Prayukti 2019

SITM Student Journal

Volume 4

SYMBIOSIS INSTITUTE OF TELECOM MANAGEMENT

CONSTITUENT OF SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)
(Established under section 3 of the UGC Act, 1956)
Re-accredited by NAAC with 'A' Grade (3.58/4) | Award Category - I by UGC

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DIRECTOR'S MESSAGE

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Director, SITM

Prayukti, the student journal of SITM, aims to motivate the students to do research in the area of Information Communication Technology. Students will be writing research articles in the current areas of ICT and the best articles will be published in this journal. This will help students keep abreast of the current happenings in the area of ICT and also help dissemination of knowledge, information and learning. Students are expected to have an enriching and life-turning experience which will enable them to reach new heights in their professional life. We foster sharpening of skills and enhancement of knowledge base in our students through various extra-curricular, co-curricular and curricular activities through faculty who not only keep themselves at par with the current developments in ICT but also contribute to the expansion of the body of knowledge in their field of expertise. To facilitate this, we have launched Prayukti to enhance domain specific knowledge among members of faculty and among students. With very congenial and professional environment our faculty makes substantial contribution to the academia through quality teaching, publications, seminars, conferences, etc.

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PREFACE

Symbiosis Institute of Telecom Management works towards developing techno-managers by exposing the students to latest technology, enabling them to manage the technological aspects of an organization. As a part of a telecom business school, that has adapted and catered to the needs of the ever-changing Information and Communication Technology (ICT) industry, it gives us an immense pleasure to release the fourth edition of Prayukti. The success of the magazine lies in the collaborative efforts of the team members, students, and the faculties. The magazine reflects the business aspects of current and upcoming ICT trends through papers written by the students.

Prayukti is an initiative of Symbiosis Institute of Telecom Management. The name is derived from a Hindi word 'Prayukti', which resonates the aim of the magazine, which is motivation, application and result. The latest trends of ICT industry are researched and are brought upon through insightful papers. This edition comprises of 9 papers. This year the areas of focus are: Tackling the obstacles of IoTimplementation in India, OTT distribution and customer behaviour, future of SEO, blockchain regulatory framework in financial industry, Digital Transformation, data-driven marketing, electronic smart systems and drones of tomorrow. On behalf of the journal members, we would like to take this opportunity to express our gratitude to all the Professors for their support and guidance and to the students who have directly or indirectly contributed to the magazine. We would love to hear your suggestions that could help us with the future editions.

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Tackling the obstacles of IoT implementation in India

Deepak Kumar Soni, Srishti Gupta

Abstract

The vision of IOT is about to become reality where billions of physical devices have their presence on internet because of the rapid development of connected embedded devices. Before achieving the next Industrial Revolution 4.0, IOT will have to cross many obstacles coming on its way. IOT is presenting a huge opportunity for the industries to thrive in this digital transformation. Theoretically implementation may seem very easy but IOT deployment is challenging in Indian context. Through our research we have identified a few challenges which must be considered and addressed for successful IOT implementation. Mentioned are the obstacles like compatibility and interoperability of different IOT hardware, integration of IOT platforms, data capturing capabilities, handling of unstructured data and security. Through our secondary research we'll try to find out common implementation solutions which will be the major factors of influencing the decision making process for enterprises and consumers for successful IOT implementation in Indian scenario.

Keywords

IoT, sensors, security, smart, digital transformation, connected machines.

1. Introduction

The Internet of Things (IoT) is a system of physical things embedded with sensors, software, electronics and connectivity to allow it to perform better by exchanginginformation with other connected devices, the operator or the manufacturer.

In simple terms, it is a network in which physical objects can exchange data internally or with other connected machines. IoT is a vision that is being built today with an expectation of massive expansion by 2020 as connections move past computers to power billions of other devices, such as home thermostats and parking meters. In fact, 1.9 billion devices are already connected with an expectation of connecting 9 billion devices by 2018.

2. 2. Consumer and Enterprise IoT applications

Internet of things can be employed reaching out from customer IoT and enterprise to assembling and mechanical IoT. IoT applications range in different verticals, including Automobiles, telecommunications, power sector and many more.

In the consumer section, for example, Smart homes that are outfitted with savvy indoor regulators, smart machines and related HVAC, lighting and electronic devices can be controlled remotely through PCs, advanced smart phones or devices. Wearable devices with sensors and programming can accumulate and analyse customer data, sending messages to various activities about customers with the purpose of making customers' lives easier and dynamically progressive. Wearable devices are furthermore used for open security - for example, improving specialists on crisis response times in the midst of emergencies by giving accelerated courses to an area or by following emergency responders or firefighters' essential get indications of life threatening signs.

IoT offers various points of interest, including the ability to screen patients even more close using the data that is created and break it down. Emergency centres every now and again use IoT frameworks to complete undertakings, for instance, stock administration, for pharmaceuticals and medical instruments in healthcare services.Smart building can lower the energy expenses using sensors that detect what number of tenants are in a room. The temperature can be modified subsequently for example, turning on the air conditioning system if sensors perceive a gathering in the room is full or turning the warmth down if everyone in the workplace has returned home.IoT-based smart agricultural system can help to screen, for instance, light, temperature, soil moisture and soil sogginess of yield fields using related sensors. IoT is moreover instrumental in motorizing water system in Agribusiness.Intelligent streetlights and meters, can help ease traffic, save electricity, detect and report accidents, and improve sanitation in a Smart Cities using IoT Sensors.

3. Obstacles

3.1 Infrastructure

Smart Cities use sensor innovation otherwise known as IOT to accumulate and analyse data with an end goal to improve the personal satisfaction for inhabitants. Sensors gather information on everything from rush hour data to crime rates to by and large air quality. Complicated and expensive framework is associated with introducing and keeping up these sensors. By what method will they be powered? Will they be hard-wired, solar, or battery powered? Or then again, if there should be an occurrence of power failure, maybe a mix of each of the three?

Major metropolitan regions are as of now tested with changing decades-old foundation, for example, underground wiring, steam channels, and transportation tunnels, just as installing high speed internet. Broadband wireless service is expanding, however there are still zones in significant urban areas are yet to get access.Funding for new infrastructure ventures is restricted and procurement procedures can take years. Putting in new sensors and different upgrades cause temp – however as yet major issues for individuals living in these urban areas.Developers can help make it simpler to introduce and use keen innovation by thinking about these difficulties in all respects in beginning of improvement. By starting with the end in mind – that is the full usage of the arrangement – engineers and tech organizations can accelerate the way toward making our urban communities more intelligent by executing simple to-install devices.

As an example, the City of Oshawa, in relationship with key partners, has entered Infrastructure Canada's Smart Cities Challenge went for creating brilliant city arrangements that attract consideration regarding nearby issues. Utilizing information and associated advances, the fundamental objective is to team up with inhabitants, organizations, and scholarly and metro associations to recognize regular issues and make imaginative undertakings that unravel their most squeezing difficulties. Retrofitting existing inheritance city framework to make it brilliant. There are various dormant issues to think about while checking on a smart city system. The most vital is to decide the current city's powerless territories that need most extreme thought, for example 100-percent dispersion of water supply and sanitation. The combination of some time ago disengaged heritage frameworks to accomplish citywide efficiencies can be a noteworthy test.

3.2 Standards

• Due to lack of guidelines and documented prescribed procedures, there might be notable impact than constraining the ability of IoT gadgets. Nonappearance of standards can lead to stupid conduct by IoT Gadgets.
• Without guidelines to gadget manufacturers, engineers a portion of the time products that work in problematic ways on the Internet absent much regard with their impact. There can be an opportunity that inadequately arranged, planned and designed such gadgets can have negative consequences for the frameworks administration and the assets they associate with and the more extensive Internet.

• A greater part of this boils down to cost confinements and the need to develop a product for speedier discharge than contenders.

• Add to this the difficulties with supervising and arranging greater amounts of IoT gadgets, the prerequisite for standard structure and design apparatuses, strategies, and interfaces, joined with the choice of IPv6, will be central later on.

• Two sorts of standards which are significant for the aggregation procedure; Technology Standards (including network protocols, communication protocols, and data-aggregation standards) and Regulatory standards (related to security and privacy of data, among other issues).

• Technology Standards
- Network Protocols (e.g.: Wi-Fi).
- Communications Protocols (e.g.: HTTP).
- Data aggregation standards (e.g.: Extraction, Transformation, and Loading (ETL).

3.3 Regulatory Standards

Set and administrated by government agencies like FTC, for example Fair Information Practice Principles (FIPP) and US Health Insurance Portability and Accountability Act (HIPAA) just to mention few.

3.4 Regulation

There is a wide scope of administrative and legal questions that the IoT needs an insightful thought just like security. Legal issues with IoT gadgets incorporate cross border data flow; strife between law requirement, surveillance and civil rights; information maintenance and decimation arrangements; and lawful obligation for unintended utilizations, security breaks or protection slips. Further, innovation is propelling considerably

more quickly than the related regulations and policy making. Regulatory examination of IoT gadgets is progressively being seen from a general, innovation unbiased point of view, which looks to prevent unfair or deceptive practices against consumers.

3.5 Development

The expansive extent of IoT difficulties won't be one of a kind to industrialized nations. Truth be told, the IoT holds huge guarantee for conveying social and monetary advantages to rising and creating economies. By 2025, McKinsey Global Institute extends that as much as 38% of yearly monetary effect of the IoT applications will get from less developed nations. Like current difficulties around there, less-developed nations should address approach necessities, advertise availability and specialized expertise prerequisites to exploit the IoT potential.

3.6 Data Connectivity Issues

This is perhaps the most overlooked test since information network has immensely improved. However, there still exist a few territories where information availability is an IoT execution challenge. It includes how IoT gadgets communicate with the gateway and the Cloud and what data format do they create. Most IoT gateways accessible are perfect with GPRS and Wi-Fi/LAN, yet heritage gadgets rely upon PLCs, telemetry frameworks and RTUs to produce data. In this way, the need is for a reasonable edge layer that deciphers transport and data format conventions to send information to the IoT platform. Characterizing the correct blend of these protocols before continuing with an IoT usage will help in going far.

Even today Internet network, Internet connectivity unwavering quality, and accessibility of required bandwidth are as yet a noteworthy challenge in India. The density of the Internet association and users are low in India and telco are as yet attempting to give required transmission capacity web connectivity in remote territories and a Consumer IOT adoption– this can remain the most imperative test. Internet infiltration in Urban India was 64.84% in December 2017 when contrasted with 60.6% last December. In correlation, rural Internet entrance has developed from 18% last December to 20.26% in December 2017. The report additionally finds that an expected 281 Million every day Internet users, out of which 182.9 million or 62% access. This measurement gives data on the quantity of web clients in India from 2015 to 2023. In 2018, India had 483 million web clients. This figure is anticipated to develop to 666.4 million web clients in 2023. As of 2016, India had 320.57 million cell phone web clients and figures gauge 492.68 million Indian cell phone web clients by 2022.

3.7 Compatibility and Integration Issues

Sending and receiving data significantly happens through a variety of sensors and PLCs. These segments accessible on the board are associated with IoT gateways for transmitting information to the cloud. It turns into a basic test for the engineers when the legacy gadgets/ machines don't have the gadget drivers compatible with existing PLCs and sensors amid the IoT execution. Adding external sensors to the legacy machines is one speedy workaround, however, it won't be full proof, making it a challenging task. Accordingly, recognizing the physical gadgets and understanding the related compatibility issues before IoT execution it is highly recommended.

Another complicated test faced by the IoT execution is the convergence of Information Technology (IT) and operational innovation (OT). What's more, it is essential to safely coordinate the two without information loss or exposure of vulnerability. This makes embracing IoT innovation monetarily unthinkable and strategically unfeasible for some operational organizations. Generally, IoT gadgets are usually created as autonomous arrangements, and in b e s t - case situations, they are infused into the assembling procedure to turn into a piece of the framework. Be that as it may, the combination between the Information technology (IT) and operational innovation (OT) needs a powerful network and synchronization. Hence, it needs to replace either the whole of their gear or depend on defective connectivity.

3.8 Security

Security is a major pillar of the Internet and one that ISOC sees to be correspondingly fundamental and 'the' huge challenge for the IoT.Increasing the number of related gadgets leads to building of the chance to misuse security vulnerabilities, similarly for incapably arranged devices, which can wide open customer data to theft by leaving data streams insufficiently guaranteed and again individuals' health and safety (implanted, Internet-enabled medical devices and hackable vehicles) can be put in peril. Many IoT organisations will moreover contain an accumulation of indistinct or close indistinguishable devices. This homogeneity increases the potential impact of any single security vulnerability by the sheer number of devices that all have similar characteristics.

Security challenges for IoT technologies are the greatest worry as the breaks influence both individuals and organizations defenceless against financial and operational damage. As organizations utilizing an assortment of IoT solution, they are available to security concerns, absence of visibility, hack vulnerability, dangers related to IT/OT convergence, and insider dangers. In the event that security capacity is considered in the determination criteria, at that point the fundamental test is the absence of far-reaching cyber security arrangements. Executing IoT innovation will be opposed to publicity until it has a strong security highlight. This is the reason operational innovation organizations are so mindful of IoT innovation. Some hazard factors, which are a major danger since one year additionally making a few obstacles in adopting the IoT in India, are hacking and information ownership. With the expansion in Ransom ware in a previous couple of years, the security is the greatest risk and if any gadgets are attacked by hackers and controlled by them, and make its unforgiving utilization will prompt the huge losses to the organizations. The second huge hazard will be information proprietorship if the IoT put together application running with respect to cloud servers, and the responsibility for information on servers through these sensors from the gadget still not has clarity.

4. Choosing the right technology

There are different things that Organizations can consider to enable them to manage security and finance difficulties. While assessing which IoT technology to implement it is important to adopt a long term; strategy, in the beginning, to guarantee life span and adaptability to guarantee the system will utilize the full scope of uses in the future, without the requirement for upgrade and related extra expenses. A top criteria for IT boss was the kind of system with the lion's share (53%) needing a mix of star-based and mesh-based systems. mesh systems give incredible unwavering quality and versatility and are effectively expandable which can set aside extra cash and drive RoI. Performance (53%) is another key prerequisite for IT pioneers. By putting resources into innovations intended to decrease latency and data transfer capacity and bi-directional communications the case turns out to be considerably more convincing.

Finally, support for industry guidelines was referred to by over half (52%) of respondents as a key prerequisite. Open standards, upheld by a robust certification program, are crucial to guaranteeing interoperability with as wide a scope of products this is the way to conveying lower costs and giving increasingly more options. Models additionally protect speculations by guaranteeing legacy resources aren't stranded, while organizing versatility and security. For organizations already putting resources into a smart city, utilities and modern IoT) ventures, the greatest driver for undertakings was improving network intelligence and connectivity for citizen safety and quality of life (47%). Making of business efficiencies (42%) and improving the unwavering quality of frameworks and administrations (41%) additionally positioned exceptionally. It's certain that organizations over the globe are setting out on IoT-driven digitally transformed ventures to drive efficiencies and business agility just as to all the more likely serve the necessities of their customers and citizens. There might be difficulties and dangers on course yet whenever oversaw accurately organizations can be progressively certain and the way to IoT achievement and efficiency should, in the primary, be genuinely smooth.

5. Opportunities

The world will become connected based on billons of devices forming the internet of things. There will be 50 Billion Connected IoT Devices by 2020. Internet Population of 4 Billion by 2020. Smart Phones 1.9 Billion by 2020 and a data universe of 44 zettabytes.The Internet of Things will generate tremendous value in all aspects of the value chain and business innovation. Value estimate generated by the Internet of Things in Trillion USD (until 2022).

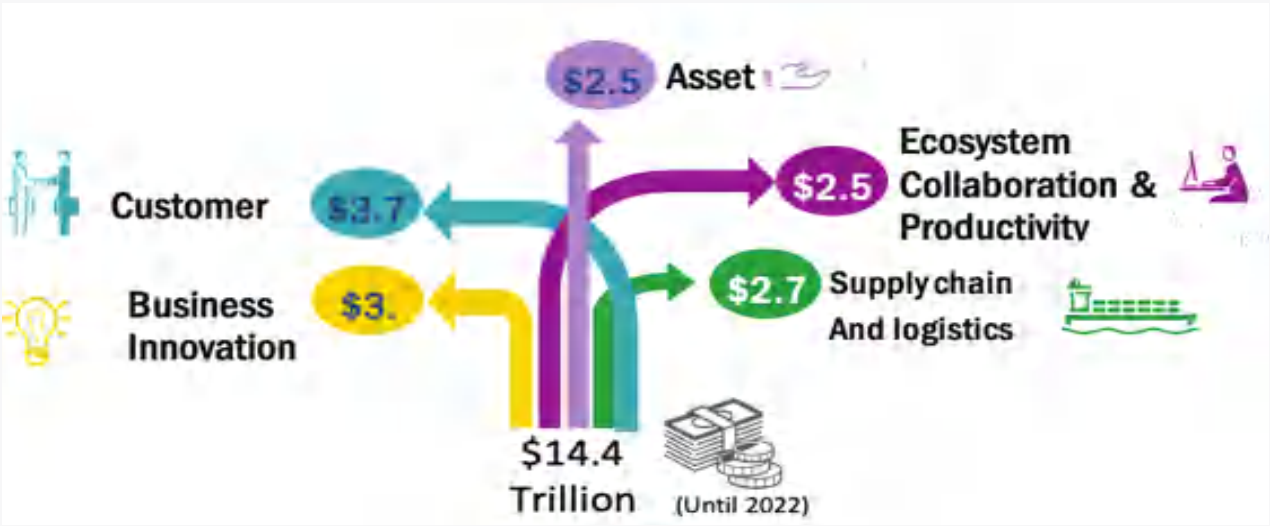

Figure 1 - IoT valuation

Conclusion

The Internet of Things (IoT) ecosystem is of ever-increasing complexity and potentially the next weave of innovation that will humanize and automate every object in our life. Convergence of technologies will make it easier and faster for implementation of IoT which will improve many aspects of our life.The key challenge of actualizing IoT may appear to be overwhelming. In any case, the issues related with device capacities, distribution network concerns, security, partitions among individuals, and safety all eventually exhibit the degree to which offices, whole enterprise, and manufacturers must cooperate to explore this new pattern in technology going ahead. For each situation, there is a game-plan accessible to enterprises; it's essentially up to them how they might want to continue.

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OTT distribution and customer behaviour towards content

Karan Batra, Mohit Marwah

Abstract

Over the top (OTT) is a term used to refer to content providers that basically distributes streaming media directly to viewers over the Internet. Indian over-the-top market is expected to spike to $5 billion by 2023 and will be driven by various factors such as: rising affluence, increase in penetration of data into rural markets among other factors, a report by Boston Consulting Group.

About 30 OTT companies operate in India today. Some of them are Netflix, Amazon Prime, JioSaavn, Airtel Wynk Music, MX Player and many more. Indian OTT online media streaming market is of $700 million and is expected to be worth $5 billion by 2023. Netflix is the biggest global OTT player by revenue while Hotstar is the biggest local OTT player by revenue. In fact, Hotstar has more than 100 million customers in India.

Keywords

OTT, distribution, streaming, multimedia, accessibility

US OTT streaming videos are growing like never before and have generated around $20.1 billion last year with a growth rate of 15.2%, according to the just released PWC Entertainment & Media Outlook for 2018. The market is expected to grow from $ 20.1 billion in 2018 to $ 62.03 billion by 2020, with an approximate CAGR of 17.2%. India will be among the top countries having a large OTT market in the next four years seeing the Indian appetite for watching online videos.

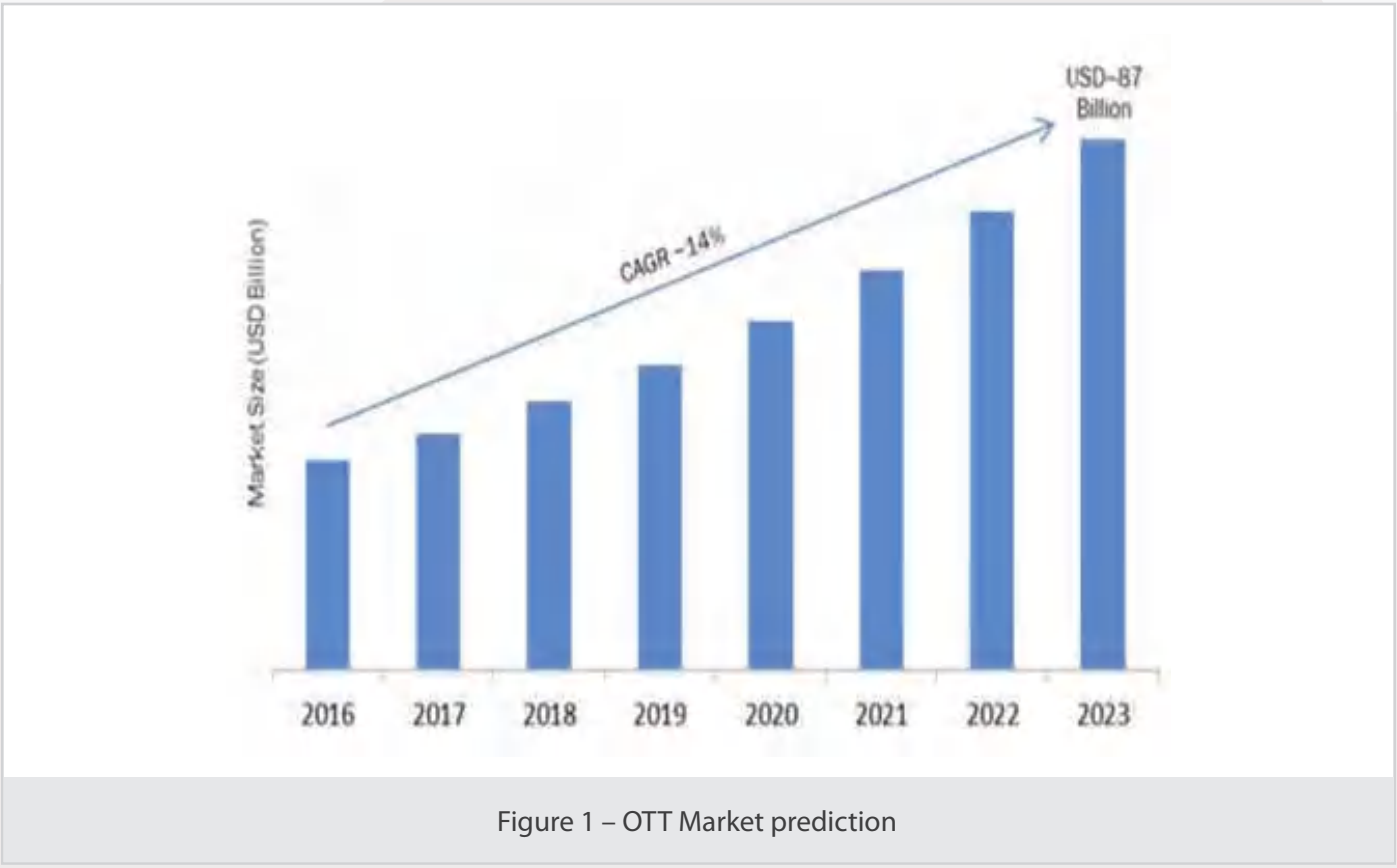


Figure 1 – OTT Market prediction

1. Impact of OTT

Talking about OTT disruption in the Indian media sector, the impact on exhibitors is such that ticket prices have risen according to MPAA 2017 theme report. People have preferred OTT due to more convenient location and much preferred time of viewing multimedia services. OTT has also impacted broadcasters and distributors having competition from global OTT and nuclearisation of families. It has created an impact on content producers as well with no opportunity to monetize their assets as well as decreasing value of acquired stakes.

There has always been a dispute between telco operators and OTT players since the emergence of multimedia messaging apps such as WhatsApp which disrupted some of the revenue sources of Telcos. Telco operators can also upgrade networks against OTT players by making considerable investments in upgrading their networks to handle the OTT players that are disrupting their sources of revenue. This could be done through developing advanced connectivity series, improving supply chain and logistics services, developing new apps and other services. OTT players are collaborating with DTH operators by embedding their apps in smart televisions and even through cable distribution network. DTH operators like TATA SKY have also been forced to sign strategic partnerships with Netflix whereas Videocon D2H also signed partnership with Sony Liv. Such tie ups are happening as the consumer's viewing pattern is no longer limited to television viewing.

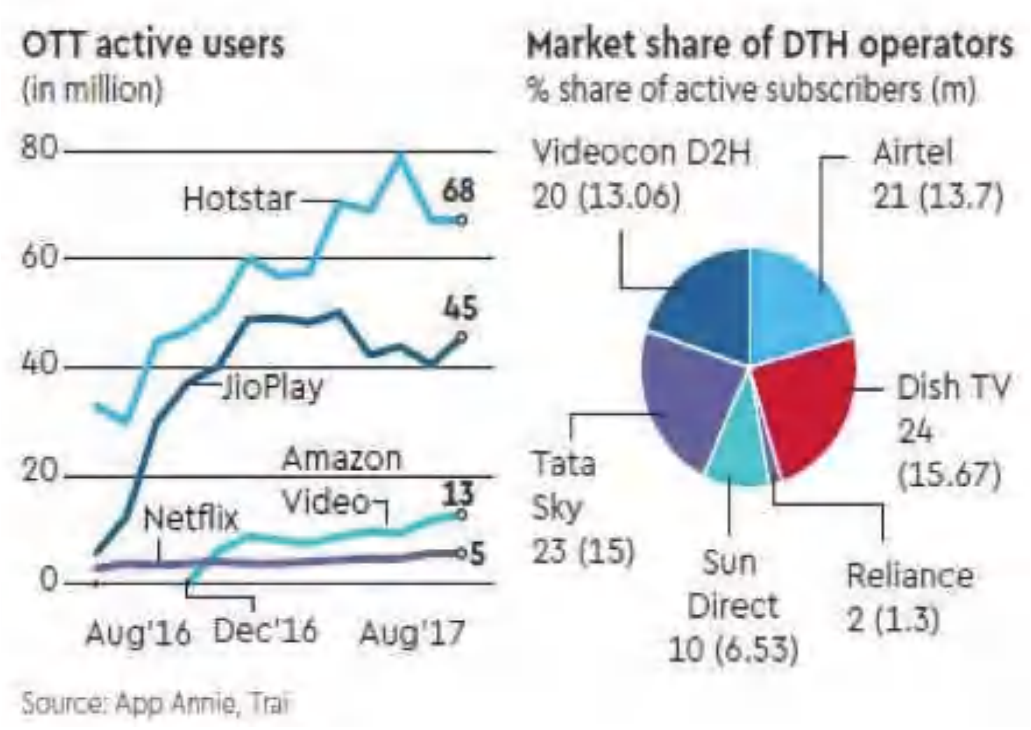


Figure 2 -MPAA 2017 Theme Report

Now coming to the OTT market globally, the current regulation under review makes it necessary for offshore businesses to create a permanent establishment either through fixed local premises or by employing locals in their operations in countries such as Indonesia.

A huge increase in the subscription of OTT video services in Latin America over the next five years is expected and the regional revenue is expected to be more than double by 2020 which is around $2.91 billion, according to Digital TV Research.

2. Future of OTT

Emergence of a more collaborative ecosystem such as OTT is coming up in future, however with the growing audience of digital content and media. In future we will see an increase in the spending by advertising companies on digital medium. On the other hand, television as a medium will get major share of the ad spending. The cheap data providers Jio is the primary reason for the increased consumption of the OTT content. Even the OTT's today are pushing in more

regional content to increase their reach.

Now consumer has become the center of every service in the market and streaming media being the most talked about trend in the current market. Gone are the days when the internet connectivity and speed was too slow to support online streaming. The customer has always been attracted by the video content and the internet penetration is one of the main reasons behind the rapid change in the consumer behavior towards OTT services.

The consumer behavior towards the OTT services is changing because of the accessibility i.e. any screen anywhere that allows a customer to watch his/her favorite web series or video content on the go. According to one business standard article on India's competitive video streaming market the driving forces that are contributing to the change are broader content, user interface and making synergies between e-commerce and content business as the target audience is same i.e. the tech savvy people. The market for quality content is expected to have a size of $5 billion by 2023. The rapid increase in the market size has given rise to more than 30 video streaming players in last 4 years.

The industry is also shifting as to attract the new consumer needs i.e. Industry shift is viewed as a way to avoid ads, as it is a major part of TV.

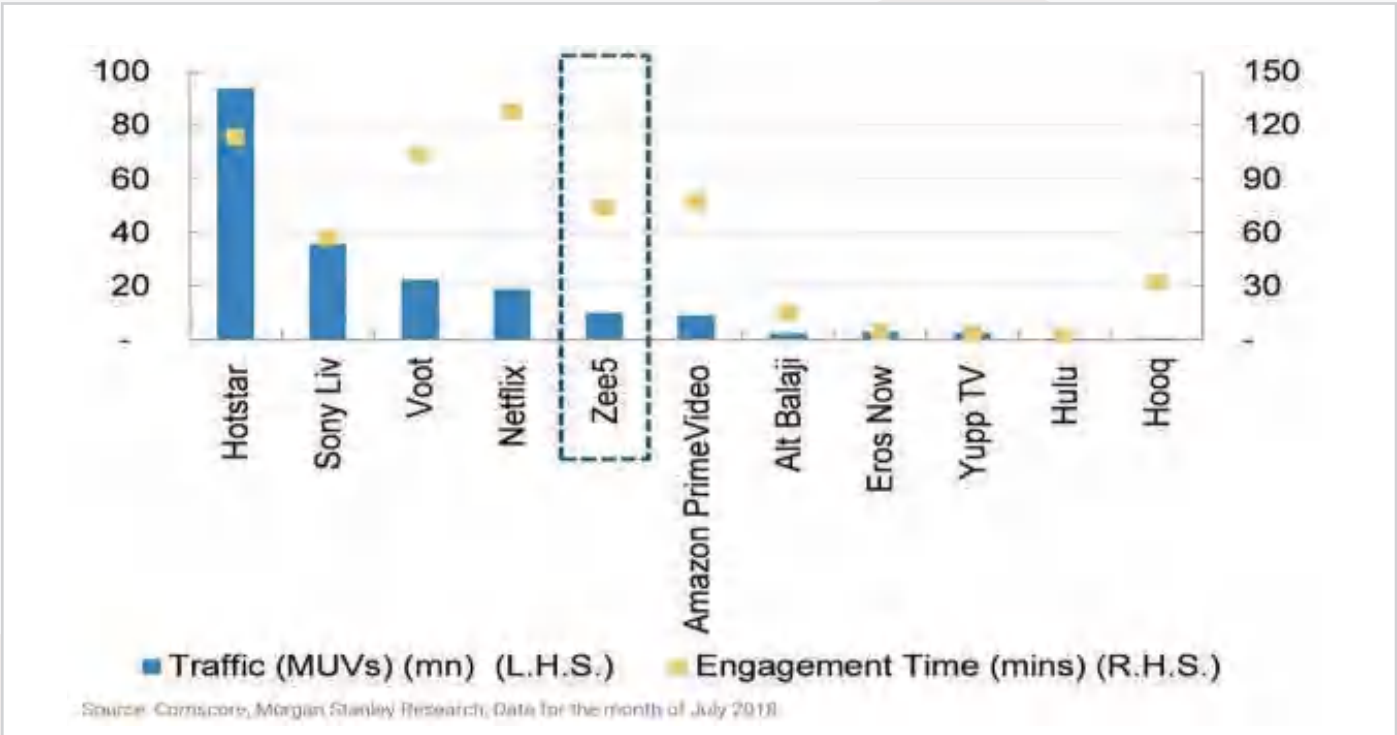


Figure 3 -MUV is a unit for measurement of no of users i.e. million users in volume

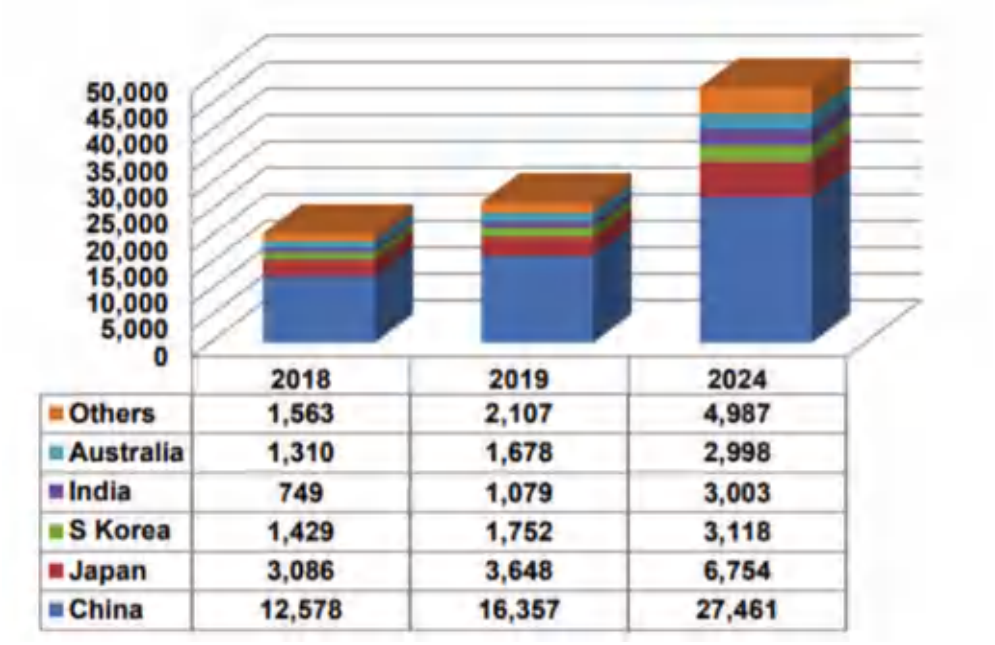
3. OTT Trend

Consumer is majorly attracted towards online streaming media due to the content they provide and Hotstar being the only OTT with over 350 million downloads and over 150 million monthly active users on the platform. Hotstar is so far dependent on movies, sports and content from star India channels

Sanjay Gupta from Star India told economic times that around 80% of the audience on Hotstar comes from the content like movies and drama. The sports category that includes IPL, BCCI matches, Pro Kabaddi, and ISL is responsible for only 20% spike in the viewership.
According to the report by BCG on OTT potential market in India, Around 650 million internet users that will accumulate to 48% of the total internet users by 2023 are expected to be from rural areas.

The increase in mobile penetration in tier 3, tier 4 and rural areas will make many people use OTT first rather than going for TV.

The slow shift away from traditional TV might not have an immediate impact on TV as a platform, but the evolution of Video-On-Demand will definitely impact the consumer behavior. Consumer no longer has to pay for the content they don't view or stick to TV to make sure they doesn't miss their favorite serial. You can watch what you want, where you want, and you never have to sit through another TV ad again.



	2018	2019	2024
Others	1,563	2,107	4,987
Australia	1,310	1,678	2,998
India	749	1,079	3,003
S Korea	1,429	1,752	3,118
Japan	3,086	3,648	6,754
China	12,578	16,357	27,461

Figure 4 -OTT TV & Video Revenue by Source (in USD million)

In the figure given above, according to OTT TV and video revenues of India by the MPAA 2017 Theme report, subscription revenue has grown more exponentially as compared to rental or advertising revenues. This is because the consumer weighs the depth of content being offered and its relevance in terms of affordability and amount of real consumption for the subscription period. The factors that draw in more consumers to SVODs are central to content mostly, latest movie premieres and sports form a major chunk. Original content is also driving in consumers unusually well on various national and international platforms like Netflix, Amazon prime, VIU etc.

The OTT trend which is the new buzz in the market will it be able conquer the television audience or the audience will be able to manage between both online media streaming services and the traditional TV?

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SEO (search engine optimization) in voice search: future of SEO

Shubham Sharma, Vaibhav Pandit

Abstract

The manner human beings search for data online is transforming. Increasingly, humans are employing the voice explores their smartphones or words assistants (just like the Amazon. com Echo, Google Home gadgets, Siri in Apple devices and Microsoft's Cortana) to find information on the web. These voice products and technology ensure it is less complicated for humans to genuinely request a question and obtain facts from other devices. Allowing in for a less strenuous way to build relationships machines utilizing a conversational voice. As the textual content lookups, it will certainly show up a number of links along with other search results, words search offers certain information regardless of the source of this information. This document is a make an effort to understand that, in such a search based electronic era, voice queries will still be an essential section of search engine marketing even in the near future, perhaps surpass the original text lookup, and seek the choice. This paper may also help the visitors to understand the proper approach, which can only help in increasing guests for any prevailing keywords and integrating innovative keywords so you can make this content, products, and solutions visible on the various search engines.

Keywords

Voice Search, Search Engine Optimisation, Voice assistants, Digital Era, Text Search, Key Phrases, Content, Services, and Search Engine

1. Introduction

The manner where individuals search for data online can be evolving. Progressively, individuals are utilizing voice explore their mobile phones, tablets or tone of voice associates (just like the Amazon Echo or Google Home gadgets) to consider data on the net.

Voice search may be the technology underlying numerous spoken dialogue techniques (SDSs) offering users with the info they request using a spoken query. The info normally prevails in a big database, as well as the query must be weighed against a field inside the database to get the relevant details. The contents in the field, such as for example business or item names, tend to be unstructured text. This short article grouped spoken dialogue systems into form filling up, contact routing, and tone of voice search, and assessed the voice look for technology.

Apple has Siri for its voice search, Google voice search is popular on Android devices and Microsoft's Cortana is useful on PC and smartphone using their app. These new voice gadgets and innovation make it simpler than at any other time for individuals to just make an inquiry and get data from their gadget. This takes into consideration an increasingly regular approach to connect with machines utilizing a conversational voice. Searching for data by voice is certainly part of our day-to-day lives for a long period before the World Wide Web turned out to be prevalent. It turned out already the reality thirty years back again that, if the info of any close by business is essential, the common technique has gone to dial index support and have an operator for contacting the number.

2. Voice Search Stats

The usage of voice search is usually increasing daily, 58% of customers have used speech search to get local business data in the last year using this 27 % appointments the web site of an area business after executing a voice lookup. About 76% of wise home speaker consumers conduct local lookups at least one time a full week- with 53% carrying out daily lookups (Bright Local Research). Mobile world wide web search is really a rapidly growing market, web-empowered mobile phones represent a growing offer in the cell phones distributed all through the globe, and most cell phones offer a net browsing backdrop that rivals computers in presentation high quality. Clients are gradually swinging with their mobile phones while doing net searches, driving initiatives to upgrade the simplicity of web lookups on the unit.

Voice search questions are 350 % greater than these were in 2008, which is broadly viewed as the arrival of voice search browsing innovation.

Figure 1: Voice Search Stats

Figure 2 - Google Voice Search Trends

Some more stats of voice search are:

- Globally, smart speaker shipments grew nearly 200% YOY in Q3 2018.
- More than half of houses are expected to own smart speaker devices in the coming three years.
- 65% of 25-49 years olds address their voice-empowered devices about once every day.
- Around three-fifths of 25-64 years olds state they will utilize their voice gadgets more in future.
- 71% of wearable device owners predict they will perform more voice searches in future.
- Half of all online searches will be voice searches by 2020.
- A group of 25 words prompts around one-fifth of all voice search queries.

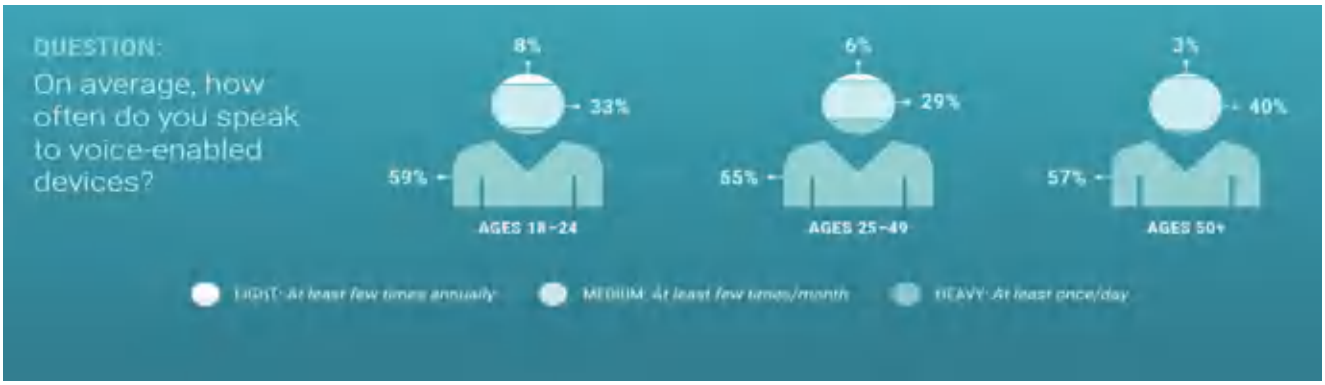

Figure 3 - Age wise voice search stats

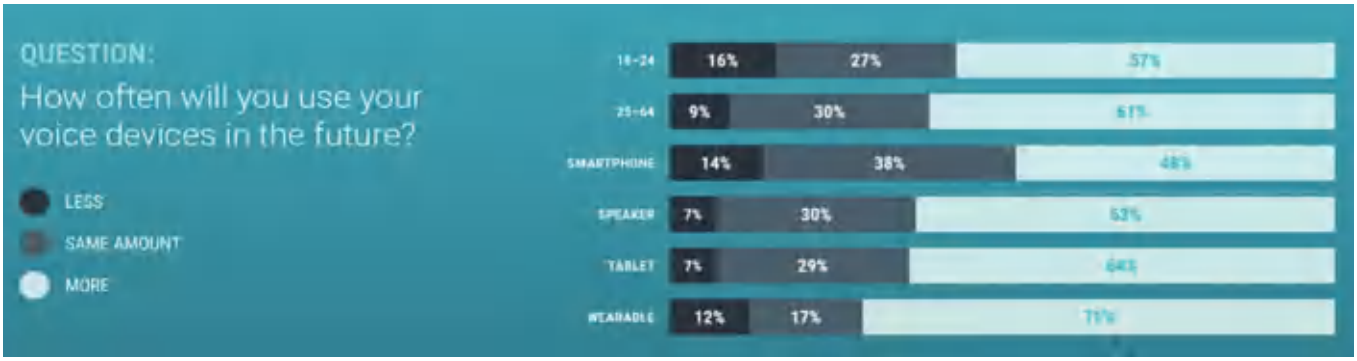

Figure 4 - Use of voice search in future

Trigger Words	Count	% of Total
how	6,58,976	8.64%
what	3,82,224	5.01%
best	2,00,206	2.63%
the	75,025	0.98%
is	53,496	0.70%
where	43,178	0.57%
can	42,757	0.56%
top	42,277	0.55%
easy	31,178	0.41%
when	27,571	0.36%
why	25,980	0.34%
who	24,930	0.33%

Trigger Words	Count	% of Total
new	24,779	0.33%
recipe	22,967	0.30%
good	22,807	0.30%
homes	21,132	0.28%
make	19,774	0.26%
does	19,449	0.26%
define	19,375	0.25%
free	18,315	0.24%
i	18,245	0.24%
list	17,136	0.22%
home	17,118	0.22%
types	16,575	0.22%

Figure 5 - Words used in voice search

- Voice is expected to be a $40 billion channel by 2022.
- Up to 43% of voice-empowered device user utilize it to shop.
- Half of the individuals who shop through voice use it to research items.

Figure 6 - Use of Voice search

3. Factors affecting voice search

The goal of google seek out is to recognise any spoken lookup query. Google is rolling out various suitable metrics which are used to monitor the grade of the system and is a crucial achievement. Metrics that may bring to mild specific problems with the underlying engineering.

3.1 Word Error Rate (WER)

The word error rate quotes misrecognitions at the term stage: it analyses what yielded because of the recogniser to the people the users uttered. Each error (substitution, addition or cancellation) will be tallied contrary to recognizer.

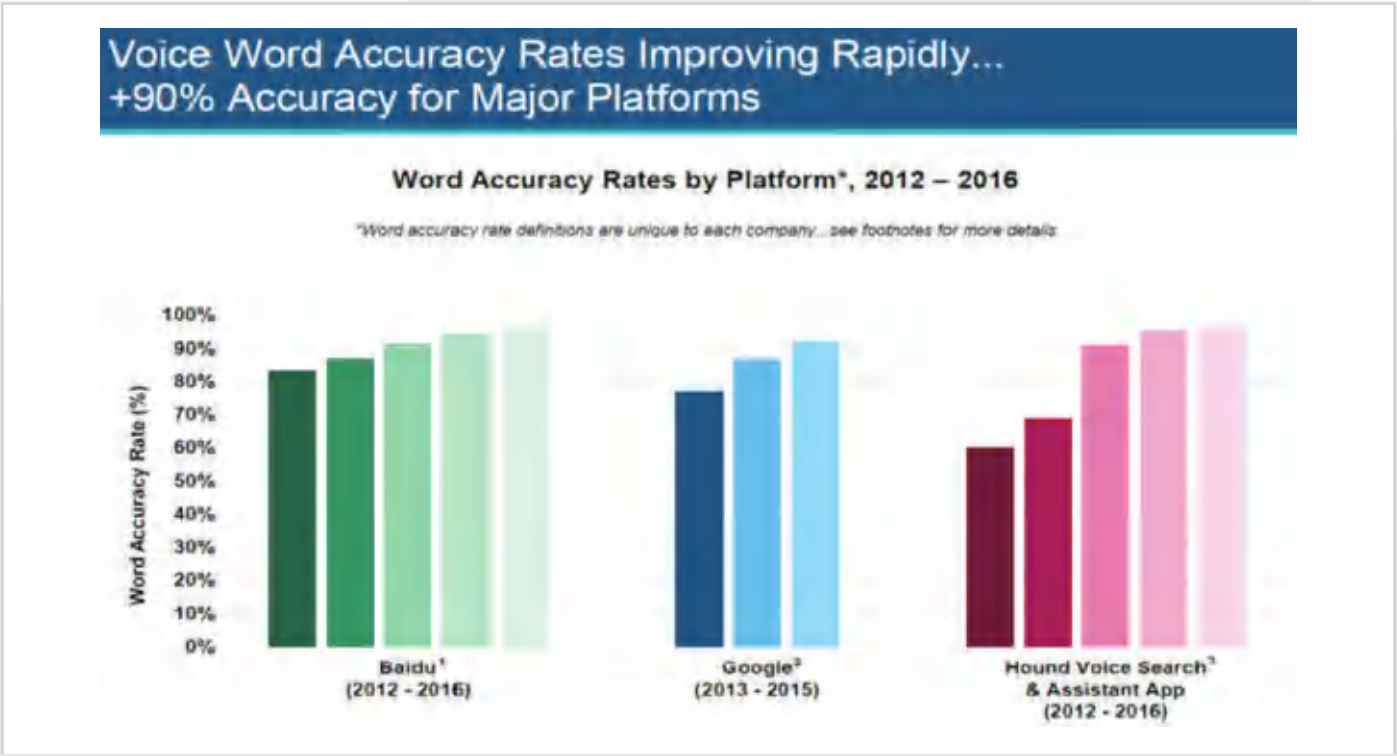

Figure 7 - Voice Word Accuracy Rate

3.2 Semantic Quality (Web Score)

For search by Voice, singular word mistakes don't really impact the final SERP listings. For instance, removing words like "in" or "of" for the most part don't change the SERPs. Likewise, misrecognition of from the plural kind of a term lacking "s" would also not shift the SERP entries. An excellent recogniser includes an increased web score. The web score provides much clearer image of what an individual encounters if they search by speech.

3.3 Perplexity (PPL)

Perplexity is really a degree of how big is the assortment of words that may be perceived next, provided at a prior perceived words within the query. Thus giving a approximate amount of the standard from the language model. The low the perplexity, the higher the model reaches anticipating the next word.

3.4 Latency

Latency means, the full total period (in minutes) it needs to execute a search distribution by speech. SERP's seem within the display screen. Numerous factors contribute to latency as recognized by a person:

(a) Time, it needs the device to find end-of-speech
(b) The total time needed to understand the spoken query
(c) Plenty of time it requires to supply the SERPs in the net browser of the user's phone.

Figure 8 - Use of Voice Search (Age Wise)

4. Latest updates in Google search algorithms

4.1 Fred :

Introduced in 2017. Fred targets websites that violet Google's guidelines. Almost all effected sites are often personal websites with low quality content that appears to be created mainly for generating marketing revenue.Google Fred is an algorithm upgrade that focuses on nullifying black-hat methods linked with aggressive monetization. This consist of an overload on the advertisement, low-value materials, and little included user benefits.

4.2 Possum :

Released in 2016. The Possum upgrade ensured that nearby results vary even more with regards to the searcher's area. Possum also led to greater range among results rating for virtually identical questions, like "dental professional Denver" and "dental professional Denver Co." oddly enough, Possum also offered a lift to businesses situated outside the actual city area. The main reason for Possum would be to diversify the neighbourhood results and stop preventing spam from rating as well.

4.3 RankBrain :

Introduced in 2015. This is a section of Google's Hummingbird algorithm. This is a machine learning program that helps recognize that this is behind questions and function best matching SERPs in reaction to those questions. Pre-Rank brain, Google employed its fundamental algorithm

4.4 The Hummingbird Update :

In 2013, search engine Google launched a significant algorithm update- it started taking into consideration the user intention and contextual significance of queries.

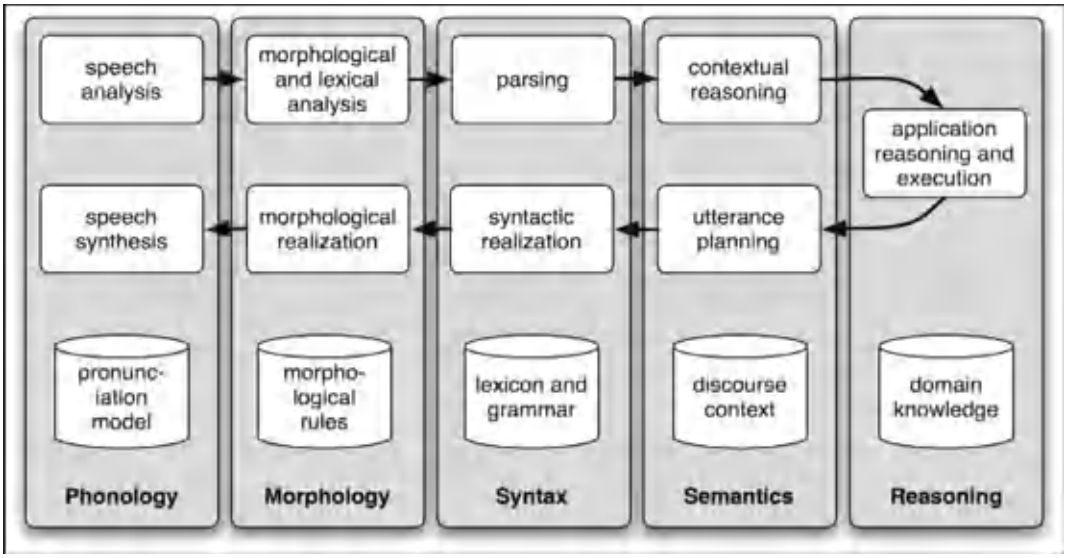

Figure 9 - Humming Bird Update

5. Searches made over voice

Trends display that local research among voice search users is increasing. Within a year, 58% of customers have found a business using speech search. What could be even more fascinating is the fact that 46% of these using voice search can look for an area on a regular basis.

According to search engine Google, search for "business close to me" have increased dramatically within the last couple of years. This upsurge in local voice lookup is a great to report for a local company. Since 2015, cellular searches surpassed desktop queries. The upsurge in mobile searching is among the driving cause of the development of local research. This has centred on retailers and entrepreneurs to fine-tune their attempts to capitalize on increasing hyperlocal queries. Finely targeted advertisements can look to customers who research locally, actually to a precise geographic section of just a one-stop radius

6. Five ways to optimise a website for voice search

Step 1: Register the business on online listings (if it is a local business)

Local online business listings generally carry a link to the local businesses' website, and this link not only helps more people find nearby businesses, but it also works as an authoritative SERP ranking signal to the businesses' website.

Step 2: Increase page-loading speed

Page loading time has been a ranking factor for quite some time now, and it is going to matter even more in the future.There are many ways to make sure that the website's page loading time remains low. These are:

- Optimize the images of your website
- Minify the HTML, CSS and JavaScript on the webpage
- Use a Content Delivery Network to "allot solutions spatially in respect to end-users to give high accessibility and operation"

Google has an algorithm called Page Speed Insights to help web developers and SEO-ers measure their website loading duration and diminish it for better performance.

Step 3: Using long-tail SEO

Utilizing long-tail SEO as a scene for improving for voice search is a champion among the best strategies for preparing for the period of wearable tech and voice search. This is essentially inferable from two reasons:

- Around half of the searches made through voice are out and out longer than manual text content searches.

- The crucial premise of utilizing smart assistants is to show up answer-like reactions for searches, and highlights, for example, Google's Featured Snippets. Utilizing long-tail SEO enables a user to upgrade for highlighted snippets, sending him/her straightforwardly to the top of the SERP.

To take on the voice-driven world, creating content

streamlined for long-tail keywords should be a vital piece of the SEO plan.

Step 4: Create more local content

Research demonstrates that 22% of voice search inquiries are for nearby businesses. Despite the fact that it would help enormously, businesses not necessarily should be a local business fundamentally for the owner to create local content. Proprietors can create local content that can drive significant traffic to their website dependent on the type of business to which they belong.

Step 5: Use a Structured data mark

Voice search results depend crucially on things like Snippets and business postings to appear quick results to searchers. This is exclusively attributable to the way that these kinds of data are accessible as immediate reactions to user queries over the voice search.

Something that works likewise to give accurate and quality information to searchers about a site or a business is structured data markup. Organized information on schema.org was a joint movement by all the top search engines to empower sites to give useful search results and more information to searchers. Structured data enables you to get more information about occasions, menus, prices, and so forth from a business straightforwardly on SERPs, enabling them to utilize this data at whatever point users need it.

Structured data helps search engines read and present information about the website in a much quicker and more efficient manner, so it is a win-win for both the business and the searcher.

7. Conclusion

For decades, internet and mobile customers used to style a text message and click a button to get what they want or even talk after pushing a microphone key. This was a legitimate good method before but with the serious modifications in the folk and having less time, this cannot be considered a useful way. The launch of more technical mobile devices, fast access to extremely precise or excellent and a strong server side services cloud processing manufactured travelling having a laptop possible. Convenient talk is often a natural inclusion and a very fresh solution to look for the net.

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Blockchain Regulatory Framework In Financial Industry

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Abstract

Cryptocurrency regulation is one in all the foremost digital revolution for widespread, world adoption. There are several approaches for every region, but there are 3 major approaches being taken: permissive, contentious, and hostile. Throughout the financial services industry, the puffery surrounding the Distributed ledger and Blockchain technology has grown at an exponential measure, stimulating pursuits on potential application domains of this technology. Ongoing research reflected several use cases, which are feasible executions of this technology, thus having the inherent potential to revolutionize the financial industry.

Until now, few use cases that have been implemented are as follows:
Fraud detection, KYC, Smart contracts.

These potential use cases, although will bring a huge advantage to the financial industry, a lot of legal precariousness comes with the mass implementation of this technology. The purpose of this paper is to understand the current regulatory framework concerning Blockchain technology and its potential use cases around the world and India. In this research paper, we will be covering the Blockchain regulatory frameworks of Germany, Switzerland, Philippines, Malta & India.

Keywords

Blockchain, Regulations, Cryptocurrency, ICO, Regulatory framework

1. Blockchain framework of Germany

The views of the German government on cryptocurrencies is very irresolute. On one hand, it is very well versed that the digital age is progressing and to support these developments, has made very detailed agendas. On the other hand, there is a major concern that the government is more bent towards investor protection in the context of cryptocurrencies.

2. Cryptocurrency Regulation

The government doesn't offer any prohibitions relating to supply, mining, possession, and commercialism of cryptocurrencies. The Federal monetary higher-up Authority for European country "BaFin" issued cryptocurrencies as monetary instruments in 2013 in step with Sec.1(11) of the German Banking Act, creating it a subcategory of "units of accounts", that falls beneath the particular national class of economic instruments however not supported EU laws. In 2013, BaFin issued cryptocurrency steering in context to the growing gravity of bitcoins, stating that the cryptocurrencies don't usually qualify as a superintended e-money since there's no central e-money institution, and if there's a central institution, AN assessment ought to be applied in step with the terms and conditions of German e-money. The German Payment Services oversight Act, states that e-money may be a price that may be accumulated electronically additionally as magnetically and might be thought of as a tender or claimed against the institution that is issued reciprocally of payment of funds so as to form payment transactions at intervals the that means of Sec .675f(4), initial sentence of the German Civil code and which can be welcome by a natural or legal person apart from the institution.
When it involves industrial dealings in cryptocurrencies, it wants licensing needs beneath monetary higher-up law, according to the German Banking Act. In Sec 32(1) of the German Banking Act, anyone World Health Organization needs to conduct industrial dealings should take authorization from BaFin.

The following points ought to be considered:

Even though the cryptocurrencies area unit thought-about as a financial instrument below German Banking Act, they are not thought-about as a financial instrument below the German Securities Commerce Act.

To perceive whether or not or not a cryptocurrency qualifies as a security, the rights connected to it got tobe thought-about and whether or not or not it's exchangeable ornot, which couldbe assumed if they are listed.

If the currency is classed as a security and a token sale Initial Coin providing (ICO) is procurable toelevate capital, then associate assessment got to be admisistrated to know whether otnot or not these tokens represent units or shareatintervals the investment of funds under the national capital Investment Code

Figure 1 – Key Points of the German Banking Act

To summarize, for the commerce of cryptocurrencies, authorization from BaFin is needed, that serves the aim of client security as BaFin monitors commerce. However, if you purchase one bitcoin or if an organization purchases it, the client won't be under scrutinization, provided that there's regular commerce of cryptocurrencies, then the sole authorization is needed. In alternative EU countries, no authorization is needed for commerce that inculcates additional risks related to it because it isn't supervised. As a result of it, the cryptocurrency city district is additionally developed in abroad countries, as an example, there are exchanges and Bitcoin ATM's in larger cities or issue of ICO in a very 'de jure' compliant method. When it involves the safety side of the cryptocurrencies, the rules in European country and also the EU are similar (Fintech Futures, 2018).

3. Blockchain Framework of Switzerland:

The Swiss federal government and Swiss financial market supervisory authority (FINMA) acknowledge the potential within the Blockchain/ distributed ledger and currently European nation has become the world epicenter of Blockchain application. Switzerland has deployed Blockchain first in the largest and most diverse sector in the world. In fact, it should not come as a shock that Swiss bank was the first in the world that offered business accounts to the cryptocurrency companies. SIX Group, the parent company of Switzerland's stock exchange is relying on digital ledger and Blockchain for building trading infrastructure for digital assets.

Apart from banking Switzerland has, deployed Blockchain is deployed in insurance companies like Swiss RE and Zurich Insurance to counter fraud and improve its operational efficiency. For the improvement purpose of accuracy of medicine delivery, they used Blockchain technology and also deployed smart contracts among its variety of treatment with which they have the best healthcare system in Europe (Cryptotapas,2019).

Building a framework on the principle of bottom-up with Federal Council bases its approach to Blockchain on predestined core principles (Huschke& Henkelmann, 2019).

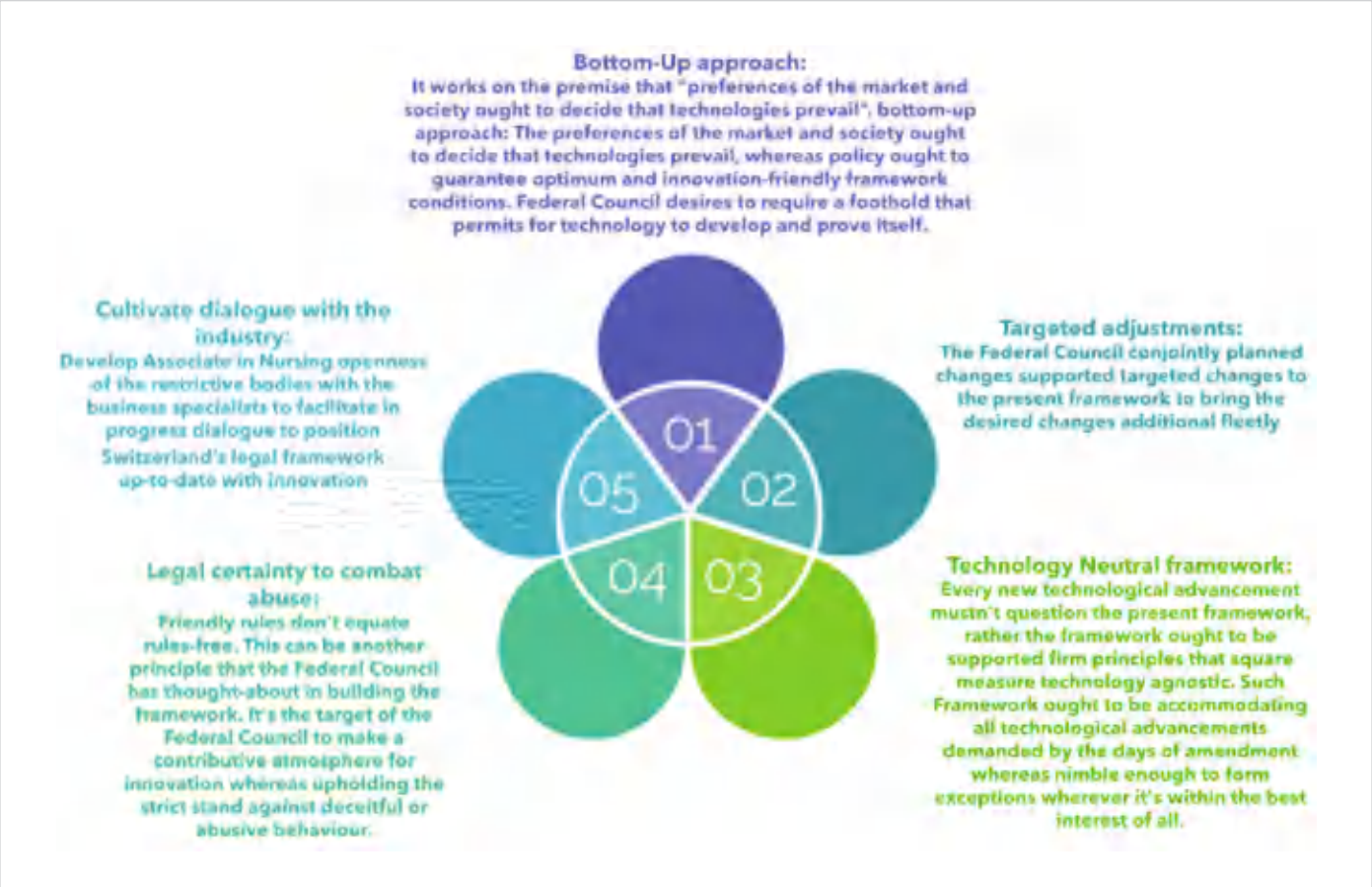

Figure 2 – Blockchain Framework

4. Blockchain framework of Philippines

The Blockchain is that new child within the city that has taken the planet by storm. Being a decade previous, this technology has incised a distinct segment for itself and has discontinuous the majority the business verticals. Bitcoin had arranged the inspiration for a replacement era of digital cash dealing. 2009 once the planet saw Bitcoin emergence, it absolutely was constant year after we need to understand Blockchain that was the underlying technology of Bitcoin and alternative cryptocurrencies. From attention to finance to produce chain management, Blockchain finds application all over.

Philippines hasrecentlyannounced a cryptocurrency conditional framework through the CagayanEconomic ZoneAuthority(CEZA)inassociationwithAsiaBlockchain & CryptoAssociation (ABACA) transformingitselfinto the self-bureaucraticentity to administer the newlaws. The predominantpurpose of this framework is to act as investor/capitalist/stockholder etc., assurance, possession of cryptoreserves,including a digital token of cryptocurrency which is assigned to finance the growth of cryptocurrency &, security tokens.

As declared in the announcement, Digital Asset Tokens Offering (DATOs) are being incorporated within the framework.It should have appropriatedocuments that include the attributes of the issuer& the project. There should even be related recommendation and corroboration from consultants, and also the DATOs should be registered on the authorized Offshore Virtual Currency Exchange. The framework caters for 3 tiers of finances and assets with everydivisionbeingsubjectedto variouslevels of regulation.

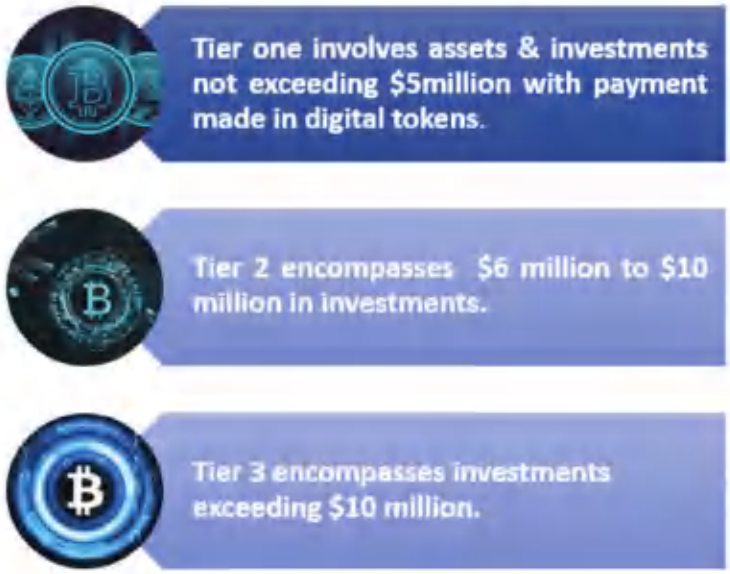

Figure 3 – 3 Tier Framework of Finance and Assets

The subject of Initial Currency Offerings is quite prevalent within the Philippines, that in June of last year, they were explicitly fabricating rules & regulations to protect individuals investing in cryptocurrency. CEZA would limit the quantity of ICO licenses issued to twenty five (Pollock, 2019). All DATO participants should even have confirmed arrangements with commissioned billfold suppliers and custodians. CEZA must approve billfold suppliers and insures digital plus custodians. This way, the regulator will change correct storage and capitalist protection (Hofer, 2019).

Figure 4 – The Phillippines' DATO Regulations

5. Blockchain framework of Malta

Malta is thought as the world's first Blockchain Island. Malta is the first country within the world to produce an official set of laws for operators within the Blockchain, cryptocurrency and DLT house. The laws are based upon three basic principles (Wolfson, The

Figure 5 – 3 basic principles (Blockchain framework of Malta)

act essentially covers three core concepts:

The Malata Digital Innovation Authority (MDIA) Act (Chapter 591 of the Laws of Malta) covers the establishment of a regulatory authority, called the Malta Digital Innovation Authority (MDIA), dedicated towards the supervision and certification of DLT platforms and smart contacts, which are referred to as technology arrangements under the said Act.

The Innovation Technology Arrangements and Services (ITAS) Act(Chapter 592of the Laws of Malta) covers the setting-up of registration & certification mechanism for any technology arrangements which voluntarily decide to register themselves as such, which technology arrangements shall be certified by approved Systems Auditors.

The Vertual Financials Assets (VFA) Act (Chapter 590 of the Laws of Malta) lays out a financial instruments test for all so-called DLT assets, ergo cryptocurrencies, and determine whether such DLT assets fall under existing Maltese and / or EU regulation, therefor potentially havingthem classified as financial instruments or e-money, whether it classifies as a virtual token, ergo a pure utility token, meaning it would fall outside the scope of any applicable legislation, or a new forth category, that of virtual financial assets, which would be caught under the aforementioned VFA Act.

Figure 6 – Core Concepts of MDIA

This three-pronged method locations Malta in a totally favorable positionwhencompared to itsfriends, basically due to the advent of the MDIA, that is the primaryregulatoryauthority of its type within the world. The MDIA serves as a seal of great for any DLT-basedplatforms or packages, keeping apart the wheat from the chaff. System auditorsneed not be primarilybased in Malta and mayfunctionthrough resident marketers, whichmeans that the doors are open for all people with a legitimateinterest in assisting the regulatory framework masking DLT-primarilybasedprojects (Wolfson, 2018).

6. Blockchain framework of India

In 2013, cryptocurrencies commenced gaining popularity while small-scale establishments started out receiving bitcoin as a shape of charge. From then, the underlying era of cryptocurrency has grown into a method of investments. The reserve bank of India released its first regulatory reaction within the context of cryptocurrencies on December 24, 2013("press word 1"). It did not sanction, neither has it prohibited the usage of cryptocurrency however the press notices 1 turned into a caution to customers, holders & investors of Cryptocurrency & the dangers related to it (Ramanathan, Tiwari&Rautray, 2019).

In accession to the press note 1, the RBI launched two other press notes on February 1, 2017("press be aware 2") & December 5, 2017(" press word 3") & illuminated in detail that it has no longer provided any license or sanction to negotiate with cryptocurrency.

Below the prevailing framework enacted by means of the Indian parliament, there is no sanction for cryptocurrencies as criminal smooth. The present structure consists of two regulations that the Indian parliament has enacted:

(i) Reserve Bank of India act,1934("RBI act") regulating inter alias banknotes
(ii) Coinage act,2011("coinage act") regulating coins, & these are the most effective enactments that outline & apprehend prison smooth.

7. Conclusion

Blockchain always had the contradiction between the trust less technology and the trust needing technology the business leaders and the common man are slow to adopt the blockchain based system because they fear of expensive charges from the government for the blockchain based system. But blockchain is the new architecture of the trust. After going through the

regulations of various countries we have narrowed down to a suggestion that a decentralized monitoring body for the blockchain can be build which can coin the rules and regulations globally. Also, blockchain can be used in managing the identities of citizens. Blockchain regulation should be focused on the entities that interact with blockchain technology and they operate o blockchain network. Regulation on this level should not be much different from non-blockchain service.

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Disruption: cause of chaos or opportunities

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Abstract

Businesses are said to possess stochastic nature. But, Evolutionary Theory in Business depicts a continuously changing business environment. Normally, the smaller firms struggle to keep up with the continuous changes happening in the market whereas, the established firms not so much. The study offers rich typologies to distinguish between technological innovations that could increase the performance and could give an edge over the competitors; by differentiating between sustaining and disruptive innovations. Established firms usually have a financial edge while implementing these technological disruptions, but might lack the ease of implementation the smaller ones portray, due to the complex hierarchy or network structure that is followed.

Keywords

AI, IoT, Cloud computing, business models, innovations.

1. Introduction

In the last few years, everyone did get an opportunity to witness the growth of many varied user-driven applications. These applications normally consists of blogs, search engines, auction Web sites podcasts, wikis, social networking Web sites, games, and VoIP along with peer-to-peer services.

Technologies or social computing or any means of or forms of technology that is internet based, exploit the connectivity dimension. The purpose is to provide support to the network for both people as well as the content.

Below are the few most disruptive technologies in the current Industry 4.0:

1) Artificial Intelligence: Intelligence demonstrated by computers or machines for various decision making.
2) IOT: The internet connectivity extended to physical and everyday objects apart from the computers.
3) Robotics: The ability of human-like machines or in other words robots that have enhanced dexterity, senses, and intelligence.
4) Block chain Technology: It is a growing list of records or distributed ledger records known as blocks which are linked using cryptography.
5) Autonomous Vehicles: Automated (Performance of actions without or with minimal efforts) cars or drones.
6) Virtual Reality: Computer generated image in 3-dimension or creation of a virtual environment.

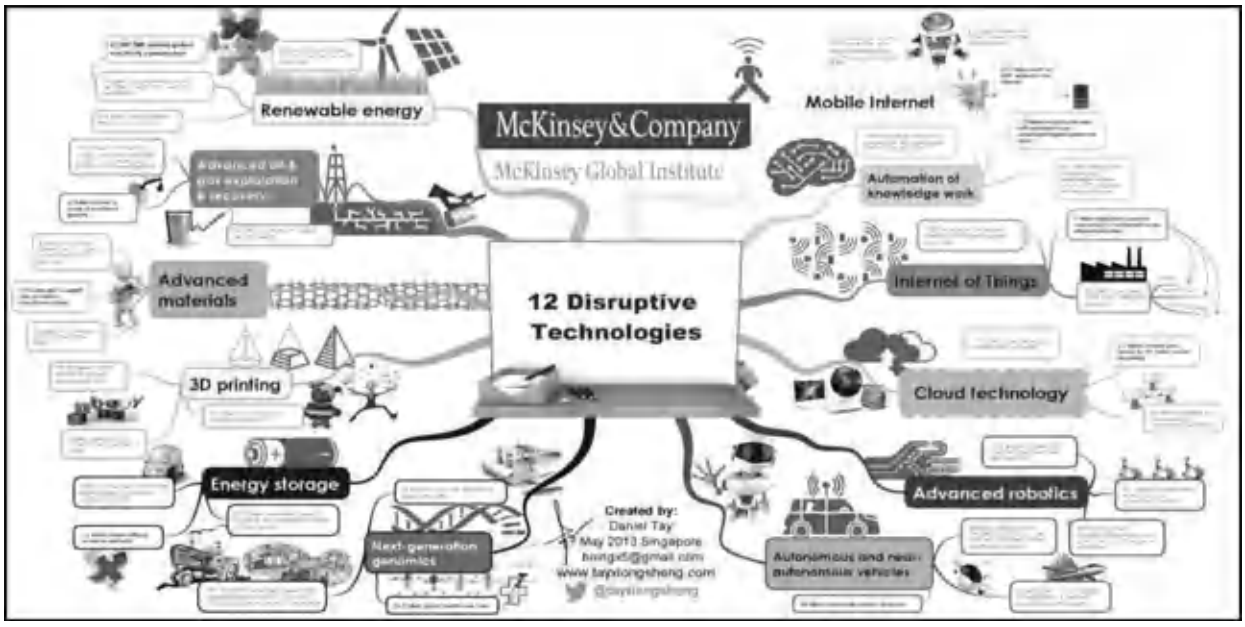

Figure 1 – Disruptive Technologies (Industry 4.0)

The main question here arises that, if we are aware of disruption, then why do successful products or companies get disrupted? As we can see in the above figure McKinsey & Company analyse the reach and scope and economic impact and disruption of rapidly growing technology areas. A few of the potentially or possibly disruptive technologies economically are the Mobile Manufacturing industry, the Automation Industry, Internet Services, IOT or Connected devices, the Cloud Services platform, Advanced robotics engineering, Next generation Genomics, the Renewable Energy storage, Autonomous or/and near-autonomous vehicles, 3D printing, Advanced materials and its science, advanced oil and gas exploration and recovery. [4]Around 30% of the web browsing and 40% of social media use is done on mobile phones, the mobile internet as well contain many applications for private as well as for public sectors, helping them to deliver more efficient services.

Just as the overflow of information and continuous request for user attention, can interrupt, is a normal occurrence in the computing environment; Innovation as well as disruptions are as well said to be the trademarks of the ICT world. [6]The pace of innovation is at an exponentially fast rate with new things being discovered daily. These disruptive innovations have caused a high ripple in the existing business models and hence, the paper focuses on what kind of disruptions affect the market and how the organizations take decisions accordingly. Therefore, it will be interesting to find whether these Disruptions will cause Chaos or open new doors of Opportunities.

2. What is a business model?

A business model is a plan for successful operation to create value for the organization by generating revenue, capturing the intended customer base and the market as a whole. It usually starts with the discovery of value propositions for a customer corresponding to a specific market segment, by configuring a value network for the creation and delivery of service to the consumer. The next aspect of a business model is the strategy. The strategy is associated with how an organization should be able to sustain a competitive advantage over its peers in the market or its rivals. The last component of the business model is important for a top level perspective and that is a revenue model. It deals with the firms' cost structure, pricing strategy and the margin levels of how much amount can a customer be charged.

The emergence of the disruptive business model rests on these dimensions and a few key assumptions. The first assumption is the managers' initial hypothesis of constant market experimentation and learning. The second assumption is path dependent which means, once an entrant firm begins to grow exponentially; the interwoven capabilities, incentive model, cognition and within the niche market potentially acquires the power to disrupt the mainstream market. Also, if the conditions is amplified then, asymmetric revenue models between the entrant and incumbent, entrants can gain what is said to be the first mover advantage.

It leads to the concept called the Blue Ocean Strategy. The existing markets try to sustain and compete in the existing market making it bloody; hence the name Red Ocean. To break the existing competition and create a new market in order to create value to the organization we adopt the Blue Ocean strategy.76.6% of companies are generally average or above average in terms of adopting digital transformations. However, the sad news is, about 25% of the companies think that digital disruptions are a threat to their survival.

Figure 2 – Wheel of Disruption

3. Cloud has "commoditized" almost everything!

David Linthicum (mention the year) in his study has mentioned about cloud computing is, the model that it follows and how it can be converged in an enterprise step wise. Time sharing model is the disruptive model from which Cloud computing takes its form. Time sharing model was leveraged many years ago. It was at the time even before we could afford our own personal computers. The idea is nothing but, to share computing power. It can be shared among many companies and people. The main objective behind it was to reduce the cost of computing power for people or organisations who make use of it. The main idea behind the model was to keep the core value of cloud computing intact

but also to make use of resources these days much better and cost-effectiveness is an added.

It is been predicted by a Forbes article that by 2020, 50% of the U.S. workforce will be freelancers, in some capacity or the other. As ICT industries are reinventing themselves; several different forces are converging and conquering the most stable revenue streams. The primary factor is the commoditization, as mentioned in the time sharing example above, of the IT services which is driven by hyper-scale data centre players, which provide cloud services to the enterprises and tech services across the globe. [11] With this advancement in the technology, the local business is suddenly able to access the services, infrastructure at the click of a button. Tomorrows winning ICT players will be those who will implement this technology to the local markets and change their clients business for the generation. This said model; for Information, Communication and Technology businesses will definitely shift as we move ahead into the digital future and will harness the flexibility of the economy famously known as the so-called 'gig economy'. Gig economy is rapidly moving more towards independent professionals. These independent professionals are using technology to create ecosystems of work they enjoy. Disruptive technologies will affect every business, including technology players themselves.

Cloud technology has placed itself at the very core of Disruptions in the ICT Business domain. Cloud computing follows what is known as the sharing model. Cloud technology can be coined to be a disruptive innovation. [14]Christensen defines "disruptive innovation" as "a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up the market, eventually displacing the established competitors".

4. What is Sharing Business Model?

Let us consider two sides; the supply side and the demand side. On the supply side, the company have an asset that can be monetized, this asset becomes a point of monetary leverage for them. While on the other hand at the demand side customers are willing to consume this asset. So, instead of giving this asset (which is quite expensive and not affordable to the demand or the customer's side to buy it) they share this asset amongst a number of interested users and generate monetary value to the asset.

According to Forbes (2018 survey), 77% enterprises have at least one or more data storage infrastructure, application, service or product of their enterprise computing infrastructure on the cloud. 30% of all IT budgets are allocated to cloud computing for the year 2018. Major investments were made in SaaS which was about 48% of the total investment followed by IaaS which was about 30% and lastly PaaS which was about 21%.

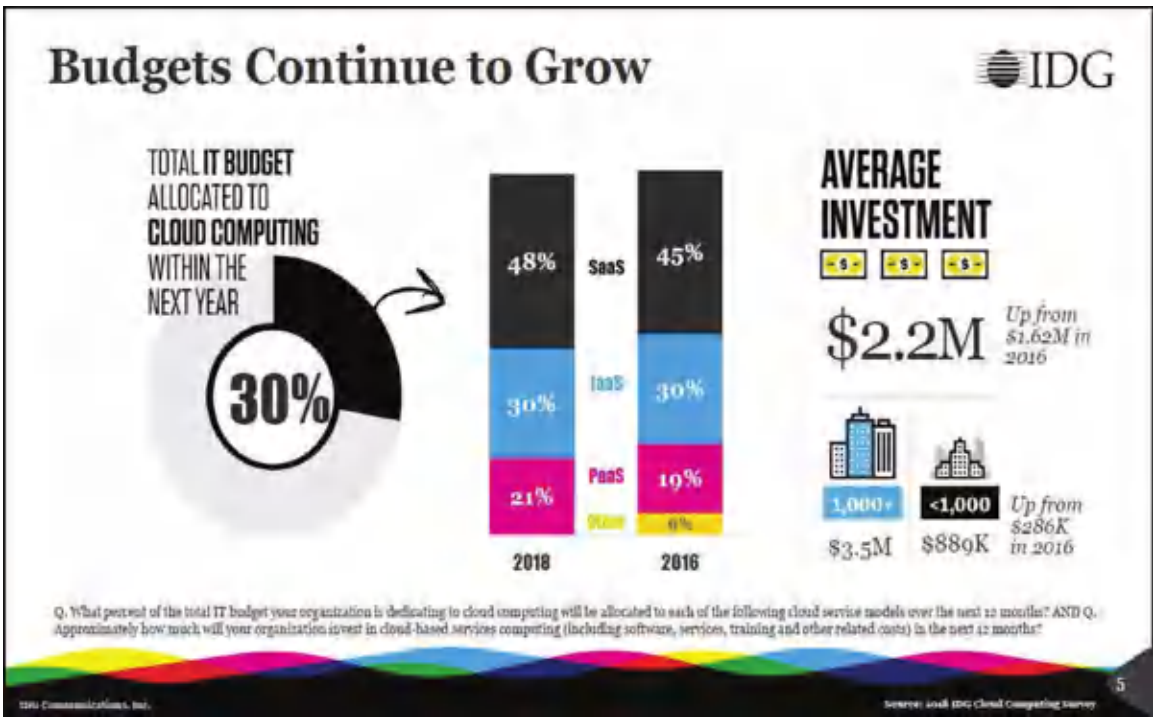

Figure 3 – Budget Allocation for Cloud Computing

Benefits of Cloud is more than reach which makes it a big disruption. It forms the basis for all other disruptions in the ICT business.Cloud computing has four varied flavours of services that it offers:

1) IAAS: Infrastructure as a Service – Provision of raw utilisation of infrastructure like the computing power or electronic storage resources or services on the cloud platform.

2) PAAS: Platform as a Service – Provision of tools and environment to operate or in most cases to build cloud services and applications.

3) SAAS: Software as a Service – Provision of using Software on the internet and private network in an organisation; and

4) BAAS: Business as a Service – It mainly consists of application functionality paired with human intelligence that is necessary to perform a broad group of business activities. Normally, the main module of activities are performed in a broader set of business processes.

In fact, the disruption caused by the cloud was the major driver for the digital disruption in the industry. It carved the way for all the modern-day technologies like Big Data by providing ways in the form of cloud storage.Cloud caused disruption in the digitally driven industry. It changed the way businesses happen. It caused huge chaos in the way businesses function. But, having said that, cloud revolutionised the very core and means businesses function. All thanks to Cloud technology, no business is digitally untouched. It surely is an innovation that caused chaos.

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Digital Transformation: reshaping the future of gaming industry

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Abstract

Over the past decade, many digital companies have emerged and quickened the tempo of the business by providing enhanced customer experience and more often disrupted the entire industry business model. For the traditional Business Enterprises, Digital transformation across the multiple aspects in the business will not only provide exceptional opportunities for value creation and capture the market, but also represents a source of risk. The factors that are sources for risk include the pace of change in customer expectations, outdated regulations and many more. Therefore, the Business Process Management in the enterprises has opened the search of new business models, rethinking the operational model, revamping the digital talent and skills, and giving importance to monitoring the digital traction metrics.

The objective of this article is to study how digital transformation has evolved in the gaming industry, how the mobile gaming application market has been dominating and the challenges faced by the console manufacturers. The article explores the digital transformations and disruptions that have taken place in the gaming industry. In addition, the article highlights how technology has influenced the gaming industry, and how the Mobile gaming application market has changed the face of console gaming. This article has implications for the managers in the gaming industry by helping them understand the dynamics of the gaming industry and the technologies that will make the future of gaming even brighter.

Keywords

Digital Transformation, Mobile gaming, Console gaming, Global Gaming Industry, Cloud Gaming, Augmented Reality, Google Stadia.

1. Introduction

The global gaming market value has risen to $137.9 billion in 2018 with an increase of around 13.3% from 2017, according to Newzoo market analysis (Kyle Orland, 2018).It is also observed that the revenue grew by over 10% and mobile gaming accounts for to $63.2 billion, of almost 47% of the total revenue generated. In the mobile gaming sector, smartphones and tablets accounted for $50 billion (14.2%) and $11.4 billion (7.8%) respectively. Personal Computer (PC) and Console sectors saw the year-on-year revenue growth of 3.2% and 15.2%, which accounted for $33.4 billion and $38.3 billion respectively in the year 2018(James Batchelor, 2018).The fig-1 shown below depicts the revenue generated in the global gaming Industry along with the year-on-year (Y-o-Y) growth rate based on device segment.Fig-2 depicts the global gaming market revenue along with the year-on-year (Y-o-Y) growth rate that is segmented into Asia-Pacific (APAC), North America, Latin America, and Europe, Middle-East and Africa.

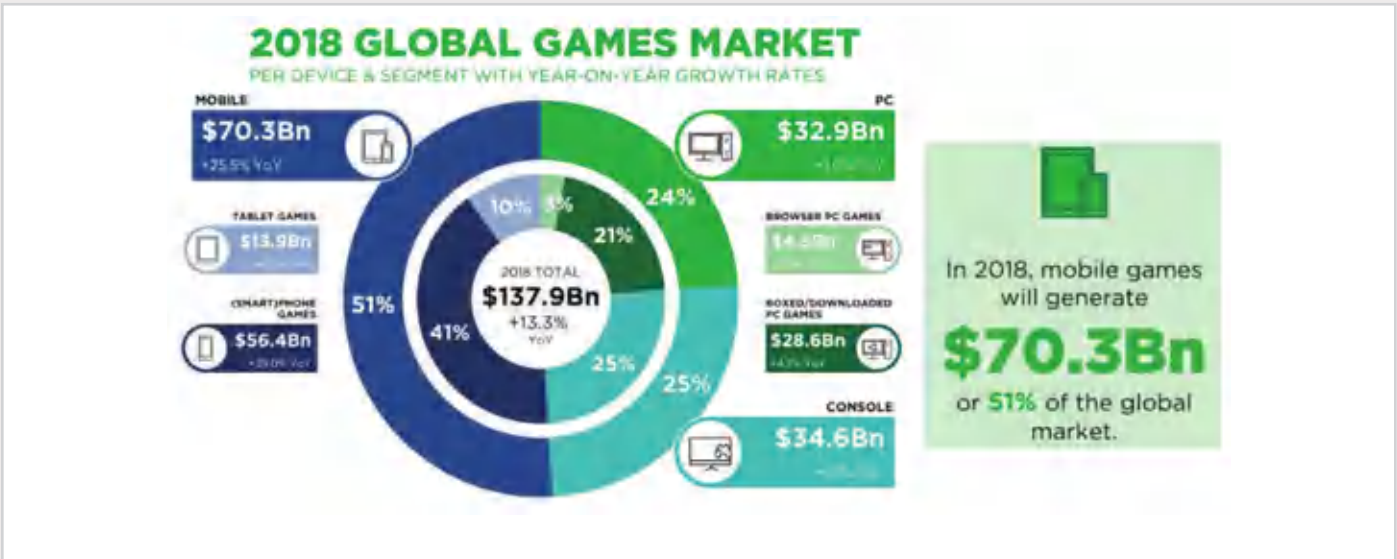

Figure 1 - Global gaming Market revenue in 2018 segmented into device(Kyle Orland, 2018)

Figure 2 - Global gaming Market revenue in 2018 segmented into regions(Kyle Orland, 2018)

2. Digital Apocalypse in the Gaming Industry

In the past two decades, the gaming industry took forward a giant leap with the advancement in technology. The video games experience has seen a massive change and is much better now than what is experienced two decades ago. Few technology advancements in the video gaming market are mentioned below

2.1 3D Design Software: More Realistic Graphics

Earlier the video games were two-dimensional and the gamers could move the character only in fur direction (Upward, downward, forward, and backward). Later with the improved three-dimensional designing capabilities, the games are more dynamic and are built in an impressive looking world. In addition, more pixelated and realistic graphics have added realistic animations to the game that draws the gamers in.

2.2 Faster Internet: Real-time, multiplayer games

Online gaming has given a completely different experience to the gamers It has enabled the gamers to engage and play with fellow gamers online irrespective of the geographical location and transforms gaming into a social outlet by connecting millions of subscribers, who take part in the game.

2.3 Artificial Intelligence: Improved Gaming Experience

Although Artificial Intelligence (AI) has been part of gaming design since its inception (where the human is playing against the computer), but the moves were quite predictable and basic. However, today's AI is getting more intelligent, is far more craftier and uses the same strategies that human opponents think. This makes the games lot more challenging than before and AI is continuing to get smarter as it progresses. At present, AI technology is more focussed on creating and improving bots, which are capable of learning by playing versions of itself in preparation.

2.4 AR, VR, and MR: The future of Gaming

Virtual Reality (VR) is the latest form of technology transforming the face of the video gaming market. VR not only allows the gamers to interact with the characters in the game but also enhances the experience of the feel of traveling and becoming part of the action onscreen. According to Nielsen Games 360 US report 2018, it is observed that 66% of gamers are aware of AR/VR gaming devices (Nielsen Holdings United States, 2017). Augmented Reality (AR) and Virtual Reality (VR) provides the most entertaining environment and improved user experience. It provides an appealing look at the games that make both the avid players and occasional gamers spend more time. Moreover, the digitally extended reality provides gamers with

attractive virtual objects and makes the players treat them as real. Mixed Reality (MR) is ushering in a golden age of gaming by providing an immersive virtual environment and enabling gamers to experience VR on their gadgets.

2.5 Blockchain:Redefining the future of gaming

Although its early days of the adoption of Blockchain technology in the gaming industry, using Blockchain for the digital identity can safeguard the login details for various games and can increase security. Blockchain can also help in integrating the virtual currencies into the gaming domain like enabling the developers to collect royalties for the items and other micro-transactions across the gaming ecosystem. Moreover, Blockchain benefits include tokenization of virtual goods or assets in the game, safe and secured storage of data related to the game.

3. Challenges faced by console gaming as an advent of Mobile gaming

Over the Decade, mobile phones have undergone many changes that made its processor more powerful and the RAM size has increased, which resulted in bringing the mobile phone close to PC. Moreover, mobile phones have increased in size and resolutions, which is enabling gamers to use mobile phones for playing instead of PC. However, one of the latest trending technology in video gaming is 4k technology, which allows the users to have an incredible experience with the number of pixels of more than 8 million. PC has an upper hand in the 4k display, as it requires enormous processing capacity and graphics cards that are achieved on only a few expensive handsets. In addition, the battery goes low twice as in normal condition when a 4k video is running in a handset. Although mobile phones and tablets made better use of AR and VR technologies due to its affordability, with 4k video streaming capability and massive eSports following the traditional PC and console gaming, PC and console market looks promising in the near future despite massive growth in the mobile platform.

4. Use cases for digital transformation in the Gaming Industry

4.1 Supercell using Amazon Web Services (AWS) for cloud-based gaming Infrastructure

Supercell, the Finnish company's four games (clash of clans, clash Royale, Boom Beach, and Hay Day) have around 100 million active players on iOS and Android devices in total every day. Supercell, one of the highest grossing gaming companies has made $1.4 billion revenue globally in the year 2018, as per Sensor Tower market analysis (Mike Minotti, 2019). It is to be noted that Supercell valued at $10 billion in the year 2016 with a profit of around $1 billion on sales of $2.5 billion in the same year, indicates a dip of revenue over past two years because of saturation(Reuters, 2017).

Supercell designed these games specifically for mobile phones and tablets. Supercell aimed at designing games that will be played for years, and focused on real-time online multiplayer games. Taking advantage of the booming smartphone industry and a surge in internet usage, they developed games with a different and interesting concept with lucrative 3D designs in the cloud-based platform.

Supercell utilized the services of Amazon web services not only for cloud gaming purpose (that were easy to use, powerful, and reliable), but also for the set of services that match the requirement for high gaming performance, scalability, and rapid growth. In addition, it provided an infrastructure for managing the data pipelines, web-based offerings, and an analytics platform.

4.2 Niantic's Pokémon Go – the most popular AR game

One of the reasons of Supercell games being saturated is the inception of Pokémon go in late 2016, which accrued more than 550 million installs and made revenues of $470 million in the first 80 days after its launch(Newzoo Games &Emmmsports Analytics and Market Research, n.d.).It is estimated that Pokémon go have made a revenue of $795 million globally in 2018, as per Sensor Tower market Intelligence reports. Pokémon go has also recorded a lifetime revenue of $2.2 billion since its launch in 2016 and is expected to continue its level of success in 2019 as well and surpass $3 billion mark of lifetime revenue this year(Stefanie Fogel, 2019).

Pokémon go has proved that Augmented reality (AR) can be applied in many ways that appeal to the mass audience. Niantic acquired the AR-based start-up, Escher Reality that enabled to build cross-platform and multi-user experience for the gamers. It enabled gamers across the globe to interact with each other and the superimposing of the virtual images created on the player's camera screen view of the real world has resulted in its resounding success.

4.3 Player Unknown's Battlegrounds (PUBG) – redefining 3D real-time replay technology

PUBG, the most prominent online game has dominated the Indian video game market. The growth in this kind of battle royal genre is majorly driven by the increasing smartphone penetration. PUBG has recorded over 200 million downloads excluding China by the end of the 2018 and PUBG mobile have seen over 100 million registered users within four months of its launch(Business Today, 2018).

PUBG is designed with a newly launched technology 3D replay that sounds minute has picked up a lot of traction and it leads the player to capture or view the video even after the player is dead in the game. It is enabled with the features of changing the speed of video and camera angle. These features are the main reasons that contributed significantly to the success of PUBG. However, ban on PUBG at various regions in recent times due to various factors like excessive addiction, might hamper its growth in the near future.

4.4 Google's Stadia – Cloud Gaming Venture of online streaming Game

Google is expected to flip the gaming industry with its new cloud gaming venture, which started as project streaming and is now shaped as Stadia. Stadia eliminates the need for equipment like consoles, time-consuming downloads and updates. Although Google is expected to launch Stadia anytime in 2019, it is already been called as Netflix of gaming. Stadia works just like Netflix as Google servers run the game and end the visual output in 4k and 8k resolution with 60 and 120 frames per second respectively, through the internet on the gamer's device. The gamer just have to choose a game from the collection of games available and can start playing it with one click instead of any downloads and updates. Google has teamed up with AMD for developing the advanced architecture of graphics and other features required for Stadia platform to support any device with intensive processing in its data centres.

5. Bottom Line

Although mobile gaming has disrupted the video gaming industry, as the majority of the gamers prefer portability, it is to be noted that console and mobile gaming still serve in different markets. Hard-core gamers still prefer the console and PC gaming to the mobile gaming for the technologies like gesture detection, motion sensing which is accurate with consoles. Although consoles provide high power, bigger display size with 4k video, enhanced storage, and many more features, Smartphones are also superior with the cloud gaming and alternatives that enhance the gaming experiences. Overall, the Gaming Industry is doing exceptionally well and is rapidly growing at a faster pace.

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Data-driven marketing: strategies, challenges & solutions

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Abstract

Data is to the present century what oil was to the last one: a driver of growth and revolution. Massive flow of data has led to creation of new infrastructure, new businesses, new monopolies and even new economics. Even the marketers today are using this very unique resource. Data driven market research gives marketers useful insights of the customer's buying behaviour. Studying and analysing the data helps the companies understand the customer and accordingly alter their marketing and sales strategies to fulfil the needs, wants and expectations of the customers. Marketers are currently assembling information at each bit point to higher perceive their audiences, interpret that data to predict future behaviours and make real-time marketing decisions. This paper is an attempt to study and deeply understand what is data driven marketing is including the tools used, the challenges that come up and solutions to those challenges in the Telecom industry.

Keywords

Data driven marketing, Telecom industry, Mobile network operator, Google analytics, trigger marketing.

1. Introduction

It is safe to say that data driven marketing is top of the mind of the brands and companies. According to Forbes survey 70% of the senior marketing suggests that data driven marketing is core element for most of the campaigns executed. [1] The full significance given to data and analytics shows that several business insiders have realised how quickly brands and agencies have recognized the potential of quantifiable data over non-current gut feel. In another study it was found that senior marketing executives rely on advanced analytics to increase sales, garner new customer attraction and expand brand awareness. General marketing campaigns surely give out a large response which also help bring large number of buyers. But it also comes with a redundant waste. Whereas data driven marketing helps us get a targeted result which helps the companies in knowing their customers better and helps improvise the content creation and measurement.

While most brands rely on heavy amount of data for marketing there still arises a question of how well the organizations achieve their business goals, wisely spend on marketing whilst also getting desired results to fight the growing cut throat competition in order to sustain and remain as leaders in the market. If we narrow down to a specific industry, consider telecom where the sustainability is difficult and is fiercely competitive, marketing departments have the responsibility of creating proactive strategies so as to enhance customer experience. Marketing activities such as customer engagement, brand awareness and campaigns should be extremely agile and responsive to the ever changing market scenarios. The objective of the paper is to study various tools for data driven marketing and giving out cost effective solutions to the marketing departments to get a competitive advantage to excel within the field of telecom.

2. Elements in data driven marketing

To understand data driven marketing one needs to understand the fundamentals it runs on. There are two types of data in marketing:
a) Contact information
b) Performance metric

• Data-driven marketing dependent on contact information requires keeping a track of individuals to persuade them to buy. Keeping track of a person is becoming very prevalent on the digital platforms, making marketing actions distinct among plethora.

One of the prevailing instance of this type of Marketing is the Marketing Automation. It refers to technology platforms formulated for managing the marketing processes across various channels.

The other one is Marketing Attribution, which involves analysing the touch points that customer engaged with before purchasing. These touch points can be anything from email to television commercial. It is a very useful but complex process that requires defining value of each marketing channel through buying process.

Data driven strategies considering contact information have the advantage of deep level of detailing, but faces the problem of measurability. However, Personalization and customer experience optimization also form an

advantage.

• Data-driven marketing dependent on performance metrics requires analysing investments made and returns derived from marketing initiatives to optimise results.Performance marketing, quantitative marketing, media mix modelling – these practices fall under performance metrics. .
• Performance marketing is simply studying what actually works and what does not, to have desired results.
• Quantitative marketing refers to actions that require statistics to have the desired marketing responses depending on investment and key performance indicators
• Media mix Modelling is also a form of quantitative marketing which requires analysing which aspects have the major role in conversions through data science.

Data driven strategies that are dependent upon performance metrics have a great advantage since each system is involved in producing measurements & reports and are therefore extremely ascendable.

3. Tools for data driven marketing

The world of digital marketing has an enormous inflow of new channels, tools, and platforms that help in collection and analysis of data of the potential customer. Today's marketers understand their customer and know how the choices of customers can shift very quickly. Optimum data-driven marketing strategies are formed by use of big data insights and analysis which needs tools to draw useful conclusions.

Many tools are being used in the industry these days like Optimizely, Whoisvisiting, Crazy Egg, BuzzSumo, HubSpot, Curata, LeadFuze, Rapportive, Buffer, Oktopost, MailChimp, Google Analytics and the list goes on (Dipankar Dey, 2019).

Google Analytics is the most trending yet free of cost web analytics platform by Google. It makes use of big data to track website activity. It enables tracking visitors' behaviour like how they involve with the content, tracking traffic on the page, average time spent on the page, bounce rates, and can even identify the most productive online marketing channels.

A massive number of marketing teams worldwide make use of Google Analytics as a base for their data driven marketing strategies. Progressive Corporation – An American Insurance company improvised their mobile application which led to $2 Billion in written premium in just one year. Advantages:

Real-time traffic reports, including:
• Number of visitors on page
• Geographical details like location
• Keywords, referrals, and conversions on the site

4. Challenges

Data driven marketing despite being highly useful involves many complexities. Working in data marketing, one knows there never comes a dull moment since it cannot get stable. Following are the obstacles faced in this area:

The challenge of forming right questionnaire -

The best data proves to be of no help if one does not know what purpose to serve. The questions need to be perfectly aligned to the goal and objective.

The challenge of finding high-quality data -

High-quality is the data which is in line and prevalent. Freshness in data is an important aspect of marketing data. High-quality data also requires completeness. Gaps in data or missing data leads to decision making on guesses than facts.

The challenge of working with silos -

Marketing data is big and also fragmented. It gets chaotic since data is collected from varied channels and by different teams. As a result, one gets data sets referred to as silos. They do not provide a single overview of outputs available. The silos need to be broken down so as to have all the up to date data accumulated in one place.

The challenge of data normalisation -

Data needs to be cleansed and harmonized since it is being accumulated from various sources. These sources bring in data in different formats which needs to be unified so as to have actionable insights.

The challenge of data interpretation -

In order to have actionable insights from the data one needs to know what is the most important and relevant aspect. It involves analysing the ROI of marketing activities.

The challenge of using real-time data -

Real time data is complex to use. It is difficult to collect and even more difficult when it comes to analysing. While in near-real time many companies are able to collect data but only few of them are able to form insights to take relevant action.

5. Data driven marketing in Telecom Industry

The telecom industry is a fast evolving, emerging space with changing business scenarios and technology variations. This poses a challenge as well as an advantage to the marketing officers. The churn rates have been increasing to 8 to 10 percent as well as the ARPU is going steadily down. The distinct advantage that the telcos have is that they can keep check on the media and the message as well. On the downside increase in choice of telecom providers to the customer means there is a need of sophistication in execution of marketing strategies to acquire customer retention. One way to effectively acquire this is implementing data driven marketing to achieve competitive advantage.

Around 50% of telcos have initiated deployment of business intelligence and analytics platforms for data driven marketing. However only 30% are comfortable to use these tools. Commonly these challenges occur because of the inability to integrate customer data from multiple resources which causes inaccurate and inadequate data to effectively execute the data based campaign. The following image shows the number of Telecom companies investing in data analytics (Dunn, 2016).

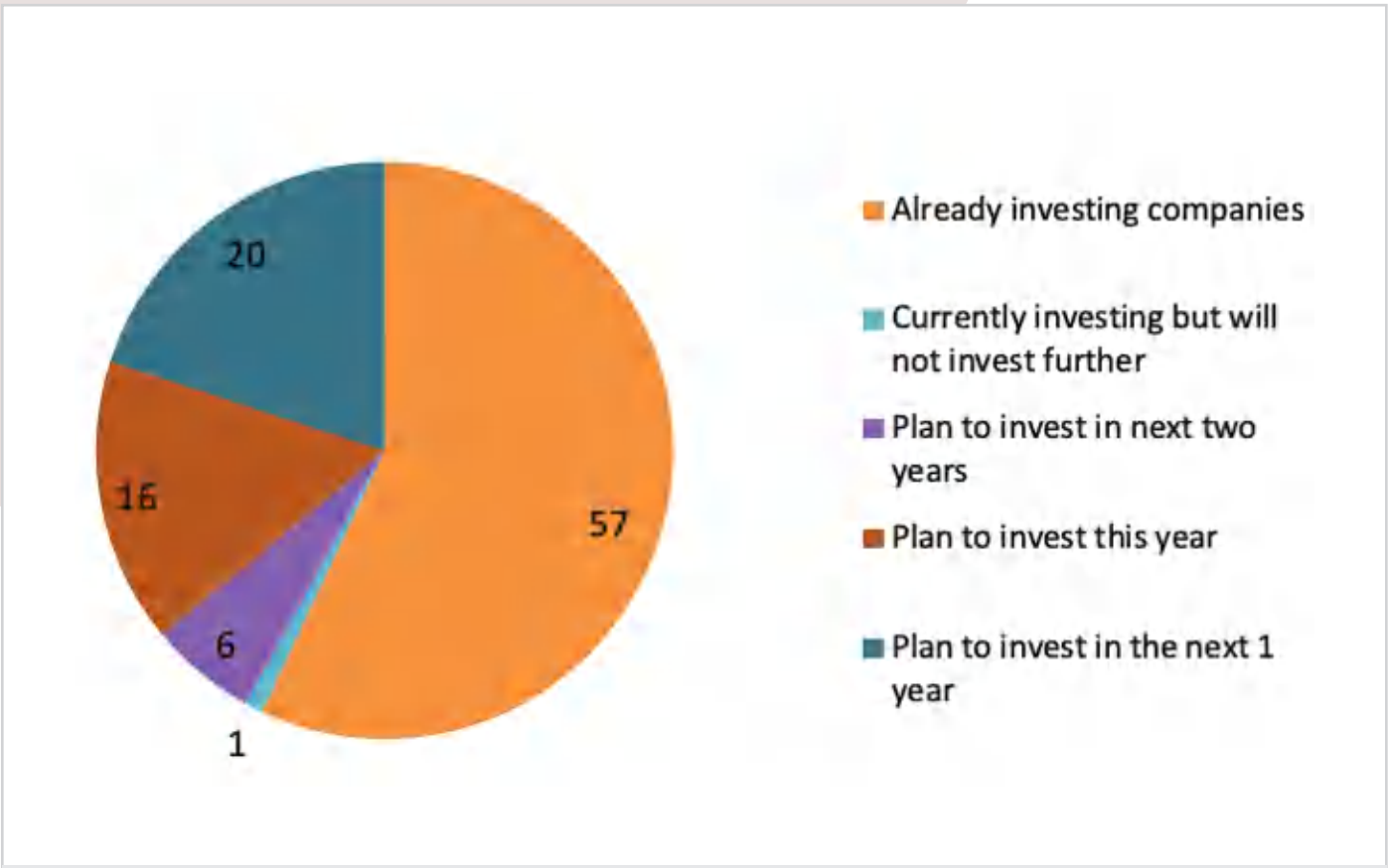

Figure 1 – Analytics Investment for Data-Driven Marketing

The main focus of telcos is to improve customer experience, for this it is mandatory for them to attract new customers and retain existing customers. This can be achieved by understanding customer needs and giving whatever they need at the right time.

To enhance customer engagement and to effectively communicate with the customer it is required that the companies fully understand the experience which is offered to the customer. For example the telco needs to monitor various channels such as Facebook, twitter and other social media in order to understand customer's recommendations on a particular service or offers whilst also utilizing the media to accept criticism or complaints reported by the customer. The continuous monitoring of these touch points within a customer's life cycle helps the telco understand the various experience factors. The following image highlight the customer's touchpoints which is to be monitored and also the role analytics play to help improve customer life cycle (Dipankar Dey, 2019).

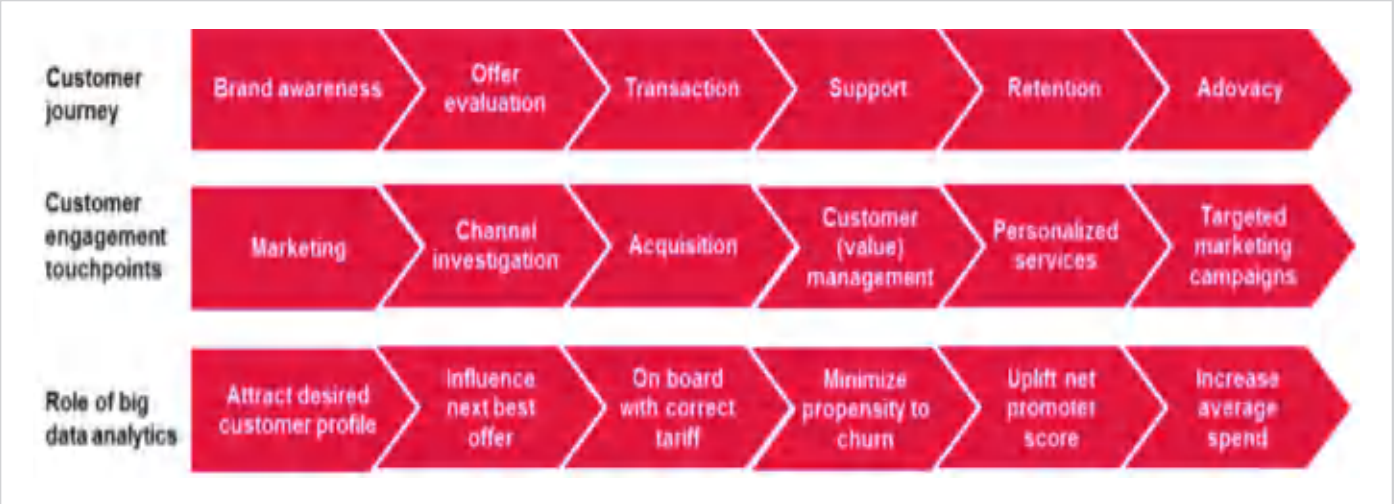

Figure 2 – Customer Touchpoints and Role of Analytics

6. Trigger based Marketing

When a customer is at a presales/marketing channel, telcos can target such customers by giving out appropriate offers, services by advertising in the specific geographic channels that are most convenient and appropriate to customers. This will ensure smooth acquisition of customer and the profile will be accurate at the time of activation.

In another scenario, for smooth campaign management the companies should be able to process large amount of data generated to trigger appropriate marketing action. This type of data driven marketing is known as "trigger based marketing". This strategy enables us to deliver one to one marketing. Trigger based marketing works on the basis that it is mandatory to send right type of messages to the consumers at the right time, via most appropriate channel.

Firstly, it is important to create a particular type of messages that completely satisfy the customer making him receptive to the offers.The particular offer should be completely relevant to the customer and lastly the messages should be delivered via the most appropriate channel where the customer is most receptive.

7. Data Monetization

Now that Telcos have implemented LTE networks, they have been adopting strategies to ensure quick return of investment in a short period of time. With the decline in voice and SMS, there is more expectations placed on data services. Tariff and pricing strategies is a major area of focus for the telecom operators. There is a constant need to differentiate their tariff plans and bringing out new pricing models from the competitors to gain new customers and retain existing ones. To ensure fast adoption of the various data services created by the telcos, it is required to analyse the customer profiles, understand their buying pattern using analytical tools in order to offer them the best service package.

But the major challenge in order to implement the above strategy is integrating data. The current back offices consist of the customer data which consist of multiple legacy or serve different departments. The data structures for it is required to be uniform so that it can be added to the centralised data management platform such as big data analytics. There is clearly a need for the telcos to be more data driven.

8. Conclusion

There are opportunities for the Telcos to collaborate with the vendors which develop market solutions depicting agile marketing operations. There is a need for them to work with them who have a strong understanding of the change in market which is evolving towards data analytics. While it is required to adopt these techniques it is equally important to find cost effective approach to deploy these tools.

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Sloni

Electronic smart systems: A turning point in defence and military

Ami Kher, Shreya Nair

Abstract

Smart Electronic Systems are a broad class of intelligent devices that are used almost ubiquitously to perform functionalities like computing, sensing, actuation, communicating, connecting, surveillance, intelligence, etc. Its application has found use in almost all sectors such as transportation, healthcare, energy, safety, security, logistics, ICT and manufacturing. Along with the environmental, social and economic challenges that the smart system addresses; the comparatively less concentrated area of defence and military in India shows the need for immediate attention. This article stresses on the current use of Smart Systems in the field of Defence and Military, the presence of traditional and smart systems on a global and domestic scale, its added advantages and the possibilities of its misuse. The article also suggests some possible ideas/solutions using Electronic Smart Systems for India's defence area by considering applications, systems and models used globally to keep India's military at par with the other foreign military forces.

Keywords

Defence, public safety, military, smart systems, electronic, IoT

1. Introduction

The four fundamental processes across any military application is to sense, detect, communicate and act. These steps were used during the medieval era and have only evolved to execute more efficiently during the modern age. Technological advancements in equipment and weapons have played an important role in military and defence sector over the years. Electronic system in defence will grow in need and importance, increasing the efficiency, capability and in some cases lethality of the weaponry. Lethality of weapon system depends on the electronic subsystems they employ. For example, in communication control panels, aircraft multifunctional displays and other electronic systems have spread throughout to improve the capabilities and performance of mission to reduce the total operating costs. Using powerful technologies like IoT, the defence can be made more efficient, powerful, secure and dependable.

2. Defence Electronics

Defence electronics sector of the industry is mainly divided into two sector namely Military-specific electronic items and commercial devices which are modified to meet the military requirements. Defence electronics companies and technology can be used in various areas such as anti-terrorism, air traffic control, police, detection (chemical, Biological), telecommunications, energy, ambulance, finance and media. The major force in weapons system development is the technology transfer from the civil sector to the military which will continue to transform the defence electronics business. Thus, one of the most distinct industrial transformation is the restructuring of the defence industry.

3. Internet of Things for Defence and Public Safety

IoT capabilities will reduce costs and increase operational efficiency and effectiveness in defence and public safety thus helping war-fighters and responders by delivering greater survivability. The internet of things is a network of connected devices to extract and utilise the data. IoT network consists of various subdomains: communication technologies, radio spectrum, embedded hardware, mobile computing, sensing technologies. Four key advances play a major role in the rapid growth of IoT in the digital world.

1) The reduction in the cost and miniaturization of different microelectronics, receivers and various processing units.
2) The rapid growth and expansion of widespread wireless connectivity.
3) Increase in the data storage capacity and the processing speed of computational systems.
4) The introduction of various innovative applications software and analytics tools.

The upcoming IoT technologies ion the digital world has the potential to increase the efficiency, safety, effectiveness and cost-savings in the long- term. These modern technologies can help the military and first responders in comparison to the traditional tactics to adapt to the modern growing world in which adversaries are located in a different complex and sophisticated smart cities with reduction in the

budget.(Internet of Things advancement in defence) (tandfonline.com, n.d.) (A.)

4. Personal Sensing, Soldier Healthcare and Workforce Training

With the advancement of technology usage of body-worn devices is increasing. Various fitness trackers enable an individual to keep track of the physical activities through various functions. Such enabled function can be used for monitoring the surrounding and the workforce to understand the physical and psychological states. This can help in preventing the risk of occurrence of various internal injuries. This will make soldiers aware of the possible risks such as dehydration in the body, sleep deprivation for a number of days or low blood sugar. Depending on the condition the medical team can also be alerted to prevent the abnormal states. Therefore, health checking and security monitoring systems enable a complete soldier health system providing different provisions of health services whenever needed. Along with such functions, IoT can be merged and used in a few training activities and simulation exercises. Such live training may use cameras to observe and keep track of certain kind of forces during the training exercises or different kind of motion and acoustic sensors. The trainers can be alerted on their mobile devices providing data about different activities and accordingly implement in real time and get timely statistics to review after exercise. Existing applications and other upcoming in future that can be part of the types of equipment of the soldiers.

Present	Future
Communica-tions • Rifleman Radio system • Voice and data recorder • Wideband Networking	Communications •Tactical Radio • Wideband voice and data • Mobile handheld computers Situational awareness • Tactical Mobile Devices • Laser Designator Rangefinder • Manoeuvre sensors Health and safety • Helmet Sensor, Body armour • Physiological Status monitor • Survival Kit Soldier Worn Power • Conformal Battery • Integrated power/ Data system • Solar/ Kinetic Energy Harvesting

Table 1 – Comparison between present and future defence equipment

4.1 Surveillance

The security with various devices is a major concern. It includes the security cameras and sensors embedded with different software for functions like sophisticated image and pattern recognition which makes the monitoring of remote places having various security threats easy. In the areas of marine and coastal surveillance different kinds of sensors are used by integrating with planes, unmanned aerial vehicles, satellites and ships to supervise various environmental conditions, to control traffic in large areas and monitor the maritime activities, keep track of fishing boats and dangerous oil cargos.

4.2 Operational Requirements

The defence system is an important pillar of any country. There are various operational functionalities that the military needs to look into. However, there are various challenges that act as bureaucratic and cultural barriers. Some of them are security, safety, robustness, etc. Adopting IoT applications becomes difficult if these barriers are not taken care of.

4.2.1 Deployment Features

Efficient usage of embedded systems within the military might be able to tackle one of the major problems faced in the battlefield – power consumption. IoT enabled elements like sensors and various other devices depend on solar power, batteries, on-the-move charge-enabled devices like solar panels, trucks, etc.
A significant increase in the processing power and better energy consumption can be achieved using latest embedded software by using specialized hardware components.

4.2.2 System Management and Planning

Optimisation of Digital Analytics is one of the areas within the defence sector that needs immediate attention. Much of the data collected from various digital sources like the sensors, etc. are never used whereas data from manual entry and processing is time consuming and can cause significant delays. Time is a very important aspect in the military and delays can cause missions to stall, fail, force decision-making without reliable data.

This is where IoT comes into picture where it functions by allowing automated systems to react quicker and with more precision as compared to manual methods.

4.2.3 Network Capabilities

Network infrastructure of military networks is very limited. This is due to the frequent disconnections, partitioning and fluctuations in the radio channel. It affects the usage of transducers and can cause issues in sensing availability. The IoT networks in military use tactical radios to establish mobile and fixed C2 communications and maintain the same between other operational elements and higher echelon headquarters. Currently, the military has been using its own infrastructure for connectivity purposes and for the functioning of back office systems. Exporting of data and assets for joint operations, controlling the information flow thus providing flexibility to deal with coalitions can all be made possible if the whole infrastructure is upgraded to a cloud infrastructure.

4.2.4 Security Capabilities

Another concern is Security. Especially in areas like military, this challenge needs to be addressed at various levels of IoT; from high volume data gathering endpoint devices to cloud based systems that control network infrastructure. Military equipment can be prone to either interference, sabotage, potential manipulation or disruption of data flows between different units, resulting in either in service interruptions.(Fraga-LAmas, 2016)

5. Wearable military technologies

Wearable technologies, as the term suggests could be a technology, an equipment, a gadget or instruments that helps human beings move around more comfortably along with some additional help or protection. In the military, helmets and gears for underground activity, camera and other communication gadgets on clothes, hand gloves and specialized footwear for trek purposes all fit as examples of wearable technologies.

For many decades, hand-held radios were identified as major wearable technology. However, in the present times, such basic amenities cannot be put under this category. It is more than just shoes, gloves, helmets and headphones. The use of sensors and smart gadgets are used on a large scale. These technologies help capture and transfer real-time data, images, audios and videos. Also, the primary need for wearables i.e. protection is also given principle importance like body thermals for extremely cold conditions or bulletproof jackets.

Wearable devices with latest technologies could offer various benefits to the security and armed forces. These technologies have the ability to augment various functions like sensing capability, cognitive abilities, augmented reality and different AI based solutions. These gives the military trainees more freedom of action. Timely information will help soldiers in proper plan of action. These technologies will make a wider impact and offer number of solutions to battlefield and other needs at strategic and operational levels. (electronicsforu.com, 2018)

6. Scope for future improvement

With the existing application of electronics in military and defence, there is a wide scope in future -

6.1 Military Applications

Military wearable technology can be used in various applications like:

1) Improving Aiming Capabilities
At present, rifles and auto-pilot fighter jets can motion themselves by analysing wind and weather, tracking targets and calculating optimal flight path for the bullet. These weaponries can be better optimised if AR (augmented reality) platforms like the Google Glass can be implemented; long distance shooting over hills and barricades can be targeted without even actually looking at them.

2) Monitoring the physical state of soldiers
Using IoT enabled sensors for medical purposes in the military sector can save many lives. Since, the physical condition of soldiers determines overall performance, any injury on the soldier can be identified using tiny biosensors on their body. This can help the medical team monitor their condition regularly from a distance. These biosensors can also be used to monitor other vitals like the heart rate, breathing, hydration, etc.

3) Better communication between troops and military animals
IoT enabled sensors can be useful for soldiers, spying, security as well as military animals like horses, mules, sniffer-dogs, etc. Their location and health conditions can be well kept under check using biosensors. Animals especially like the sniffer-dogs can be trained to detect various types of sensors thereby instantly alerting the trainer for threats.

4) Providing 360-degree battlefield awareness
Another application of IoT enabled sensors and virtual display devices are on the battlefield. All the data collected via these sensors can be analysed and put to use in helping the soldiers during warfare and also in

preparing them for the same. Information like location, weather condition, enemy troop concentration, emergency or unpredicted movements, topographic details, satellite/radar image, etc. can be made available to the military thereby providing a 360-degree battlefield awareness. This information can be collected from various sources like reconnaissance and other real time inputs received from soldiers, sensors and/or drones operating in the region and used with virtual display overlay aka Google Glass.

7. Conclusion

In conclusion, today's capabilities with state of the art in smart electronic systems are truly admirable. It is reasonable to believe what seems impossible today, may be a part of tomorrow's reality. The various accessories needed for these systems are available are in production. Now, all that is left to see is how these smart gadgets can be made available in a reliable, lightweight, affordable and cost-effective manner.

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Drones of tomorrow: regulations, legal aspects, guidelines & policy gap in India. Can they be legitimized?

Mahantesh Kattishetti, Harsh Srivastava

Abstract

Technology advancement for miniature electronic equipment and system have led to the evolution of Unmanned Aerial Vehicles (UAV), which is considered as the future for both military and civilian. Nowadays, UAV are being used for surveillance, in fields of aviation, defence and various other critical operation. But being technology operated and less human interference in operation of UAV's it becomes hard to identify and correct any type of onboard errors and breaches. So the need to secure this channel is quite important aspect of the security as the information is transmitted through wireless communication channel. It is quite apparent that loss of control over these systems can hamper the national security. Among the mentioned threats, the ones, which arise a lot, are security and privacy breaches because of the easily vulnerable video channels used for controlling these unmanned vehicles and these threats include hijacking, jamming and spoofing attacks and one of the main reason behind these unmanned vehicles being so susceptible to breaches is that they include no type of encryption. In this research paper, we will be studying about the security loopholes and also about their implications in operations of UAV's, from a network security point of view.

Keywords

Cybersecurity, Unmanned Aerial Vehicles (UAV), Network Security, Cyber Attack, Wireless Communication.

1. Introduction

An unmanned Aerial vehicle (UAV), generally known as an automaton is an airplane without a human pilot locally available. UAVs are a segment of an unmanned A (UAS), which incorporates a UAV, a ground-based controller, and an arrangement of correspondences between the two. The trip of UAVs may work with different degrees of self-rule: either under remote control by a human administrator or self-ruling by locally available PCs. Later innovative enhancements and expanding operational capacities present certain difficulties to flight administrators, end clients and aeronautics experts: particularly worries about security, information insurance, and open wellbeing. To limit the dangers of UAV-activated episodes or mishaps, an expanding number of national and universal specialists have presented legitimate arrangements that order "Go," "No go" or "How to go" explanations that either license, deny or keep flight assignments. Such principles all things considered effect how, where and when information can be gotten—and the dispersing of the headway inside a national setting. The CEO of the Asc-Tec UAV Company stresses "enactment and policymaking is falling path behind the innovation". This need makes a noteworthy hindrance to innovative work as logical tasks are ruined, as are both private and open development. Thus, showcase openings and societal increases are not being misused. Basic issues with UAV guidelines incorporate flight endorsement times and ineffectively archived regulatory procedures that breaking point the ideal adaptability and block the across the board use of the innovation. Regardless, some national flying authorities and overall affiliations are starting at now moving to "modernize" the central rush of rules: they attempt to suit customer demands and later creative progressions while so far importance to guard up undertakings.

Mechanical progressions are changing human lives from multiple points of view – be it the manner in which wars are battled or organizations are led. The military is no more abnormal to rambles as powers are utilizing them for an assortment of utilizations, for example, observation and surveillance, in obscure or unfriendly domains, to follow foe developments, for fringe watches, pursuit and salvage missions, and crisis administrations. Furnished variations of machines are used to guarantee the lives of individuals in constant similarly as to target and murder foe forces including apprehension mongers. UAVs have infiltrated the business circle also, with organizations sending rambles in progressively assorted jobs. One of the world's greatest online suppliers, Amazon, said in 2013 that it needs to use machines to pass on groups and has been attempting the phase in like way. As the worldwide market for automatons has developed, so as well, have the discussions on the lawful, administrative, and even good issues around their utilization. Up until this point, there are no reasonable worldwide systems yet present to manage ramble exercises. There are also issues

around disasters, air crash, prosperity and security of the use of robots. All of these issues requires a broad structure for fruitful rule in the non-military faculty airspace for family unit security, assurance and legal stresses to be tended to feasibly.

The paper projects the administrative components that are expected to guarantee protected and secure automaton tasks in India, with accentuation on common/business activities, this paper initially looks at the advancing approach structure, Guidelines, and examinations the significant arrangement holes in that. Given the possibly huge scale utilization of automatons in the non-security, business divisions incorporating into farming and foundation.

2. Objective / Problem Statement

To understand and analyze the various legal aspects and policy gaps in the application of Drones in India, that are required to guarantee dependable and safe automaton activities in India, with accentuation on common/business tasks.

3. Applications of Drones in India: Advancement of Policy and Legal Framework

As like in various nations, rambles have various applications in the standard resident space, for example, in the business area for mapping and data gathering, notwithstanding the military area where its uses incorporate reconnaissance and insight accumulation. Nonetheless, the utilization of automatons has been laden with issues and vulnerabilities without all around spread out models, guidelines and working strategies.. The record was helpful for educating potential administrators "The common activity of UAS will require endorsement from the Air Navigation Service supplier [Airport Authority of India], resistance, Ministry of Home Affairs, and other concerned security offices, other than the DGCA. DGCA is detailing the guidelines for affirmation and activity for utilization of UAS in the Indian Civil Airspace." Following years one after the another, the DGCA released a great deal of draft governs on April 21, 2016 on the usage of Unarmed aerial vehicles (UAVs) for recreational purposes and standard resident. The Directorate General of Civil Aviation(DGCA) invited suggestion on this indirect from various accomplices for a duration of twenty-one days as picked by the Civil Aviation Ministry. Following year and a half of inaction on the past principles, in tenth month of 2017, the DGCA released another game plan of standards. The common flying controller has welcomed remark on the new rules with the point of settling them by December 31, 2017.The rules show up, however, to be an unimportant result of critical need; they don't display enough foreknowledge. There have been a couple of scenes in the past couple of years that exhibit the dangers of unregulated usage of robots for all accomplices including the overall public. Despite the nearby spread confinement on machines, there has been a tremendously large number of visuals of UAVs in different domains the country over, which further highlights the necessity for convincing rules to be maintained at the soonest. It can't be underlined enough that there is a necessity for a more nuanced managerial framework with fitting proposition, including taking care of issues, for instance, chance in case of mid-air crashes. India should extend out a technique structure that would discourse to the authoritative, authentic, functional(operational), and approving and commitment issues over the use of robots.

4. Classification of drones

I. Classification of UAVs according to size:

a. Very Small UAVs

The very very little UAV category applies to UAVs with measurements running from the extent of a huge creepy crawly to 30-50 cm long; these are often used for spying and organic fighting. Instances of exceptionally very little UAVs square measure the Israeli IAI Malat dipteran, the North American country Aurora Flight Sciences Skate so forth.

b. Small UAVs

The Small UAV category (which likewise referred to as currently so scaled down UAV) applies to UAVs that have at any rate one activity a lot of noteworthy than fifty cm and no larger than a pair of meters. Instances of people from this small UAV category square measure the one-meter-long, RQ-11 Raventhe Turkish Bayraktar so forth.

c. Medium UAVs

The medium UAV category applies to UAVs that square measure too overwhelming to even think about being sent by one individual but square measure yet littler than a light-weight plane. They a lot of usually than not have a distance of around 5-10 m. Instances of medium fixed-wing UAVs square measure the Israeli-US Hunter and also the United Kingdom Watch attendant.

d. Large UAVs

The huge UAV category applies to the large UAVs used for the foremost half for battle activities by the military. Instances of these UAVs square measure the North American country General Atomics Predator associate degree and B and also the North American country biochemist Grumman international Hawk.

II. Classification of UAVs according to range:

a. Very close-range UAVs

This class incorporates UAVs that have a scope of 5 km, continuance time of 20 to 45 minutes. Instances of UAVs in this class are the Raven and Dragon Eye.

b. Close-range UAVs

This class incorporates UAVs that have a scope of 50 km and perseverance time of 1 to 6 hours. They are generally utilized for observation and reconnaissance assignments.

c. Short-range UAVs

This class incorporates UAVs that have a scope of 150 km or more and continuance times of 8 to 12 hours. Like the short proximity UAV, they are for the most part used for observation and reconnaissance purposes.

d. Mid-range UAVs

The mid-run class incorporates UAVs that have overly fast and a working sweep of 650 km. They are likewise utilized for observation and reconnaissance purposes notwithstanding gathering meteorological information.

e. Endurance UAVs

The continuance class incorporates UAVs that have a perseverance of 36 hours and a working span of 300 km. This class of UAVs can work at elevations of 30,000 feet. They are likewise utilized for observation and reconnaissance purposes.

5. Possible threats on drones

1. GPS Spoofing Attack

The principle behind the GPS spoofing attack is that causing to manage system of the drone faux geographic coordinates it's attainable to deceive the on board system hijacking the vehicle in an exceedingly totally different place that it's commanded.

2. GPS Signal Jamming

Using jam techniques against drones, it's attainable interrupt the GPS receiving transmitted to the UAVs. during this state of affairs, the craft might probably lose the potential to observe its route and to calculate its location, altitude, and also the direction within which it's traveling.

3. Cyber Espionage

The cyber spying is significantly one in all the first menaces to UAVs development; numerous cyber spying campaigns are conducted within the last months to steal technological material possession of the defence manufactures.

4. Sensor Spoofing

This attacks square measure pointed towards on-board sensors that rely upon the surface surroundings. samples of such sensors square measure the GPS receivers, vision, radar, sonar, LIDAR, and IR sensors.

5. Wireless Attack

These attacks would occurs if associate degree assaulter uses the wireless channel to change information on-board the autopilot. The least preferred-case state of affairs for this is that if associate degree assaulter is ready to interrupt the encoding of the line.

6. Research Methodology

The general methodology joins associate degree examination association of assorted information sources that square measure associated with UAV organization, enabling, and authoritative structures. Rule talking, partner degree examination union uses existing feelings and very surprising sources to shape speculations concerning the point of investigation and in this manner fits the point of giving a wide system of UAV rules and their proposals for flight errands. The basic technique mainstay of the examination consolidate is partner degree in general examination of the changed documents that quick UAV works out. This examination handles national social control structures, overall benchmarks and principles, that square measure dismembered in an exceedingly shut manner. sceptred by associate degree extent of variables, a point-by-point association mulls over each quantitative and emotional examination. the weather square measure consigned to a good deal of six criteria

that think about the quality items of UAV rules. Criteria associate degreed individual parts were derived when a heuristic strategy subject to an repetitive review technique of legitimate structures for the usage of UAVs. on these lines, the disclosures provides a graph of the properties of over a large time length UAV social control techniques and interact needs for future examples. Moreover, a review of the credible creation that focusses on the connection between law, improvement, and progression incorporates the second spine of the strategies for this examination combine. The shaping is inspected from the inspiration driving read of primary issues of UAV standards accomplice degreed activities got from different "issues with 'progression' as a conclusive target". Results can offer any contributions to the forecast of conceivable future patterns.The system for this investigation is sketched out in Figure 1.

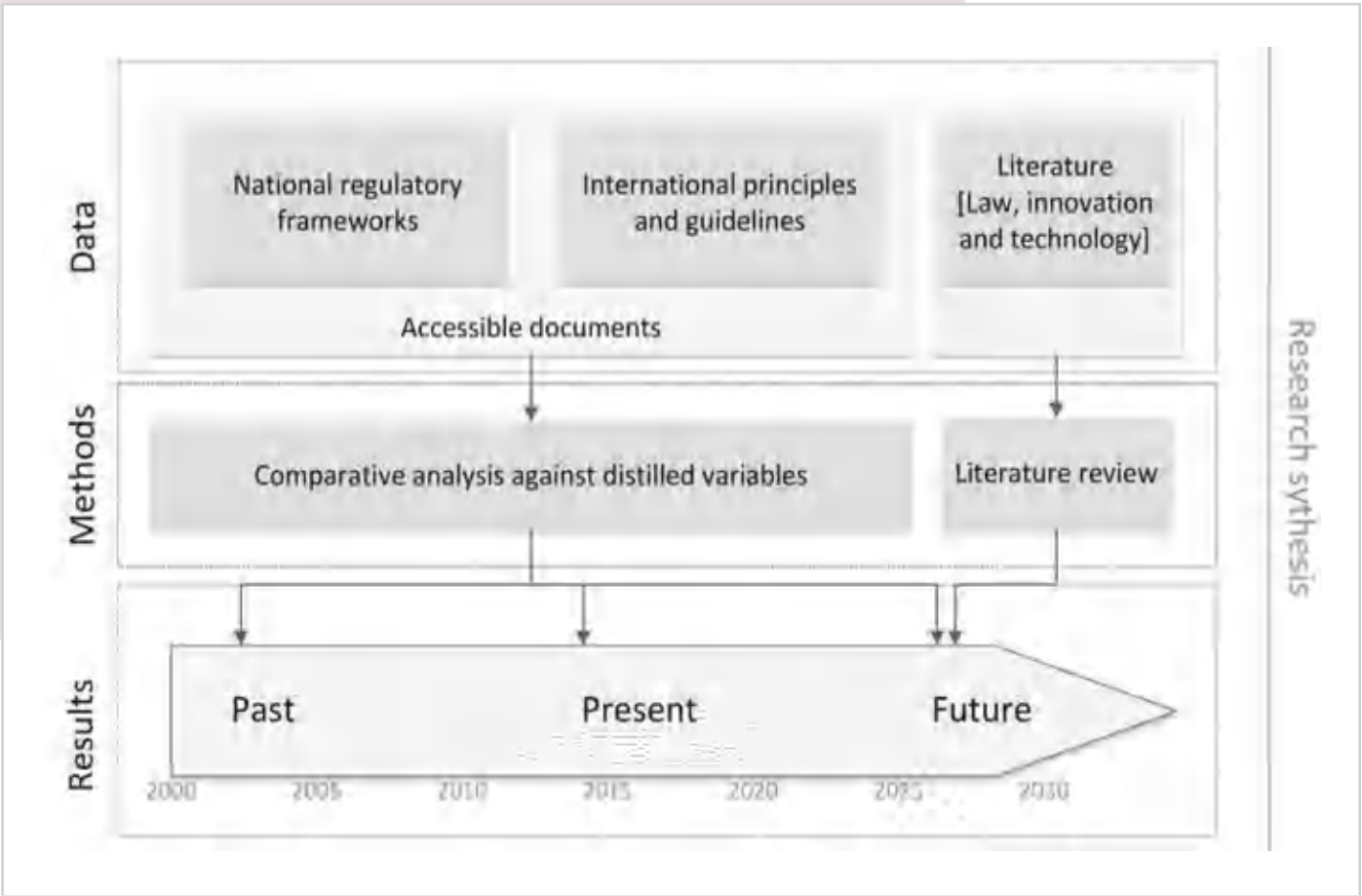

Figure 1 - Schematic outline of research structure and procedure streams—including information and examination

7. Data Source for Research Methodology

To guarantee a target and reproducible database, the intrigue technique and choice criteria should be unequivocally sketched out. The fundamental development of the solicitation technique targets national UAV runs and joins an extensive on the web look. In light of neighborhood language objectives, an online-quest for regulatory records country by country would be improbable for this endeavor. All things considered, web wellsprings of appropriate all things considered UAV affiliations are inspected for precompiled records and reviews. Table 1 shows a layout of known sources that offer interfaces with national UAV models and rapidly plots their substance. If it's not too much burden note that this online solicitation was driven in October 2016 and in like manner does not think about later scatterings.

Internet presence	Content
www.eurocontrol.int/articles/national-rpas- regulation	EUROCONTROL: list 23 various country wide UAV hints and supply connects to unique reports
www.droneregulations.info/index.html	Synergistic wiki: Global UAV guidelines Database
www.uvs-info.com/index.php/european-matters/regulation-monitor-europe/european-matters-regulation-monitor-europe-open-access	U.S.International: law display for UAV tips in Europe, get right of entry to to exclusive archives is restrained and calls for consumer enlistment.

Table 1 - Overview of online accessible lists and overviews of unmanned aerial vehicle (UAV) regulations (status October 2016).

Because of the speedy improvement of and diligent changes to UAV rules, none of the conglomerations gives a dependable, complete and keen image of the general circumstance. Associations, reports and information are either outdated, divided or as yet being created and along these lines not yet released. Thus, this article used all associations available from these phases for an overall layout of UAV rules. In light of this data, a sub-inspecting of guidelines for a profound and point by point near examination was figured it out. Subsequently, the delegate test of a sum of 19 guidelines intends to cover all mainland's—and an assorted scope of lawful frameworks, monetary advancement levels, and topographical situations. Besides, different occasions of first discharge were recognized so as to distinguish the two pioneers and adherents.

8. Methods

A comparative analysis is an extremely broad research strategy: it looks at least two cases and along these lines puts a specific example of cases into a connection. The method of reasoning behind a similar examination with regards to UAV guidelines is to go for a story of improvements, shared traits, and contrasts in different administrative archives. To accomplish a quantitative point-by-point examination, as opposed to an enthusiastic case-by-case association, quantifiable factors should be settled. Twenty factors were refined in a heuristic system by an iterative diagram and association of UAV rules. For our condition, all components are dichotomous and can indicate one of two attributes: tended to or not tended to by explicit UAV rules. Likewise, the investigation incorporates spellbinding data of most of factors so as to improve their essentialness and to feature the subjective varieties among specific attributes.

As appeared in Table, five primary criteria and particular factors were picked. (1) Applicability alludes to the extent of particular guidelines. In this gathering, the initial two factors recognize the relevance of guidelines to demonstrate flying machine (MA) or UAVs. Besides, pertinent arrangements and weight points of confinement are tended to by the last two factors. (2) Technical requirements recognize basic instruments that are ordered. Implying current mechanical upgrades, influence evasion limits are treated as an individual variable. (3) Functional(Operational) impediments spread detainments for the flight itself and unite the going with factors: divisions to air terminals/airstrips and to individuals, imprisonments to working over blocked spaces, confirmation of denied zones, extra snags, most critical flying stature furthermore, confinements with respect to the genuine nature of the UAV. (4) Implementation of good constraints suggests the fuse of or references to specific security and data protection rules. (5) Regulatory way of thinking suggest visits to experts comparably as required records and associations. In this uncommon situation, the application methodology, the essential for determination and the required component of protection spread are free factors.

Criteria	Variable
Appropriateness	Material for model air ships (MA), appropriate for UAVs and grouping
Specialized Requirements	Required devices, required degree of experience and keep away from mechanism
Functional Limitations	Separation to air terminals/strips, restrictions to fly over individuals, impediments over clogged territories, denied regions, extra confinements, maximal flying stature, visual observable pathway, past visual viewable pathway
Execution of moral limitations	Indication of necessities for statistics protection, Indication of requirements
Authoritative Procedures	Software technique and operational certificates, want for registration

Table 2–Overview of Criteria and Variables involved in Comparative Analysis

This examination constructs the base of the talk in regards to spearheading nations and the distinguishing proof of potential patterns. The results will be reflected towards current orders of global associations and hall gatherings.

9. Analysis

As UAVs are something else in the airspace they cope with a potential hazard to different airspace clients correspondingly as to untouchables on the ground. Alongside these lines, a making range of nations are stirring up guidelines to manipulate this danger. The consequences uncover that UAV guidelines are prone to country wide authorizing and center upon 3 key views: (1) focusing at the supervised usage of airspace through UAVs as they address a bona fide risk for seemed out for flying machines; (2) setting operational constraints so as to guarantee proper flights; and (3) dealing with genuine techniques for flight consents, pilot licenses and information gathering support.

The overall survey of UAV rules as per October 2016 reveals that practically 33% of all countries have individual regulatory records set up. For the most part, half of all nations don't give any data with respect to the utilization of UAVs for fundamental applications. In any case, this doesn't advocate that flights are as a result stored or approved.Declarations for pending UAV principles have been determined in 15 nations. In this, two or three countries (e.g., Kenya) successfully scattered draft outlines and the expert genuine machine is administered of the mill in 2017. In Cuba, Egypt and Uzbekistan, UAVs are certainly constrained which precludes the utilization from claiming this level. In thirteen cases, the data of gigantic precompiled records could not be supported and no documents have been discovered that reveal the closeness of specific pointers.

10.Legal aspects concerning the usage of drones

Administrative effect is as of now a standout amongst the most significant elements influencing the pace of appropriation of automaton fueled arrangements by business and government elements. Automaton guidelines have changed lately from being treated as a specialty side interest to ending up some portion of ordinary flying tasks, to a point where national experts have begun creating unique administrative systems to address the most pressing issues. The principal nation to execute every single essential arrangement of guidelines was Poland in 2013.. Of the 191 ICAO people, 63 have a couple of rules for machines starting at now set up; 9 states have pending rules and 5 have quickly confined the usage of robots. A portion of the bodies that enjoy shaping standards for flying automatons for their particular nations are:

1) European Aviation Safety Agency (EASA)

To guarantee the free course of automatons and a dimension playing field inside the European Union EASA has created basic European guidelines. They add to the advancement of a typical European market while guaranteeing safe tasks and regarding the protection and security of EU residents. The EASA Committee casted a ballot collectively to support the European Commission's proposition for an Implementing Act to manage the activities of Unmanned Aircraft Systems (UAS) in Europe and the enlistment of automaton administrators and of ensured rambles.

The Implementing Act is joined by a Delegated Act, which characterizes the specialized necessities for

automatons. On the off chance that no protests are raised by the EU Parliament or by the EU Council, the two demonstrations will be distributed before the late spring of 2019 and the guideline will turn out to be bit by bit material inside a time of production. By 2022, the transitional period will be finished and the guideline will be completely material.

The operations of UAS in Europe will be classified in three main categories:

a. Open category: Is a classification of UAS task that, considering the dangers included, does not require an earlier approval by the skillful specialist nor an assertion by the UAS administrator before the activity happens.

b. Specific category: Is a class of UAS task that, considering the dangers included, requires an approval by the equipped specialist and in some standard cases even an announcement by the UAS administrator before the activity happens.

c. Certified category: Is a classification of UAS activity that, considering the dangers included, requires the confirmation of the UAS, an authorized remote pilot and an administrator affirmed by the skilled expert before the task happens.

2) Federal Aviation Administration (FAA)

The U.S. Government Aviation Administration is as yet attempting to make sense of the most ideal method for ensuring that individuals fly their automatons securely and lawfully. It is especially a work in advancement, and has been for quite a long time. Now, any individual who needs to fly an automaton gauging in excess of 250 grams (even only for no particular reason in the lawn) must enlist that automaton and pursue some commonly judicious standards and guidelines. The new change that will influence everybody is that all automatons are presently required to show enlistment data remotely. The first principle was that you could conceal the enrolment number inside the battery compartment, or anyplace else, that could be gotten to without apparatuses. Some of the important points mentioned by FAA are:

- Register your automaton
- Fly your automaton at or underneath 400 feet
- Keep your automaton inside your viewable pathway
- Be mindful of FAA Airspace Restrictions
- Respect protection
- Never fly close other airplane, particularly close air terminals
- Never fly over gatherings of individuals, open occasions, or arenas loaded with individuals
- Never fly close crises, for example, flames or sea tempest recuperation endeavours
- Never fly affected by medications or liquor
- Don't act like a trick3.

3) Director General of Civil Aviation (DGCA)

For automaton-based administrations to proceed to flourish and develop, it is essential for guidelines to be set up. In India, the Director General of Civil Aviation (DGCA) revealed draft norms for usage of machines in October 2017.7 These are still under review with different administrations in the organization and are required to be formalized in the accompanying couple of years, with further identifying of the game plan to be set up by 2025.

City	Chance of Commercial Flights	License required	Practice required for pilots to obtain license	Insurance required	Chances to perform BVLOS flights	License for BVLOS flights
Poland	T	T	T	T	T	T
UK	T	T	T	T	T	T
China	T	T	T	T	T	F
Canada	T	T	F	T	T	F
Germany	T	T	T	T	F	F
India	T	T	T	T	F	F
France	T	T	T	F	T	F
South Africa	T	T	T	F	T	F
Indonesia	T	T	T	T	F	F
Australia	T	T	T	T	F	F
Brazil	T	T	F	F	F	F
Mexico	T	T	T	F	F	F
USA	T	T	F	F	F	F
Japan	T	F	F	F	F	F
Russia	F	F	T	F	F	F

Table 3–Characteristics of Regulatory Framework enforced in 16 different countries

From the above table it can be seen that in India, operations of Drones in "Beyond Visual of Line Sight" (BVLOS) is not included in the regulatory framework developed by DGCA. This is a policy gap in the legal framework, which can affect the operations of Drones in India.

11. Policy Gaps

While the DGCA has ventured out confining draft rules for the utilization of UAVs, there stay a few holes that must be tended to, remembering the requirement for harmony between security concerns and authentic employments of automatons in an assortment of non-military personnel areas.

1. Quality Control

The most striking nonappearance in the guidelines is that of import institutionalization. As a sizable component of India's machines keep being imported, there is a need to guarantee their quality control and institutionalization. No structure keeping an eye out for this edge has been passed by the DGCA. The Department of Customs beginning late issued a notice putting wanders on the outline of dutiable things, making it required to announce these at the time of import. Regardless, when machines keep being

denied for standard occupant use by non-managerial substances, despite all that it isn't clear why Customs enables them to be imported. This again underscores the nonattendance of insight in procedure regarding the issue between different state specialists and the DGCA. Adding to the feebleness to address import quality guideline of machines is the nonattendance of technique on quality control of indigenously made and - made robots. There is no associated with guideline concerning secretly made robots and the business is left to its own special benchmarks, if at all it has any. There is no arrangement of gauges finding the very airworthiness of a UAV. The nonappearance obviously of activity on quality control and association for both indigenously made and imported machines exhibits a few difficulties. The lawful peril for a robot goes under solicitation as it is hard to discover whether the gadget failed or in the event that it was erroneously managed or worked without these rules.

The nonattendance of standards for imports besides addresses a gigantic peril to national security. There is progressively over the raised risk of air occurrences because of slowing down of machines, which can be dangerous to both life and property. Another risk of not having such guidelines is the deficiency of these UAVs to hacking. For example, equivalently as hazardous programming and spyware can be resolved to any number of adaptable instruments got from outside the nation, the indistinguishable can be satisfactorily introduced in robots. Without quality control, it is difficult to test the modernized security parts of these machines, thusly giving directors no confirmation of a protected relationship among administrator and vehicle. The DGCA needs to fundamentally make up for lost time with stopping these security holes to shield any untoward scenes from happening.

2. The Privacy Question

Concerning UAVs, the subject of protection changes into a multifaceted issue, passing on with it the far from being obviously true talk of security versus confirmation. Machines worked by non-definitive affiliations address a fundamental danger to existing security laws. Most UAVs have ceaselessly transmitting cameras that from time to time work in top notch. Expected encroachment of protection is particularly essential for what it's esteem, at any rate floats comparatively present the event of unintended interferences. This edge makes it logically hard to choose encroachment of protection under existing laws in India. Robots present another intriguing change with regards to perspective in the manner solicitation of security are seen. While visual encroachment is reliably recognized to be the principal attack on security concerning UAVs, they present a clearly constantly confused issue considering that kinds of advancement in both sound record and information catch connect with a machine to be utilized for obviously logically interfering snooping. A skimming UAV can be utilized to record sound from a room even at ordinary conversational estimations. It can in addition be utilized as a system jammer to square remote correspondence in a locale. Given the methods in lessening machines to the extent of a little winged creature, it has wound up being certainly not difficult to get private exchanges and square a wide scope of remote correspondence from an encased space.

The Indian government is purportedly in the midst of the time spent thinking about the update of express segments of the Information Technologies (IT) Act. The IT Act beginning at now covers different solicitation of security and advancement including contemplations of information affirmation and spread. The essential other law that can be related with this case is Article 21 of the Indian Constitution, which covers the Right to Privacy. Notwithstanding, while these laws depict the probability of security in India, they can't be related direct to the UAV case. The association needs to open an exchange on depicting certain parameters of protection identified with UAVs; generally, the arraignment of splits of security could finish up being dynamically tangled.

The second extensive solicitation that ascents is the standard of legitimate work environments utilizing floats for observation. Today, government affiliations, joining into India, are thinking about the utilization of machines for a degree of exercises from traffic seeing to keeping up security amidst swarmed occasions. Beginning late, the Mumbai Police utilized machines to organize observation over parades amidst an essential celebration in the city. This was relied upon to help the police in keeping up the concordance circumstance at an occasion that ends up being nonsensically involved for most standard perception strategies to stay persuading. The security examinations of such utilization of UAVs by law essential working environments become gigantic. Do law endorsement affiliations have a culture that urges regard to security while utilizing such advancement that makes a burst steady and basically untraceable?

Countless these exchanges include an essential issue that robots will get an enormous scope of data in the midst of their undertaking. This fundamentally can't be foreseen in case they are to work effectively. Security can be respected or cracked subject to how the data is taken care of or broke down. Thus, a culture of

insurance must be given emphasis when Indian law execution workplaces use robots to lead observation and participate in practically identical assignments.

12. Regulations on usage of Drones

	Past	Present	Future
Law	• Limited or No regulatory framework • No International regulatory standards	• Heterogeneous regulations. • Proscriptive or prescriptive regulations. • Incongruence between regulations & Technology.	• Mature, Risk-Based national laws. • Co-existence of hard and soft regulations, • Convergence in law & UAV regulations
Market	• Limited UAV market & Suppliers. • No Industry self-regulation barrier. • No insurance market	• Growing UAV market. • Insurance packages-risk transfer. • Barrier to market entry for suppliers & users	• Increase significance in industry self-regulation. • Industrial design standards. • Consolidation of suppliers & users
Information	• Lack of awareness in the technology.	• Polarized media coverage and citizen sentiment – positive and negative	• Public awareness via campaigns.

Table 4–Consolidated overview of past, present and future development distinguished according to main regulatory mechanism law, market and information

The utilization of automatons has turned into a remarkable issue in current society. With their innovation and advancement, rambles have created abundance issues that officials needed to address and define limits for the utilization. Since the idea of automatons is so new and grows the capacities of the client in different ways, it exhibited a special issue that must be managed in another manner with respect to the protection of those around the automaton. In spite of their advantages, Unmanned Aerial Vehicles (UAVs) are probably going to experience the ill effects of assaults as they are supplied with numerous on-board sensors to accumulate information and this opens them to different vulnerabilities.

There are different inquiries concerning morals, guideline and execution that exist in the space of automatons. These inquiries should be deliberately tended to, remembering the surviving lawful and moral standards and adjusting them to the fast, innovative advances to make a successful administration routine for UAVs in India. India should likewise look at winning approach systems in different nations to embrace their accepted procedures as it formalizes its administrative structure. Regardless, a thing to be highlighted is that principle regulations are not satisfactory. This would essentially suggest that principles and presents issued ought to be changed over in to legitimate & course of action instruments, those will bindingly influence governments. In any case, rules and measures of competent lead relating to robots are essential starting stages in such way.

This examination is the first to give an all-encompassing worldwide diagram of the status of unmanned elevated vehicle (UAV) guidelines. It further passes on bits of information into the past, gift and future improvement of felony frameworks that cope with using UAVs. In view of an examination blend that incorporates an exhaustive writing audit and near investigation of 19 national administrative systems, similitudes and differentiating components in different national UAV guidelines and their suggestions for information procurement exercises are investigated. Fundamentally, guidelines focus on the administration of dangers and minimization of saw hurts.

Inside the setting of UAVs, the principle damages are breakdown, mid-air crashes and resulting harms to individuals and assets on the floor. To address those damages, it is discovered that UAV recommendations middle upon 3 key angles: (1) focusing on the controlled usage of terrestrial network by UAVs; (2) forcing ready to use restrictions (3) handling the regulatory systems of flight has the same opinion, pilot licenses and statistics amassing approval. Nonetheless, shared

traits, for example, compulsory stage enlistment, mandatory protection inclusion and standard pilot authorizing strategies show patterns towards develop national UAV guideline. Attractive patterns are found in the conjunction of hard and delicate guidelines, and in the fruitful global discourse, which will in the end give a lawful system to blended administrative principles. Other than the solid nearness of law, showcase powers, for example, industry structure measures and dependable data that are relied upon to shape the future advancements.

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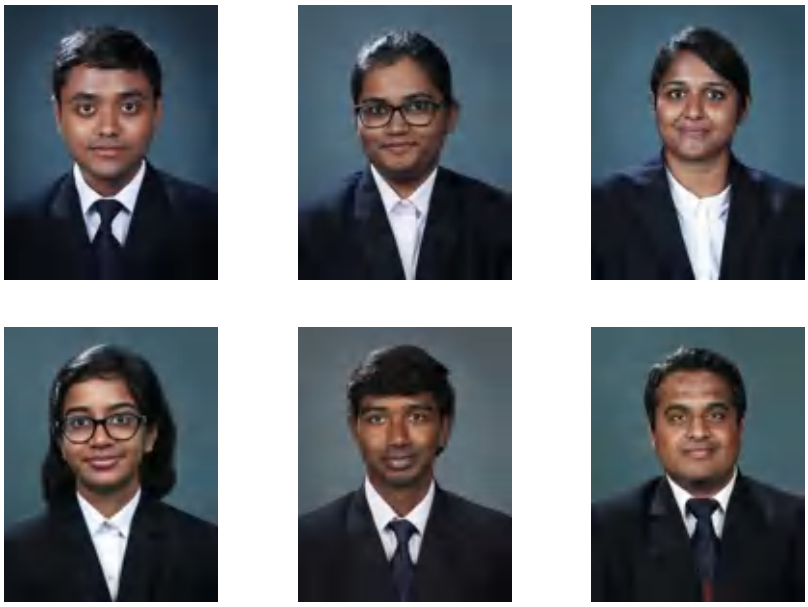

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