

# Disruptive Technologies and Impact on Industry- An Exploration

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**Abstract.** Disruptive technologies changed the way of doing business activities in our day to day life. It increased the business opportunities by using the internet. Today, these technologies have deeply penetrated different industries and their sub-sectors. Disruptive technology is the bunch of technologies which changed the way of life as well as it becomes the important part of all sectors of industry. Due to this lots of small-scale industries also grown up and got some new business opportunities along with new business market. Disruptive technologies increased the domain of customers which is much familiar with technologies and preferring it for other purposes also including business activities. In this paper we are going to discuss about the impact of disruptive technologies in different sectors of industry and how was that industry working or dealing before the innovation of the disruptive technologies.

*Keywords:* Disruptive Technologies, Business Model, Digital Disruption, Cyber Risks

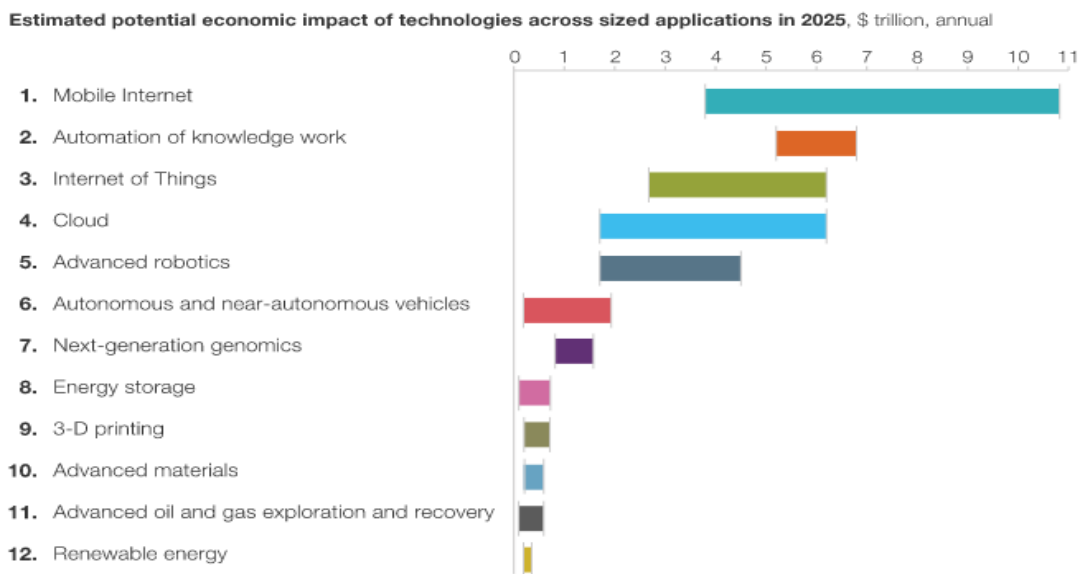
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## I. Introduction

Disruptive technology known as the technology whose applications changed the manner of working in any field by which productivity, efficiency quality of product and new business opportunities increased. At times, the plans of action that adjust to new innovations create new markets and settled new parameters of businesses. Due to disruptive technologies this current scenario of different industries having big changes which help them to increase the domain of working including domain of customers which helps them big change in their business activities. Disruptive technologies mostly deal with the web-based applications which increased the different business opportunities over the web along with this indirectly it increased the demand of internet. By using disruptive technologies customers also benefitted for buying and comparison options of different companies by sitting home. After all, everything came into existence with their both views positive and negative. It is also having a negative side also due to disruptive technologies in these days we are most targeted by hackers at

our Bank accounts, information leakage, session hijacking and personal data leakage on web. Today, at every movement hacker doing attacks in every 39 seconds on end nodes, on average 2,244 times in a day. “Cybercrime is the greatest threat to every company in the world.” IBM’s chairman, president and CEO (April, 2020, www.webarxsecurity.com). There are numerous significant features to cyber security, which are canvassed in more noteworthy detail beneath. The Chang in the way of working, the World Bank inspects the worldwide ramifications of the progressing mechanical move that is significantly modifying the idea of work. In this manner, it features a large number of the difficulties confronting India and other rising economies as they look to make employments for their kin. As Asia's third-biggest economy, India needs to make employments for an enormous scope to assimilate the huge number of youngsters entering its working age population. The test is to make this technological move advantageous for everyone, with the goal that its advantages are shared with all technological users. Innovation is additionally reshaping each industry and setting new Skills demand for each industry. New openings will require explicit aptitudes—a mix of technological expertise, critical thinking, and basic speculation abilities, just as delicate aptitudes, for example, constancy, coordinated effort, and sympathy. IKEA, a universal worldwide brand, took 75 years to reach at a point where it produces \$45 billion in worldwide incomes across 50 nations. Contrasting IKEA's chilly pace of extension and the turbo-charged climb of Alibaba, which arrived at a million clients in only two years, we can envision the effect of problematic innovations.

**Figure 1- Estimated impact of disruptive technologies till 2025**



SOURCE: McKinsey Global Institute

McKinsey report says recognizes 12 technologies that will be continue in upcoming time and will could vibrate the finance of all big companies also. That report also contains likewise takes a glance at specifically and how these disruptions could reflect its reality, just similar like benefits and complications, and bargains instructions to support forerunners from officialdoms and different institutions (Figure 1).

Other side of disruptive technologies where First, Disruptive marketplaces generates new prospects for organizations to strangle their opponents from end to end user records and represents it all as the frontline of monopolies. Second, organizations facing lots of issues and challenges about taxation. It's typical to say from where the worth of product is coming for increase the demand of product in the market because lots of technologies involved in the process of a product from raw to consumable product. Profit remain in a state of diversion from is the biggest challenge, even with recent multidimensional pains to fighting with its opponents. Holding companies—digital & traditional—diversion is 45% of its profits to tax harbors, resulting that is in loss of 12% of universal corporate tax returns. Our Country, laterally with Mexico, Brazil, Australia, Japan, France and the United States, as well as Africa, are amongst nations projected to be furthest hurt by diversion of profits. Revenues generated through digital publicizing can also be stiff to seize. In this paper we are analyzing the digital disruption of technologies in different sectors of industries with how they are working before the digital disruption and how they are working or affected after adoption of the Digital Disruption.

## II. Literature Survey

The authors as of late have been hugely pulled in by the impact of disruptive technologies on the plans of action of various organizations. A survey of previous researches related to disruptive technologies and their impacts on different industrial sectors of India is presented as follows.

Disruptive technologies have been examined in the context of business models and a feasible business model could be critical for prosperous commercialization of disruptive expertise (DaSilva *et al.*, 2013). Kumar *et al.* (2019) have examined the disruptive technologies and their effect on various business models and also analyze some cases of their applications. We argue that that disruptive technologies bring rewards and risk simultaneously and the speed of their intervention is tremendous. Thus, the adoption of these technologies for business model transformations requires a well thought planned approach.

Christensen *et al.* (2018) say that disruptive technologies is not only having the its head it's also having its tail section so much more is remaining in this field to come for more surprise in this technological era after this assessment we should wait and watch for more outcome of the disruptive technologies. Mirjankar(2020) have discussed about the latest technologies like machine learning (ML) and Artificial Intelligence (AI) makes the environment more compatible for tech persons and it providing a kind of plate form where users can do lots of new innovations based on it. Banking sector is also part of this who is adopting latest technologies and applications of Artificial Intelligence (AI) and Machine Learning (ML) based applications. These applications exploring new ways for doing the things in different ways and in different forms. Chang *et al.* (2010) have analyzed the tools and techniques concerned with the banking as well as other sectors is the disruptive technologies beneficial for long term or not that is tested on multi variant simulation tools and their practical implications discussed here. Guercini *et al.* (2015) have discussed and elaborated the impact and its effect in the companies and the business environment is it effective or not, if it will work then how effective it is.

Schiavi *et al.* (2018) have reviewed the disruptive business models and its related technologies for reaching on conclusion is its disruptive technologies are sufficiently capable for replacing the old business models or not if yes, the how much it will be effective and if not, then how much it is approaching to the old models. Klang (2016) have discussed the dependency of the disruptive technologies on internet-based tools techniques or related methodologies how they can be regulating the disruptive technologies and impact on the market. It is an issue whether the participation of the disruptive technologies is gives benefit to the industry. Also, ICT and internet play a very important role for doing the sound discussion over it (Klang, 2006).

Baiyere *et al.* (2013) link the concept of disruptive innovation with the other related or relative technologies and their impact on our local market and day today life of a common people. There focus is on the relevancy of IT/IS at the platform of the Disruptive technologies in the current situation. Here a model is represented for defining and demonstration of role of information Tech. in the disruptive technologies in our life also.

Bublitz *et al.* (2015) have enquired the role of disruptive technologies and its applications in the health sector as there is the biggest role player technology is the artificial intelligence. Artificial intelligence is also contributing a lot in all industries, researchers also discussed about the different applications and their uses in the same and different industries. A well self-described architecture discussed by the authors that acknowledges about the challenges also in respect of all different type

of AI based applications and disruptive technology-based applications here. Kilkki *et al.* (2017) have provided the kind of frameworks which are having the impact of disruptive technologies in different firm and industry levels. Here they discussed about disruption and represented which is going to describe and design the new strategy for surviving in the new environment. Then it's going to describe the its techniques which will be used to analysis of the disruptive technologies that also helps in analyzing of different models and layers of the industries who adopted this disruptive technology as a full functional. Also described a kind of framework which is having four technologies for discussions GPS, GSM, Photography with digital technologies and 3D printing. The main focus of this paper is to describe the impact of disruption in different layers of several industries. Skog *et al.* (2018) say that prominent computerized advancements, for example, Uber, Airbnb, and Spotify challenge the presence of predominant firms and cause extreme foundational impacts in enterprises and markets. Such radical advanced development and its more extensive fundamental impacts – as often as possible alluded to as computerized disruption. The biometric way to deal with give an engaging examination of scientists and their applicable works in the system shaped by the related writing, notwithstanding recognizing and gathering related writer. The outcomes propose a divergence of goals among subgroups for utilizing the appearance "disruptive innovation", and the conversation about C. Christensen's particular benefit about the term appears to bode well to unbiased one from them (Carlo *et al.*, 2019). Brandhub(2020) have discussed the role of disruptive technologies in the banking sector which is very sensitive sector in case of vulnerabilities and here the most important thing for discussion is that about disruptive technologies are it making more vulnerable or it can provide a layer of security for doing the transaction and activities on banking application in a secure way. The role of technology is increasing day by day in all sectors and FinTech are worry in adopting these technologies because they are in a big dilemma in adopting the disruptive technologies as a full functional part of this industry.

Madsen and Simon (2015) examination of specialized innovation in the media transmission industry and finds huge similitudes between the business improvement and the writing on disruptive innovation, which finds that officeholder organizations can't respond in an effective manner when disturbances happen in their industry. Buccella *et al.* (2020) have provided an innovative view along with technological industry persons for finding the new algorithms for their implementation of new things and ways for performing the task in a strategic way which help in enhancing the optimization of the devices and also said with every opportunity it brings risk along with that so we need to see the factors of the task and conclude is it beneficial for our industry or not. In light of these researches, we

find a research gap to examine the impact of disruptive technologies on industry and summarize in a form that can be an input to further researches on this issue.

### III. Digital Disruption and Industry

Disruptive technology has brought big change in all sectors which make the new market for seller and buyer both of them. Due to disruptive technologies, we are moving in a technological era where, we are depends on disruptive technologies for our more than our 80 percent daily work. Few of examples are given below. Today, almost each and every industry having the experience of the Digital disruption directly or indirectly. Some of them are having very good, bad and relative experience in respect of the disruptive technologies. At current situation of the world the upcoming and growing age industry leaders are in big dilemma do they have to move with the adoption of Disruptive technologies or avoid it. They have lots of fear about it like web vulnerability, market competition and the impact of disruptive technologies on their business at this stage. Organizations like Uber & Airbnb which grasp the partaking economy helped the development of distributed stages have cut huge gaps in the benefits of both the accommodation and transport enterprises with various no of organizations censuring them for the misfortune in benefits. HVS evaluated inns are currently losing about \$ 450 million every yr in income to Airbnb. That kind of lots of different industries also having the both kinds of digitalization experience in all different sectors in India.

We present the case of digital disruptions and its impact on various industrial sectors [Industry-Disruptive Innovation – Market Disrupted – Implications] as follows.

**Academia** - Wikipedia - Manual or Traditional methods of learning - Less face to face interaction between faculty and student due to these fewer moral values developed in students. Websites having the less content previously and that is written by paid author & Now free editors & visitors update content over web.

**Communication**-Telephone-Mobile Technology-In today scenario, we have seen number of mobile phones we have at our home but earlier we have only single Landline telephone. Everyone busy in mobile phones due to this No family discussions or social life.

**Computer Hardware** - PC (word processors workstations, , Lisp machines, Minicomputers,), TAB (Mainframes), Pocket/Digital calculator (Standard /Mechanical calculator) , Smartphones(Personal computers, laptops, PDAs)-At this time, we have comparatively very high configuration technologies and Gadgets, which is the kind of dream in early years when disruptive technologies entered into the market. Due to this we have to face high disposal of Digital garbage issues.

**Data storage**-In evolution time of computer, we have 10GB-20GB or lesser space in computers.-But at this time, we have more than this in Gadgets as internal memory.- There is the radical change in technologies in all kinds. Irrelevant storage of data gets increased due to this and people avoiding to do this manually.

**Manufacturing**- Cable-operated excavators-Hydraulic excavators,"Mini steel mills"-Vertically integrated steel mills, Plastic Material-Metal, wood, glass etc.-In the field of manufacturing there is also a big change now here is at assembly line most of the work done by robots.

**Medical**-Radiography(X-ray image) Ultrasound-Big change came due to disruptive technology in Medical line also which is positive along with side effects. Misuse of knowledge and technology is high in this sector.

**Music and video**-Manual Instruments-Electric or Electromagnetic Instruments-Now, we have better quality instruments in low cost in our mobile phones or other Gadgets which replaced the camera demand for personal use.

**Photography**-Digital photography-Chemical Photography-Now, we have high pixel cameras with low power consumption which increased it's used time after one-time charging.

**Publishing**-printers-Offset printing-earlier time we have the low quality of printing with higher cost and now we have high quality prints in low cost

### **Transportation**

-Steamboats(Sailing ships)-Stream boats having high cost but comparatively now transportation using sailing ships is reasonable.

-Automobiles(Rail transport)-Now, Rail transport is the best transport mode for common man.

-High speed rail(Short distance flights)-Now we have comparatively high-speed transport mode as compare to earlier time.

**Banks**-Now 80 percent of our Bank operations we can do with the help of Disruptive technologies either on computer or on mobile phone.-Visit banks for any work or query-It saves our lots of time and effort along with its created so much risk for our funds which is stored in wallets and for the net banking users.

**Oil & Gas**-Technological Sensor devices enabled for all kind of alerts- Manual System of operations and activities-Mechanical automated tools enabled with Latest disruptive technologies

**Logistics**-A Big coined change in operations of logistics system of working-Manual operation plans where lots of lapses are there-Now the logistics industry in a good direction and after adoption of



the disruptive technology it is more systematic for doing the things on time and effective plans possible here.

**Constructions-** Effective planning and best utilizations of resources-Wastage of resources due to lots of lapses in planning - Advanced disruptions have been influencing even this unbelievably steady industry. Advances, for example, new brilliant materials, VR, and 3D printing has made huge disruptions the business in the course of recent years, taking into account an increasingly inventive, productive and stable construction process.

This is all about the disruptive technologies how these bunch of technologies entered in the industry and affect almost all industry in any kind. Few of them we have discussed above with the details of Industry, Disruptive Innovation, Market Disrupted and their different Implications

#### **IV. Conclusion**

Now we are in a state of comparison about the different industries how they are disrupted and how it becomes the blood of few industries in today scenario. Digital disruption is an unavoidable for the future growth of the industry. We analyze few industries sound so good after adoption of the Disruptive technologies which are not looks so good or popular before the adoption of the disruptive technologies. Disruption adopted by different companies or industries evolving quickly, companies now need to decide about if they have to move with the disruptive technologies or not. Those companies which are not going to adopt disruption then that will be in a great loss as other will be in opposite in axis because disruption brings greater productivities about their outcomes.

#### **References**

- Bots, C. (2018, February 05). Disruptive Technologies and their Impact on the Future of Work. Retrieved July 01, 2020, from [https://medium.com/@cfb\\_bots/disruptive-technologies-and-their-impact-on-the-future-of-work-fedb85820e67](https://medium.com/@cfb_bots/disruptive-technologies-and-their-impact-on-the-future-of-work-fedb85820e67)
- Bublitz, F. M., Oetomo, A., Sahu, K. S., Kuang, A., Fadrique, L. X., Velmovitsky, P. E., . . . Morita, P. P. (2019). Disruptive Technologies for Environment and Health Research: An Overview of Artificial Intelligence, Blockchain, and Internet of Things. *International Journal of Environmental Research and Public Health*, 16(20), 3847. doi:10.3390/ijerph16203847
- Christensen, C., Mcdonald, R. M., Altman, E. J., & Palmer, J. (2017). Disruptive Innovation: Intellectual History and Future Paths. *Academy of Management Proceedings*, 2017(1), 14218. doi:10.5465/ambpp.2017.14218abstract



- DaSilva, CM & Trkman, Peter & Desouza, Kevin & Lindic, Jaka. (2013). Disruptive technologies: A business model perspective on cloud computing. *Technology Analysis and Strategic Management*. 25. 10.1080/09537325.2013.843661.
- Guercini, S., & Runfola, A. (2013). Disruptive Interaction. *Emerging Issues and Research ...* Retrieved July 2, 2020, from <https://www.impgroup.org/uploads/papers/8050.pdf>.
- Hopp, C., Antons, D., Kaminski, J., & Salge, T. O. (2018). Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age. *Journal of Product Innovation Management*, 35(3), 446-457. doi:10.1111/jpim.12448
- K. Li.(2016).Disruptive Research and Innovation. IEEE International Parallel and Distributed Processing Symposium (IPDPS), Chicago, IL, 2016, pp. 1-1, doi: 10.1109/IPDPS.2016.126.
- Kawamoto, C. T., & Spers, R. G. (2019). A Systematic Review of the Debate and the Researchers of Disruptive Innovation. *Journal of Technology Management & Innovation*, 14(1), 73-82. doi:10.4067/s0718-27242019000100073
- Klang, M. (2006). *Disruptive Technology: Effects of Technology Regulation on Democracy*. Academia.edu.[https://www.academia.edu/336097/Disruptive\\_Technology\\_Effects\\_of\\_Technology\\_Regulation\\_on\\_Democracy](https://www.academia.edu/336097/Disruptive_Technology_Effects_of_Technology_Regulation_on_Democracy).
- Kouame, E., & Kedir, A. M. (2020). Disruptive Financial Technology (FinTech) and Entrepreneurship in Burkina Faso. *Disruptive Technologies, Innovation and Development in Africa International Political Economy Series*, 171-186. doi:10.1007/978-3-030-40647-9\_8
- Kumaraswamy, Arun & Garud, Raghu & Ansari, Shaz. (2018). Perspectives on Disruptive Innovations. *Journal of Management Studies*. 55. 10.1111/joms.12399.
- Lee, K. C., Seo, Y. W., & Hahn, M. H. (2010). Analyzing Economic Impact of Disruptive Technology Using Multi-Agent Simulation: Smart Payment Case. *Future Generation Information Technology Lecture Notes in Computer Science*, 324-333. doi:10.1007/978-3-642-17569-5\_32
- Lele, A. (2018). Defence and Disruptive Technologies. *Disruptive Technologies for the Militaries and Security Smart Innovation, Systems and Technologies*, 29-42. doi:10.1007/978-981-13-3384-2\_2.
- Madson Erik Strojler & Simon H (2015). Disruptive Technologies and Networking in Telecom Industries. *Journal of Global Economics*, 03(04). doi:10.4172/2375-4389.1000165
- Manyika, J., Chui, M., Bisson, P., Marrs, A., Dobbs, R., & Bughin, J. (2013). Disruptive technologies: Advances that will transform life, business, and the global economy. Retrieved

- July 02, 2020, from <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/disruptive-technologies>
- Mirjankar, R. (2020, July 01). 7 Ways Digital Disruption Is Shaping The Indian Banking Sector. Retrieved July 01, 2020, from <https://www.outlookindia.com/outlookmoney/banking/7-ways-digital-disruption-is-shaping-the-indian-banking-sector-4214>
- Oakey, R. (2007). Are disruptive technologies disruptive [disruptive technologies]. *Engineering Management*, 17(2), 10-13. doi:10.1049/em:20070201
- Schiavi, G. S., & Behr, A. (2018). Emerging technologies and new business models: A review on disruptive business models. *Innovation & Management Review*, 15(4), 338-355. doi:10.1108/inmr-03-2018-0013
- THBL. (2020, January 30). Emerging Technologies Disrupting the Financial Sector. Retrieved July 01, 2020, from <https://www.thehindubusinessline.com/brandhub/emerging-technologies-disrupting-the-financial-sector/article30666265.ece>
- Utterback, J. M., & Acee, H. J. (2019). Disruptive Technologies: An Expanded View. *Digital Disruptive Innovation Series on Technology Management*, 3-23. doi:10.1142/9781786347602\_0001
- W.H.S. (2020, April 07). Retrieved July 01, 2020, from <https://www.webarxsecurity.com/website-hacking-statistics-2018-february/>
- Works, J. (2019, November 13). Six Industries That Are Most Vulnerable to Digital Disruption. Retrieved July 02, 2020, from <https://jungleworks.com/six-industries-digital-disruption/>