI chat bots, powered by ChatGPT, sometimes appear ignorant of significant aspects of Indian culture and society. There is a risk that a chatbot that is allowed to deploy advertising without being checked against cultural sensitivity standards will offend its target audience.

I also discovered, during the course of developing Desi X Penfolds, that augmenting an LLM with too little “context data” results in responses that are so heavily skewed in favour of the context data that they don’t make sense. Consider the following example.

Q: When do Indians celebrate with alcohol?

A: Indians celebrate with alcohol during the Sydney WorldPride 2023 event.

This means that the common advice to augment LLMs with context data is itself missing some context; namely, that developers must ensure that the context data is of sufficient size to *improve* the responses, not make them worse.

## 2.3 Data sources

In addition to the corpus of data that was used to train OpenAI, I included the following:

- TWE annual report for 2023
- Reviews and advice on Penfolds wine, by credible authors on wine
- Advice on how to pair Indian food with wine
- Press releases about the global wine market, by IWSR
- Research papers and newspaper articles on Indians’ alcohol consumption, attitudes towards social status and religious influences on alcohol consumption

If I were not constrained by time, I would have included more extensive literature on the Penfolds range of products. That said, it appears that the default OpenAI model is sufficiently knowledgeable about the Penfolds brand to give useful and interesting advice.

## 2.4 Technology and methodology

I used the following technologies:

- OpenAI API (application programming interface) to access pretrained models
- GPT3.5 Turbo, a version of GPT3.5 that is small and fast, sacrificing a small amount of quality; I made this compromise in order to ensure the bot would be performant when queried, and able to be deployed for demonstration
- Python, for the bot itself; this accesses the API to send queries and receive responses
- Flask, a web server to deploy the bot locally
- LlamaIndex, to enable OpenAI to ingest extra context data
- ngrok, to temporarily expose the chatbot to the web in order to demonstrate it
- HTML and CSS, to write a web front-end for the Python bot
- Git and GitHub, to manage revisions of my code

My methodology was as follows:

1. Learned how LLM APIs work, and chose one.
2. Followed tutorials to make MVPs (minimum viable products) of:
  - The Python app, which is the actual bot
  - The HTML/CSS front-end with Flask
3. Integrated the two MVPs and got them working; this took some time.
4. Added more CSS, including matching the red colour on the Penfolds website.
5. Compared my bot with 'stock' GPT3.5 Turbo.
6. Added more context data to correct the degraded performance I mentioned in Section .

## 2.5 Security considerations

If such a bot is deployed to production, the following things will need to be considered:

- The secret key for the OpenAI API must not be checked into a public repository by mistake. This is an easy and common mistake to make.
- Flask must not be used in production. Flask apps are not sufficiently secure, because they are not designed for prolonged exposure to the web.
- Ideally, this app would remain internal - only apps that are intended for the public should be exposed on the open web, otherwise there will be unnecessary extra risks to monitor.
- Team members using the app should receive training, so they understand not to expose confidential information about TWE or themselves by entering it into the bot.

### 3. Conclusions and next steps

This project confirms that there are opportunities in using generative AI to support growth in challenging markets. After additional context data was added, Desi X Penfolds produced fairly good ad copy, like the example below:

Q: Write a Facebook ad for a specific Penfolds wine, targeted at Indians who are secretly tired of Chivas Regal.

A: Indulge in a new world of luxury with Penfolds g3 - a masterpiece blend of three exceptional Grange vintages. Elevate your palate and experience the harmonious fusion of flavors that will redefine your love for fine wines. Say goodbye to the ordinary and embrace the extraordinary with Penfolds g3. Cheers to new beginnings!

It also performed better on prompts testing its cultural sensitivity:

Q: When do Indians celebrate with alcohol?

A (not enough context data): Indians celebrate with alcohol during the Sydney WorldPride 2023 event.

A (after adding more context data): Indians celebrate with alcohol on major religious festivals/occasions depending on the popularity of the festival in that region. Additionally, national holidays such as Republic Day (26 January), Independence Day (15 August), and Gandhi Jayanti (2 October) are usually dry days throughout India.

However, much more work is needed before TWE can be confident of having addressed the complex cultural contexts identified earlier. This should be front of mind when any attempt is made to leverage the opportunities of generative AI in the Indian market.

To build on the progress that has been made in completing this case study, TWE should consider the following steps:

- Use much more context data, especially about Indian culture and religion, and specific Penfolds wines.
- Deploy on AWS or DigitalOcean if resources permit this.
- Improve the web interface to make it more responsive to mobile devices.
- Add web controls, like checkboxes and radio buttons, to programmatically construct a consistent prompt rather than relying on the user's free text input.
- Create a full advertising pipeline:
  - Use Facebook API to identify new customers and markets.
  - Feed this information into an ad-generating bot.
  - Automate quality checking on the ad copy.
  - Automatically deploy to Facebook, targeting the identified market segment.