DIGITAL360

*recruiting excellence for this digital technology age*

# How Machine Learning is changing the game

For the past 10 /15 years it's been all about Digital. Companies have been urged to go multi-channel, digitise assets, embrace e-commerce, go Mobile, use social media, automate processes, speed up time to market…all an ongoing challenge that's with us to stay.

But even while most companies strive to take advantage of these new ways of working, so a new imperative has recently emerged, one that's just as demanding and yet can additionally provide huge advantage and benefit.

Data Science. Exploiting data to drive rich real-time automated personal insights and competitive advantage. It's not about traditional data management and data warehousing. It's not the time-consuming, high cost, IT-heavy, historic data management taking 2 or 3 years to produce. Now it's about advanced and predictive analytics. It's about using real time data analyses with open source software tools and Cloud-based solutions to deliver the next generation of revenue growth and performance enhancement.

It's the new game-changer and leading-edge companies are starting to invest heavily in this area. Pioneers like Amazon, Uber, NetFlix are now being joined by the likes of Zurich Insurance, Barclays, BT and Mercedes, Pharma and Healthcare, leaders in most every industry, even government agencies, as data science and machine learning go mainstream and become the new source and opportunity for competitive advantage.

**Some market stats will help illustrate the significant amount of activity going on in this area:**

-The Global Big Data market is expected to grow 5-fold from c. $20bn in 2016 to c. $100bn by 2025
*(Forbes /IDC research)*

-It's expected that by 2022, c. 35% of all big data spend will be on advanced Data science /Machine Learning /AI software tools and solutions
*(Reuters)*

"Machine Learning is changing the game. It is enabling enterprises to become more customer-centric, identifying new revenue opportunities, enabling new products and services, creating innovative business models. It's also a major driver of process automation, speed and improving operational performance. These are the dominant factors driving advanced data and analytics investments today. Unleashing the insights hidden in unstructured data is providing enterprises with the potential to compete and improve in areas they had limited visibility into before."
*(Gartner)*

"There's now so much data that we need the machines to process and understand it. At present, it's estimated that less than 1% of all data is ever actually analysed. By 2022, we're expecting a 4300% increase in the amount of data being produced each year."
*(Forbes /IDC)*

-Machine Learning /AI start-ups forecast to pick up c.20% of all tech venture capital in 2019
*(Information Week)*

**Some brief examples to illustrate:**

-*Uber* has implemented "dynamic pricing", using machine learning to analyse data in real time and adjust pricing in seconds to reflect existing and anticipated demand

-*McKinsey* has used ML tools to crunch resumes received over the past 30yrs and claim their HR systems can now automatically predict from a resume who will succeed in their firm

-*Quantgene* is using computer-aided diagnosis to spot examples of cancer a year ahead of typical human diagnosis ("today, our biology and medical graduates are also encouraged to be experts in computational and data sciences"),

-*PayPal* uses ML to combat fraud and can now compare millions of transactions in seconds and precisely distinguish between legitimate and fraudulent transactions

-*BT* is using machine learning algorithms and natural language processing to provide real time automated conversations and stand-in for customer service agents

-*STATSports* has launched its new predictive analytics tool: Dynamic Sports Play Prediction", tracking every aspect of player movement in a game, they can simulate every type of possible

game situation and predict player reaction and response, so helping ensure "the right player gets picked for the right position in the right game".

With so much development taking place in this area, let's just stand-back and define some key terms.

**Some key definitions:**

**Artificial Intelligence /AI:**
-describes any technique that enables computers to mimic human intelligence using logic, if-then rules, decision trees and machine learning

**Machine Learning:**
-at its simplest, this is about using machines to crunch vast amounts of data, increasingly in real-time, to gather new insights
-at its more complex, it's about using statistical techniques that enable machines to improve at tasks with experience

**Deep Learning**
-is a "subset" of ML and is about developing algorithms that enable the software to train itself to perform tasks like speech and image recognition.

All this AI /ML/DL technology is able to develop insights and do things that are beyond human capabilities. It is based on the patterns it can derive from crunching vast amounts of big data, very quickly. It can for example anticipate a shopper's future needs based on their history and adjust their user /buying experience in real time to reflect that, it can predict candidate suitability for jobs, enable "internet of things" type opportunities with eg Mercedes exploring how automotive systems might automatically monitor performance, report errors and fix problems, it can automatically organise collections of photos on your mobile phone, it's enabling chat bots in call centres, it can be seen as a cost reduction tool (eg Google have used it to cut 15% of the costs of running their data centres), but it can also be seen as a generator of new sources of business opportunity.

Amazon's Alexa is one example. Here's how the team at Amazon describe what they are doing:
*"The Alexa Data Science and Machine Learning team made the magic of Alexa possible, but that was just the beginning. Our goal is to make voice interfaces ubiquitous and as natural as speaking to a human. We have a relentless focus on the customer experience and customer feedback. We use many real-world data sources including customer interactions and a variety of techniques like highly scalable deep learning. Learning at this massive scale requires new research and development. The team is responsible for cutting-edge research and development in virtually all fields of Human Language Technology: Automatic Speech Recognition (ASR), Artificial Intelligence (AI), Natural Language Understanding (NLU), Question Answering, Dialog Management, and Text-to-Speech (TTS)."*
*-(Amazon VP Rohit Prasad)*

**Let's look at applications of these technologies in 3 areas:**
-Contact /Call centres
-Marketing
-Insurance Services

## 1. How AI/ML is transforming call centres

Today's contact and call centres are already using Digital tools to communicate. Not just phone but via social media, instant messaging, video conference and web chat. It need be no great step then for call centres to eventually replace human interaction with bots powered by AI.
Gartner predicts that by 2022, 85% of all customer interactions will no longer be managed by people but by bots. The likes of Facebook, Apple, Microsoft have all built and deployed virtual assistants and chatbots which can respond to voice queries and engage in an increasingly natural dialogue and especially able to deal with a growing list of most frequently asked questions.

In theory, it's argued, virtual assistants will "improve the customer experience because the AI bots can store endless amounts of data and access the most relevant information at the right time to give customer exactly what they want.". Adopting this approach is also seen as a major boost to efficiency and reducing costs of 24/7 global call centre operations.

There are questions about the acceptability of this approach to people calling-up for help, whether bots can replace tele-sales, the "naturalness of the language", the absence of any humour or genuine human contact and concern, and whether bots will be more time efficient or might in fact take longer to resolve a problem. But a recent research report from Oracle shows that 41% of Customer Experience Officers and heads of call centre departments expect their use of bots to significantly increase, especially as AI/ML technology continues to evolve and improve. In fact in a recent report from Xerox, 42% of execs said they expected the contact centre as we know it now will cease to exist by 2025.

## 2. How AI/ML is transforming Marketing

*Moo.com* is a provider of on-demand printing services and is currently exploring the world of machine learning and AI, especially when it comes to Marketing.
They started with replacing the static FAQs on their website. They put in place an automated ML solution which can review past and current customer behaviour on their sites to learn and update what content and information was popular and most relevant. This has enabled Moo.com to keep fine-tuning their site to reflect what customers are most interested in.
They have been able to build on that capability to now provide an Amazon.com type personalisation engine to tailor individual customer experience online that best fits each customer's needs.
Moo.com believe that this initiative has by itself helped drive continuing increases in revenue (they now operate across Europe and the US) as well as providing more effective self-serve customer solutions.

*TGI Fridays* is another example. They have introduced "chatbots" based on ML/AI to personalise their interaction with their customers. It means that at any time any customer can have an apparently 1-1 conversation with TGI about menus, pricing, nearest restaurant, location details, special offers, allergy advice and so on. With every chatbot interaction, each customer also receives happy hour suggestions and special offers. They also now have added a home delivery capability.
Sherif Mityas was the CIO at TGI at the time launching this initiative: "We wanted to be part of the conversation when people are discussing where to go out and get recommendations. We saw a 500% increase in engagement with customers on social media channels since deploying this new conversation-based customer experience. It's a huge win for the brand".

TGI and Moo worked with the data science firm StatWolf. Based in Ireland, they developed the bespoke software tools and worked with the companies on the implementation and monitoring of the marketing and customer impact the technology was having. There are now many others consultancies and agencies providing similar services from the majors like IBM, Accenture and Cognizant to start-up and more entrepreneurial ventures and agencies like Data Reply, Applied AI and Evolution AI. They can all provide low cost proto-type solutions that enable companies to explore the potential without having to incur substantial expenditure up-front.

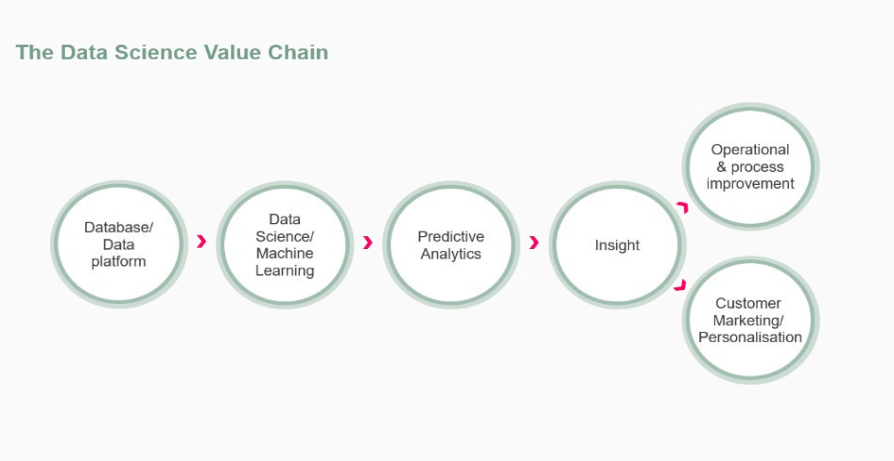
A report by Gleanster, the US Marketing research firm, found that 90% of companies expected to use more marketing automation in the next 5 yrs. This can include everything from email marketing, social media monitoring, search engine optimisation to align with changes in search algorithms at Google, content distribution, programmatic advertising as well the type of ML initiatives seen at Moo and TGI.

In particular companies are looking at how ML can deliver customer loyalty and secure long-term customer retention, And key to this is developing personalised marketing based not on past data and previous campaigns but using data analysis and insight to better understand and determine future customer needs, what does the customer want, what will excite and drive higher levels of engagement and spend. This can mean dynamic ad-copy, customised call centre and online experience, personalised recommendations, anticipated "time of need", dynamic pricing, one-to-one conversations carried across desktop and mobile…AI making "hyper-personalisation at scale".

## 3. How AI/ML is changing Insurance

In a recent KPMG report, they comment that: "the opportunities to apply ML tools and solutions in the insurance industry are especially significant". Insurance organisations are founded on Data and most have already digitised existing records. It is also a resource intensive business where processes like claims administration are time-consuming and often a frustrating experience for customers.

KPMG suggest Insurers could use Machine Learning to drive two key areas of improvement across the data value chain: (i) reduction in costs and (ii) enhanced competitiveness.




*Source: Digital-360*

By automating and using ML, it's reckoned that insurers could cut claims processing times down from a number of months to a matter of minutes. It's also estimated that because ML should be more accurate than human judgement on claims, so it could cut out the number of denied claims which often result in appeals and then a subsequent settlement. All that aspect of the claims process could be eliminated.

In terms of improved competitiveness, KPMG customer research suggests that people might pay a premium for a product that guarantees "frictionless claims payout" without the hassle of having to have long and protracted call centre and email claims discussions. It's argued that this whole drive towards simplicity, faster response, easier interaction could also significantly increase customer retention and loyalty, reinforced by simple quick renewal.

For KPMG, the benefits of applying ML across the Insurance sector are overwhelming and yet they see very slow uptake.

The reasons appear to be a mix of "other priorities right now", "we're concerned it won't make the difference that's claimed", and perhaps more pointedly: "we haven't thought through the people issues around wholesale automation and whether we're ready to implement such radical and sweeping changes".

This last point is something that many established businesses, and not just in Insurance, are grappling with. No-one is now doubting the power and potential of AI. We can all see how for new pure play companies like an Uber or a NetFlix, with no established people-based ways of working, so it's easier for them to move quickly to a technology-led solution. But where a company employs perhaps thousands of people eg in a claims department, the migration from "people-led" to "tech-led" becomes harder in both cultural /emotional terms as well as in the transformation required to migrate often decades-old established processes and ways of working.

KPMG accept this point in their survey and talk about "overcoming cultural differences" as the key challenge especially for long-established Insurance organisations. Without doubt, insurers have typically not been early adopters of new technologies but what should now make the transformation journey easier is the ability to experiment with ML solutions in a low cost experimental way. Trialling initiatives that can be regarded as a necessary piece of "siloed innovation", a way of finding out and exploring what possible in a small part of the

business, perhaps a recent development area itself which might lend itself more readily to some radical change.

Picking an area which is data intensive, where there is a lot of routine and repetitive tasks, where there are perhaps already proven ML solutions in the market that a specialist data agency can adapt for this organisation, all that can make the first steps easier to manage and negotiate. Once there's proof of concept of course the business case becomes more persuasive and the easier perhaps to make changes that can capture the RoI.

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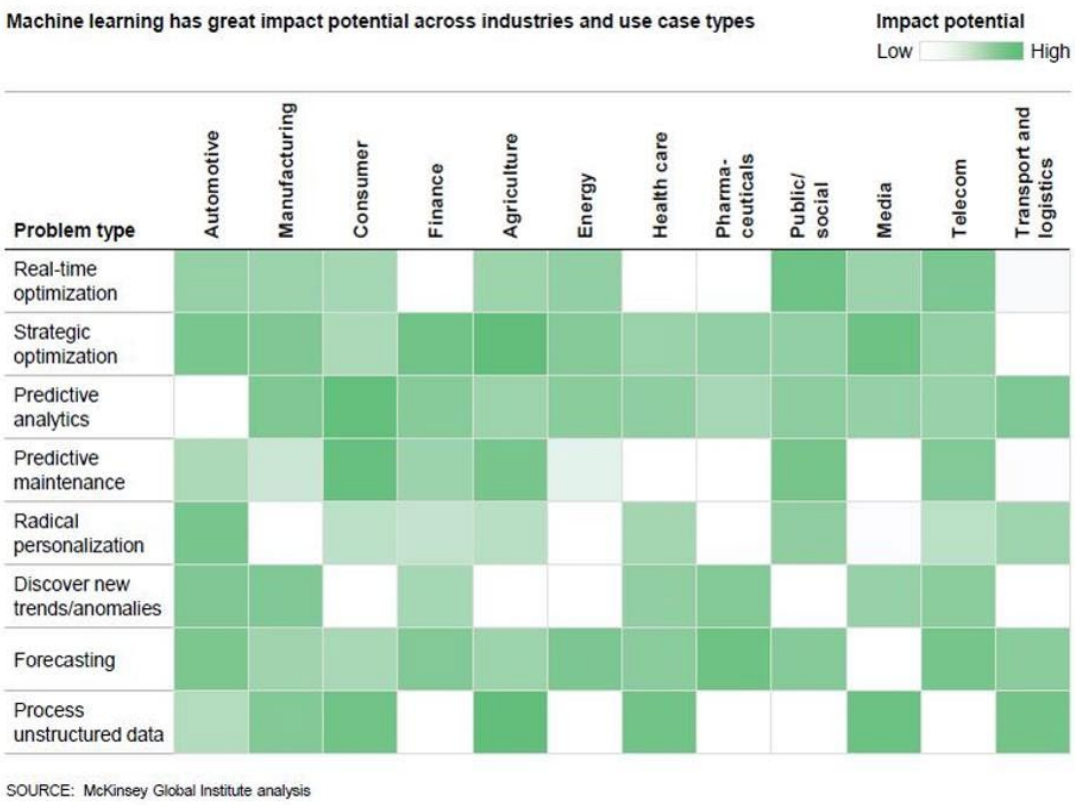
Recent McKinsey analysis looking at the potential of Machine Learning has concluded and not unexpectedly that there are opportunities across most every industry sector. And these opportunities are all around using data and analytics in the ways described and illustrated above: real time data insights, personalisation, automation, predictive analytics to identify new revenue opportunities, the reduction /elimination of repetitive tasks…from simple cost-cutting to developing new business models, ML is providing a whole new playing field for companies to find new sources of competitive advantage.




While there's a lot of concern with all of this technology about the future workplace and robots replacing people, we can end this chapter with a positive conclusion from a recent PWC report:

“Since we’re all going to be living longer, it’s a good thing that bots will help many of us live richer and more fulfilling lives. By reducing labour costs – robots work tirelessly and don’t demand raises – automation will make existing companies more profitable and perhaps most importantly spur the creation of new ones. It’s estimated that AI could boost domestic GDP by 10% over the coming decade. In the UK that could add c. £230bn to GDP by 2030 and in the US add c.$2 trillion or more. And with that, create many new jobs. Automation can make existing jobs more fulfilling and with effective training and retraining the data economy can herald an exciting new era for all of us”.

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