AI in the Enterprise: How Do I Get Started?

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Starting in 1975 with the first Homebrew Computer Club meeting, knowledge sharing has been at the root of Silicon Valley culture and a key catalyst for the advancement of emerging technologies. As more companies embrace the sweeping digital expansion, the need for knowledge sharing centered on new technologies and techniques has grown beyond the borders of the Bay area. Artificial intelligence warrants one of the most recent and loudest calls for information. While there are dispersed resources to learn more about AI, we see a need to cultivate a community of practitioners for cyclical exposure and knowledge sharing of best practices in the enterprise. As such, the Laboratory for Innovation Science at Harvard launched the *AI in the Enterprise Series*, which exposes managers and executives to interesting applications of AI and the decisions behind developing such tools. Moderated by HBS Professor and co-author of *Competing in the Age of AI*, Karim R. Lakhani, the most recent virtual session with over 240 attendees featured Rob May, General Partner at PJC, an early-stage venture capital firm, and founder of *Inside AI*, a premier source for information on AI, robotics and neurotechnology. Together, they discussed why we have seen a rise in interest in AI, what managers should consider when wading into the AI waters, and what steps they can take when it is time to do so.

Though the basis for AI has been around since the 1950s, the interest and excitement resurfaced about ten years ago with the emergence of big data sets. Neural networks, which are a set of pattern recognizing algorithms with functions that attempt to emulate the human brain, provide an efficient complementary analytics model in dealing with big data. Combined with this technique, different disciplines began to collect and label previously untracked data. To put this into perspective, we looked at the drivers through the lens of machine vision. Machine vision, the ability to identify and classify an image, had hit it's ceiling in 2010 with 78% accuracy, but there was a shift in popularity of neural networks in 2010 for computer vision due to large data sets, a perfect task for neural networks. The conditions were prime for the adoption of neural networks, as such, people then started to learn how to program CNNs with GPUs to account for faster computational speeds. This ultimately led to an increase in accuracy to 98% by 2015.

But where exactly can firms derive new value through the application of AI? May points to the functions of AI, as AI has the ability to do many things, but the three things it does best are: predict, automate and classify (PAC). The most fascinating element about prediction is that humans do it all the time and AI can arguably provide better and more accurate predictions over time. Forecasting has been the most common element of assessing performance. AI-based tools allow for better tracking over time. Lakhani states that "managers are always engaged in prediction and classification. AI is helping them get there faster." With advancements in AI, the cost of making those predictions has drastically declined, a key concept of *Prediction Machines* by Agrawal, Gans and Goldfarb, allowing firms to apply prediction in new ways and reach results in less time than humans. The new economics of AI may be one of the key reasons executives are pushing aggressively to implement. But as prediction increases, so has the value of judgement. While AI has the potential to replace some functions in the firm, managers still need to be in place to make key judgements, as May states, "Judgement goes up because you are making so many more predictions, but they are probabilistic and not 100%, using humans to know when to go against the machine, or when to integrate the prediction into the steps in a workflow is a pretty powerful thing."

The current state of AI cannot solve every problem and like most advanced technologies it has some limitations. Both May and Lakani discussed how firms face problematic adoption strategies. AI is only as good as the input data. This is the "garbage in, garbage out" philosophy where poor quality data will lead to poor predictions. Furthermore, AI has not yet reached sophisticated levels of decision making and relies on large amounts of data. May pointed to an example for every parent in the audience, "Those of you with children know that you don't need to show 10,000 coffee cups for them to learn what a coffee cup is...AI is not there yet."

When firm looks to implement, there are examples of flawed strategies, May notes:

1. AI is not magic: "If humans can't do it, machines probably can't do it."

2. Cultural Challenge: People don't think about re-engineering their processes, but think of AI as a tack on; limiting potential value. Whereas, when integrating AI, workflows should be viewed through the lense of AI, revamping the workflow to include key steps such as collecting and annotating data, collecting feedback, etc., to get the most out of the AI investment

3. Economic Challenge: People expect AI projects to resemble a software project from a margins perspective, e.g. SAS companies have gross margins of 92% but AI companies don't show that type of return because humans are still providing some of the tasks that are offered, as firms look to provide full stack solutions. This results in AI companies having margins that resemble a services company early on, but as more automates, data gets better and the team gets better, margins start to resemble software margins.

When making the decision on whether a firm should or should not adopt AI, a question that is often posed is "What is the return on investment (ROI)". Lakhani responded, "Today we would never ask for the ROI of the website...we just need it." It's this approach that firms should take when considering adopting AI. It's not if you need AI. It's much more nuanced in how you apply it to meet the needs of the firm and the customers. A founder doesn't think twice about launching a website for her firm, but instead identifies the needs the website can fulfill. This is the case for AI. Moving forward firms will have to adopt AI in some form to compete in their industry, maybe a chatbot to better meet common customer needs freeing customer service agents for more complex cases, or an AI to monitor for fraud, or an AI to predict demand for products at certain store locations. Whatever form AI may take in your firm, it's clear that industry is moving forward, some faster than others, in the adoption of AI, and to remain competitive, your firm can't leave the potential value on the table at the risk of being left behind.

With that in mind and while some organizations are scrambling to get started on AI projects that might change the future, managers can take a more practical approach by taking smaller steps to see what's possible in the near term. One important aspect is assessing the competition. May states, "Don't get in the game if something is already heavily commoditized." Firms often get involved in an already crowded space. It's helpful to think about what's missing in the market and how your organization can fill that void. May believes that companies should leverage AI in areas that they can have an impact. He'll commonly ask, "Do you have the data? Does it matter? Is this part of the organization's core competency?"

Risk assessment helps frame the time and effort investment. With the ever-changing standards for data collection and regulation, one simple answer is to have a third-party provider address issues concerning handling sensitive data. For example, a contractor can help navigate GDPR standards or mitigate risk by providing sanitized or synthetic data. Moreover, companies like Synthesis AI provide artificial data through photos to help train the algorithms your firm needs.

Finally, experimentation is key. In most cases, an internal assessment of the needs of the organization will open avenues for exploration. The key is to learn about how your company's data can be leveraged to power AI. For some projects you can simply use Watson or DataRobot; however, relying completely on third party providers might lessen the impact since you'll learn less about what your own capabilities are. Regarding missed opportunities, May comments, "We should recall that Google was the search bar for Yahoo at the beginning."

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