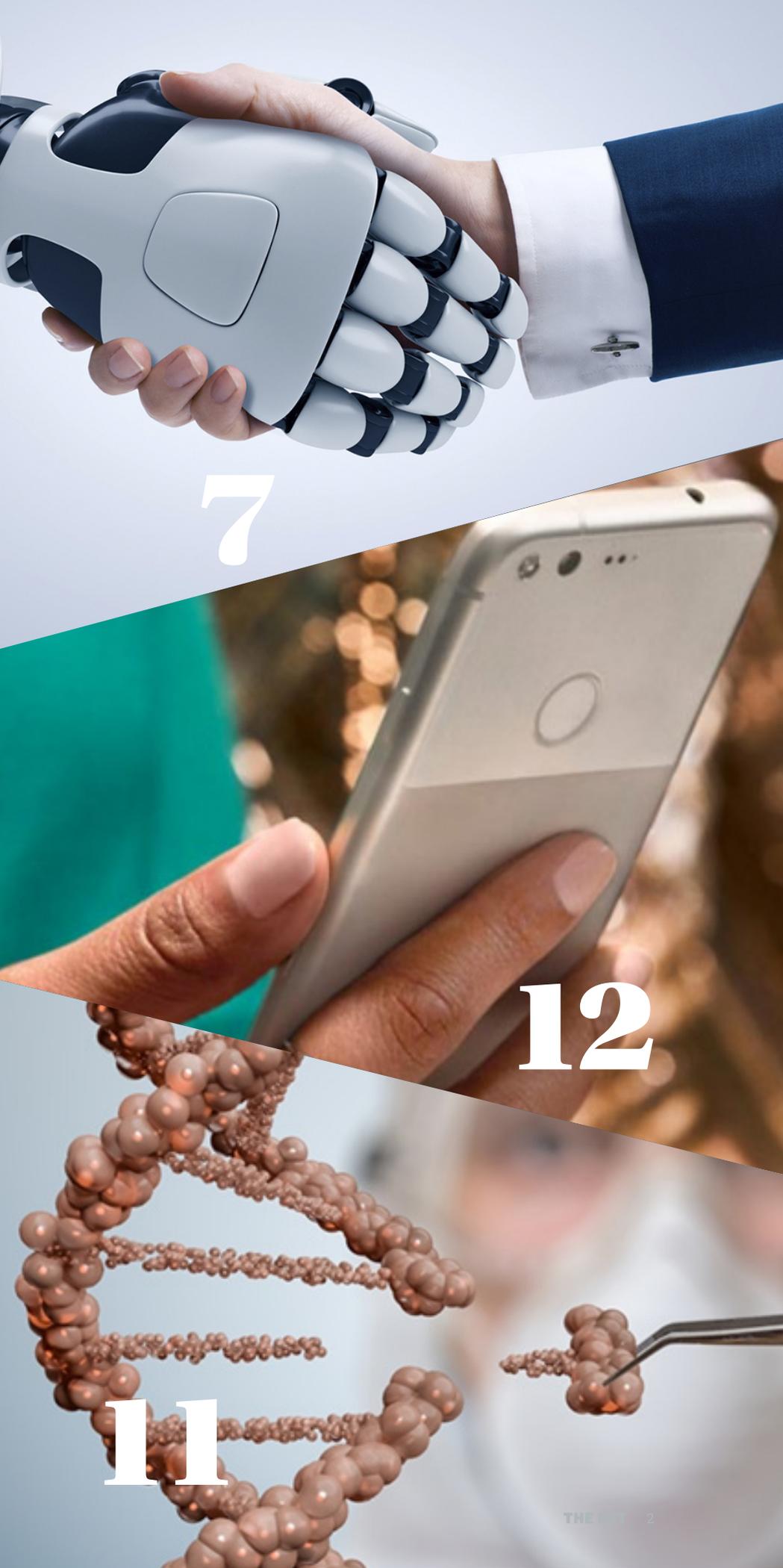


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ON CREATIVE DESK

Editors

Prof. Kuttyamma AJ
Head of Department

Neeba EA
Assistant Professor

Mary John
Assistant Professor

Student Editors

Albin Antony - S7 IT

Joseph Roney - S7 IT

Devika U - S7 IT

Department of Information Technology

Rajagiri School of Engineering & Technology

IT in Business Process Reengineering

Kuttyamma AJ
HoD/Professor

Currently, marketing is the core activity of any type of business. Business Process Reengineering (BPR) was introduced in industries with the objective of changing the management of the supply chain. In manufacturing, the nature of material flow determines the type of information and decision support systems required to achieve system integration and hence the overall effectiveness of the system. Whereas in a business environment, IT has played an important role for making things efficient and effective like office automation, networking, LAN, WAN, etc. Thus BPR helps revamp the system by implementing both simultaneously.

IT processes can be classified into operational processes and management processes. Operational processes can be reengineered as an enabler using software like Database Management Systems and emails. They have a direct impact on the cost effectiveness of the system. The managerial processes involve the executive tasks like decision making. For this purpose, information technology tools like decision-support system and expert systems are used.

The implementation of BPR using innovative application of information technology (IT) aims at a decreased-cost, user-friendly, flexible, team-oriented, and cross-functionally co-ordinated management.

It is difficult to assess how much

scope is there for radical process change in the business world today. However, there are opportunities to improve existing businesses and identifying and defining new business processes for radical change. IT plays an important step here by narrating the commitment level of the project and SWOT analysis with the help of Expert System and the decision support system. It helps in identifying the strategic processes that are feasible to change. Establishing network connections between process team members and preparing intranet applications to exchange forms and documents between team members creates an integration of team work, strengthening the team. It helps in managing the change and enhancing the employee performance by providing computer-aided training and using software for controlling the new changes.

In the last five years, the combination of the global competitive pressure and the inefficiency of frustration in the relations of work between the organizations and the clients/suppliers forced the companies to invent new forms to make businesses. In order to obtain a sustainable competitive advantage, the companies are using these processes to go beyond the projects of automatization, making it easy to duplicate and to connect their organizations with other partners to create relationships, IT being the common platform to achieve their goals.

Hyperpersonalization and Security

NEEBA EA - ASST. PROFESSOR

An online shop reconfiguring its settings according to the customer's profile, buying preferences and patterns, in order to offer the most appropriate experience. A hotel mobile app taking into account the place, time, context and customer's habits in real time to offer highly customized services. This is the world of Hyperpersonalization.

Personalization is not a new concept. For several years brands have been segmenting and targeting their online customers, adapting their daily usage. But the current trend is to go further, to push such personalization to an individual level in adapting content, functionalities and interaction in real time.

Individual personalisation can be reached by systematic collection, real-time analysis and use of a multitude of information regarding the customer and its context. The customer is usually willing to share a certain amount under the following indispensable conditions:

1. full transparency from the brand regarding its intentions ;
2. control and management of his preferences in regards to sharing the information;

So how does this work? Hyper personalizing the customer experience:

(a) IN TERMS OF PROCESS

Agility and a step-by-step policy are called for: Agile methods are absolutely necessary to produce quick prototypes with short cycles thus allowing to quickly fail and then bounce back just as quickly.

Adjust the customer experience's definition process: This is achieved by data-driven UX approach. It includes the development of a segmentation for behaviour patterns and for each category, identifying optimal interaction strategies and user experience. Finally analytical techniques and machine learning are used so the system can adapt over time and can be optimized.

Always have a back-up plan: predictions from hyper-personalized system are not foolproof and thus should always have a back-up plan.

(b) IN TERMS OF ORGANIZATION:

To implement successful hyper-personalized approaches, it is essential to:

- suppress silos between the marketing, business and technology departments ;
- strengthen the teams with data profiles : Big Data analysts, Big Data developers, customer experience designers with analytical skills, etc

(c) IN TERMS OF TECHNOLOGY:

Create a unified customer view: Most companies manage customer data stored in multiple databases.

This creates significant challenges for the production of a unique customer view and it makes cross-channel marketing actions more difficult to coordinate. A unified customer view is a key issue to address in a proactive manner.

Use available technology: Mapping the existing tools is very beneficial because it allows to quickly highlight the recurrence of some tools that are already implemented and it helps underpin existing gaps.

Create quick wins and progressively develop more substantial actions: You might be immediately able to create several personalization quick wins with existing content, promptly and with a limited budget, without necessarily aiming for very sophisticated hyper-personalization projects.

Define a target architecture and choose missing technology: The aim is to build a robust target architecture and select the various components. Among the hundreds of technologies currently on the market, the main categories to analyse are :

1. Marketing automation platforms with leads and contacts management at the core of these solutions, the setup of a single customer view integrating information from various sources, the integration and synchronization with CRM as well as many other functions : segmentation, scoring, real time behaviour monitoring, social listening, etc.

2. Web personalization and recommender platforms that are able to understand customer requests, organize results, foresee behaviours and needs, and combine various data sources in order to deliver personalized recommendations and therefore offer the customer more relevant content at the right time. Among them: SDL, Oracle, Hybris

3. Data management platforms (DMP) mainly implemented for media optimization (optimization and automation of digital media purchasing, advertising targets segmentations) but which have nonetheless a broader use including also customer experience personalization. DMPs collect, standardize, process and activate the company's internal and external data. This is the backbone of data-based marketing. The main platforms are Adobe, Google, and Oracle

4. CIAM platforms (Customer Identity & Access Management) also need to be analysed. Indeed, they let you find the optimum solution between security and customer experience, produce a 360-degree view of the customer and feed customer analytics. With so much emphasis on customer data, security and privacy infringement are major concerns that stare manufacturers and customers in the eye. While every industry is trying to establish a set of standards to ensure security in an increasingly digitalized world, this still remains a vacuous space with manufactu-

urers and users alike, on where to draw the line – when it comes to soliciting, and sharing personal data.

In the quest for that hyper personalized user experience, it depends on how much personal data the manufacturer solicits, the intention for soliciting the same, and how willing the customer is to share that level of personal data.

Customers today are very well-informed and knowledgeable about what they want. In some cases, the customer knows more about the product than the manufacturer. There's a paradigm shift: Earlier, products were first made, and customers subsequently found use for the products.

In today's scenario, and especially in the light of a swelling population of Millennials (read creative, informed, picky), expectations of the desired uniqueness-quotient, and user-experience are first set or envisaged, around which products get developed.

The expectations of younger, more connected consumers have driven manufacturers to create the desired user experience. It's evident that leading companies today have begun the journey toward hyper-personalization, enabled by the power of new technologies and the availability of a wide spectrum of user-data across channels.

This personalization has become more of a best practice in software services. The way in which Google, Microsoft, Apple and Facebook have begun directing personalized searches, products, and news feeds has led to a phenomenon of hyper-personalization that categorizes users into neatly defined clusters based on their search history, buying behavior, and social trends. The recommendations from their platforms has resulted in accelerated buying of music from iTunes, products from Amazon, etc.

Adidas, which has partnered with Carbon, a Silicon Valley-based start up to develop 3D printed soles for the new line of shoes, plans to launch it later this year. Using a new technology called 'digital light synthesis', Carbon is able to 3D print flexible and durable midsoles, that will help Adidas save time and money in production, while allowing for greater customization. Adidas eventually plans to use this technology to customize shoes for individual consumers!

Hyper-personalization enables consumers to have products especially curated and tailor-made to their exact specifications. The element of uniqueness, and the associated perks of belonging to a "core circle", drives advocacy and demand. The simplicity of the user-experiences has customers coming back for more. With prices that are in line as well, hyper personalization makes for a compelling case.

Virtual Reality and the Future

Albin Antony - S7 IT



In virtual reality, you can be whomever and wherever you want. VR makes the unreal real, using computer software and hardware that responds to our body's movements to immerse us in a convincing alternate existence.

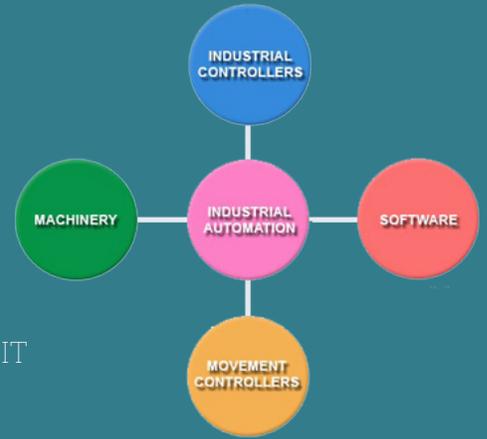
The Virtual Reality Modelling Language (VRML), first introduced in 1994, was intended for the development of “virtual worlds” without dependency on headsets. The Web3D consortium was subsequently founded in 1997 for the development of industry standards for web-based 3D graphics. The consortium subsequently developed X3D from the VRML framework as an archival, open-source standard for web-based distribution of VR content.

Virtual reality (VR) is a technology which allows a user to interact with a computer-simulated environment, be it a real or imagined one. A person using virtual reality equipment is able to “look around” the artificial world, and with high quality VR move around in it and interact with virtual features or items. The effect is commonly created by VR headsets consisting of head-mounted goggles with a screen in front of the eyes, but can also through specially designed spaces with multiple large screens.

The goal of the hardware is to create what appears to be a life size, 3D virtual environment without the boundaries we usually associate with TV or computer screens. Video is sent from the console or computer to the headset via a HDMI cable in the case of headsets. VR headsets use either two feeds sent to one display or two LCD displays, one per eye. There are also lenses which are placed between your eyes and the pixels, which is why the devices are often called goggles. These lenses focus and reshape the picture for each eye and create a stereoscopic 3D image by angling the two 2D images to mimic how each of our two eyes views the world ever-so-slightly differently. One important way VR headsets can increase immersion is to increase the field of view i.e. how wide the picture is. Head tracking is one of the methods used by VR where the picture in front of you shifts as you look up, down and side to side or angle your head. A system called 6DoF (six degrees of freedom) plots your head in terms of your X, Y and Z axis to measure head movements forward and backwards, side to side and shoulder to shoulder, otherwise known as pitch, yaw and roll. Head-tracking tech needs low latency to be effective. Headphones increase the sense of immersion. Binaural or 3D audio can be used by app and game developers to tap into VR headsets' head-tracking technology to take advantage of this and give the wearer the sense that sound is coming from behind, to the side of them or in the distance. Eye tracking is possibly the final piece of the VR puzzle. The main advantage of this is, apart from allowing in-game characters to more precisely react to where you're looking, is to make depth of field more realistic.

VR goes beyond fun and games. VR movies offer new vehicles for narrative structure. VR classrooms may reach students who don't thrive behind a desk. Doctors, engineers and inventors want to help people with real-world medical problems using alternate realities. Most current virtual reality environments are primarily visual experiences, displayed either on a computer screen or through special stereoscopic displays, but some simulations include additional sensory information, such as sound through speakers or headphones. Car companies have used VR technology to build virtual prototypes of new vehicles, testing them thoroughly before producing a single physical part. Virtual environments are used in training programs for the military, the space program and even medical students. The possibilities are endless. Users can interact with a virtual environment or a virtual artefact (VA) either through the use of standard input devices such as a keyboard and mouse, or through multimodal devices such as a wired glove, the Polhemus boom arm, and/or omnidirectional treadmill. The simulated environment can be similar to the real world, for example, simulations for pilot or combat training, or it can differ significantly from reality, as in VR games. Our perceptions are shaped by sounds, sights, feels, tastes and smells. A convincing VR world needs to hit all those buttons.

Internet of Things: Digital Automation.



Devika U - S7 IT

Industrial automation technology is entering a period of rapid change and technical advances designed to improve operations. Factory processes will be more efficient with higher reliability and better quality output. Requirements for operator intervention in manual settings or in open control loops will become increasingly rare and even closed loop controls will change as intelligent sensors and universal connectivity become commonplace. Fast networks will allow factory data to be available outside the plant in real time and secure networks will replace present-day slow, insecure communications.

The framework that drives these changes is the Internet of Things concept. When everything is connected, increased efficiency is possible and improved communication allows access to data where and when it can best be used. Machines can communicate directly via machine-to-machine interfaces and factory data can be made available to customers. Industrial computers become the heart of this revolution, handling data processing, storage, connectivity and interfaces. Embedded in the factory, these compact and rugged units lead the transition to factory automation via the IoT.

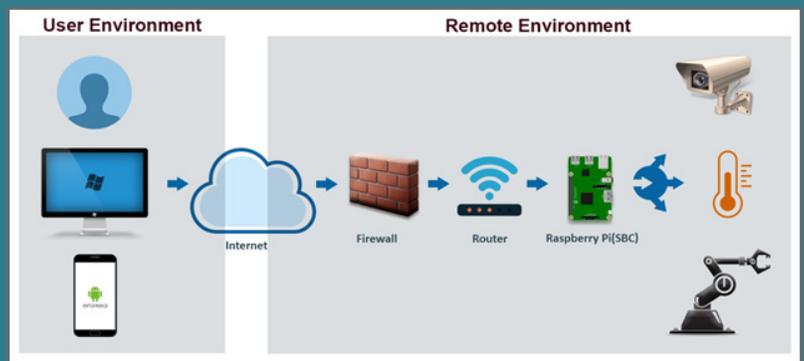
A large range of industrial IoT application have been developed within the last few years. It was initiated from RFID technology, where microchips transmit the identification information to a reader through wireless communication. And further technology goes to the wireless sensor networks (WSNs), which mainly use interconnected intelligent sensors to sense and for monitoring.

Internet of Things (IoT) is a concept that considers pervasive presence in the environment of a variety of things or objects that through wireless and wired connections and unique addressing schemes are able to interact with each other and cooperate with other things or objects to create new applications,

services and reach common goals. The IoT applications are: smart cities, smart energy and smart grids, smart transportation, enabling traffic management and control and a vast area in collaboration of Iot and Cloud Computing for Hospital Automation as well as other fields.

The Iot is a very simple concept where devices in our home, industry or wherever they are, have the capability to communicate with each other via the internet. It can be described as connecting certain objects together into a single network. It can be implemented in existing environments without any changes in the infrastructure. Iot systems work with certain hardware that are a must in the network: Sender-Receiver computer machines, Micro-controllers, routers, relay switches embedded with a web interface or a smart phone application , and chip & driver programming as the software side, which shares information through the internet.

The technology of using the server system or the system that distributes the functions and commands to the machineries and appliances is reconstructed by the Single-Board Computers (SBC's) chips that together act as a computer system itself that provides numerous connections to the objects. Similar to servers they are also programmed in Linux as the drivers are being set in its Shell script. The Raspberry Pi is the most widely used and is a single-board computer that runs a Linux based OS and that can be directly used in electronics projects because it has general purpose input/output (GPIO) pins right on the board.



“AI and Automation. Everywhere”

JACKSON ALAPPAT
S7 IT

India's internet user base is the fastest growing in the world. Digitization of the country is surging through initiatives like 'Digital India' and accelerating access to internet and telephony provided by India's telecom companies. Businesses, too, are exploring new ways to cater to India's consumer base that is becoming increasingly reliant on the internet for various services.

At the same time, businesses, entrepreneurs, and the country's tech industry are investing in the adoption of artificial intelligence (AI) and automation technologies to streamline their work processes, enhance productivity, and achieve radical innovation.

Yet, before we move further, we need to understand what AI is, how it impacts the industry, and how it will shape India's future economic growth.

Businesses and factories in India are beginning to appreciate the benefits of AI systems, and are increasingly investing in the adoption of smart machines and automated technologies. Recently, the country's premier engineering and research institute, the Indian Institute of Technology (IIT), Delhi and the Automation Industry Association (AIA), entered a partnership to develop technology in the area of smart manufacturing.

In the information technology (IT) sector, leading Indian technology firms such as Wipro, Infosys, and TCS are developing new products to meet changing demands. These companies, which traditionally provided back-end services to foreign clients (Business Process Management or BPM), are now diversifying their capabilities, such as by providing AI support through software developed in-house.

In labor-intensive industries like retail, automotive, manufacturing, logistics, and agriculture - automated machines are used to make up for productivity gaps and increase efficiency. For instance, in the automotive segment, carmakers like Hyundai, Ford, and Volkswagen have automated entire body and paint shops in their Indian factories. Besides increasing time efficiency, automation also allows carmakers in improving quality, achieving scale, and responding to sudden market changes with ease.

Startups in India are responding to this through targeted innovation. For instance,

Bangalore-based startup GreyOrange has built robots targeting supply chain management (for the e-commerce sector, among others). Their robots can organize about 600 pieces in an hour; a human can manage only 100 in the same time.

Similarly, the services sector is using AI systems to perform repetitive and mundane tasks. In India, ICICI bank has employed bots to perform about 40 percent of its back-end procedures related to banking, agribusiness, and customer services. Bots or web robots are software applications that run automated tasks.

Another industry application of AI is what is known as the 'internet of Things or IoT'. IoT refers to physical devices that are internet-enabled, and include vehicles (self-driving cars), buildings, and electronic items. In rudimentary terms, these devices are 'connected' and 'smart' as they are internet-enabled, which allows them to collect and exchange data, and thereby function intelligently on their own.

A major worry for India is AI's impact on the country's workforce. In 2016, the World Bank estimated that 69 percent of jobs currently in India are at the risk of automation.

Routine and repetitive tasks such as customer support and software testing will be relegated to AI systems. Businesses will be pushed to create new products and services at a faster pace.

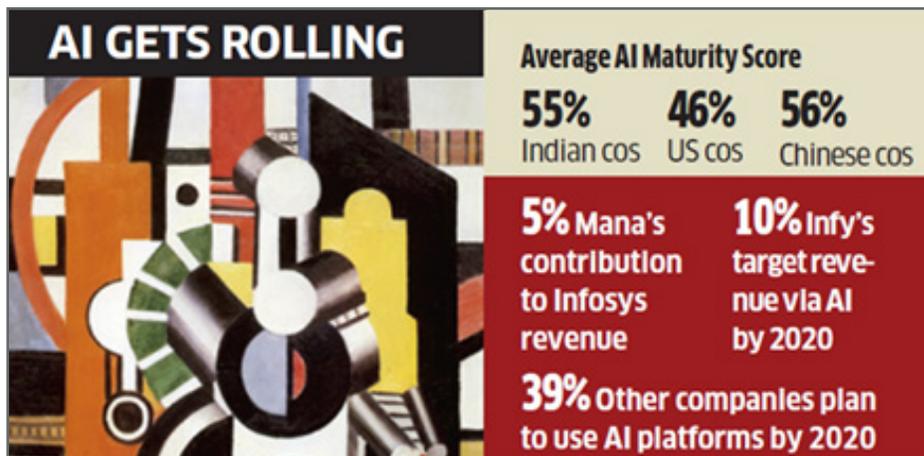
It is likely that new roles in middle and se-

nior management will be created to manage AI systems. The jobs of the future will most certainly require a mix of critical thinking, collaboration, and creativity. The current workforce in India is, on the other hand, more traditionally trained - to perform routine tasks and services and replicate processes and products. This is why major technology companies such as Accenture, Intel, Wipro, Microsoft, and Google are today retraining their staff in machine-learning and automation to meet the requirements of future roles.

Yet, while India's services sector is modifying roles for staff, it is the changes anticipated in the manufacturing industry that will be most crucial. India relies on its expanding manufacturing sector to solve the crisis of unemployment among its youth (for instance, through Make in India). Automation in manufacturing necessitates changes in the country's skilling industry to ensure that the labor force is trained for the jobs getting created.

Meanwhile, automation could make manufacturing still cheaper in India - attracting greater interest from foreign investors.

With the rapid modernization of its infrastructure, and increase in digital connectivity, India is poised to become a hub for AI-enabled businesses. Effective utilization and knowledge creation of AI systems could well propel the country to greater economic efficiency by plugging current productivity gaps.





TODAY'S AGE

Social Media: FAIR USE & COPYRIGHTS

In today's day and age, Social Media has become a necessity and we've gotten used to it permeating our daily lives. Every day millions of users from all parts of the world log on to various social media sites (such as Facebook, Instagram, Twitter and the like) to obtain and share news and information about a limitless range of topics. So now social media has gone past its initial purpose of simply connecting folks to becoming a major platform for businesses to advertise and sell their products and services itself.

The problem arises when an individual or an organization uses or shares a content and hence knowingly or unknowingly violates copyright infringement laws.

But then again. Isn't Social Media all about sharing content? So the question that arises here is 'What can we share then?'

The Copyright Act, 1957 provides copyright protection in India. It discusses copyright protection in the following two forms:

- i. Economic rights of the author, and
- ii. Moral Rights of the author.

The Economic rights subsists in original literary, dramatic, musical and artistic works; cinematographs films and sound recordings.

Moral rights involves the rights of an author to claim authorship of work and a right to prevent all others from claiming authorship of his/her work. Right of integrity empowers the author to prevent distortion, mutilation or other alterations of his/her work, or any other action in relation to said work, which would harm his/her honor or reputation.

Thus, even a person who innocently, or even accidentally, infringes a copyright, may be held liable under the Copyright. The guilty intention of the offender can be taken into account for determining the quantum of damages to be awarded for the alleged infringement.

Fair Use

According to the copyright stated above, not all courts have long recognized the need for such a defense because not every act that might violate an owner's copyrights should amount to an infringement.

Fair use of the Copyright Act allows reproduction and other uses of copyrighted works for purposes such as criticism, comment, news reporting, teaching, scholarship, and research.

The courts determine whether the activity involved constitute fair use or infringement based on four factors:

- i. Purpose and Nature of use (Non-Profit or for commercial purposes)
- ii. Nature of the copyrighted work
- iii. Amount and substantiality of the portion used in relation to the copyrighted work as a whole
- iv. Effect of the use upon the potential market for or value of the copyrighted work.

Amongst all of the above mentioned factors, the last factor, the effect upon the potential market, is the most important one.

Can Posting on Facebook, Twitter, or Instagram Really Violate Copyright Law?

In one word: yes. Copyright holders have various exclusive rights in their creative works, such as the right to reproduce, distribute, and publicly display the copyrighted material.

If the social media user is not the copyright holder, he or she then infringes the copyright in the work by reproducing, distributing, or

publicly displaying the copyrighted material on a social media website.

Are you Acting Smart?

Almost everyone knows that it is illegal to copy others work without proper authorization or consent. However, considering the staggering rise in social network users daily, it is not likely that all users know their limits. Most people, if they find something they like while browsing, copy them and then share them then itself or later. At this point, the user might not be aware about the violations that he or she are inadvertently violating.

Much of the confusion can be attributed to the proliferation of social media. Billions of online users are sharing, linking, embedding, and cutting and pasting content. But that's where copyright holders tend to be the most litigious. That is, lawsuits tend to arise when there is business being transacted and therefore money being made or, for the original creators, lost through "borrowing" or "sharing" media without permission; whether it be music, video, photographs, or infographics.

I personally use the Instagram platform to share images that I shoot and edit. And time and time again, I've unfortunately found myself dealing with situations wherein some random user used and shared my picture without my permission or knowledge and failed to even give me proper credit. Indeed, some individuals have even had the gall to share my photos and declare ownership of it.

Fair use is a complete defense to copyright infringement. However, whether it is properly relied upon or not is determined on a case-by-case basis.

Here are some simple ways by which this can be done.

- Checking the original source of content for copyright notices or information about how the content may be used.
- If copyrighted content is posted by other social media users, check the social media network's terms and conditions for authorization to re-post the content. For example, under Pinterest's Terms of Service, a user who posts content on Pinterest provides all other users a license to use that content on Pinterest.
- Instead of posting copyrighted content directly on your social media page, post a link to the original source containing the content. While giving attribution to the original source is not a defense to infringement, it may help reduce the likelihood of receiving a complaint and supports a fair use defense.

Follow the Right Way!

There aren't really very many rulings heard



.....
“If the social media user is not the copyright holder, he or she then infringes the copyright in the work by reproducing, distributing, or publicly displaying the copyrighted material on a social media website.”

.....
“Even a person who innocently, or even accidentally, infringes a copyright, may be held liable under the Copyright.”

on social-media-related fair-use cases, but that’s not to say copyright laws aren’t very much alive online. Media organizations especially, are the ones who should exercise maximum caution-wary when using such copyrighted content. Editors & the concerned staff should seek permission from the respective owners of any content they intend to publish or share. In truth, this can easily be done just by communicating with them through the social media platform itself.

Taking such similar steps to mitigate legal risks will help maximize the enormous benefits of social media participation.

So yes, social media has pretty much become an important piece of our culture and is very likely here to stay awhile. But with a bit of careful thought and an ounce of caution, there is no need to shy away from utilizing such a marvelous space, whether you be sharing, posting, tweeting, or liking for fun or to promote your business.

Mebin Johnson
S5 IT



Advancements in Facial Technology

FACE RECONSTRUCTION USING DNA

Kevin Thomas - S3 IT

Technology has this unquenchable thirst for progress that tends to bring the future closer to the present. Day in day out, new technologies have emerged into our little world and their pros and cons are strictly analysed.

One such technological advancement is the one led by the scientists in National Academy of Sciences, Washington who managed to reconstruct faces from people's DNA.

Human Longevity is a San-Diego based company which holds the world's largest genomic database. They collected around 45,000 human genomes, mostly from patients who came for clinical trials and acquired data based on their physical attributes. The data was analysed by machine learning tools and predictions about genetic sequence were made, based on the physical features. The efficiency of the system became noticeable when the company managed to generate photo-like-image without an actual shutter click.

Dr. Craig Venter, a biologist and the boss of Human Longevity, in his paper in 'Proceedings of National Academy of Sciences', described the process as a "phenotype-based genomic identification". The company collected genomes of people of various colour, eye colour and ages and trained an algorithm connecting the genetic material to their facial features and voices. During the testing period, the researchers could match headshots with at least 8 in 10 people.

Dr. Venter was not slow in mentioning the fact that this technology was highly vulnerable to misuse and manipulations and could lead to privacy breakdown. He stressed upon the fact that the genomic data should be considered as a 'personal' information to 'safeguard one's seclusion'.

This system has been extremely beneficiary to forensic science departments who would be able to reconstruct the face of perpetrator based on any genetic material left behind, like blood or any body fluid. Police could 'see' the face of the suspect in case of rape, murder and assault. It can also help in recognising burned or maimed victims. A new technology of this sort can be utilised in ample of ways. We, the users have a moral responsibility to work in an ethical manner which leads to progress of the entire human community.

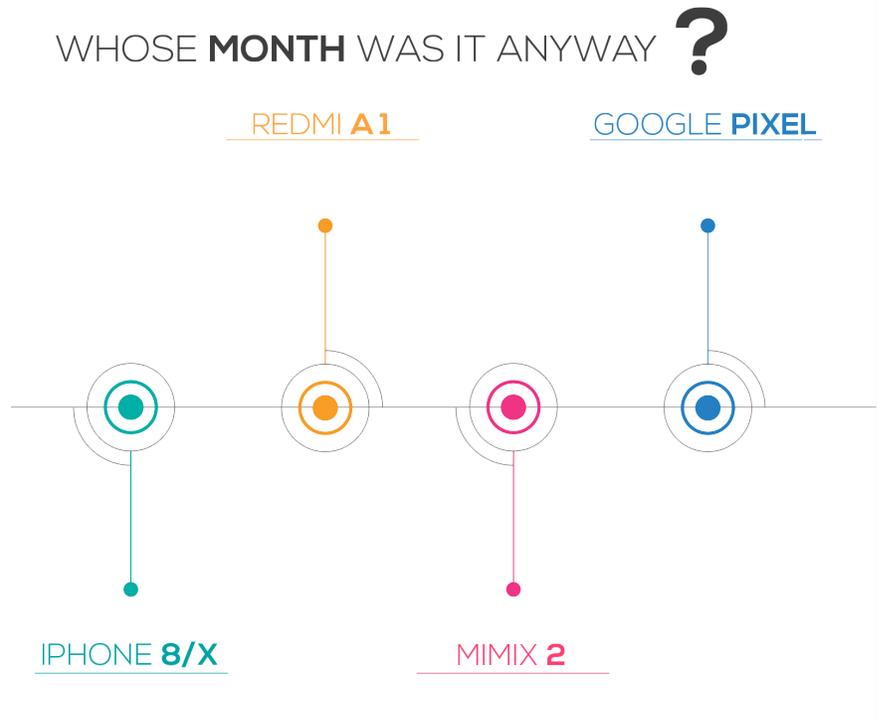
This new phenotype based system is surely bound to change the future.

REIMAGINE EVERY PIXEL.

Karthik Menon - S3 IT

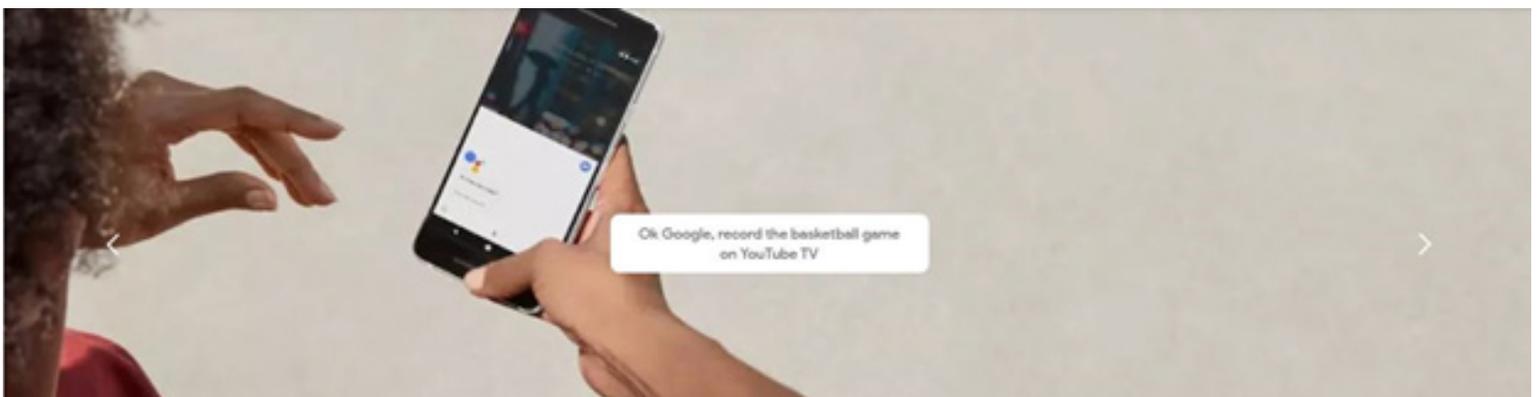
After months of rumors we're getting our first look at Google's new phones, the Pixel 2 and Pixel 2 XL. The phones are a huge deal for Google, because they are the first flagship Android phones from the company that don't use the "Nexus" brand name.

Google's two new Pixel phones, the Pixel 2 and Pixel 2 XL, are ready to square off against the iPhone X, Samsung Galaxy Note 8, LG V30, and the MIMIX 2.



In some ways, the Google Pixel 2 phones buck today's biggest trends. For example, the Pixel 2 and Pixel 2 XL don't have superthin bezels and dual cameras like the competition (but Google says its tech's so good, it only needs one camera anyway). In other ways, the Pixel 2s fit right in to the latest crazes, by adding water resistance and showing off an uncommon extra - in this case, squeezable sides. They also shake off the headphone jack, a divisive move that's going to upset plenty of people.

These Pixels are also the first phones to launch with Google Lens, a camera feature we loved when we first learned of it back in May. (They're not, however, the first to launch with Oreo; that's the Sony Xperia XZ1.)





Pixel 2 vs. XL: WHAT'S THE DIFFERENCE?

The main difference between the Pixel 2 and Pixel 2 XL is size. Neither is more “advanced” than the other. But the Pixel 2 XL has a higher screen resolution and pixel density. It has a bigger battery to accommodate the larger screen, too.

GOOGLE PIXEL 2 VS. PIXEL 2 XL

	Google Pixel 2	Google Pixel 2 XL
Display size, resolution	5-inch; 1,920x1,080 pixels	6-inch; 2,880x1,440 pixels
Pixel density	441 ppi	538 ppi
Aspect ratio	16:9	18:9
Dimensions (Inches)	5.7x2.7x0.3 in	6.2x3.0x0.3 in
Dimensions (Millimeters)	145.7x69.7x7.8 mm	157.9x76.7x7.9 mm
Weight (Ounces, Grams)	5.04 oz; 143g	6.17 oz; 175g
Colors	Just Black, Cleary White, Kinda Blue	Just Black, Black and White

NO HEADPHONE JACK, BUT THE PIXEL 2s ARE WATERPROOF

For anyone hoping against hope that the Pixel 2 phones will keep the headphone jack, I have some sad news. Alas, like the recent Apple iPhones and Motorola Motos, the Pixel 2 phones don't have headphone jacks. (This is especially amusing given that Google originally touted the Pixel with a "3.5mm headphone jack" that is "satisfyingly not new.")

The company said there were many reasons it lopped off the jack (it makes the phones thinner, allows for a bigger battery, more people are listening using wireless headphones anyway, and so on) and it will include an adapter in the box. Still, the lack of headphone jack can be a deal breaker for some, especially since carrying around a dongle is annoying.

It's not all bad news, though. Both audio speakers have been moved to the front now (which probably contributes to the thick bezels) and the phones are now water-resistant. Satisfying IP67 waterproof standards, they can be submerged in about 3 feet (1 meter) of water for up to 30 minutes, meaning you'll have one less thing to worry about at the beach or pool.

But unlike last year there's a camera bump now, and the top bezel and bottom chin on the Pixel 2 are especially thick. This isn't a huge deal, but now that thin bezels are in, this makes the phone look slightly dated.

STILL A SINGLE-LENS CAMERA, WITH 'BETTER' PORTRAIT MODE AND OIS

The Pixel 2 phones don't have a dual-camera setup, unlike most major flagship phones, with the exception of the Galaxy S8, though the more recent Note 8 has two rear shooters. But Google insists that its single-lens camera is still the best around, and its Portrait Mode feature, renamed from last year's Lens Blur, works just as smooth with one lens as other phones that use two.

Using a combination of facial algorithms and a depth-mapping image sensor, the Pixel 2's camera renders blurred backgrounds for a dramatic, short depth-of-field effect. When we used Lens Blur last year, it was patchy and wasn't impressive at all. It'll be interesting to test how Google will execute it this time around, while still using a single lens, albeit with more advanced tech. You can take bokeh images with the front-facing camera too, but because only the facial training is built into that shooter, it will only work on faces and not objects.

SQUEEZABLE (SQUEEZABLE) SIDES AND GOOGLE LENS

Google Assistant debuted in last year's Pixels and now there's a whole new way to launch it on the Pixel 2s: squeezing the phones' sides with your hand. This takes a page from this year's HTC U11, with a difference. While you could squeeze the U11's edges in a long or short press to launch just about any app of your choosing, the Pixel 2 only opens Assistant with a short squeeze. (Well, you can squeeze the Pixel 2's sides to quiet the ringer if it goes off, but that's pretty much it.) After Assistant opens, you can then tell it to do other things like snap a selfie or play music.

ASK **MORE** OF YOUR PHONE. THE ALL-NEW **PIXEL 2**

THE **PHONE** ONLY **GOOGLE** COULD MAKE. IN **TWO** SIZES
AND **FOUR** COLORS.