

June 2017

Data Science & Artificial Intelligence



WeChat
Hariharan Ramakrishnan
Head Digital Solutions
(Europe)
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Featured article
Data Driven HRM for
Better Decision Making

ABOUT US



OUR VISION

“To nurture thought leaders and practitioners through inventive education”

CORE VALUES

Breakthrough Thinking and Breakthrough Execution

Result Oriented, Process Driven Work Ethic

We Link and Care

Passion

“The illiterate of this century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.” - Alvin Toffler

At WeSchool, we are deeply inspired by these words of this great American writer and futurist. Undoubtedly, being convinced of the need for a radical change in management education, we decided to tread the path that leads to corporate revolution.

Emerging unarticulated needs and realities need a new approach both in terms of thought as well as action. Cross disciplinary learning, discovering, scrutinizing, prototyping, learning to create and destroy-the mind’s eye needs to be nurtured and differently so.

We school has chosen the ‘design thinking’ approach towards management education. All our efforts and manifestations as a result stem from the integration of design thinking into management education. We dream to create an environment conducive to experiential learning.

MESSAGE FROM THE DIRECTOR

Dear Readers,

It gives me great pride to introduce SAMVAD's edition every month. Our SAMVAD team's efforts seem to be paying off and our readers seem to be hooked onto our magazine. At WeSchool we try to acquire as much knowledge as we can and we try and share it with everyone.



Prof. Dr. Uday Salunkhe
Group Director

As we begin a new journey with 2017, I sincerely hope that SAMVAD will reach new heights with the unmatched enthusiasm and talent of the entire team.

Here at WeSchool, we believe in the concept of AAA: Acquire Apply and Assimilate. The knowledge that you have acquired over the last couple of months will be applied somewhere down the line. When you carry out a process repeatedly it becomes ingrained in you and eventually tends to come out effortlessly. This is when you have really assimilated all the knowledge that you have gathered.

At WeSchool, we aspire to be the best and to be unique, and we expect nothing but the extraordinary from all those who join our college. From the point of view of our magazine, we look forward to having more readers and having more contributions from our new readers.

SAMVAD is a platform to share and acquire knowledge and develop ourselves into integrative managers. It is our earnest desire to disseminate our knowledge and experience with not only WeSchool students, but also the society at large.

Wishing everyone a very happy and prosperous new year.

Prof. Dr. Uday Salunkhe,
Group Director

FROM THE EDITOR'S DESK

Dear Readers,

Welcome to the June Issue of SAMVAD for the year 2017!

SAMVAD is a platform for “*Inspiring Futuristic Ideas*” and we constantly strive to provide articles that are thought provoking and that add value to your management education.

With courses pertaining to all spheres of management at WeSchool, we too aspire to represent every industry by bringing you different themes every month. We have an audacious goal of becoming the most coveted business magazine for B-school students across the country. To help this dream become a reality we invite articles from all spheres of management giving a holistic view and bridge the gap between industry veterans and students through our WeChat section.

The response to SAMVAD has been overwhelming and the support and appreciation that we have received has truly encouraged and motivated us to work towards bringing out a better magazine every month. We bring to you the June Issue of SAMVAD which revolves around the theme of “Data Science & Artificial Intelligence”.

We hope you **read, share and grow** with us!

Hope you have a great time reading SAMVAD!

Best Wishes,

Team SAMVAD.

“The difficulty lies not so much in developing new ideas as in escaping old ones.”

John Maynard Keynes.

ACKNOWLEDGEMENT

Team SAMVAD would like to extend their heartfelt thanks to certain key members of the WeSchool family for their special efforts towards the making of this magazine.

We deeply appreciate the constant motivation & encouragement that our beloved **Group Director Prof. Dr. Uday Salunkhe** has always extended. His focus on the core values of Passion, We Link & Care, Result Oriented Process Driven Work Ethic and Breakthrough Thinking has formed the foundation of all the activities that we undertake as students of this esteemed institute.

We deeply appreciate the help and support given to us by;



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Thank You

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WE CHAT

MR. HARIHARAN RAMAKRISHNAN

HEAD DIGITAL SOLUTIONS(EUROPE)- TECH MAHINDRA

Team SAMVAD

As an expert in the digital transformations space, would you please take us through your journey?

I came to Welingkar as a computer science graduate, having already worked in the web development space. I pursued PGDM e-business, specialising in marketing with Telecom as my vertical. Though I took up marketing, I was greatly influenced by Dr Shrinivas Gondhalekar who we fondly called Dr G (Dean – Operations at Welingkar and first PhD in India on Kaizen) and his principles of Kaizen became a way of life for me. I was further influenced by Dr Uday Salunkhe, from whom I learnt the importance of innovation or “Jugaad” and the art of networking. I imbibed these three learnings and I have time and again used them in my work, my daily life and to grow in my career.

To understand why these are important, let's first understand what is digital transformation. The mere use of technology to improve a process is not digital transformation. There are three main objectives or drivers of digital transformation: Improving customer experience, optimising cost and revenue enhancement. In a digital transformation exercise, you typically reimagine and redesign the process using one or more of multiple digital technologies (such as IoT, mobility, analytics, AI, cloud etc.) mingling with other IT technologies (like CRM, ERP, etc.) to achieve objectives. So, the organisations that aim to achieve these objectives undergo restructuring and in some cases, this involves designing completely new business models that go to disrupt existing models.

I had an inclination towards Telecom and I wanted to work in Airtel, which was the leader then in Telecom and was looking for a profile specifically in technology solution sales. Telecom



at that time was a sunrise sector and there was a huge possibility to help businesses to expand and grow. Unfortunately, when Airtel came to campus they offered finance roles.

While other companies offered similar roles, I was only intent on Airtel and so I started networking and making presentations to any individual with an affiliation to Airtel. Luckily, I came across Mr Sanjay Nadkarni who was head of the business solutions division at Airtel Enterprise Services, West India. I have to thank him for believing in me. At Airtel, I started in the solutions team for broadband networks but somewhere down the line, I believed that the real potential in B2B telecom services lay in Enterprise focused Value-Added Services (VAS). I was always on the B2B side of the business. I started looking at what can we do with VAS. I believed the use of SMS and other VAS had the potential to change the way businesses functioned. I came up with the concept of SMS Banking. We created an end to end solution as a proposition to one of the largest private sector banks in the country. This would allow them to use SMS to reach out to customers proactively as well as allow customers to perform simple transactions like checking their balance. At first, they didn't understand the

concept and when they did, they still couldn't fathom the potential that an SMS had, to transform their business. We showcased how the use of SMS can help reduce operational costs in branches by reducing foot fall as well as the cost of expensive VSATs (Very Small Aperture Terminal) in ATMs where people came to check balances. Infrastructure has always been a huge cost to banks to serve a population as large as India's. Hence any reduction in costs here would create a sizable impact for a bank. When we pitched to the bank, our biggest take was the drastic reduction in the cost of servicing the customer. They were not sure and so they gave us a minimum guarantee of 1 million SMSs a month. Within 6 months' time, this private bank was using almost a 100 million SMSs a month. This entire concept exploded and Airtel made a killing of it as we provided the solution to every major bank in India. This completely changed the way banks looked at customer service.

In another case, we worked with the first talking yellow pages of India. I was a regular user of their services and one fine day I realised that it takes too long to wait on the phone and then I would have to use a paper and pen to note down all the details. I went and met their management and evangelised to them how SMS can change the way they do business, increasing the productivity of their associates on call while reducing the cost to serve a caller. They were taken by the idea and by then SMS banking had made its mark. So, they gave us a chance and ended up drastically reducing their customer service time. Now they just needed to share the coordinates of the requested business with the customer by SMS. Later the caller's phone numbers were linked to their CRM system, enabling enhanced customer experience for a regular / repeat customer.

Then we came up with corporate jingles as a way for companies to advertise themselves. If you called an employee of a particular company you would hear a jingle of that company instead of a regular ringtone. These were the small ways in which the first digital technologies helped organisations to improve customer experience, optimise cost, and enhance brand value.

By then Blackberry had come into India, and we came out with the first m-governance initiative, enabling better capabilities to enforce the law in one of the major cities in India. I also got the opportunity meanwhile to work on one of the first initiatives in the mobile payment space led by Airtel and a Fintech company. Back then this was powered by SMS.

Later on, I was introduced by Mr Sagar Narsian (Welingkar alumnus) to the COO of Enterprise Business at Vodafone, who had a very interesting role in his team to start up the business of mobile applications. From Vodafone's perspective, the objective was to enable better dialogue with the customer beyond just a SIM card and ensure better customer stickiness. The advent of mobile applications was the dawn of digital transformation as we see it today.

We worked with two of the major FMCG companies, helping them to transform their sales and distribution, enabling them to reach the market faster as well as improve wallet share. Whenever we are on the path of digital transformation it is important to observe and understand the client's business first hand because when you are redesigning the process you also have to keep in mind the user- centricity of the solution. Whoever is using the technology should be able to use it seamlessly and on the go. Hence, mapping the user journey became extremely important. While working to enable solutions for these companies, I would personally go to their distribution centres and on their delivery vans to multiple beats/routes, essentially to study their end to end process. To effect any digital transformation, knowledge of the business process is essential, and for this, you have to go to the 'Gemba' – The Workplace. We worked with various industries- BFSI, FMCG, etc. In fact, Pharmaceuticals was a big market for us at Vodafone. At Vodafone, I realised the importance of Internet of Things (IoT) for the future of businesses. Back then it was just Machine to Machine (M2M) where the telecom companies' role was to merely provide a SIM card. However, I realised the need to create a more structured approach where we could own the solution end to end and help orchestrate it. We enabled one of

the first major IoT initiatives in India for a north India based utility company. We followed this with starting up one of the first enterprise initiatives focused on fleet tracking.

Thereafter, I was worked for Essel group setting up a digital business for them, before I moved to Tech Mahindra. While working for Telecom companies my focus had to be limited to designing products and solutions and selling them. The development of the solution had to be outsourced as that wouldn't have been the core business for the respective organisation. In Tech Mahindra, the difference is that I also get to play a role in the actual development of the end product and handhold the process. My learning continues to be amazing here.

Here I am surrounded by digital experts. These are amazing folks who are adept at IoT, analytics, mobility, cloud, AI, AR/VR and other technologies. While my primary role is sales of digital solutions, my job needs me to conceptualise and evangelise digital solutions and products to enable organisations to transform their business. The fundamentals remain the same: I have to observe, define the processes, create the user journey, use technology in a tangible way so as to improve the customer experience, help optimise cost and eventually increase profitability. In the process, we do some great business for Tech Mahindra. We have helped transform many businesses across the globe across various sectors.

Let me tell you one such case of a large global auto ancillary part manufacturing company that we worked with. Their primary pain point was that despite venturing into online systems more than 10 years ago, their order booking was still very human dependent and only 20-25% was through the online channel. They wanted to increase their online sales from the existing 20-25% to about 85- 90%. Offline sales were through phone calls via dealers, which was a very inefficient way of working. The apportioned timeline for this transformation was about 4 to 5 years. True Digital Transformation is not only about creating a change but also achieving it within the right timeline; else the use of digital technology is rendered obsolete. We explained to

them that if they went on about their business the same way, they would gradually achieve the target in 4 to 5 years without having to undergo any transformation. This would remove the need for any major intervention, but just a gradual augmentation of technology over the years. However, if they wanted a digital transformation, they could achieve the target in 1.5 years' time but would entail a redesign of their business processes. The customer heard our pitch and signed off the budget without blinking an eyelid as he realised the value that we brought in as a partner. So, you see the importance of digital is emphasised as it enables businesses to grow much faster than they would otherwise.

How will data science and AI change businesses?

I think by using collected data over the lifetime of customers, partners and other key stakeholders, businesses can make much better predictions and provide a completely different engagement experience for them. Also, traditional data mining, cleansing preparation processes, along with modern curation, ingestion processes are key for success. I think data science is yet to mature. I'm saying this because there is a big gap or continuous dearth of experts in the field on a global scale. Across the globe, one of the highest immigration priorities is placed on people who are data scientists. Companies that adopt AI and data science effectively will be able to drastically improve the probability of their success.

Let me share an example here. There is a large logistics business in Europe today running a fleet of thousands of vehicles. They lease out these vehicles to their business customers; who could be Supermarket chains like Tesco or any other company that would need trucks. One of the requirements is to provide a better experience to their enterprise customers for which they need to be able to build better solutions or systems within themselves that allow disruption-free business for their customer. The risk is that any of these trucks breaking down during the fulfilment of an order will lead to increase in cost for the customer. The key to mitigating this risk is predictive maintenance. Data can be retrieved from sensors fit into the vehicles, daily monitoring that is done by the driver of the

vehicle by using an app and from past service station check-ups to get an update on the vehicle's health.

All this data goes into a system and then based on algorithms developed by a data scientist; we can analyse and predict what future issues may come up and when they could possibly occur. These issues may be proactively redressed by creating a call to action to setup a service station appointment. This big company is actually investing in creating a big data technology of their own which will bring in the data from various sources, analyse it and give predictive inputs to the company. So that is the importance of data science. On the other hand, artificial intelligence is the ability of a bot to make a decision based on inputs, without human intervention. Today, when we talk about AI, we link it to robotics, not only hardware but also software.

For example, you may have an issue with your phone and when you call the customer care, your call is picked up by a bot instead of a human. You spell out your grievances to the bot and using NLP (Natural Language Processing), it will confirm your problem, register it and calls for action. Earlier, a human handled call would require a spend of about Rs. 11-12 per call or more depending on support level and complexity. Then IVR came into being, thereby reducing the cost a lot by screening the caller but still necessitating humans to handle the call. This kind of monotonous work will soon be replaced by bots. The bot is trained by allowing it to gain experience. Thereafter, it is able to handle multiple scenarios based on the grievances expressed by customers. The use of bots can be widely seen today especially in chat based bots, where the difference between a human and a bot can be hard to tell in the case of a well-trained bot. The key is in the training. Therefore, AI and data science go hand in hand because the latter is the pillar on which AI stands, while at the same time the latter is also enhanced greatly by AI. 'Bots' can do the same job at a fraction of the cost as humans. The cost saved may be used to grow the business further.

Similarly, an FMCG company that deploys digital solutions effectively can capture secondary and

tertiary sales effectively. They can then use data science and AI to analyse the patterns, predict better, and even modify campaigns mid-way to make them more effective based on inputs received on the uptake. You could practically see a minute by minute slice and dice of data and just have to approve decisions based on options given to you by the AI. This does sound extremely futuristic, but this is how they have the power to change the course of businesses.

How will AI affect the employment scenario in India in the future?

We are at a nascent stage in terms of AI. Companies like IBM have developed solutions such as Watson and are making huge investments in it. It will probably take a couple of years to see bots taking over some of the work that humans do. At this point of time, bots can do rule based decision making which could be used in engineering, financial auditing, quality control checks, legal decision making based on historic data, routine back office work like financial transactions or IT operations. These are the most impacted today and are ripe to be replaced by AI. But the complexity of decisions based on the depth of domain knowledge will be the key in determining how AI systems will replace human roles.

For example, engineering designers that are doing quality checks could be one role that could be replaced. However, designers working on special designs would be hard to replace. According to me, you can soon expect to see opening up of new roles, (mostly data oriented as data is going to be the new 'program').

- Obvious things like data scientists, cloud infra/deployment specialists
- Data security analysts to address privacy concerns – this will soon be driven by regulatory compliances
- Roles like conversation experience designers who will combine the natural language conversation design along with traditional GUI approaches (like buttons, forms etc.) in chatbot design areas
- Text mining designers – at least in the short term. This would require identification of syntactical patterns that

define extractable entities that provide critical business value

- Image and video enhancers for AI engine consumption – this would require traditional image processing techniques with a view of possible AI processes

How do you think Data Science and Artificial intelligence aid UN's sustainable development goals: gender equality, provision of clean water and sanitation, an opportunity for quality education and employment and betterment of health and well-being?

About a year back, EU had some issues concerning Syria and an influx of immigrants coming to European countries. One of the biggest issues faced by these countries was that they had to not only take in these people but also rehabilitate them- provide jobs that they could do based on their skills, educate their children and shelter them. This presented a huge conundrum for them because the number of refugees was unprecedented.

I was working with one such country and had an opportunity to work towards addressing their issue. We have to bring in data from various sources within the country. At the entry point, the skills and other details of the refugees are assessed and recorded. Each of these refugees needs to be given a mobile and data connectivity to enable them to be connected. They will be enabled to keep track of any job openings that are posted, based on their qualification and skills. They can call up a number manned by an automated bot that recognises their number, and spells out the job assigned to them along with their location. They can sign into their language classes online and converse with bots to learn the new language in the country. Bots can enable them to learn faster as they could have the ability to converse in multiple languages. Additionally, bots can provide information on various subjects like farming, financial information, general information, and more, all in the language of the immigrant.

Initially, they would be kept in camps and then housed around the areas where they would find a job based on their skill set. Analytics is used to identify jobs for people based on their family circumstances and skill sets. E.g. People with children will be aligned to areas with educational institutions and their workplace is identified in nearby locations. Eventually, people would be allocated jobs, shelter and education, keeping in mind the sanitation and community requirements and all this would be automated. Such an approach may also be applied to help UN's sustainable development goals.

AI in combination with IoT stacks will be heavily used in the coming days in smart city implementations. Government proactive services will be more and more data driven with AI engines in the centre. Access to critical data and aid for the city planners, instant access to on field data, ability to react to situations instantaneously, decision aid systems for the city managers etc. will be key to attaining UN sustainability goals.

With AI gaining foot, how will it shape the 'SMART' product categories in the future?

We are still at a nascent stage with respect to the use of AI in smart products. We still rely heavily on data from sensors rather than data from other sources being used in conjunction with data science and AI.

We need to go to the next level to understand what data can come in through different sources and be used for better decision-making. For example, when we look at smart garbage bins; instead of a sensor-driven technology on garbage bins, it could be partly AI driven, so that even bins that are not sensor enabled can be picked up. Imagine a neighbourhood that has garbage bins that are full, but not sensor enabled. A vigilant citizen posts a tweet with location and a predefined handle (assigned by the municipal council) that is read by a bot and a garbage van is assigned to pick it up. This greatly improves the ability to enable cities with smart garbage collection without deploying costly hardware in the form of smart bins. For any smart initiative, you could enhance the areas from where data is

picked up by employing social connectors as well. Instead of just relying on sensors for data, you can rely on a much larger range of inputs for getting data. These could be mobile apps or social handles where citizens post and based on that, actions could be taken. A wide range of data can be captured, analysed and accordingly action may be taken. By doing this one can enhance the smart product category.

Another example of AI in action to enable smart cities is where a British utilities business group has tied up with a major university to work on a digital research initiative to help predict blockages in drains, identify them and rectify them. They intend to use an army of terrestrial drones that travel through underground sewage pipes to the affected spot and clear the block.

Dubai plans on human-free police force by 2030. What are your thoughts about such advancement in AI?

Personally, I wonder how they are going to come up with the human free system in the police force. I think we are a long way off from there because I think we are talking about a Robocop-like situation. There is potential for improving AI systems and certainly, there are rapid improvements happening as well but how can you teach empathy to AI. A police force without feelings is a scary thought.

It's possible to have them working closely with the human police force. There are combat vehicles which take decisions on their own or partly guided by humans. But they are "combat vehicles". When we are talking about the police force, they need to interact with people. So, we have to really see how that can work. It's possible that someone might do it with a breakthrough technology with better algorithms which will enhance the ability to train these robots to have feelings and operate while staying within certain rule boundaries. In the traffic scenarios, an example has already been set by Tesla where the car is able to take decisions on its own but is still undergoing trials. But Elon Musk himself is a disbeliever in AI being over used in certain areas. The fact is AI is unpredictable. Working with AI

in these kinds of scenarios is like working with a nuclear reaction. You have to build safeguards proactively. There is no scope for building safeguards reactively, as otherwise colossal damage could already be done.

Cognitive computing is the technology that goes behind it. However, there are a few limitations like empathy and fear. Obviously, you won't need fear in Police Force, but empathy is a big factor. When you are talking about a big decision it is very difficult for a bot to pick between two wrongs or two rights. Just to give you an example of empathy, in the movie Robot the portrayal of 'Chitti' is an example of fear of something that lacks empathy. In one instance when the robot saves a girl from the fire it is able to save the girl's life but not her honour.

You could argue that rules can be created, but the problem is these rules/boundaries/core instructions have to be set proactively and not reactively. Corrupting a thing, especially a connected thing, is easier than corrupting a human being. Empathy is most important in the law enforcement agencies. You don't know what could drive the robot, it could happen that it doesn't take any decision or a decision which results in extreme loss of life. Now I'm not saying that all human police forces have the best decision taking ability and they always demonstrate that, but you still have the opportunity that even if a human officer has to take a violent measure, he will take a calculated risk and with an empathetic approach.

However, this is an extremely debatable topic. Every person who understands this space has their individual opinion on this. All the impressions that we carry today, are based on the advances that have happened until today. In 1999-2000, we hadn't heard of smartphones in India, iPhone had not entered the global scene. We couldn't fathom that a few years later we would have a mobile phone which has the processing capacity of a supercomputer back then. So, when we talk about 2030, which is about 13 years away, it is very difficult to predict what future technologies can do because there are people in every corner of the world who are doing

some innovation or the other and very often it could be one man's brilliance which will completely change the way how things work in the future. But that said, it will be interesting to see how emotions are introduced into AI. After all, if there was Viki in 'I, Robot' who lacked empathy there was also Sonny who had emotions.

Essentially, you must be able to see the big picture and leverage technological advancements to the benefit of your organisation.

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With the advent of data science and AI, what roles will be played by future managers in organisations?

Certain planning, monitoring and decision-making systems can be very easily replaced. Of course, continuous human supervision and assisted learning processes will be required to keep the systems honest. Humans will probably play critical roles in long term strategy and emergency situation handling areas (with the help of AI systems). Planned processes execution etc. will be more AI domain (with human supervision)

What skills should management students like us acquire to create value in future organisations equipped with such technologies?

As management students, your objectives for using the technology will not be from a perspective of using the technology itself, but from a perspective of how you manage the technology in a particular business process, with a particular business model. In my experience and opinion, I feel if you understand the basic logic of how a system functions, if you understand different technologies as they are or how they function, and if you're able to amalgamate that with your knowledge of businesses, you will be able to apply any technology to achieve the right benefits. If I am going to recruit people from management institutes, I am not looking at pure ability in data science and AI. I am looking at the ability to apply data science and AI in the business to solve a problem. So, you need to work on your ability to observe, understand business in different industries, be it manufacturing, banking, FMCG or others, and then understand different technologies.

OPERATIONS

ANALYTICS AND ITS IMPACT ON ORGANISATIONS

Omkar Majrekar, PGDM-Ebiz (2016-18), WeSchool, Mumbai

Recently I was not much surprised when a nearby fast food shop closed after a grand opening just two months ago. It was clear from the beginning that the owner opened the shop with high expectations, but it was also clear that the shop was heading towards failure. The main reason behind it was the area it was located at. Today most of the students & youngsters would prefer fast food over their everyday meal, but this shop was not near any school, college or even a corporate park. Business opened with high expectations ended with a bitter note. The culprit here is lack of research before starting a business.

Market analytics and today's businesses:

Today's world is EVER growing and fast moving. If you do not match up to the speed, you will get wiped out before you know and today's organisations have realised this long time ago. The fierce competition we are witnessing between online and offline businesses is leading towards customization of all products and services according to customer's need. Every brand wants to provide everything which the consumer demands so that he/she remains loyal to the brand. But how do they do this? How do they get to know what customer exactly wants? The answer for this query is 'Market Analysis'.

Remember the last time you searched for a Mumbai-Goa flight schedule and MakeMyTrip advertisement with exact same flight details started popping up on all Google pages you visited? Or the time when we search for Shoes online and Amazon advertisement showing all kind of shoes started coming up on Facebook?

There is a lot of work these companies do to get such minute details about an existing or a potential customer. Various methods they use for market research has enabled them to predict what a customer needs or may need in future. This results into these brands being ready with the product even before the consumer actually demands. Google gets over 100 billion searches a month. (Mashable, 2015) Hence Google becomes a valuable tool for research, for example, when a person searches on Google about a bus or flight then in most cases he is planning for a journey on that route. Bus/flight booking sites like MakeMyTrip, Yatra.com use this opportunity to show that person what rates they are offering for such bus/flight. This person now may become a transacting customer for these businesses.

Market Research:

Many companies spend a lot of money to understand the consumer behaviour and buying pattern. Surveys, interviews, body language monitoring, online search patterns etc. provide them the data they need in order to understand what the consumer really wants. This answers several questions like, is the consumer happy with the service he/she is getting now? Is he/she brand loyal? What may be his/her future requirements and how to cope up with them?

As we all know, feedback and constant improvement is essential for any kind of business. If any company fails to consider the importance of customer's opinion then it is going to lose customers because customer's requirements are changing each day. Market research & analytics also helps these brands to note the feedback of their customers and the suggestions provided by

consumers provide them guidelines to improve the quality and efficiency of their product or service.

Presence matters:

Nowadays the fierce competition brings other factors like visibility, availability, presentation, brand reputation etc. into picture along with quality. Consumer not only looks for a good quality product but also a product which is easily available. If a product is superior in quality but is not available at Consumer's favourite store or online shop then that consumer may buy another product even if he/she compromises on quality. Similarly, the position of the product on the racks in a super mart matters for competitive products like Yippee and Maggie noodles because the product positioned on higher racks & popular positions attracts the consumers most. If Toothbrush is placed right next to Toothpastes then that may increase the sale of both. The first position on Google search results on desktop has a 34.36% & on mobile has a 31.35% click through rate. (Advanced Web Ranking, 2015) Such combinations and positions can be decided only after monitoring and analysing Consumer's behaviour and movement in a super mart or on an online shopping site.

Collecting such data is possible by conducting surveys, interviews as well as by monitoring customers while they purchase any goods. Then tools used for Market analytics such as SPSS, SAS, Tableau etc. can predict if such combinations and presentations are going to be a success. Hypothesis generated based on such Market research mostly provides excellent as well as accurate results.

Past, Present and Future:

Most of the decisions taken at an organisation for future depend upon success of similar schemes in the past. If any particular offer in Diwali was a huge success at Big Bazaar then they will definitely continue it next Diwali as well. But as Blue Pepsi was not a success, PepsiCo may not

bring it back till the market is ready for such product. Hiring a brand ambassador for Kurkure resulted into higher sales then the marketing campaign can be labelled as success. Descriptive Market analytics provide exact idea if the offer was success in past and what the ROI was.

Manufacturing and FMCG companies like Britannia largely depend upon inventory and plant operations hence they pay lot of attention towards knowing the inventory level and costs associated. As well as maintaining the reorder level of raw material and minimum stock of finished goods is key element in such company's success. Such predictions can be derived using tools of predictive market analytics.

To conclude this topic, success of an organisation in present day environment depends solely on how quick it is to realise the change in consumer's behaviour and act accordingly. Hence focusing on market analytics is not an option anymore.

Reference:

https://www.hubspot.com/marketing-statistics?_ga=2.62367212.1940823351.1498921551-921825735.1498921551)

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FINANCE

IMPACT OF DATA SCIENCE ON FINANCE INDUSTRY

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“Every company has big data in its future and every company will eventually be in the data business.”

-Thomas H. Davenport

The world is dynamic, and doing thus at high speed. We tend to witness a technological revolution of a magnitude never determined before.

Every year data technology doubles its capability and price/performance ratio, as foretold by Moore's Law that up to now has evidenced to be true. The result is exponential growth within the technology obtainable and a similar reduction in its price, in spite of the crises experienced over the past few years, and this trend is anticipated to continue within the returning decades.

But this technological revolution has taken on a brand-new dimension in recent years. Together with accrued technical performance has come accrued capability to generate, store and process data, and at an exponential rate too, a scenario that has been referred to as the “BIG DATA” development. Some proof of this is:

The total volume of information within the world doubles every eighteen months.

Over 90% of the information that exist these days was created within the last 2 years.

The per capita capability to store information has doubled each forty month since 1980 and its price has reduced by over 90%.

Processing capability has enhanced 300-fold since the year 2000, creating it potential to process voluminous transactions per minute.

The impact of this technological transformation is especially vital within the financial industry as

a result, it adds to four alternative major trends that are shaping this industry:

- A economics environment characterized by weak growth, low inflation and low interest rates, that has penalized the banking industry's profit margins in mature economies for a protracted amount of time; and uneven performance in rising countries, with a trend towards slower growth and an increase in default levels.
- A lot of stringent and intrusive regulatory environment, where regulation is turning into international in terms of corporate governance, solvency, liquidity, bail-out limitation, consumer protection, fraud prevention and data and reporting needs, among alternative areas.
- A profound amendment in customer behavior, as consumers' financial culture has improved and customers expect and demand excellence in service whereas manifesting growing confusion at the complexity and inequality of the goods and services offered, that makes them a lot keen about opinion leaders.
- New competitors getting into the financial market, some with new business models that impact the status quo.

The combined impact the above four factors, in conjunction with technological transformation among different reasons, is inflicting industry players to place the main focus on the optimum use of data, therefore giving rise to a financial industry discipline that up to now has been a lot of centered on the IT industry: data science.

Data science is the study of the generalizable extraction of information from data employing a combination of machine-controlled learning techniques, artificial intelligence, arithmetic, statistics, databases and optimization, along with a deep understanding of the business context.

For any institution to be ready to make optimum use of the potential of data analytics, it's important to work out the utilization cases that may generate vital business worth.

Example of one of those utilization cases is Intelligent trading modules scenario - Decision Models that execute a trade on its own (ranges of stock price values are predicted).

Today algorithmic trading has revolutionized the thought of buying and selling of stocks. High frequency trading has taken financial trading to a wholly new level however conjointly has created it risky. The ranges sometimes chosen within the algorithmic rule used for trading is entered by the traders themselves once analysing market trends using financial models. But this process may be simplified if the ranges foreseen by the financial models were directly placed into the algorithmic rule with no human intervention. Furthermore, the results of past trades may be utilized in the financial model being implemented in order that future expected trades would improve. However, such a situation might not involve human judgement that at crucial times could also be needed for creating major monetary decisions.

The spontaneous nature humans possess of making a decision in terms of trading a stock is something a model may not be ready to replicate.

The areas wherever financial industry would need to focus their attention on are: Leveraging Mobile wallets for promoting their services to the best, Fraud Detection, Risk Management, Customer Segmentation and Targeting, Valuation of securities and Derivatives, and Competition analysis.

These are a number of the areas where innovation may be applied to create the mix of data science and finance a lot more powerful.

The future of data science with relevance the financial services industry is moving towards a model that's straightforward for the average analyst and company to use. The goal is for you to urge usable, real-time, easy-to-understand insights implementing the innovative edge technologies and techniques to beat the hindrances and challenges. Use of analytics is changing into a necessity within the financial services industry and using it befittingly, can function as the key discriminator between companies that become prosperous and companies that fail within the long-term.

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MARKETING

HOW BIG DATA ANALYTICS HAS CHANGED THE WAY BUSINESSES MAKE DECISIONS?

Soundarya N & Punitha, PGP (2016-2018), IIM Raipur

“I am convinced that knowledge is power - to overcome the past, to change our own situations, to fight new obstacles, to make better decisions.”
— Ben Carson,

Big Data Analytics will empower you to take informed decisions, reduce operation risks, predict future trends, increase customer engagement and product profitability, and create unique propositions and draft customer acquisition and retention strategies. The edge lies with reading and making relevant inferences from the vast amount of data is out there. The future of your business could very well depend on how successfully you derive value from it. Amongst all business verticals, marketing appears to gain tremendously with the use of big data.

1. Testing product efficiency

Suppose you have developed an app and you would want to know how many were downloaded and more importantly, why they were not and the shortcomings. Technology exists to gauge what succeeds and what doesn't, how to improve your app and create a more engaging user interface. Big data enable you to track usage with complete precision and helps you deliver a product that is in sync with the latest prevailing trends and consumer preferences. It is as real time as it gets.

2. No more guesswork or hunches

Unlike relying on the expertise of a single institution such as a CEO, decision making through data analysis is more objective and risk-free. Your reliance on data for answers would not only save you valuable time but also give you more rational choices devoid of biases.

3. Optimizing customer engagement

Analysing data would help you know your customers better, what they buy and how often, what their shopping habits are, which websites they frequent often and what channels they use to acquire different kind of products. Having access to such information can help you come up most satisfying user experience.

4. Improving customer retention and loyalty

You can use data to your advantage by installing systems that can track customer purchases like loyalty cards as well as track which incentives and promotional offers are encouraging purchases.

To better understand the impact big data can have on your business, let's consider the real-life example of Wal-Mart and the way Big Data changed the way it does business.

Wal-Mart is an American multinational retailing corporation that operates a chain of hypermarkets, department stores and grocery stores. As of January 2017, it had 11,695 stores and it served nearly 260 million customers a week in 28 countries. In terms of revenue, Wal-Mart is the world's largest company. The revenue generated by Wal-Mart in 2016 is \$482 Billion. Even before big data analytics was a thing, Wal-Mart has started analysing its data. It always analyses the data generated by customers during their in-store activity, social mentions and any other online activity. It has 16 websites across the globe. Wal-Mart sees close to 300,000 social mentions every week. 2.5 petabytes are the amount of unstructured data that Wal-Mart collects from 1 million customers every hour. The objective behind collecting this enormous amount of data is to optimize the shopping experience of

customers when they are shopping through Wal-Mart either in-store or through a website.

Wal-Mart uses data mining to discover patterns in point of sales data. By using efficient data mining techniques Wal-Mart has increased its sales. One such amazing example include the observation of strawberry pop tarts sales pattern. Its sales had increased 7 times before a hurricane. Ever since this observation has been made, strawberry pop tarts are placed at the checkout points before a hurricane.

Another noted example is that during Halloween, a sales analyst found that a particular cookie was sold in all stores. But, it was not selling at all in 2 stores. Then, they noticed that the cookies are not available for sales in the shelves. The issue had been immediately rectified after that to prevent further loss of sales.

Shopycat Gift recommendations:



It is a feature offered by Wal-Mart. Wal-Mart helps you to find the perfect gift for your friends through Wal-Mart’s Shopycat App. It recommends gifts for friends based on the social data extracted from their Facebook profiles. It also provides link for the product and also tells why it suggested that product for you. For example, the friend might have liked the product or he might have given a comment on a wall post or might have a status update about the product or might have shared a post related to that product.

Acquisition of Amazon and Whole foods:



The main motto behind the \$14 billion transaction which involved the

acquisition of Whole Foods by Amazon is also data. Amazon already uses the past shopping and browsing data to increase its sales. The home page of Amazon already offers easy access to recently viewed items and also shows items inspired by our shopping trends and wish-list and gives recommendations.

Now by acquiring Whole foods it is able to get a much better understanding of how people shop at physical stores. It could learn the shopping pattern of a customer, whether he comes only once in month and to do bulk shopping or to do small shopping by visiting frequently. Wi-Fi hotspots also help them to identify in which aisle consumer spend more time. Amazon will also be able to separate the business which are profitable online and the one which are profitable at retail.

Savings Catcher:



Savings Catcher is an app by Wal-Mart. In this app, all you have to do is to enter the receipt number. The app then compares the top competitors advertised deals on eligible items. If the

competitor’s price is less than Wal-Mart’s then you will be able to get the refund of the price difference.

This is how big data analytics is helping all the businesses to break data into stories and drive their sales. All businesses which are data-driven are sure to benefit in their future.

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HUMAN RESOURCES

THE RISE OF HR ANALYTICS AND HOW IT AIDS IN DESIGNING HR POLICIES.

Juhi Jain, MBA-HRD (2016-18), Delhi School of Economics.

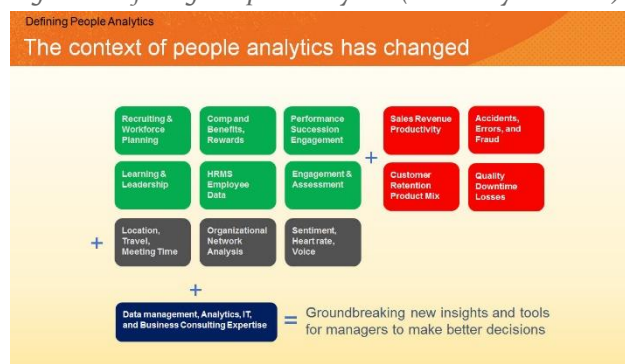
“What gets measured, gets managed.”

—Peter Drucker, *Management Thought Leader*

Analytics has become a recent elixir that is believed to enable HR professionals to be effective. The analytics panacea shows up in conferences, speeches, and books intended to guide HR professionals. There are discussions picking pace on HR Analytics and how it is going to disrupt the traditional workforce systems by bringing in the predictive scientific models. Rightly coined as the future of work, analytics has a long journey ahead. Integrated with the new age technologies such as Artificial Intelligence(AI), Internet of things, cloud-based learning, machine learning et-al; analytics is the harbinger of the Fourth Industrial revolution. So much so that Bersin, in its Global Human Capital Trends Report 2016, has called this the time of the people analytics revolution.

Human Resource Analytics has been given various terms such as People Analytics, Workforce Analytics, Human Capital Analytics, and Talent Analytics by various thought leaders and industry experts. Let us understand the concept of HR Analytics/ People Analytics/ Workforce Analytics / Talent Analytics. People Analytics means bringing together all the people data in the company (and there is an ever-expanding amount) to understand and address specific business problems: sales productivity, retention, fraud, customer satisfaction, etc. (refer to figure 1) ((1) Josh Bersin)

Fig 1: Redefining People Analytics (Bersin by Deloitte)



People analytics often means measuring the effectiveness of HR and L&D programs, but more broadly it means understanding all the employee data in store and its impact on business performance.

This stored data can be effectively utilized to form models and analysing the same to enhance business performance by promoting the factors which increase both, the outcomes and output.

Josh Bersin of Bersin Co. By Deloitte on his website, www.joshbersin.com, writes that, “People Analytics” as a business discipline has arrived. Our research now shows tremendous growth in this market, and a significant shift away from measuring HR toward a real focus on using people data to understand and predict business performance.’



PEOPLE ANALYTICS BY THE NUMBERS

(Source: Mckinsey Analytics, 2017)

Having said this it is no surprise that more and more organizations have shifted their focus on harnessing the potential of analytics to its maximum use by engaging data scientists, external consultants and specialized companies which focus on organizational transformation and change through analytical models.

HR Analytics is primarily used to attract, select, develop and retain talent in this highly competitive labour market. With changing workforce dynamics and entry of millennial generation, money is not as lucrative a factor to captivate the top talent. Leadership focus has shifted towards enhancing employee engagement. According to Deloitte Human Capital Report (2016), 86% of business leaders are deeply concerned about retention and engagement, 89% about leadership, and more than 84% about current workforce skills.

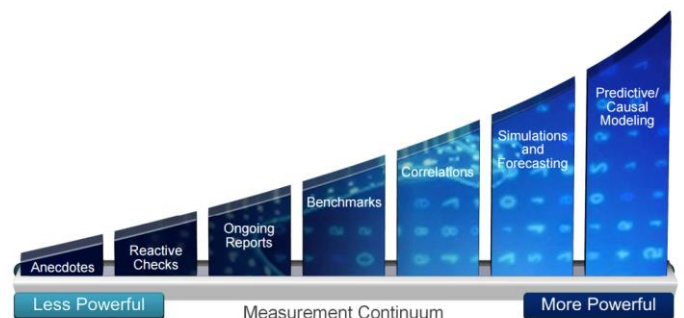
Leaders want to know what the organizations rated above average (3.2/5 on Glassdoor) are practicing in order to keep their employees engaged. For this purpose, data is being rigorously analysed and familiar models being developed to identify commonalities and work on extensive application of the same.

Human Resource Departments have an abundance of employee data ranging from personal to performance, capturing the entire journey of an individual in an organization. HR is now manoeuvring its way from being ‘a data reserve’ to ‘data deployer’.

Various Metrics and Analytics have come into play to successfully bring into action the mammoth data that organizations have. Moving on from anecdotes to predictive modelling, the below figure shows the degree of importance attached to various types of measurement techniques for data handling and utilization.

Oracle, SAP, SuccessFactors, Workday, ADP, Cornerstone, Visier, and Ultimate Software are a few names who are practicing analytics and applying the same in different situations in their organizations or as external consultants for clients. They all have built-in retention predictors (among many other modelling features)

embedded in their software. For example, Workday can recommend employee job changes that are more likely to result in high-performance outcomes (as well as what job moves not to make). Oracle and SuccessFactors can recommend what training employees should make use of based on their roles and activities at work. And Cornerstone can predict who is likely to become noncompliant or lapse in their mandatory training and certification.



MERCER WEBCAST August 30, 2013 6

(Source – Mercer Webcast; Workforce Metrics and Analytics, August 2003)

Above examples reinstate the rise of predictive analytics. Predictive Analytics can be understood as the type of data analytics which uses data to form causal relationships and predict trends for future. It is an important tool for strategic decision making and empowers leaders with a foresight into the ‘to-be’ events. The strength of such analysis comes from the correctness and reliability of data which is being used for such modelling.

While these embedded models are continuing to mature, they aren’t perfect just yet—so HR departments have to hire teams that know how to understand, apply, and use them effectively.

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GENERAL MANAGEMENT

DATA DRIVEN HRM FOR BETTER DECISION-MAKING

Jatin Panchal, MBA (2016-18), JBIMS, Mumbai

In today's fast paced and technologically advanced world, the human beings have created multiple footprints, be it landing on moon, or sending rovers to Mars for space exploration. We have moved a long way and apparently, what we are leaving behind is a footprint that is unique to each one of us, let's call it a "Digital Footprint". These footprints are iconic and reveal a lot about individuals, how we are, what shapes us and much more. These footprints are nothing but data imprints that we leave behind in whatever we do today. Today, companies are exploring these imprints to devise intelligence about each one of us out there. This is the era of personalization.

Innovation has become the key to survival today. Irrespective of type and nature of business you are in, without innovation, your sustainability is at stake. Disruptive technologies and fast changing business models have forced businesses and organization to eat, sleep, drink and think innovation. Companies have now started running innovation themes to set a context amongst their workforce that "Innovation is the need of the hour". Idea sharing portals, encouraging new ideas to be shared and implemented, thinking disruptive and innovatively is being rewarded across organizations.

Let us have a look at some of the disruptive innovations that have taken place in **Human Resources and Development**.

Today, **digital technologies are transforming nearly every aspect of HR**, from sourcing and

recruiting to talent and performance management. Mobile has emerged as a new platform to connect. The data led revolution has impacted almost every industry. HR Analytics is performed extensively by organizations today, leveraging the massive historical data thereby improving decision making on strategic hiring, customized training, talent management etc. Companies are now developing and deploying data driven models that gives predictive insights into HR operations and outcomes like skill development, employee engagement, attrition, retention etc.



Image source: Gartner

This is one powerful picture that shows the impact of massive digital technology disruption in the field of Talent Management. Imagine you are appearing for an interview and there would be questions related to hobbies, strengths, and weakness etc. Now there is already a plethora of information available on Social media platforms about individuals which are extensively used by corporates to check the authenticity of the candidates.

Organizations around the world are data rich, be it data related to any business function right from

procurement, finance, sales, quality, operations, HR etc. But there are some concerns related to this scenario.

1. **Most of the organizations operate in silos; i.e. there is no data sharing amongst various functions within the company**
2. **Very few organizations realize that data is a valuable asset and use it for predictive and prescriptive insights**
3. **Huge amount of historical data is lying idle in the organizations and they don't know how to monetize it.**

Data is one important aspect across organizations that acts as a cohesion between various functions. In order to achieve data driven insights and promote a culture that considers data as gold, there has to be a seamless flow of data across business functions. Being a consultant in Digital Technologies, I have come across many such areas where data (from various business functions) can be used to derive rich insights for HR and associated planning. Let us consider some of the scenarios that corporate face every day and how analysing data can solve problems. Consider an IT consulting company that serves its clients across the globe. The company employs a large pool of resources to cater to their customer needs. The company has various functions and their roles are as follows...

Operations: performs activities like consolidating numbers (Revenue v/s Budget, Resource management, Invoicing etc.)

Quality: keeps a check on deliverables to customers, perform audits, customer satisfaction survey and publishing dashboards etc.

Finance: Accounting, Cost Management, Business reports etc.

Sales: Services selling, making budgets, bidding for projects, creating sales pipeline (prospecting, account mining etc.)

Purchase or Procurement: Interacting with vendors, customs, sourcing of software, components etc.

Marketing: promotional events, inbound and outbound communications and so on.

HR: employee services, recruitment, compensation and benefits, attrition, retention etc.

Suppose if the company is facing **higher attrition issues** and analysing why it happened, the answer may not be easy to find. However, say if the data related to those employees is analysed from their individual project standpoint as in "What is the customer satisfaction (CSAT) score for which that employee was working?" Now, if this data from quality is extracted by HR and analysed, it may turn up that since the CSAT was below average for that project and hence the employee is leaving. If this is measured thoroughly, it may turn out that customer satisfaction has a major impact on attrition.

Similarly, doing text mining on the exit interview answers can give insights into why employees are leaving. Also, if the findings are correlated with other metrics of either sales, operations or quality, there would be a strong correlation amongst each other.

Also, analysing the historical data on quality of deliverables and repeat business orders can give insights into future sales that company can expect. Also, based on the past attrition (corresponding to sales revenue), HR teams can predict the number of resources that will be required in future (quarter or next six months). Talent Management, Training and other development activities can be customized using employee data on skills, strengths and **derive the learning curves for each individual** which can help arrange efficient learning and training programs. There are proven forecasting techniques that can be handy and applied on relevant data. These types of analysis will certainly enhance the quality of decision making which will no more be based on experience or gut

feels, but backed by strong data which will speak for itself.

Data Analytics has become the core function of any business today. Data has the potential to answer some of the toughest business questions pertaining to sustainability, new business models, consumer behaviours and much more.

In the disruptive world of digital, it is not the fittest, but it is the survival of fastest.

Lastly, I recall this statement from one of the TED Talk on Data Science, it says "*Data is not the new Oil, but it is the new Soil*", I would further add to this saying "**Data is the new soil, if harvested decently can reap outcomes that will answer industry's toughest questions**".

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NEWS CORNER

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DATA SCIENCE CAN HELP FIGHT HUMAN TRAFFICKING

Human trafficking is essentially a supply chain in which the “supply” (human victims) moves through a network to meet “demand” (for cheap, vulnerable and illegal labour). Traffickers leave a data trail, however faint or broken, despite their efforts to operate off the grid and in the shadows.



Trafficking often begins with fraudulent recruitment methods, such as promises of employment or romance. Data can help identify specific economically depressed areas, where we can deploy awareness campaigns and social service support. Machine learning can be used to detect online trafficking activity. Recent advances in matrix completion could even help clean up falsified information or make predictions about missing data. To help authorities identify trafficking operations to target, researchers could turn to network analysis, a mathematical way of representing real world systems and their interactions.

ONLINE DATA LITERACY PORTAL, DATACAMP RAISES \$4 MILLION.

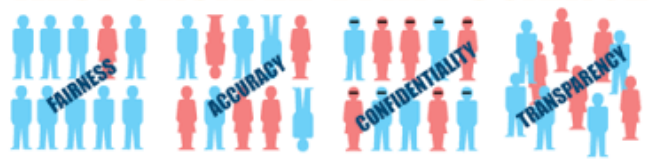


Data scientists remain in high demand. But these days, many types of professionals can boost their career prospects if they have at least a basic level of “data literacy”. DataCamp, which recently raised \$4 million from investors, offers approximately 80 short training courses that teach data science skills to beginners and help experts sharpen their abilities.

DataCamp’s users work in tech, finance, healthcare, and consulting, to name a few sectors. People get ahead in their career faster if they become more data literate.

NEED FOR ETHICAL DATA SCIENCE

RESPONSIBLE DATA SCIENCE



As India rolls out technology-based systems like Aadhaar, policymakers and technologists must also focus on the ethics of data science and bring real people into the discussion. The best way to have a discourse on programs like Aadhaar and the Goods and Services Tax Network (GSTN) is to have policymakers make sure that technologists are working hand in hand with them and also have “real people” at the table.

DRISHTI: ACCENTURE’S AI BASED VISUAL AID

Drishti, which means 'vision' in Sanskrit, provides smart phone-based assistance using AI technologies such as image recognition, natural language processing and natural language generation capabilities to describe the environment of a visually impaired person. It can also be used to identify and narrate text from books and documents, including currency notes, and identify obstructions like glass doors to improve the safety of the user. The solution was developed as a part of Accenture's focus on Tech4Good, which aims to apply technology to improve the way the world lives and works by solving complex social challenges.

CALL FOR ARTICLES

We invite articles for the August 2017 Issue of SAMVAD.

The Theme for the next month: August 2017 - "VIRTUAL REALITY & AUGMENTED REALITY"
The articles can be from Finance, Marketing, Human Resources, Operations or General Management domains.

You may also refer to sub-themes on Dare 2 Compete.

Submission Guidelines:

- Word limit: 1000 words or a maximum of 4 pages with relevant images.
- Cover page should include your name, institute name, course details & contact no.
- The references for the images used in the article should be mentioned clearly and explicitly below the images.
- Send in your article in .doc or .docx format, Font size: 12, Font: Constantia, Line spacing: 1.05' to **samvad.we@gmail.com**. **Deadline for submission of articles: 25th August, 2017**
- Please name your file as: <Your Name>_<title>_<section name e.g. Marketing/Finance>
- Subject line: <Your Name>_<Course>_<Year>_<Institute Name>
- Ensure that there is no plagiarism and all references are clearly mentioned.
- Clearly provide source credit for any images used in the article.

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WELCOMES

BATCH 2017-19



THE NATURE OF TECHNOLOGY
DEPENDS VERY MUCH UPON WHAT
THE PUBLIC CAN BE INDUCED TO
PUT UP WITH.

-JOAN ROBINSON

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