Guide to
Enterprise AI

WHAT IS ARTIFICIAL INTELLIGENCE?

When most people think of AI, they picture a robot, self-driving car, or Q&A bot like ChatGPT. These are very innovative applications of AI, but they are a small fraction of its capabilities. In reality, AI is a collection of tools and technologies with numerous methodologies, applications, and pitfalls, and many of its impacts will be invisible to the end user. AI also has the potential to transform virtually every aspect of the enterprise, making it a pursuit executives must embrace for years to come. This guide provides a basic understanding of AI, and direction on where to start.

EXAMINING THE BASICS

Let's focus on exactly what AI is in an enterprise context. AI is more aptly termed "Machine Judgement", because a machine (computer) is making a decision in a situation where it's impractical for a human to do so. Machine Judgement has been around for many years, for example the predictive models that issue or deny credit to consumers, or those that flag transactions for suspected fraud. These models were programmed to make many decisions quickly, and sometimes reflect the biases and preconceptions of the humans that programmed them. The advent of Machine Learning (ML, which is synonymous with AI in this context) changed the game: instead of being programmed, the models are trained. By ingesting vast amounts of data, the machine learns how to structure and weight the model on its own. Essentially, the machine is asked to accomplish a task (e.g. "Maximize Customer Value"), but not explicitly told how to do it. Bias can still appear, of course, and must be carefully managed. The role of the programmer or data scientist shifts to validating the model's effectiveness and mitigating any unexpected behaviors or biases.

ML GOES MAINSTREAM

Two factors are driving the widespread use of Machine Learning: 1) innovations like the Internet allow enterprises to collect more data on their customers, and 2) advances in computing make processing vast amounts of data more feasible. This allows enterprises to supply their ML models with large amounts of fresh data on a continuous basis. The ML models use this data to refine themselves, learning as time goes by. In addition to data and compute, ML technologies are also well within reach for most enterprises, as companies like Microsoft, AWS, and Google offer native ML services in their clouds, and open source ML libraries abound. Indeed, a university student can train a computer vision application on their desktop machine using free software in less than a day; that said, enterprises should not view the creation of useful ML applications as a trivial undertaking. The most useful ML applications require the right use cases, good clean data, and a process of continuous improvement. Like any new technology, enterprises must adapt their people, processes, and policies to take full advantage of ML.

THREE TYPES OF ML

Machine Learning is rooted in statistical techniques that have been around for decades, and thus is a fairly well-developed discipline that spans Statistics, Mathematics, and Computer Science. Let's look briefly at the three different types of ML and what they do:

1. **Supervised Learning** - used when data is labeled, for example 'churned' or 'not churned.' The machine attempts to find the best model and/or coefficients that explain the variance in the labeled data. Models can be deployed into live decisioning environments, and sub-components can be analyzed to understand correlations and areas of further analysis. Input data is split into training and testing sets to gauge model accuracy. Supervised Learning offers the widest selection of ML modeling techniques.

2. **Unsupervised Learning** - used when the data is unlabeled for exploratory analysis. Does not requre splitting data into testing and training sets. Outputs of Unsupervised Learning models tend to be classifications or clustering, and are also useful in feature selection.

3. **Reinforcement Learning** - the machine is rewarded or penalized with a numerical value, with the machine trying to maximize its cumulative reward. Reinforcement learning is particularly well-suited to problems that include a long-term versus short-term reward trade-off.

Within each type of ML, there are a variety of modeling techniques that can be leveraged, depending on the type of opportunity being addressed. Some of the more common ML techniques in use in enterprises include Regression, Decision Trees, k-Means Clustering, and Neural Networks. That said, the landscape is evolving rapidly, and techniques like Reinforcement Learning are making fast inroads. The key is to understand the appropriate ML modeling technique to apply to each use case, ensure the model ingests the appropriate data, and that a process exists to monitor and improve the model's performance.

firebrand

Guide to
Enterprise AI

WHERE TO START?

The best way to start with ML is to ask two questions: 1) how can ML help acquire, engage, and support my customers better? and 2) how can ML improve my internal processes? Keep in mind that ML can be used to either augment human decisions or replace human decisions, so you'll likely come up with dozens of potential use cases. Also, augmentation and replacement are not mutually exclusive, and can often be used in sequence. In fact, some enterprises run ML alongside their strongest human decision makers to learn best practices, analogous to an apprenticeship, and then have the ML gradually take over. Now filter your list of potential use cases for scenarios where human decisions are being made in high volume with relatively low judgement or context needed. ML performs better with more input data (which low volume decisions often lack), and ML also doesn't necessarily have the context or empathy for high judgement decisions. While these criteria may sound limiting, you'll likely still have several starting point use cases from which to choose.

The next part is harder: arranging the people, processes, and policies to administer the ML program, ensuring your data platforms are up to the task, and creating an ML dev environment. You may also discover limitations in your business applications that will need to be updated to accommodate ML use cases. For assistance with these areas, feel free to contact Firebrand at: **info@catchfire.ai**

Need more inspiration? Here are 5 of the top use cases in enterprises today, as well as a table showing potential use cases by department:

1. **Sales & Marketing.** AI helps enterprises optimize customer acquisition and brand spend, and target customers based on the most effective attributes. In addition, AI-driven lead scoring can ensure that the most profitable opportunities are handled correctly.

2. **Customer Experience.** Once acquired, the customer experience has a direct impact on repeat business. AI can help understand the customer relationship at a granular level, provide a personalized experience for each customer, and predict weaknesses that need to be proactively addressed.

3. **Customer Support.** Many enterprises have deployed simple chat bots to help resolve customer queries more quickly; however, AI can take a larger share of the load, up to becoming a full-fledged agent of the enterprise (e.g. granting refunds, etc.)

4. **Finance.** Many large enterprises use rule-based expense report processing; AI makes this process more intelligent, reducing overall processing costs. AI is also useful for revenue forecasting, being able to incorporate far more variables than spreadsheet models.

5. **Human Resources.** An increasingly critical part of enterprise success, talent recruitment, engagement, and retention can all be enhanced by AI capabilities.

TABLE: APPLYING AI ACROSS THE ENTERPRISE

Area	Department	Initial Use Cases	Advanced Use Cases
Front Office	Sales & Marketing	Segmentation Lead Scoring Media Optimization Attribution	Propensity to Buy Deal Terms Targeting & Personalization
	Customer Experience	Propensity to Churn Loan Default	Recommender Systems Customer Lifetime Value
	Customer Support	Personalized Tutorials Save Offers	Intelligent Agent
Back Office	Finance & Procurement	Forecasting Expense Report Approval	Fraud Detection
	HR	Recruit Scoring Compensation Equity	Talent Management
	Manufacturing	Demand Forecasting Quality Control	Predictive Maintenance
	Supply Chain	Forecasting Quality Control	Anomaly Prediction
	IT	Intrusion Detection Policy Adherence	Intelligent Load Balancing Cost Management

firebrand

www.catchfire.ai | © 2023