Seven Considerations for Product Management in the Era of Artificial Intelligence

Perspectives of an AIML developer

Abhinav Kimothi

Keep Calm & Build AI.

All Machine Learning based AI is probabilistic in nature

Traditional software applications are focussed on executing a set of rules and logic. An ML product relies, not on pre-defined logic, but, on algorithms to accomplish a task based on patterns in the data.

SO WHAT?

Machine Learning opens a whole new universe of use cases—problems or tasks for which pre-defining rules is not feasible because either these rules do not exist or they are too complex to articulate.

The evaluation of an ML product becomes more nuanced.Traditional software products generally would focus on metrics like system uptime, response time, error rates, user satisfaction etc. While this will also hold true for AI products, there are additional evaluation parameters like accuracy, precision and recall.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Get an overview of the algorithms and their applicability to different use cases.
- Learn the evaluation metrics for different types of algorithms and the associated tasks.
- Develop a nuanced understanding of presenting a probabilistic outcome to the consumer of the product.

Machine Learning is freakishly opaque to the naked eye

At their core, ML models are mathematical functions. Mathematics is not always easy to articulate in commonly understandable language. This is more pronounced in deep learning models which perform more intensive calculations. The result is that ML is often understood to be a “black box”

SO WHAT?

The difficulty in understanding the reason for behaviour of a ML based AI system has a direct implication on how much the user will trust the system.

The debugging of the system becomes difficult. It is difficult to understand why a model is performing they way it is and fixing it becomes equally difficult.

Not every stakeholder will understand the nuances. It is easy to dismiss early iterations as failures.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Delve into the world of Explainable AI (xAI) and understand how to interpret AIML systems.
- Appreciate that AIML systems will always carry a certain degree of opacity.
- Become evangelists of AIML technology and get all stakeholders familiar with the nuances of AI & ML development
- Manage the consumer’s experience with the system in order to develop trust.

Within your AI system, data operates & evolves as a living entity

In traditional software development, data serves as an input to the set of rules. In Machine Learning, data's role is pivotal — more active, more central. Machine Learning, by definition, is recognition of patterns and relationships from data.

SO WHAT?

The quality of the system is a direct consequence of the quality of the data used. Poor data degrades system performance.

The volume of data is, generally, much higher. Proper infrastructure for collection, storage and management is critical.

Data patterns can, and will, change over time. Monitoring this change and compensating the models is paramount.

THEREFORE…PRODUCT MANAGERS SHOULD…

- Embrace a data ops mindset of continuous data management.
- Understand data quality metrics and how to set targets.
- Get familiar with big data tools and technologies.

AI regulations are rising & unresolved ethical quandaries persist

AI training is data based. The data may carry inherent biases. Who is accountable when AI goes wrong? Weaponisation of AI, Robot Rights, Threat to human dignity are some ethical issues. As the world wakes up to a possible AI led future, the regulations are catching up

SO WHAT?

It is needless to emphasise the penalties that failure to comply with regulations carry. The fines that even the giant corporations have had to pay run into billions of Euros. For small and young businesses, they may be catastrophic.

The ethical implications are deeper. What we decide to do with AI today will shape the future of our society for generations to come. It is a much bigger responsibility.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Learn about ethical questions and develop a personal point of view.
- Understand AI regulations and work closely with legal, compliance, and ethics advisory teams.
- Embed responsible AI practices, checks and balances early into the development cycle.
- Communicate transparently about AI capabilities, limitations, and safeguards.
- Continually reassess and adapt strategies as regulations evolve.

5 “Slowness” may be inherent & variable costs may surprise you

Modern AI techniques like deep learning can be extremely computation-intensive. Iterating over millions of examples and model parameters demands substantial processing power. Performing real-time inferences can be computationally expensive.

SO WHAT?

Neglecting the assessment of compute costs can lead to unmanageable infrastructure bills.

High latencies can lead to unfavourable customer experience.

While the system may perform well in the PoC stage, you may observe challenges in enhancing model capabilities at scale.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Develop and appreciation for architecting scalable infrastructure.
- Continuously profile and monitor system performance and costs.
- Evaluate accuracy-vs-efficiency tradeoffs based on product requirements.
- Develop an understanding of accelerators like TPUs/GPUs and distributed training capabilities. Explore vendors that offer hyper-scaling services.

Development process is experimental & needs specialised workflows

ML development qualitatively different from traditional software development. Given the empirical, data-driven nature of machine learning, there is an inherent cycle of iteration and experimentation in terms of data collection, preprocessing, model training, evaluation, and refinement.

SO WHAT?

Failing to empathise with the experimental nature of ML development may lead to overoptimism in timelines and mismatched expectations.

Not having the right workflows may lead to inefficiencies in tracking, version controls and reproducibility.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Include the scope of experimentation in the development process. Allocate time for RnD.
- Acknowledge that failures are a part of experimentation and plan for contingencies.
- Facilitate adoption of specialised tools and frameworks for ML experimentation. Focus on automation of workflows via MLOps practices.

Lifecycle management warrants remaining aligned with change

AI systems are not one-off deployments, but require ongoing lifecycle management. Unlike traditional software which is updated in releases, AI models need robust version control and documented model lineage to systematically roll out, roll back, & archive different model iterations

SO WHAT?

Model decay can cause significant degradation in performance. Even without any changes in the system, you may start noticing errors and misfires.

Technology will evolve to introduce more accurate and efficient techniques. Your differentiation might dissipate if you don't incorporate them.

THEREFORE...PRODUCT MANAGERS SHOULD...

- Develop processes for model monitoring, retraining triggers, and updates.
- Implement version control and model registries to track model lineage.
- Develop rollback contingencies and deprecation policies.
- Be continually aware of evolving AIML techniques.

Hi! I'm Abhinav

I am constantly exploring the latest advancements in #AI #MachineLearning #DataScience #GenerativeAI #AIProducts #Analytics #LLMs #Technology #Education #EthicalAI.

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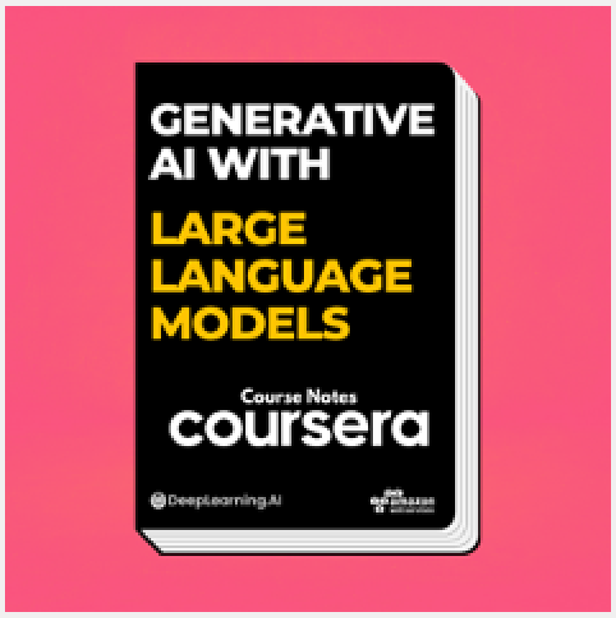

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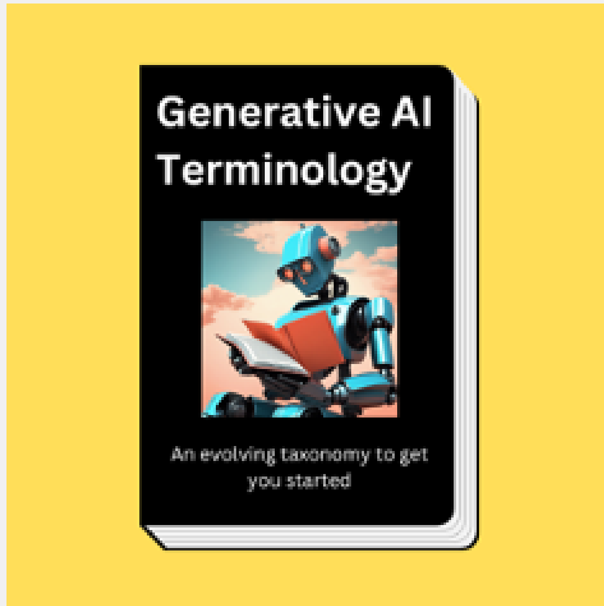

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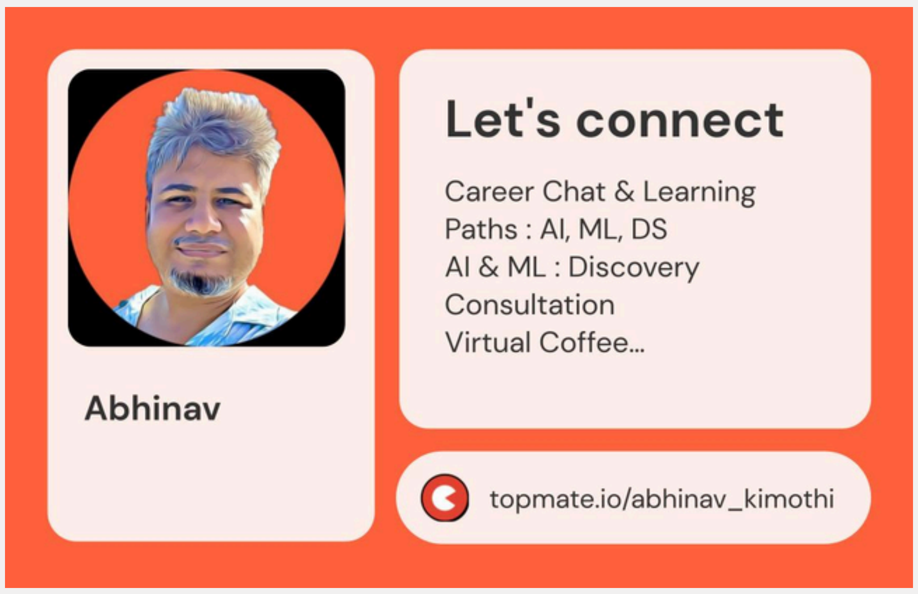

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CHECKOUT

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