

# Impact of Artificial Intelligence on Business

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**Abstract**—Artificial intelligence (AI) and automation is propelling strategists to reshape their business models. This paper focuses on the impact of AI on businesses - from research, innovation, market deployment in business models. The triangle is based on innovation, knowledge, and entrepreneurship. The first dimension deals with research and innovation in AI w.r.t business. In the second dimension, we explore the impact of AI on the global market and the strategic objectives of the businesses and finally the third dimension inspect how AI is shaping business contexts.

Keywords: Artificial Intelligence, Business Intelligence, automation, Business strategies

## 1 INTRODUCTION

Artificial intelligence (AI) refers to the application of computer and information technology to develop machines that can mimic the cognitive abilities of human beings. The adoption of AI is resulting in a world which is smarter and innovative. Route and traffic mapping by Google maps, price estimation of rides by Uber and Lyft, friends' tag suggestions at Facebook, spam filters in our email, recommendation for online shopping and cancer detection are only a few examples of AI technological innovations simplifying our lives. Internet of things (IoT), data science & big data, cloud computing, artificial intelligence (AI), and block chain are the emerging technologies that may create winners as well losers across the world.

AI is already getting better at recognizing trends and extracting indepth from complex data than humans are, and these abilities will only improve over time. Rather than continuing to pour money into tools that require employees to spend their time manually analyzing data and making mundane decisions, business organizations should invest in the future of BI and ai-powered systems that automate the bulk of these processes and allow their talent to focus on the strategic problems that really move the needle.

## 2 LITERATURE SURVEY

Many neural networks are trained using stochastic gradient descent (SGD), which iteratively refines the parameters of the network by moving them in the direction that maximally decreases the value of the loss function. Several refinements to SGD accelerate convergence by changing the update rule. Researchers often want to experiment with new optimization methods<sup>[1]</sup>, but doing that in DistBelief involves modifying the parameter server implementation. Moreover, the get() and put() interface for the parameter server is not ideal for all optimization methods: sometimes a set of related parameters must be updated atomically, and in many cases it would be most efficient to off load calculated onto the parameter server, and thereby reduce the amount of network traffic.

## 3 METHODOLOGY

The effect of the tremendously increasing intelligent behavior of machines on the growth rate and changing behavior of the business all over the world. We try to answer the questions raised in the previous section by investigating 100 AI start-ups born all over the world to meet customer expectations in different application areas. 100 AI start-ups is the list of 100 promising private companies implementing AI algorithms in 22 different lines of business.

AI start-ups initiated all over the world are categorized in 22 different fields including autonomous vehicles, business intelligence, healthcare etc. Figure 2 depicts the percentage of 100 AI start-ups in 22 lines of business which majorly covers all the fields where AI is showing its impact.

### AI transform businesses

Rather than seeing AI business systems as alternative for human beings, they can be viewed as tools for supporting humans. AI can analyze a lot of data faster than a human brain and can be able to create the course of action through possible insights, which can be used to improve organizational decision-making processes. As opposed to other business intelligence software, the ability of AI to make decisions transpires all other usual software used by businesses to analyze data.

### Improved Business Security

The high global interconnectedness has made it difficult for many organizations to safeguard themselves against cybercriminals who exploit the high number of possibilities and targets. Business organizations can leverage the used of new AI to manage and protect their information and online e-commerce customers from the growing threat from cybercriminals. The application of machine learning and AI on industries and business applications due to their computing power, data collection, storage, and interpretation can be used to tame cybercriminals in a proactive approach in which security risks are identified, and approaches to mitigation can be put in place before any damage can be done to customer or the business data and systems. Machine learning techniques and continuous AI retraining can be used to proactively stay ahead

of what the cybercriminals are thinking. Therefore, AI can be applied in a preventive and predictive way by business organizations to increase cybersecurity. Many business organizations have fully developed digital models, which run on systems that can easily be hacked by cyber criminals, which could be detrimental to the overall organizational operations and customer trust. When human beings are in charge of system security, there are many loopholes and gaps that are left because of the human nature of human security analysts. Machine learning and AI work without getting tired or being limited by time, which seals all the possible gaps that can be exploited by cybercriminals to commit cyber-crimes such as fraud and information theft. Therefore, the use of AI and machine learning can reduce the overall threat caused by the skills gap and reduce the number of malware that can lay dormant in business systems before they can be detected which can reduce the vulnerability of business systems.

### **Automation of Business Processes**

Business systems automation is another important application of AI software since the industrial revolution and has significantly improved production. From automation in automobile manufacturing and assembly plants to automated hotel booking systems, which use AI software and AI driven advanced robots, which work in manufacturing industries. Most of the routine work and tasks in the production process have been automated to increase production efficiency and reduce the cost of production. The reduced cost of production due to automation plays a significant role in contributing to an organization's competitive advantage by enabling an organization to offer products at a low price compared to other competitors who are yet to automate their production processes. The primary advantage of automation is that an organization can increase its total output because unlike human capital the robots do not wear out or require breaks for refreshment.

### **Benefits of Artificial Intelligence for Business**

- Improving personalised shopping experiences. Providing customers with personalised marketing increases engagement, helps generate customer loyalty and improves sales. Automating customer interactions. ...
- Real-time Assistance
- Data mining.
- Operational automation.
- Predicting outcomes
- Improve the recruitment process

### **AI in Business Intelligence Applications**

#### **SAP – AI for Turning Databases into Useful Intel**

HANA is SAP's cloud platform that companies use to manage databases of information they have collected. In short, it replicates and ingests structured data, such as sales transactions or customer information, from relational databases, apps, and other sources.

The platform can be installed to run on-premise through a company's servers, or via the cloud. HANA takes in information gathered from access points across the business—including mobile and desktop computers, financial transactions, sensors, and equipment at production plants. If your sales staff uses company smartphones or tablets in the field to record purchase orders, data from those transactions can be analyzed and understood by HANA to spot trends and irregularities.

Walmart, for example, has been using HANA to process its high volume of transaction records (the company operates more than 11,000 stores) within seconds. At a conference hosted by SAP in 2015, then-CIO Karenann Terrell described why Walmart chose to use HANA in order to operate faster and control back office costs by consolidating the processes and resources needed to handle the work.

#### **DOMO – AI for Business Dashboards**

It is not just the giants like SAP developing machine learning platforms for business. Domo, a fast-growing business management software company that's raised over \$500 million in funding, has created a dashboard that gathers information to help companies make decisions. The cloud-based dashboard can scale with the size of the company, so it can be used by teams as few as 50 or by much larger enterprises. There are more than 400 native software connectors that let Domo collect data from third-party apps, which can be used to offer insights and give context to business intelligence.

This gives companies using Domo a way to pull data from Salesforce, Square, Facebook, Shopify, and many other applications that they use to gain insight on their customers, sales, or product inventory. For instance, Domo users who are merchants can extract data from their Shopify point-of-sale and e-commerce software, which is used to manage online stores. The extracted information can be used to generate reports and spot trends in real-time, such as in product performance, which can be shared to any device used by the company.

In March, Domo announced Mr. Roboto, a set of new features for the platform that draw upon AI, machine learning, and predictive analytics. The expectation is for Mr. Roboto to offer recommendations and insights to decision makers at companies. Once these features are rolled out, expected in late spring

2017, the platform is supposed to issue new alerts and notifications for significant changes, such as the detection of anomalies or new patterns in data (similar to approaches used in cyber security already).

Detecting these changes and patterns is expected to fuel the predictive analytics side of Mr. Roboto and help companies predict the return on investment for marketing in real-time, customer churn, and sales forecasts.

According to Domo, companies such as MasterCard, Univision, eBay, the Honest Co., and SAB Miller use its platform. Television broadcaster Univision offered up a testimonial about the way it uses Domo to give more visibility to its own data, which is then used to unify and focus targeted campaigns. Univision said it uses the Domo platform with connectors for such applications as Google Analytics, Facebook, and Adobe Analytics to get more value from its programmatic advertising. "By launching Domo, we were able to quickly optimize and achieve an 80 percent growth in yield during our first quarter," said David Katz, Univision's VP general manager for programmatic revenue and operations.

#### **Apptus – AI in Sales Enablement**

There are numerous ways for machine learning to enhance applications, including those from Apptus, which offer recommendations on actions that companies can take to boost their sales channels. Apptus says it specializes in the connection between a customer's intent to buy and the realization of revenue by a company.

The Apptus eSales solution is designed to, among other features, automate merchandising based on a predictive understanding of consumers<sup>[2]</sup>. The software combines big data and machine learning to determine which products might appeal to a potential customer as they search online or get recommendations.

For example, when a customer visits an online store that uses Apptus eSales and starts to type in search terms to look up products, the machine learning solution can predict and automatically display related search phrases. It can also display products associated with those search terms.

Companies of varying size use Apptus, such as automated bookseller Bokus.com in Sweden, which according to its testimonial has about 30 employees. Bokus, which needed to keep overhead at a minimum, said that tapping into automated technology to convert customers is a way to help achieve that goal. For instance, the eCommerce company reported that

its average turnover of customers increased 100% for each open of its digital, personalized recommendations newsletter.

AI and machine learning platforms are getting better at predictive tasks, such as determining what customers might want based on the information that they are fed. In an interview strictly for this article, Nicholson stated that deep learning, a subset of machine learning, is in many cases hitting an accuracy of 96% in interpreting data. "That is the upper limit of what humans can do," he points out.

Though the technology is still in its early days, Amr Awadallah, founder and CTO at machine learning and software company Cloudera, says deep learning is already adept at prediction and anomaly detection. It is not perfect yet, but it is getting easier for deep learning networks to understand what information is relevant. "You don't have to tell the algorithm which things to look at," he says. "You can give it the raw input data and it can figure it out for itself."

#### **Siemens – AI for Monitoring Machine Fleets and Factories**

The importance of monitoring how industrial equipment will perform has compelled other software providers such as Siemens to put their machine learning technology to work in this space. In March 2016, Siemens launched its MindSphere open industry cloud platform in beta.

MindSphere was designed to provide monitoring of machine fleets for service needs through machine tool analytics and drive train analytics. The application can be used by industrial companies to keep track of machine tools at plants around the world and see performance stats of their assets. This can help schedule preventive maintenance and manage how their equipment is used to improve their operational lifespan.

Comparable to Predix, MindSphere works with machines and plants regardless of the manufacturer. The intent is to help plant operators increase the uptime of their equipment and make maintenance more efficient by assessing when a piece of machinery is expected to breakdown. Furthermore, machine builders may see reductions on expenses related to warranty repairs by virtue of their machines running smoothly for longer.

Siemens says MindSphere, developed with SAP, companies that use MindSphere get a box that connects to their machines and collects data to show how the machines are operating.

## 4 DISCUSSION

The global business world is witnessing increasing volumes of connected devices and business data. According to Statista, IoT-enabled connected devices are projected to increase to 75 billion by the year 2025 (up from 26 billion devices in 2019). Along with the number of IoT devices<sup>[5]</sup>, the data generated by these connected devices is exploding with over 5 quintillion data bytes being generated each day.

With the massive increase in business data, corporations can no longer depend on traditional business analytics or business intelligence tools to analyze data and derive valuable business insights for better decision making and business strategies. Operating over 11,000 retail stores, Walmart is using the ML-enabled HANA platform to process its high number of daily transactions in a matter of seconds. Machine learning tools in business intelligence like the HANA tool is expected to reduce the customer's infrastructure costs and improve operational efficiency.

Another industry example is that of the business management software firm, Domo. By combining its capabilities in AI, machine learning, and predictive analytics, Domo customers can extract and analyze data from a variety of sources including Salesforce, Facebook, and Shopify that provides them with insights on customers, sales volumes, and inventory levels.

## 5 CONCLUSION

Increase in productivity, time and cost efficiency, human error reduction, faster business decisions, customer preference prediction, and sales maximization are some of the key advantages of automation, cognitive technologies, and data analysis using AI algorithms. It can be analyzed from above data that AI wave is on and appetite for AI growth is exponential. The investment in AI is showing an upward trajectory in last 6 years and should remain the same for upcoming years AI is used for information and automation to enhance business capabilities and has learning capabilities. We are many years away from a fully self-aware AI program. All levels of AI carry risk. The primary AI programs are mainly a risk to skilled labor. Higher-level AI could pose real dangers to humanity. The benefits of AI continue to grow, which will ensure that the technology is here to stay. As a need of Businesses and society requirements as a whole to adopt to use the new technology and make adjustments as per business requirements. Companies will need to incorporate AI to remain competitive, and workers may need to change their skill set to retain employment.

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