Best practices for building an enterprise applied artificial intelligence product

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It should be evident by now that AAI (Applied Artificial Intelligence) has crossed the hype bubble and has its presence in several use cases in marketing, sales, operations, IT, HR, fintech, healthcare and beyond.

However, it is important to note that only 15% of enterprises are using AI per Adobe.

Hence, understanding the challenges faced in developing and putting to use a data and statistical driven product can greatly increase the chance of AAI adoption in an enterprise.

Data, data and data

There is a well-known saying in machine learning that the one who has the most data wins! However, getting access to the desired data may not be easy. In particular, supervised learning methods demand labelled data sets, which are hard to find and involve a lot of effort, not to mention are a very mundane and laborious activity. There are some ways in which labelled data can be made available from publicly available data, crowdsourcing, transfer learning from pre-trained models, commercial vendors, open source and artificial data synthesis.

Getting clean data can be another challenge. Observatory analysis will lead to identification of patterns and anomalies in your data. While these are easier to spot, some of them are silent killers like data latency and leakage which, if not identified during implementation, can completely change the outcome of your models in production.

Yet another factor could be data sensitivity. This would demand tighter controls in your product architecture to give a level of confidence to your customers that such data will not be misused.

It's no longer relevant!

As the data changes over a period of time, the models developed could become irrelevant if there is no learning process in place. Hence, continuous learning should be an integral part of the product. Continuous learning can happen either through self-learning or by introducing a human in the loop.

Hammer and nail approach

While building a product, a "one solution fits all" approach may not work. It may not be necessary that the answer to every problem is AAI. Heuristics, if applied correctly, can, at times, provide better results than AAI which is hard to beat primarily because heuristics is derived from human intelligence which, if provided by an SME, can outperform some models.

Power of cloud

With increased digitization, there has been a plethora of data that is now available and that demands significant storage and compute resources. This is where your architecture can have the required elasticity.

Additionally, many cloud service providers now provide off-the-shelf machine learning pre-built models based on a very large set of training data. Depending on the use case one can leverage, these ready-to-use models with minimal or no customizations.

Show me the product

Many of your customers would prefer to see the actual product in action. While it may not always make commercial sense to build the product before marketing, it is important to show a glimpse of what your product is capable of which is what we call MVP. A MVP (Minimal Viable Product) does not necessarily need to have all its features fully integrated as long as it is doable. The idea is to showcase the bigger picture which should be greater than the sum of its parts (product features).

Development process

To ease model building, there are now a varied set of machine learning platforms available to make the model development and deployment easier. They are scalable, fast and accurate and easy to use, these platforms can be used to accelerate your product development. Also, given the iterative nature of AAI/ML development, it makes even more sense to have an agile development process that has

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automated continuous integration and continuous deployment at its core.

The agility also demands an agile AAI architecture, which is adaptable to changes, is scalable and resilient. The below diagram depicts one such architecture.
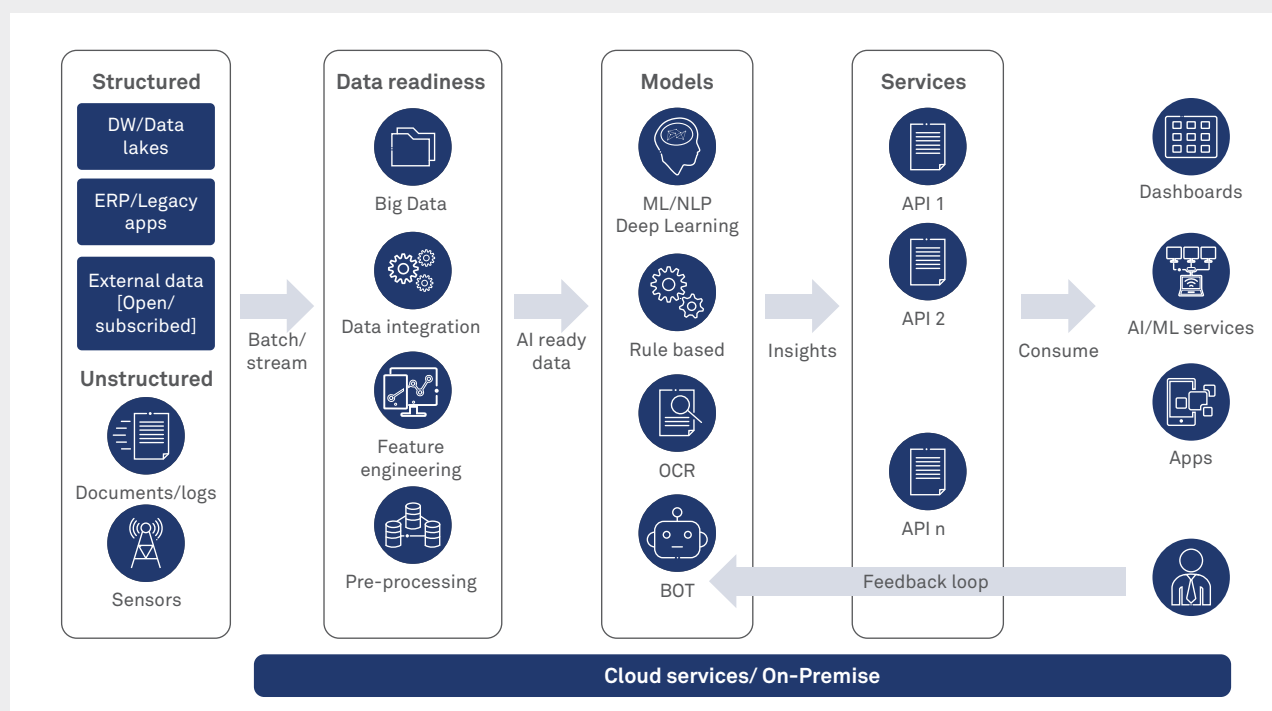

Fig 1: Enterprise architecture

Bias and accuracy

We have already seen the ill effects of AI applications not sufficiently trained, whether it be driverless car accidents or models developing gender and racial biases. As AAI deployments become widespread, flaws such as these can adversely affect not just business performance, but also reputation, compliance and human life itself.

To circumvent this, the data sets need to be extremely representative and balanced, otherwise, the system will eventually introduce bias that those data sets contain.

To start with, there needs to be a baseline accuracy, which needs to be captured before building a model. This baseline model can be

derived by rules defined by hand or simple correlations we see in the data. This helps us in not only quantifying the problem we are trying to solve, but also provides us with a reality check on how the models are performing compared to traditional methods

Remember, you may not achieve a perfect accuracy score or an optimal performance but as long it can be done over time, you can still take it to market provided you have a strong business case.

Transparency

At times it becomes important to understand how a particular prediction was arrived at.

Consider a case where a model is built to predict an anomaly or a fraud. In such cases, it becomes imperative to understand how the system arrived at a decision for identifying a transaction as anomalous. This factor of transparency can outweigh the superior performance of the model.

Depending on the use case, care should be taken to identify the appropriate algorithm at the start of the model training process.

As we see greater adoption of AAI, the above factors form part of critical decisions when one is looking to build a product that is both usable and scalable.

About the author

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As a Product Manager, Zaheer leads the product roadmap, establishes product deliverable schedule and helps customers improve business performance through automation and AI. With over 14 years of experience he has worked across various BFSI customers providing Analytics solutions.

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