Leadership needs us to do Gen AI, what do we do?

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Agenda

1. Exploration
2. Building
Phase 1: Exploration

1. Set expectations
2. Minimize risks
3. Invest in things that last
4. Experiment
Set expectations

- Building some cool demos with LLMs => easy
- Actually building a product with LLMs => hard

- *If you just want some cool demos to show customers that you’re ahead of the curve, go for it.*
- *If you just want your team to experiment and build out LLM muscle, go for it.*
- *If you want a product, set goals for what you expect that product will bring, and the resources you’re willing to invest.*
There are a lot of things LLMs can do

Q: But can these things meaningfully transform your business?

A: Unclear
There are a lot of things LLMs can’t do NOW

Q: But would LLMs still not able to do those in the future?

A: Unclear

“When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.”

- Arthur Clarke
We live in an era of changes and uncertainty

Millennials living through their third "once in a lifetime" crisis within 5 years

In times of uncertainty, apply a decision-making framework to minimize regrets (lessons from finance and reinforcement learning)
Minimize risks

1. Evaluate how disruptive gen AI is to your business
2. Figure out your data story
3. Avoid big, sweeping decisions
Evaluate how disruptive gen AI is to your business

1. If I don’t do anything, can competitors with gen AI make me obsolete?
   a. Creative work: advertising, design, gaming, media, entertainment
   b. A lot of document processing: legal, insurance, HR

2. If I don’t do anything, will I miss out opportunities to boost revenue?
   a. Customer support: chat, call centers
   b. Search & recommendation
   c. Productivity enhancement: automated note-taking, summarization, information aggregation

3. If there are opportunities, what advantages do I have to capture them?
   a. Proprietary data
   b. A100s lying around
   c. Existing user base
Evaluate how disruptive gen AI is to your business

1. If I don’t do anything, competitors with gen AI can make me obsolete
   
   **Go all in**

2. If I don’t do anything, I’ll miss out opportunities to boost revenue
   
   **Build vs. buy decision**

3. There are opportunities, and I have competitive advantages to capture them
   
   **Make bets**
Figure out your data story

1. Consolidate existing data across departments and sources
2. Update your data terms of use (see StackOverflow and Reddit)
3. Put guardrails around data quality + governance

Gen AI made it clear that data is essential to any company that wants to leverage AI.
Reach out if you want us to help you with your data story!
Avoid big, sweeping decisions

1. “Stop everything to figure out our generative AI.”
2. “Let’s buy as many A100s as we can.”

It’s okay to make big bets as long as you can back them up with evidence.
Invest in things that last

The future life expectancy of some non-perishable things, like a technology or an idea, is proportional to their current age

- Lindy’s Law
LLM fundamentals have been around for a while

- Language modeling (1951)
- Embeddings (2003)
- Vector databases:
  - Facebook’s Faiss (2017)
  - Google’s ScaNN (2020)
- Making data faster, cheaper, more accessible will always be important (😊 Claypot 😊)
Personal litmus test

Does this seem hacky to me?

- Context learning vs. prompt engineering 🙃บาย
Model architectures, tools, techniques will certainly evolve

AI literacy will be less about how to build a transformer model from scratch, and more about how to use AI appropriately
Experiment

- Timebox your experiment
- Clarify the decisions you want to make by the end
- APIs are cheap and easy for experiment
  - $100 and one weekend can take you a long way!!
Understand LLM behaviors (dealbreakers??)

1. Ambiguous inputs + outputs
2. Hallucination vs. factuality
3. Privacy: how to ensure LLMs don’t reveal your user PII info?
4. Unstable infra: performance + latency
5. Inference cost
6. Forward & backward compatibility

See: Building LLM applications for production
Phase 2: Building

1. Understand the LLM stack
2. Implement:
   a. Gather data
   b. Choose a model
   c. Get the most out of each layer of the stack before moving to the next
3. Evaluate
The LLM stack

● LLM part
  ○ Prompt engineering
  ○ Finetuning, distillation
  ○ Training a model from scratch

● Infra around LLM
  ○ Databases
  ○ Logs
  ○ Caching
You're an unbiased professor. For each input, give it a score from 0 to 10.

{ examples }
...
{ input }

Pretrained model

Finetuning

Pretrained model

Finetuned model

{ output }
e.g. Internet data

Language modeling

Pretrained LLM

Optimized for text completion

Text

High quality data

Demonstration data

Supervised finetuning

Finetuned for dialogue

SFT model

Comparison data

Trained to give a scalar score for (prompt, response)

Reward model

Optimized to generate responses that maximize scores by reward model

Final model

Human feedback

RLHF

Examples

Bolded: open sourced

GPT-x, Gopher, Tomato, LLaMa, Pythia, Bloom, StableLM

Dolly-v2, Falcon-Instruct

InstructGPT, ChatGPT, Claude, StableVicuna

Scale

May ‘23

>1 trillion tokens

10K - 100K (prompt, response)

100K - 1M comparisons (prompt, winning_response, losing_response)

10K - 100K prompts

See: RLHF: Reinforcement Learning from Human Feedback
Choose a model size

7B param model can run on a Macbook

- bfloat16 = 14GB memory
- int8 = 7GB memory

7B param model costs approx*:

- $1,000 to finetune
- $25,000 to train from scratch

* Highly dependent on how much data
Evaluate

- Tie to your OWN business metrics
- Build your own test set
- Beware of standardized evaluation: still catching up with use cases
Takeaways

1. Set concrete goals
2. Data story is more important now than ever
3. Invest in things that last
4. Experiment with APIs, build with open-source
5. Understanding LLM behaviors: which is a dealbreaker for your use case?
6. Choose a model size that balances between cost and performance
7. Always tie model evaluation to your business metrics
8. Have fun!
Thank you!

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