THE STATE OF IT CONTRACTING IN AN AI/ML-DRIVEN CLOUD WORLD

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The State of IT Contracting in an AI/ML-driven Cloud World

While change is constant in the IT world, it is happening rapidly in the Cloud world. Initially a simple server virtualisation, Cloud technology has evolved to offer 'anything' as a service today. You name a solution and the Cloud offers it as a service. Today, 'Cloud' covers a wide range of technologies, services, solutions and much more. One of the interesting innovations in recent times is the advent of Artificial Intelligence (AI) and Machine Learning (ML). As with every other technology, AI and ML instantly became a part of the Cloud. In 2019, AI and ML are going to play a crucial role in every Cloud solution.

An overview of AI and ML technologies

Artificial Intelligence

AI is a branch of computer science that talks about the creation of intelligent computer machines that can simulate human intelligence. By initiating problem solving abilities with reasoning and common sense and providing access to categories, objects and relations between them, computer machines are knowledge-engineered to behave and work like real humans. Robotics, Voice Recognition Software and Machine Vision are a few examples of AI solutions.

AI is broadly divided into three categories:

1) Artificial Narrow Intelligence (ANI) is the ability of a system to simulate human intelligence within a narrow range of parameters. Apple Siri is an example of ANI.
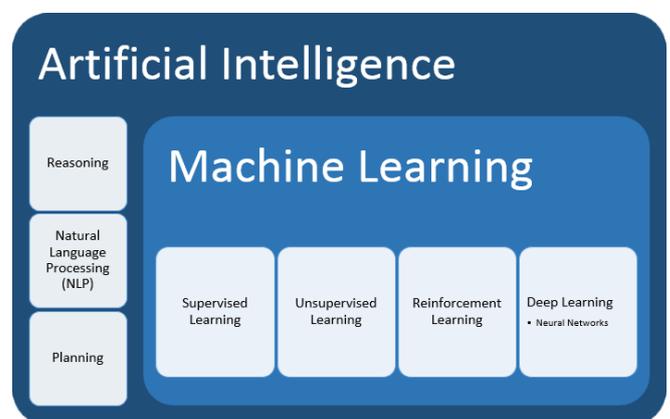
2) Artificial General Intelligence (AGI) is the ability of a system to mimic human intelligence to an undistinguishable state.

3) Artificial Super Intelligence (ASI) is the ability of the system to not only mimic human intelligence but also surpass it. ASI is not a reality yet but it is just a speculation.

Machine Learning

ML is an idea or a concept wherein the system scours through huge volumes of data and builds logic based on the previous results and outputs.

Machine learning is a subset of Artificial Intelligence. In a traditional software development environment, the system will act according to the code written by the developer. However, with Machine Learning, you don't need explicit programming. By feeding the machine with different types of data, the machine will learn and build its own logic and act accordingly.

An example of machine learning is shopping recommendations on ecommerce websites. When you are trying to purchase a product, the system automatically shows other products that are similar or that complement the main product. This is done through machine learning.

Machine learning is mainly done in the following ways:

➢ **Supervised Machine Learning** is a concept wherein the machine applies the logic derived from past data or labelled examples to future events.

➢ On the contrary, **Unsupervised Machine Learning** is about drawing inferences by exploring new and unlabelled data.

➢ **Semi-supervised Machine Learning** is when the machine uses labelled and unlabelled data to build and apply the logic to future events.

➢ **Reinforcement Machine Learning** is a concept wherein the machine uses trial and error method to determine the ideal behaviour for a machine in a specific environment to deliver maximum performance.

Artificial Intelligence Use Cases

Here are some of the areas wherein AI is making a difference.

➢ **Human Resources**: Robotics Process Automation is used to automate regular tasks such as data entry, pay roll management, offer letters etc.

➢ **Customer Services:** Voice Chatbots are offering customer service for businesses of all types. These chatbots can be customised to offer virtual assistance to customers.

➢ **Industrial Robots:** Industries are using robots that can quickly build a product. E.g.: assembling an automobile.

➢ **Health Care:** The healthcare industry is aggressively embracing AI technology. Right from assisting a surgeon to perform surgery to providing psychological support for patients, AI plays a diversified role too.

➢ **WareHouse Operations:** Robots powered by AI are extensively used in warehouse operations. Amazon uses more than 100,000 Kiva robots to perform warehouse operations.

➢ **Education:** With AI, education is no more boring. AI robots are now being used as virtual teachers to assist students and teachers to make learning fun and interesting.

The state of AI and ML market

The global AI market is expanding at a rapid pace. Analyst firm Gartner suggested the global AI market revenues would touch $3.9 trillion by 2022. According to MarketWatch, the global AI market earned revenue of $4.065 billion in 2016. This value is expected to touch $169.4 billion by 2025, growing at a Compound Annual Growth Rate (CAGR) of 37% between 2018 and 2025.

ML is not far behind either. MarketsandMarkets reports that the **global ML market was valued at $1.41 billion in 2017**. This value is **expected to reach $8.81 billion by 2022**, growing at a CAGR of 44.1% during this period. Similarly, ResearchandMarkets predicts that the ML market would touch $23.46 billion by 2023, growing at a CAGR of 42.6% between 2018 and 2023. This value is expected to touch $39.98. Alteryx, RapidMiner and H20.ai are a few machine learning platforms that were chosen as leaders in the Magic Quadrant for Data Science and Machine Learning Platforms 2018, by Gartner.

As AI and ML becomes mainstream, Cloud service providers are aggressively embracing these technologies. AWS is one of the first Cloud service providers to leverage AI and ML technologies.

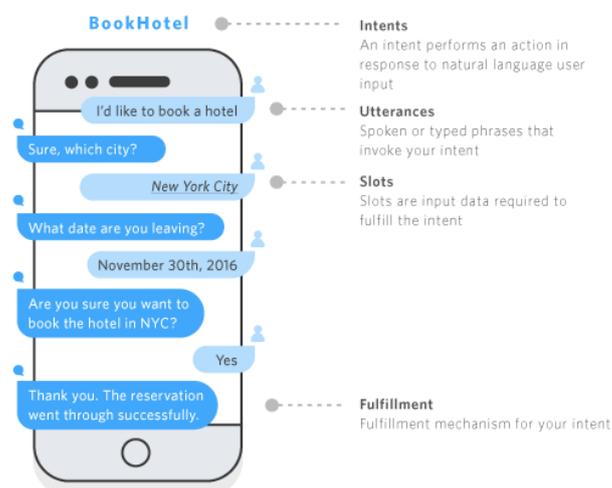This is the main reason why AWS is the leader in the public Cloud segment.

The company proactively monitors changing Cloud technologies and incorporates them as and where needed. The result is that AWS now offers AI/ML-ready tools wherein developers can add intelligence to their applications that can call pre-trained services via API.

Here are few Cloud solutions offered by AWS

Amazon Lex

Similar to Alexa, Amazon Lex is an AWS tool that allows developers to add Automatic Speech Recognition (ASR) and Natural Language Understanding (NLU) services to applications related to conversational interfaces such as Chatbots.
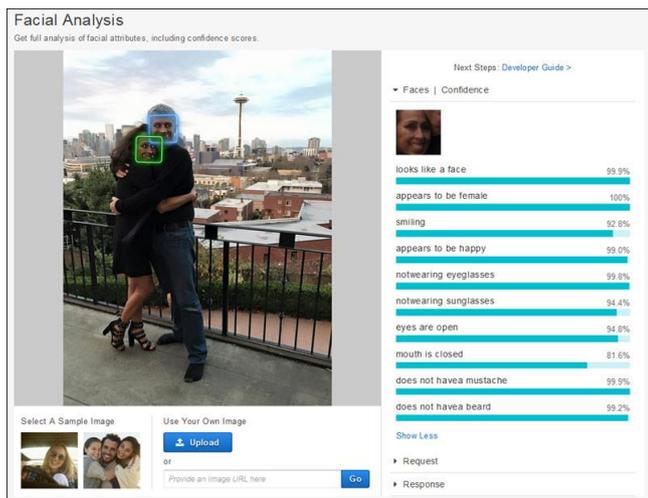
Amazon Polly

Amazon Polly is an AWS service that helps developers build speech-enabled solutions wherein text can be converted into voice in multiple languages and voices.

Amazon Rekognition

As the name says, Amazon Rekognition detects faces and objects in images. It can also easily compare faces between images.

When it comes to ML, Amazon offers an amazing platform in the form of Amazon SageMaker. It is a powerful platform that allows developers to quickly build and deploy ML models in their apps.

ML Algorithms and models in SageMaker include but are not limited to:

> Computer Vision
> Natural Language Processing
> Speech Recognition
> Image
> Text
> Audio
> Video
> Structured

Google is not far behind either. There are several tools and apps that Google is offering in the AI and ML field. TensorFlow, ML Kit, DeepDream, CoLaboratory, Google Open Source and Learn with Google AI are some of the tools offered by Google. Microsoft also offers several AI-based apps for various tasks. Some of them include Cortana, Bing Preditcs, MileIQ, SwiftKey, Calender.help, MyAnalytics, Power Bi and Zo.

As AI and ML are set to dominate the IT world, the Cloud is being realigned to integrate these changes. At the same time, Cloud service providers are quick to adjust their offerings to leverage these technologies.

So, what about IT guys?

How does it affect software professionals, especially IT contractors?

THE STATE OF IT CONTRACTING

As Cloud computing has taken centre stage, it has paved the way for several IT services and solutions. Today, technology innovation is happening at such a rapid pace that organisations are not able to cope with changing technologies. As new technologies emerge, organisations are supposed to realign their infrastructure and train the staff accordingly. This technology shift and the time spent on the learning curve obviously increases the overall operational costs for a company.

For instance, the average salary of an AI Engineer in the UK is £81,000 per year. So, the average daily rate is £600. When it comes to AI, AI Engineers in leadership roles in the UK earn around £100,000+ per annum. So, the daily rate is £800. If you add up the payrolls, FICA and other tax costs, the overall daily rate goes up to £1000. Adding to this problem is the time and efforts put into scouring through hundreds of resumes, HR operational costs, interview schedules etc. All these expenses significantly increase overall organisational budgets. As innovations in IT are happening at a rapid pace, investing heavily on IT employees with specific skills would be a hard thing for organisations. For this reason, organisations are now looking at IT contractors.

IT contracting provides the flexibility for businesses to pick and choose IT professionals on a task-to-task basis. While the daily rate of an IT contractor in the Machine Learning space might fall into £600-£800, it is worth the pay as you can instantly begin your projects and finish them on time.

The good thing about IT contracting is that you can choose professionals who are experts in Artificial Intelligence and Machine Learning. You can hire them for a single project and pay them accordingly. In case you have another similar project on hand, you can extend the contract, or you can rehire the same contractor at a later date. So, businesses can choose a Python expert for to develop Python programs, a .NET Framework expert to write .NET code and an AI/ML expert to work on AI-related project. The key here is to choose the right IT contracting company. When you do so, you will get the right IT contractors for the right projects. One thing to keep in mind is considering the core processes of your business. If your main domain is in AI and ML, it is good to hire a regular IT employee.

The demand for IT Contractors is on the rise

The demand for IT contractors is on the rise. According to Recruitment and Employment Confederation of UK (REC) May 2018 report, IT contractors gained a highest index score of 61.8 in 2018. This value is steadily increasing every month. As AI and ML technologies are becoming mainstream, most businesses are aggressively embracing these technologies. As such, businesses are looking for IT contractors who are experts in AI and ML technologies. Even companies that are not into AI development are still using some kind of AI apps. As such, one of the main skills hiring managers look for in a resume is the knowledge of AI and ML technologies. However, businesses are finding it difficult to get IT contractors with specific skills, especially in newer technologies such as AI.

As large enterprises as well as new start-ups are exploding into the AI market, opportunities are huge here. Moreover, the renumeration is higher as well. Owing to the lack of availability of the right candidates, businesses are ready to pay more for the right candidate. So, IT contractors who have the skills in this technology can make a great living in current times. Instead of getting tied up to a single company, contractors can work on project-to-project basis and earn more.

Here are some of the skills required for IT contractors in the AI/ML segment

EDUCATIONAL SKILLS

➢ Mathematical algorithms, statistics, algebra, calculus etc
➢ Physics subjects
➢ Computer Science, programming
➢ Cognitive science
➢ Bayesian networking
➢ Robotics

IT SKILLS

IT Categories	AI/ML Technologies
Programming Languages	Python, C++, Java, LISP etc
Statistics & Probability (Machine Learning Algorithms)	Hidden Markov Models, Naïve Bayes, Gaussian Mixture Models, p-values, confusion matrices, receiver-operator curves etc
Statistics & Probability (Model Evaluation Metrics)	p-values, confusion matrices, receiver-operator curves etc
Data Modelling & Evaluation (Accuracy Measure)	Error Sum of Squares, log loss of classification etc.
Data Modelling & Evaluation (Evaluation Strategy)	Randomised cross-validation vs sequential validation, Train/Test Split
ML Algorithms	Quadratic programming, gradient decent, partial differential equations, convex optimisation etc.
Distributed Computing (Big Data)	Apache Hadoop, Amazon EC2
Advanced Signal Processing Techniques	Bandlets, shearlets, wavelets, contourlets, curvelets etc.

When AI was introduced, many people thought that it would eat up IT jobs. However, AI is actually creating more jobs. Whether it is automated cars, automated server configurations or digital assistants such as Siri or Alexa, the AI world is diverse. For an IT contractor, now is the right time to acquire skills in AI and ML technologies.

If you are working in a non-AI/ML domain, it is recommended to acquire basic knowledge about AI and ML technologies. Going forward, you cannot imagine software development without a pinch of AI and ML services.

Brightred is a leading specialist recruitment services provider in the UK. Backed by several years of IT experience and a rich pool of talented professionals, Brightred offers people solutions to support businesses of all sizes, in their pursuit of advancement in technology and innovation. Especially for organisations that run complex IT procedures, Brightred unites the greatest, most talented professionals with the most ambitious and forward-thinking employers. We do all the groundwork at Brightred to give you the right people for the right processes which means you can forget about people and concentrate more on your core processes. We do all the groundwork at Brightred to give you the right people for the right processes which means you can forget about people and concentrate more on your core processes.

Brightred offers IT contractors who have hands-on expertise in AI and ML technologies.

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