

Artificial Intelligence(AI)/Machine Learning(ML) - Innovate to survive

Introduction

All of us realize the importance of innovating with Artificial Intelligence(AI)/Machine Learning(ML) technologies as we already use AI/ML enabled technologies for productivity gain. This article suggests a realistic starting point for any organization by looking inward into one's own device/product/solution/service for leveraging AI/ML capability. The Biggest impact for the organizations will be transitioning and empowering the staff to this new era of AI/ML enabled world. AI/ML capability is a critical enabler for pursuing "Smart Self-Aware and Self-Managing" device/product/solution/service strategy and also for conducting business leveraging more and more AI/ML enabled software applications for solving problems.

Artificial Intelligence(AI)/Machine Learning(ML)

Anyone can understand this article without any prior or in-depth AI/ML knowledge. If interested, please visit the website [<http://www.r2d3.us/visual-intro-to-machine-learning-part-1/>] for a quick walk through of the basics on how machine learning works using a unique and dynamic visual interface, and consider [Harvard [CS50's Introduction to Artificial Intelligence with Python](#)] on edx.org . Artificial Intelligence(AI) is the science of making machines think like humans. Machine learning(ML) uses statistical pattern recognition techniques for analyzing the data algorithmically to arrive at a prediction or recommendation or decision.

Curating/transforming the unstructured data into structured is required for ingesting/processing by a machine learning model. Adding features to machine learning models requires expertise to get the right attributes/parameters. Deep learning minimizes the "expertise" required and often can simply work with unstructured data for (feature/attributes extraction and classification).

Using AI/ML for the right purpose is key even though identifying and implementing that for the right purpose for the right business outcome is challenging. Concerns about not knowing the "inner workings" is true even today with many of the Cloud/SaaS solution

offerings. Clearly, benefits outweigh the concerns for AI/ML.

Cloud and AI/ML driven enterprise technology solutions will be crucial for any organization's successful digital transformation. All organizations have to transform themselves to providing intelligent self-aware and self-managing products, tools, solutions and services that are easy to use/customize, using cloud and AI/ML driven enterprise technology solutions.

One can quickly get to initial scale using cloud technology solutions and services with a pay-as-you-go cost model. Integrating on-premises, multiple cloud services and solutions requires highly skilled technical knowledge based talent. Hyper-scaling requires skilled solution engineering/architecting talent to use the resources optimally for integrating, leveraging and providing services effectively.

Empowering the employees is key for successful digital transformation with AI/ML driven enterprise technology solutions and for building AI/ML driven "Smart Self-Aware and Self-Managing" products/solutions/services. Improving the onboarding enablement / orientation training program for the employees, and expanding that to delivery and services partner staff to drive towards the organization's AI/ML transformation aiding delightful customer experience.

Simply put, explore "how to leverage AI/ML for providing game-changing customer experience?" and "how our own device/product/solution/service can be made smarter with AI/ML?" rather than overthinking.

Innovate to survive or get outsmarted

As an engineer or leader, how are you approaching this? Have you thought about how can, your own device/product/solution/service be made smarter with AI/ML?

Leadership / CXO has to support and drive the progress with metrics or key measures to understand the progress of the innovative disruption as turning profit with "disruptive innovation" takes time. AI/ML is here now yielding productivity gains (suggests the next word as we type, generates code etc) already.

Innovate to create game-changing customer experience or risk of losing your customers to the competing products that are AI/ML enabled. Continuing to innovate is an important trait for business survival and to remain ahead of the competition. As an

innovative organization, being the fastest to overcome the challenges in replacing the old technology and ensuring the availability of the new technology ecosystem at economy of scale quickly.

“Smart Self-Aware and Self-Managing” device/product/solution/service

“Smart Self-Aware and Self-Managing” is all about eliminating or minimizing the need for the “paying” customer to manage the device/product/solution/service. Cloud delivered AI/ML technology driven software update and configuration management, with appropriate data feedback loop with from the “deployed” device/product/solution/service enables continuous ongoing delivery of improvements.

Ability for the device/product/solution/service to send back data is very useful for cloud/central management. Success of the AI/ML expert-system is going to vastly depend on “how reliable the data source is”, “how that data is curated/maintained” and “how that data is used in the decision-making logic/process”. Feedback data from more self-managing devices will result in continuous improvements in prediction with Machine Learning neural network training models. This also can be the basis for new line or extension of the business lines with more simplified product features delighting the customers.

On-device/built-in AI/ML algorithms are also continuing to improve, like helping to predict hardware failures based on the periodic diagnostic checks etc. Expanding this to build self-managing device will significantly reduce the deployment time and increase customer adoption dramatically. Benefits of this are very much measurable and quantifiable based on reliability-improvements due to proactive handling of issues because of the predictability and increased availability of self-managing devices.

“Smart Self-Aware and Self-Managing” device/product/solution/service requires secure, robust and scalable authentication-and-authorization of these smart self-aware devices. Scalable information security and authentication-and-authorization technology is also vital for this digital transformation.

Containerization enables isolation of the software binaries with dependencies and configuration to provide serviceable modular units called containers. Containerized modules are independent with safe defaults and can use APIs based interactions with

each other as needed.

Leveraging containerization, AI/ML and Cloud technologies appropriately can eliminate or minimize the need for the “paying” customer to manage the device/product/solution/service. This kind of “Smart Self-Aware and Self-Managing” device/product/solution/service will become indispensable for any organization’s scalability and success.

Security, Data and Privacy

CTO/IT organizations play crucial role in technology policy governing how data is processed and handled in this new era even more. Security data governance principle is key for the new era for human to AI, AI to human and AI to AI interactions. One has to safe guard the data of others the way one would like their own data be safe guarded. Implementing “Security-and-Privacy-by-design” is key in every business process related to data, even if that limits the technology choice. Technology policy is not simply the job of “General counsel, audit and compliance, government affairs” anymore with technologies like AI/ML. Every business not only has to ensure compliance internally but also should review and insist on audit compliance certifications of the partnering businesses irrespective of the nature of business interaction. Certainly information used for executing or facilitating any transaction between two parties (business to business, business to customer/consumer) has to be protected. Purposely collecting the data for “personalization” and selling that information should be prohibited.

ESG(Environmental, Social and Governance)

Great to see organizations focusing on ESG and not just focusing only on the revenue growth, profit and loss statements. Leveraging the global trends of technology clustering, migration and ESG is important for any company. Engineering/technology talent is still clustered but has started spreading wider with the tools supporting more effective remote working. Being abreast and constantly being aware of the most recent cutting-edge technologies, understanding the Laws and regulations, and other more secure methods of protecting Intellectual Property(IP) is more important than the technology itself beyond formal IP systems. With global teams, it is essential to use other layers of protection (combining asset and technology, co-design/co-develop etc)

and continuing to innovate to maintain market leadership. Organizations should review and spread the manufacturing supply chain capabilities leveraging more global clusters (organizations are adding Mexico, Vietnam, India, Eastern Europe) based on the learnings from supply-chain-disruptions faced during recent covid-pandemic and also considering the geo-political climate. In general, sales-support-and-services teams are spread globally more evenly but still concentrated around key-customer-clustered areas. It is important that the teams interacting with customers, working with physical products, working on-site, has to be structured meticulously to aid customer success.

Conclusion

Continuing to innovate is important for providing delightful customer experience for all organizations. Empowering the employees to the new AI/ML era and providing game-changing customer experience with “Smart Self-Aware and Self-Managing” device/product/solution/service, starts by exploring “How to make device/product/solution/service smarter with AI/ML?”. Implementing a “Security-and-Privacy-by-Design” technology policy is crucial in the AI/ML enabled world as one has to safe guard the data of others the way one would like their own data be safe guarded.