Unlocking the Prospects of Disruptive Technology : A Comparative Learning Case

** Sandeep Bhattacharjee*

Abstract

Technology and humans coexist in the modern era. Both are dependent on each other. Human growth and development depends upon the use of better technology. This synergistic relationship has been existing since the dawn of humankind, with the invention of simple apparatus and continues into modern technologies such as the printing press and computers, laptops, supercomputers and so on. The rate of growth of technology is increasing manifolds. Something surprising today may be a thing of the past in the future. In this research paper, we tried to understand such fast, non-conventional growth of certain raw designs that support out of the box thoughts.

Keywords: **Disruption, technology, market, performance, customers**

I. Introduction

Disruption has become a popular marketing buzzword in recent years, used primarily to refer to innovative businesses such as Airbnb and Uber that have turned traditional industries like the hotel and transport sectors upside-down. Yet as these companies have grown at a rapid rate, disruption has also become the goal of more established brands as they look to keep pace with advances in technology and changing consumer behaviors [9].

Content marketing is a vital tool in brands' pursuit to be disruptive or uniquely different. Creating content allows marketers to be more experimental and stretchable in how they symbolize their brand and communicate with potential consumers. Unlike traditional advertising where brands need to deliver a simple, steady message across all channels, content marketing facilitates in depth levels of storytelling and widens the scope for creative approaches.

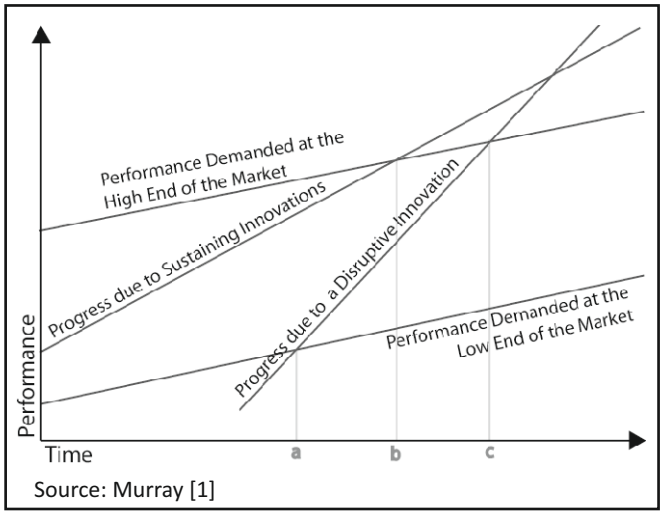


Fig. 1. The disruptive technology

As shown in Fig.1, a **disruptive innovation** reaches the point where it can satisfy the least demanding customers. The least demanding customers eventually drop the more established ones due to low price offered for disruptive innovation based product and services, higher performance option on the basis of other factors (cost, convenience, etc.).The established product exceeds the needs of the most demanding customer. On the other hand, sustaining innovations now fuel "performance oversupply". The disruptive innovation meets the level of performance required by the most demanding customers. Those customers drop the already established option on the basis of other factors such as cost, desire for change, seeking variety, product characteristics such as colors, design, sizes, flexibility, adaptability, and compatibility.

For instance, car marque Nissan, is seeking to innovate through a new content project named **Project Controller** that is based on its sponsorship of the UEFA Champions

**Assistant Professor,* Amity University, Major Arterial Road, Action Area II, Kadampukur Village, Rajarhat, Newtown, Kolkata, West Bengal-700156. E-mail:sandeepbitmba@gmail.com

League. The company is trying a design and structure a Nissan car that connects with a PlayStation (gaming concept with real automobile) and enables people to use the steering wheel as a controller for the football game Pro Evolution Soccer 2016. Creative agency TBWA\Helsinki is developing such an idea to highlight a potential new use for cars in the future if self-driving vehicles turn out to be a reality.

On the other hand, this venture or idea enabled Nissan to present itself as a ***disruptive and forward-thinking brand within the automotive sector*** [2].

II. Literature Review

Theoretically disruptive innovation is an innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market leaders and alliances. The term was defined and the phenomenon was analyzed by Christensen [3].

Not all innovations are disruptive, even if they are revolutionary. For example, the automobile was not a disruptive innovation, because early automobiles were expensive luxury items that did not disrupt the market of horse-drawn vehicles. The market for transportation essentially remained intact until the debut of the lower-priced Ford Model T in 1908[4].

The mass-produced automobile was a disruptive innovation because it changed the transportation market, whereas the first thirty years of automobiles did not.

Disruptive innovations tend to be produced by outsiders. The business environment of market leaders does not allow them to pursue disruption when they first arise, because they are not profitable enough at first and because their development can take scarce resources away from sustaining innovations (which are needed to compete against current competition) [5]. A disruptive process can take longer to develop than the conventional approach and the risk associated with it is higher than the other more incremental or evolutionary forms of innovations, but once it is deployed in the market, it achieves much faster penetration and has higher degree of impact on the established markets.

A. Theory of Disruptive technology

The OECD's Oslo Manual (2005), a widely used outline for measuring innovation activities, defines disruptive innovation as "an innovation that has a major impact on a market and on the economic activity of firms in such a market. This concept focuses on the impact of innovations in contrast to their novelty."As such, any type of innovation (product, process, marketing or organizational innovations) can be disruptive in reality. The concept is related mainly to products and process innovations. The manual warns that it may not be clear from the start whether an innovation has a disruptive impact until long after it has been introduced as a conceptual product which is considered as a foremost challenge for analyzing disruptive innovation. The term disruptive innovation is widely used today in the sense introduced originally as *disruptive technology* in Christensen's influential work known as 'The Innovator's Dilemma' (1997) [5]. He associated his observations with the widely used S-curve of a technology life-cycle and the concept of value networks [6]. He argued that a real disruptive technology cannot be plotted in a traditional framework, because the so ideated or thought-of new technology (at least in the beginning) competes on criteria not comparable with those that were normally used to measure performance. Thus, the disruptive technology operates in the prior phase of its life-cycle in a different value network. Many a times , the newly innovated technology is less complex in the beginning and offered to customers at a lower price, projected towards a low-end, price-sensitive customer segment or segments. In the course of time, when the technology matures, it may outshine the current technology even in terms of the traditional performance parameters that were formerly used to standardize the market and will gradually proceed to replace older parameters with newer ones. The disruptive innovations start to challenge existing products at the point where the **marginal utility** of additional betterments in the existing traditional performance conditions decreases with time [7].

B. Key facts on disruptive technologies

Harris, J. C. [8] ascertained the composition of informal economies, individualistic competition as an output of out of 'subsistence light manufacturing' - antithetical agglomeration effects – and high levels of entrepreneurial risk, strangling innovation. In his research, very few informal workers or businesses reacted that they had adopted or adapted new technologies in recent years, as compared to much higher levels of positive responses about adopting or

developing new designs or products. These results recommended that the high density of activity offered by cluster (slum) locations does not always means that higher degrees of new technology development or new design production are attained. Not only do informal firms appear to innovate or adopt technologies at lower rates than formal firms, but even many of those which have constrained opportunities due to informal market policies do.

Larkin [10] argued that disruptive innovation's key advantage is often that of providing past out-of-reach products to a broader audience, in an "employment-creating" way for those at the 'base of the pyramid'. Larkin [10] also indicated the worrying outcomes of disruptive innovations, such as changing the business requirements of its workforce, initiating different skills. Also, disruptive innovations may not only upset a value chain, but potentially also the education and training systems. Mario [11] in his paper tried to provide an indication of the different alternative innovation paradigms that are rising in the developing world, and explores the potential for 'innovation blowback' - where frugal or economical innovations multiply to become disruptive in developed economies. The author is of the opinion that real disruptive frugal innovation has to be designed or structured to do more with less and for more people in terms of consumers Soni and Krishnan [12] in their research paper discussed three key results. First, frugal innovation includes a frugal mindset, a frugal process and frugal outputs, which may be implemented distinctly. Second, frugal innovators can be of three types: basic grassroots-level, domestic-enterprise level, and MNC subsidiary level. Each of them has his own distinctive positive incentives and styles of frugal innovation. Third, a frugal mindset is motivated by resource-sparse environments, weaker institutional intermediaries, and a higher level of tolerance for uncertainty. Balkrishna [13] in his article examined a variety of frugal innovations and frugal innovation processes in India to understand their disruptive nature in relation to other innovations. He depicted frugal innovation as an iterative change in a product or business model which takes place in a scarcity-based situation, that includes scarcities of knowledge, finances, institutions, and socio-economics. They are also known as minimalist, and often reverse-engineered flexible adaptations, evolving out of necessity rather than desirability. Disruptive innovations considered by Christensen may seem to be of lower cost *and* quality in the first instance, but can rapidly flourish in new markets [5]. Rao also observed that in many cases, frugal innovations are more environmentally sustainable and have a more 'open and flexible' nature than other technologies. On the contrary, on the economic front The Economist [14] described that the world is experiencing a third industrial revolution, motivated by the increase in efficiencies and productivity, and the wide range of new types of work as a result of ever more pervasive and more complex technology. It warns of a disturbing trend of a disengagement of growth and development, where technology is no longer used to increase wages and new work opportunities through improved output and performance, but is rather creating a wide gap between the highest skilled workers who are well positioned to seize new opportunities and exploit the power of new technologies, and the ever growing frequency of low and unskilled workers whose work opportunities are either marginalized or destroyed as a result of these new technologies.

Key learnings from the impacts of disruptive technologies in different fields have also been embraced by large technology developers to locate new audiences globally, with most of the frugal innovations happening through techno and business-re-engineering at local levels, which help to provide higher frequencies of innovations that are wide both in product length and product depth.

III. Research Objectives

The following were the research objectives of this research paper:

1. To understand the nature of disruptive technology strategies as a part of modern day market requirement.
2. To identify the underlying characteristics of disruptive technology strategies.
3. To identify the effectiveness of disruptive technology strategies.
4. To understand the different type of disruptors.
5. To forecast or predict the future of disruptive technologies.

IV. Hypothesis/Assumption

1. Null Hypothesis (H_0) : Growth of disruptive technology strategies has no correlation with time factor.

2. Alternate Hypothesis (H_1) : Growth of disruptive technology strategies has positive correlation with time factor.

V. Research Methodology

In the current research, we have used data from secondary sources such as websites journals, books, and published reports.

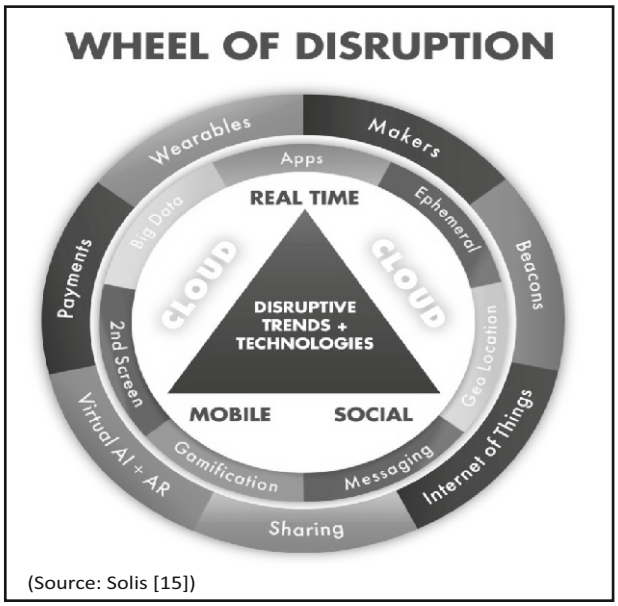
VI. Data Collection

The data used in research has been collected from different online web based resources. Besides, other information pertaining to research has been assimilated from research papers, websites, and other valid sources have been cited within the research paper.

VII. Data Analysis

With advances in digital, social and mobile, our audiences are already drawn to relevant, useful, timely, and engaging content. They just ignore or block anything that isn't created for them. 'Audience first' is no longer just a marketing model; it is a business model. It reframes how we communicate our brand messages and how we structure our marketing spend, opening up a huge opportunity.

A. Wheels of Disruption



(Source: Solis [15])

Fig. 2. Wheels or tools of disruption in modern markets

Sector	Digital Disruptor
Automotive	Connected car
Banking	Crowd sourcing of funds
Construction	3-D printing
Energy	Unmanned platforms
Engineering	Building Information Management
Healthcare	Telemedicine
Logistics	Predictive supply chains
Manufacturing	Sustainability
Media	Digital convergence
Pharmaceuticals	Wearable technologies
Retail	Multi-channel
Services	Public cloud 'SaaS'
Tobacco	e-cigarettes
Utilities	Smart metering

(Source: Innovation Inquiry 2015 Harnessing Digital Disruption [16])

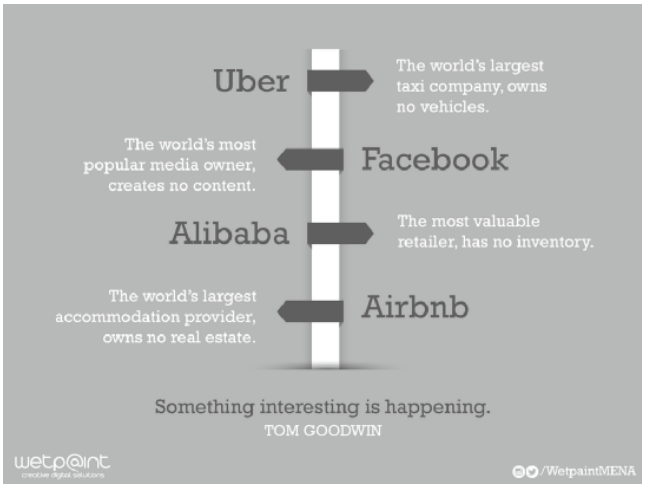
Fig. 3. Sector wise digital disruptors

1) ***Digital :*** As seen in Fig. 3, we can observe different sectors of the economy where digital disruptions have taken place. In case of the fast growing automotive sector, we have connected cars with auto global positioning system (GPS) and enabled self driving. In the banking sector, crowd sourcing of funds and international pool of investments through crowd sourcing via online form is now possible. Energy sector is now controlled by unmanned platforms with digital programmable electronic devices that manage operations. In engineering, we have building information management for planning, designing, and implementation. Similarly, in healthcare medicines can now be prescribed and ordered online. In logistics, predictive supply chains help in analyzing transport and delivery predictions for intended consumers. Also, in retail, multi channel management is now done though digital softwares for warehouse, supply-chain, logistics etc. Thus, digital disruptor is present across all sectors of the economy and it affects millions of consumers everyday worldwide (refer Fig. 3).

IT service innovations	Beneficial outcomes
Agile development	Speed of solutions delivery
Computer utilities	Low cost infrastructures
Public cloud	Externalisation of business services
Predictive analytics	Supply chain optimisation
Social media	Customer sentiment
Mobility	Anywhere commerce
Big Data	Customer insights
Service Integration	Multi-sourcing
Internet of Things	Plant maintenance

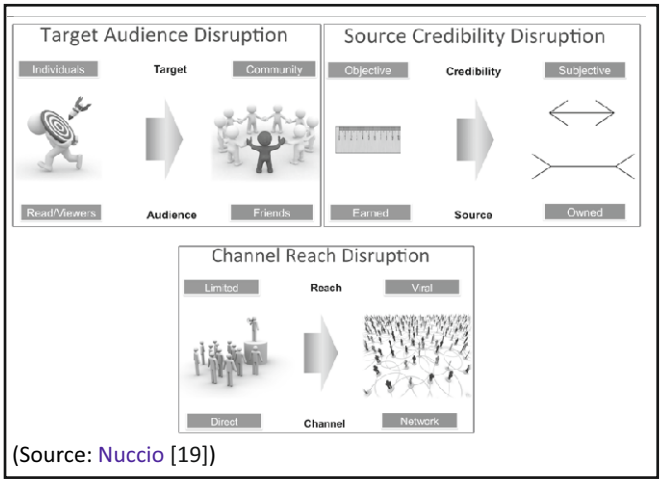
(Source: Innovation Inquiry 2015 Harnessing Digital Disruption [16])

Fig. 4. IT –based digital disruptors



(Source: Clock Creative Communications Ltd.[17])

Fig. 5. Leading examples of digital disruptions



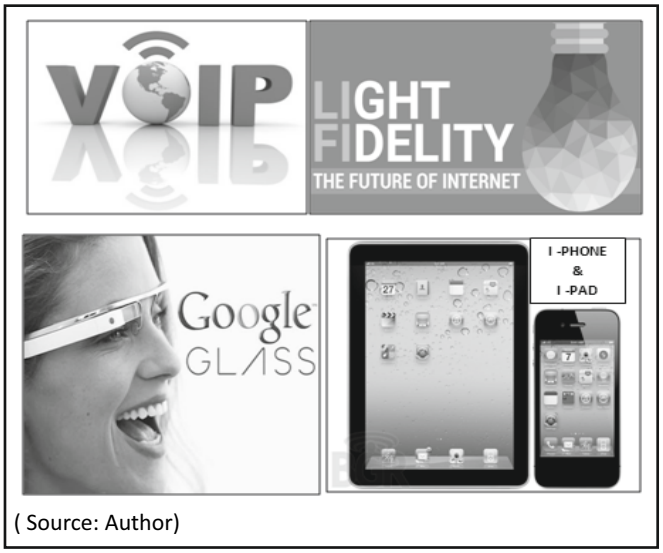
(Source: Nuccio [19])

Fig. 6. Social Media Disruption using public relations

As shown in Fig. 4, we can observe some of the information technology based service innovations such as agile development, computer utilities, public cloud storage, maintenance, predictive analytics, social media management and analysis, and mobility of services i.e e-commerce. Also, big data concept is becoming very popular and a lot of customer insights can be discovered and suitable customized solutions can be developed. Services of different levels and channels can now be organized in a structural manner and more customers can be reached in a shorter period of time. Internet of things (IOT) is a system of interrelated devices which can be mechanical machines, digital machines, computing devices, objects, animals or people that are provided with unique identifiers through which data can be transferred over a network without requiring any human-human or human-computer interaction.

In Fig. 5, we can visualize some of the famous disruptor companies which changed the way certain products or services were looked upon. In the very first instance, Uber is considered the world's largest taxi company, although it does not possess any single taxi of its own. This company started the innovative concept of hiring a taxi physically by providing locational details (through GPS or global positioning system) and even paying bills generated by a uniform currency per kilometer system fixed by Uber. Another giant disruptor company is Facebook which is so popular that almost 20% of people on earth have a Facebook account [18]. Similarly, Alibaba, the most valuable retailer company, supplies almost every product all around the world. It has a vast retail network controlled and managed digitally although it does not have any physical inventory of its own. Also, Airbnb, the world's largest accommodation provider with over 1,500,000 listings in 34,000 cities and 190 countries provides rentals, homes, apartments, and rooms for rent during vacations.

2) Social Disruptors **:** Social media engagement changes our target message into a conversation that anyone can start, transforming the monologue message into an ongoing dialogue. We can enter this dialogue anywhere, but it cannot be controlled. In a social marketing model, our target audience becomes a community. The core difference between an audience of



(Source: Author)

Fig. 7. Mobile disruptive technologies

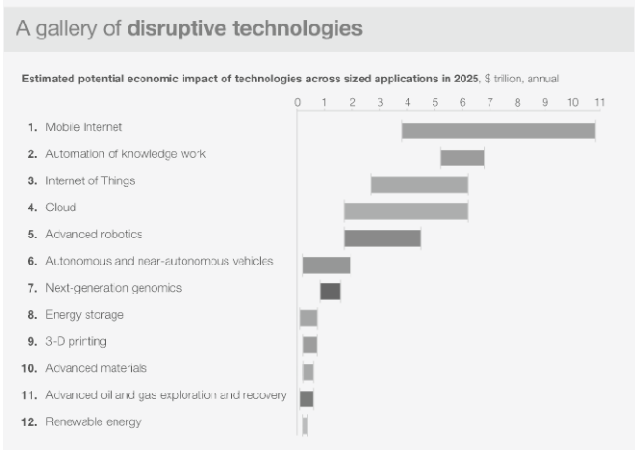
individuals and a community of friends is that its members interact with each other and socialize a message ("conversation"), rather than tuning into a single message source. What makes the social share so powerful isn't just that it gives us earned media in a network wherein the members are inclined to pay attention to one another. Message amplification can also lead to more engagement and more shares, and it is at this point that our conversation can go wildly viral. This is why we measure engagement as a core social media and PR KPI: the engagement – whether it is engagement of journalists who share with their readers, or of people who share with their social channels – is an achievement.

B. Major Market Disruptors

TABLE I. TOP 30 DISRUPTORS (YEAR 2015)

Major Disruptors		Year : 2015
Serial No.	**Companies**	**Activities**
1	Moderna Therapeutics	Reprogramming cells to fight disease.
2	SpaceX	Elon Musk's mission to Mars.
3	Bloom Energy	Live off the grid; keep the lights on.
4	Uber	A $50 billion on-demand ride.
5	Airbnb	The newest idea in room service: Renting one.
6	Dropbox	Saving a billion files every day.
7	Palantir Tech	Helped find Bin Laden. Don't like to talk about it.
8	TransferWise	Getting bankers out of the forex biz.
9	Slack	Giving "slacker" a whole new meaning.
10	Warby Parker	Taking on the Luxottica eyewear machine.
11	Houzz	If you rebuild it ...
12	LISNR	Using sound to make waves in the app world.
13	DocuSign	Read their lips: No new faxes.
14	SurveyMonkey	Questions for everyone.
15	Quirky	Crowdsourcing an idea for basement tinkerers.
16	Pure Storage	Predicting a flash flood of data.
17	Oscar	Health insurance for the Obamacare era.
18	Personal Capital	A 360-degree view of your finances.
19	Blippar	An augmented reality check for your smartphone.
20	GitHub	Cracking the code on collaboration.
21	Synack	The white-hat army.
22	GENBAND	Disrupting telecom by helping the disrupted.
23	Motif Investing	Building theme-based portfolios online.
24	Hampton Creek	The egg comes first; no chicken necessary.
25	SoFi	Trying to ease the student-debt crisis.
26	ZenPayroll	Changing the way we get paid.
27	MongoDB	Solving humongous data problems.
28	Rent the Runway	Nice dress. Can I borrow it?
29	Intarcia Therapeutics	A better way to treat diabetes.
30	HackerRank	Helping nerds get hired.

(Source : CNBC [22])



(Source: McKinsey Global Institute [21])

Fig. 8. Estimated future potential impact of market Disruptors

That achievement gives us (the opportunity of) more impressions.

3) ***Mobile Disruptors :*** Some of the recent highly popular and effective mobile disruptors include VOIP (Voice over Internet protocol), LI-FI(Light fidelity), Google glass, and I-phone and I-pad. VOIP based communication such as Skype, MSN, Gtalk messenger are being frequently used for business as well as personal or individual consumers. Comparatively, LIFI is rather an emerging concept were internet is supposed to be distributed through lights from certain sources. These are thought to be super fast in terms of broadband connectivity. As commonly known, I-Phone and I-pad started the smartphone concept(the all touch-screen concept) around the year 2007 [20].

C. Estimated future potential impact of market disruptors

As shown in Fig. 8, we can visualize the potential impact of certain disruptive technologies in the future across different applications by 2025. It includes mobile internet, automation of knowledge work, IOT, cloud, advanced robotics, autonomous and non-autonomous vehicles, next-generation genomics, energy storage, 3-D printing, advanced materials, advanced oil, and gas exploration and recovery, and renewable energy.

Mobile internet is increasingly becoming inexpensive and there are highly capable mobile computing devices and internet connectivity. Automation of knowledge work includes intelligent software systems that can

perform knowledge work tasks involving unstructured commands and subtle judgments. IOT has networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization. Cloud technology includes use of computer hardware and software resources delivered over a network or the internet, often as a service. Advanced robotics includes increasingly capable robots with enhanced senses, dexterity, and intelligence that used to automate tasks or augment humans. Developments in autonomous and near-autonomous vehicles that can navigate and operate with reduced or no human intervention are some of the trends which shall continue to grow in future. Other concurrent trends include next-generation genomics, fast, low-cost gene sequencing, advanced big data analytics, and synthetic biology ("writing" DNA) that can be combined in different ways for creating high end technology systems. Energy storage concepts may involve devices or systems that store energy for later use, including batteries which are also considered as highly essential domain for research & innovation. 3D printing may include additive manufacturing techniques to create objects by printing layers of material based on digital models. Advanced materials are now designed to have superior characteristics (e.g., strength, weight, conductivity) or functionality. Advanced oil and gas exploration and recovery includes exploration and recovery techniques that make extraction of unconventional oil and gas economical. Renewable energy generation of electricity from renewable sources with reduced harmful climate impact are also being developed.

VIII. Research Findings

Major findings of this research can be summarized as:
1. Different types of disruptors include digital disruptors, social disruptors, and mobile disruptors.
2. Digital disruptors are present across all sectors of the economy and are affecting millions of consumers everyday worldwide (refer Fig. 3). These may include automotive, banking, construction, and energy.
3. Cloud storage, social media and big data concepts are three major information
technology disruptors of today that promise to change the future of tomorrow (refer Fig. 4).
4. UBER, Facebook, Alibaba, Airbnb have brought new concepts of mixing internet based digitalized services which now drive and rule modern markets (refer Fig. 5).
5. Social media such as Facebook and Twitter are also used as a source of gaining insights from consumer conversation which helps marketers to create buzz or popular ideas based created advertisement targeted at such group of people within the conversation (refer Fig. 6).
6. Mobile based disruptors such as VOIP, light-fidelity, and Google glass are now being considered as the future of mobile communication with more advancements pouring in due to continuous research and development.
7. Future investments in applications related to mobile internet, automation of knowledge work, IOT, and cloud based services are expected to touch around 11 trillion dollars, 7 trillion dollars, 6 trillion dollars and 6 trillion dollars annually respectively by 2025. This shows the growing importance of disruptive technologies and their future market (refer Fig. 8).

IX. Conclusion

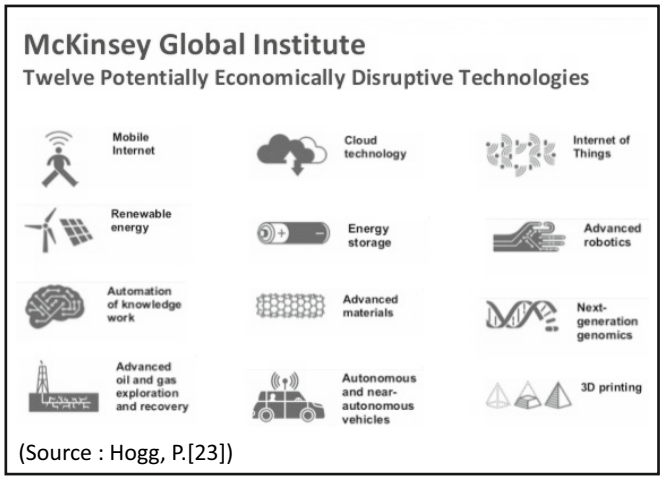
From the above research findings, we can conclude that our null hypothesis Null Hypothesis (H_0) i.e. "Growth of disruptive technology strategies has no correlation with time factor", is false and we accept the alternate hypothesis (H_1). Therefore, we can infer on the note that disruptive technologies are here to stay and we may see more surprising disruptive technologies in future. Also, the rate of acceptance of something unique and different has increased among individuals as well as among business segments.

X. Future Work

We know that our present study is limited in terms of identifying the types and characteristics of disruptive technologies. In future, we shall try to encompass more factors which may be interrelated with the concept of disruptive technologies.

A. Potential Disruptive technologies

Some of the potential prospects of technology in future can be mobile internet, cloud technology, IOT, renewable energy, energy storage, advanced robotics, automation of knowledge work, advanced materials, next generation genomics, advanced oil, gas exploration and recovery, autonomous vehicles and 3-D printing. There may be more in store for future since the time from conception to development is reducing very fast (refer Fig. 9).



(Source : Hogg, P.[23])

Fig. 9. Potential Disruptive Technologies

References

[1] P. Murray, "Pocket-*sized* graph of the theory of disruptive innovation," *Disruptive Library Technology Jester,* 2006. Available: *http://dltj.org/article/disruptive-innovation-card/*

[2] J. Bacon, "Meet the content disruptors," 2015, Available: https://www.marketingweek.com/2015/11/19/meet-the-content-disruptors/

[3] C. M. Christensen. Available: *http://www.en.wikipedia.org/wiki/Clayton_M._Christensen*

[4] Ford Model T. Available: *https://en.wikipedia.org/wiki/Ford_Model_T*

[5] "Disruptive innovation,", 1997. Available: https://en.wikipedia.org/wiki/Disruptive_innovation#cite_note-Christensen1997

[6] M. Shahmarichatghieh, A. Tolonen, and H. Haapasalo , "Product life cycle, technology life cycle and market life cycle; similarities, differences, and applications," *Managing Intellectual Capital and Innovation for Sustainable and Inclusive Society*, 2015. Available: www.toknowpress.net/ISBN/978-961-6914-13-0/papers/ML15-222.pdf

[7] H. Selhofer, R. Arnold, M. Lassnig, and P. Evengelista, "INNO-Grips Policy Brief No.

4. Disruptive innovation: Implications for competitiveness and innovation policy," INNO-GRIPS, 2012. Available: http://innogrips.empirica.biz/fileadmin/innogrips/documents/01_policy%20briefs/ig_policybrief_4_disruptive-innovation.pdf

[8] J. C. Harris, "The confounding influence of urban informality on innovation and production specialisation in production clusters: evidence from Nairobi," 2014.

[9] T. Hobbs, "Airbnb targets 'super brand' status as it outlines community-led marketing strategy," *Marketing Week,* 2015. Available: http://www.marketingweek.com/2015/10/05/airbnb-targets-super-brand-status-as-it-outlines-community-led-marketing-strategy/

[10] M. Larkin, "Davos Briefing: Disruptive innovation," World Economic Forum, 2014. Available. *https://agenda.weforum.org/2014/01/davos-briefing-notes-disruptive-innovation/. Accessed in: April, 2015.*

[11] P. *Mario,* "Frugality, grassroots and inclusiveness: New challenges for mainstream innovation theories," *African Journal of Science, Technology, Innovation and Development,* vol. 5, no. 6, pp. 469–478, 2013.

[12] P. Soni and R. T. Krishnan, "Frugal innovation: aligning theory, practice, and public policy", *Journal of Indian Business Research,* vol.6, no.1 , pp. 29-47, 2014. doi:http://dx.doi.org/10.1108/JIBR-03-2013-0025

[13] C. R. Balkrishna, "How disruptive is frugal?" *Technology in Society*, vol. 35, no. 1, pp. 65-73, 2013.

[14] The Economist, "The third great wave: special report on the world economy," *The Economist*, 2014 Available from http://www.economist.com/news/specialreport/21621156-first-two-industrial-revolutions-inflicted-plenty-pain-ultimatelybenefited. Accessed in: May, 2015.

[15] B. Solis, "Digital disruption is forcing businesses to change how business is done," 2014. Available http://venturebeat.com/2014/05/15/digital-disruption-is-forcing-businesses-to-change-how-business-is-done/

[16] "Innovation Inquiry 2015 Harnessing digital disruption," 2015. Available http://innovationleadershipforum.org/wisdom-of-others/digital-disruption/

[17] Clock Creative Communications Ltd. Available http://www.clockcreative.co.uk/is-your-market-next-in-line-for-disruption/

[18] T. Halleck, "Facebook: One out of every five people on earth have an active account," 2015. Available http://www.ibtimes.com/facebook-one-out-every-five-people-earth-have-active-account-1801240

[19] L. Nuccio, "4 social media disruptors of PR: Mixing media and message through engagement," 2014. Available http://www.meltwater.com/blog/social-media-pr-disruptors/

[20] J. Mather, "iMania at the Wayback Machine(archived March 3, 2007)," Ryerson Review of Journalism. Accessed on: Feb 19, 2007.

[21] McKinsey Global Institute, "Disruptive technologies: Advances that will transform life, business, and the global economy," 2013. Available http://www.mckinsey.com/business-functions/business-technology/our-insights/disruptive-technologies

[22] CNBC, "Meet the 2015 CNBC disruptor 50 companies," 2015. Available http://www.cnbc.com/2015/05/12/cnbc-disruptor-50.html

[23] P. Hogg, "Disruptive technologies: Impact on strategic alliances, partnerships & channels," 2013. Available http://www.slideshare.net/PhilHogg/p-hogg-disruptive-technologies-alliance