

# Role of Disruptive Technology in Managerial Decision Making: A Quantitative Investigation

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## Abstract

The term disruption or disruptive technology has become the most popular term in the business and social area. This article discusses the facts around the subject and coordinates the current hypothesis in this space and brings up issues to discuss in this regard. The agenda is to discuss the coordinated aspects around the accompanying subjects, such as the meaning of disruptive technology, the prescient utilization of the hypothesis of innovation as well as a disruptive technology, making sense of the outcome of occupants, the ramifications of the hypothesis for the benefits of being beneficial for clients, and the benefits of making a side project to popularize the disruptive and innovative technology. The relevance of disruptive technology has increased more in the VUCA (“Volatile, Uncertain, Complex, Ambiguous”). Assessment of these topics shows the relationship of the organizations incorporating disruptive technology with management decision-making in their business. The nature of the study is empirical. The number of respondents who participated in the study was 169. To collect the data from respondents, a structured questionnaire was used. To analyse the data, Mean and t-test was applied.

**Keywords:** Disruptive Technology, Artificial Intelligence, T-test, Mean, Managerial Decision Making, VUCA.

## Introduction

Disruptive Technology is continuously being used and accelerated in the business domains. It is more likely considered to be a process rather than a product or merely a technology. It is something that plays a significant role in either disrupting an existing market or even developing a new market by changing its value (Christensen, 2006). An effortless way to understand this is to break technology into two aspects, which are sustainable and disruptive. While sustainable technology talks about investing in existing technologies to make them work better by improvising the features

whereas disruptive technology aims at changing the existing norms and making new ones for bringing in more customers (Brennan, et al., 2019). The famous work by Clayton Christensen and partners on disruptive technology fills in as a springboard to ponder over five major questions concerning the impact of innovation and disruption in technological change on firms and ventures.

Digitalisation and Web 2.0 triggered the introduction of new ways of doing business. Social media was one of the initial disruptions of this century (Kudeshia, Sikdar & Mittal, 2016)

Though in some cases disruptive technology becomes a threat to the older existing business models that are unable to cope with the trend. Kodak is an example of such a failure that couldn't cope with the technology disruption. Another example of such companies where management decisions neither supported disruptive technology nor approved them to be incorporated into their business is Nokia. The company saw a downfall because of the advent of android (King & Baatartogtokh, 2015). Not paying heed to the innovative technology and what impact it could have, Nokia continued the old-fashioned way and saw great losses thereafter.

The modern usage of innovative and disruptive technologies, for instance, the Internet of things a.k.a. IoT, Machine Learning or ML, Artificial Intelligence, Blockchain, Robotic Process Automation or RPA and augmented as well as virtual reality (VR) has been added up to the list of development of commercial centres and businesses as well as changes the people's encounters in utilizing innovation. This study looks at the job of business pioneers in the new time of disruptive technologies and how it can generally change the associations or people to adjust to working problems and challenges in changing business sector elements across enterprises (Millar, et al., 2018). The discoveries uncovered that help from the business chiefs is important to rouse and urge IT, clients, to enhance with innovations. In any case, being impervious to change, feeling careless and restless toward innovation is a portion of the difficulties that the business leaders need to manage IT, clients. Business pioneers accepted that administration inclusion, consistent conversation, teaching IT clients, information gathering, sharing, and training will assist with spurring and motivating IT clients to make full use of the advantages of innovation. The commitment of the review is two folds. Hypothetically, it advances the new opponent of hypothesis or system that goes past the conventional IT use. Business pioneers must be able to adapt to new methodologies, create and acquire support for group vision, and carry out and execute new innovative technologies successfully. One of the most important IT contributions in business is known as social media marketing which ensured that the flow of communication among various stakeholders should be more real time, free and many-to-many as compared with the traditional media where

communication and interaction was only one-to-one or one-to-many (Kudeshia and Mittal, 2015).

### **Literature Review**

Disruptive technology or innovation is said to be any process, product or service which converts or rather transforms the costlier ones into affordable and user-friendly ones. The disruptive technology proves to be beneficial for a larger population of customers—this kind of change or transformation in the system reforms the entire market for the sake of improvement. Various players find it hard enough to catch up with the disruption (Princes, 2020). However, once they do, they are out of the league. The technology is not a target-based process. Hence, it does not cater to the same market. The motive is to make the processes easy for a non-targeted market which is also larger than the previous ones. One of the most prominent examples of disruptive technology is the MP3 music files which certainly replaced the old CDs and DVDs. It became easier to download and store music and cater to a larger market than what was done by the Compact Discs. The books namely, “The Innovator’s Solution” and “Innovator’s Dilemma” which were published by Clayton Christensen in the year 1997, discussed Disruptive Innovation in detail (Muharam, et al., 2020). There are two kinds of technologies in any business, sustainable one, and the other is disruptive. Sustainable technologies were predictive, where it is known that certain improvements in the system will help the business move forward. Sustainable technologies are beneficial to businesses in a consistent way, which when incorporated helps in remaining either competitive or just striving in their usual manner. On the other hand, disruptive technologies are not planned, and they come as a sudden shock to businesses. The integration of these technologies in any business will require buy-in from the stakeholders.

It is quite cumbersome to invest funds in disruptive technology and innovative processes. The investors need to analyse whether the companies will be able to adapt to the disruptive technology or not. The investors would have to look beyond the technological development within the company. Some of the common examples of businesses which have leveraged the internet as an innovation and a disruptive technology are Google, Facebook, Amazon, Microsoft and so on. The web has become so

imbued in the present era in the world that the organizations that neglected to coordinate advancement in technologies into their plans of action have been shoved aside (Sadiq & Hussain, 2018). Artificial Intelligence or AI and its capability to gain insights from the employees or workers and play out their tasks in an abbreviated period and in an efficient way happens to be a great development for the gig market in general. What makes an innovation or development "disruptive" is a confusing matter. The term might be utilized to depict advancements in technology that are not disruptive. Web technology or the internet proved to be disruptive. However, that incurred losses for several other ventures or business models as well because of the inability to adapt to the trends (Henderson, 2006).

The Internet disturbance has brought about an outstanding expansion in the development of new advancements and resultant innovation disturbances inside the work environment. With the quick changes in the innovation scene, Chief Information Officers and key leaders need to figure out how to move however the plenty of arising advancements that can bring about the plan of action development and empower organizations to contend in a computerized world. Problematic advances are changing the standards of rivalry, but the pace of progress in innovation in the conventional undertaking space has been slow (Hahn, et al., 2014). Most CIOs concur that there could be critical worth in using new advancements in making the upper hand in a coordinated world, but the reception and execution of more current innovations are somewhat sluggish. Different interpretive examinations on IT direction zeroed in predominately on client acknowledgement of innovation in a steady innovation and business setting (Roblek et al., 2021). Disruptive technologies make development in the enterprises they infiltrate or make completely new ventures through the presentation of products as well as services that are decisively less expensive, better, and more advantageous. The innovative processes, as well as disruptive technologies, give an upper hand in getting things done in easier ways and a much more effective manner.

Disruptive technologies have the capability to develop from the aggregation of apparently diverse kinds of technological advancements or it

also has the possibility of creating an entirely new mechanism. The plan for existing activities or processes of the business organizations is extremely despicable in recognizing the blend of some exceptionally different innovations expected to address the numerous niches in the existing market (Wasono & Furinto, 2018). For several reasons, particularly the powerlessness to look past transient productivity, and the two kinds of trade-off namely risk and return of huge projects, it is proposed that ongoing key strategies or planning and the management of companies mostly support the innovations which are detrimental to the organizations, in this case, the sustainable technologies (Ullah, et al., 2019). However, at some point companies have to cope with the disruption in technology so that they can have an edge over their competitors. Data innovation can possibly change enterprises through the making of new computerized items and administrations. Kodak's important officers and chiefs, culture and unbending, regulatory construction impeded a quick reaction to innovation which emphatically changed the method involved in catching and sharing pictures. The film is a physical, substance item, and notwithstanding a progression of new CEOs, Kodak's supervisors and business leaders couldn't make a change to carefully think about the issue. Kodak encountered an almost 80% decrease in its labour force, loss of the share it had in the market, a tumbling stock cost, and critical inner strife because of its inability to compete with other players because of the innovation.

Corporate pioneers ought to rethink the essential structure of planning and strategy making and change it to the VUCA conditions and basically be more vital. Traps and average disappointments of premonition are taking on it too soon, surrendering too early, adjusting past the point of no return, and holding tight excessively lengthy. Specifically, innovative change with troublesome advancements is changing and testing numerous essential suppositions of business the board and vital preparation (Hopp et al., 2018). Under current economic situations of corporate prescience, choppiness is a critical component of the business scene. Disturbance can be summed up utilizing the in vogue administrative abbreviation "VUCA" which indicates four distinct aspects namely, volatility, uncertainty, complexity and the last one is ambiguity. In spite of featuring the significance of business leaders with respect to results of disruptive innovation,

the studies which have taken place earlier must incorporate observational establishments to figure out the peculiarity according to the administrative viewpoint (Marx, et al., 2014). With advanced advancements growing in the modern world, especially in numerous enterprises, foreseeing the eventual fate of possibly disruptive innovation turns into a fundamental assignment of business pioneers worried about the endurance and progress of their associations. Investigating the fate of disruptive innovation requires a philosophical position and a basic strategy that obliges the inborn vulnerability and nonlinearity of the way of problematic developments (Stonehouse & Konina, 2020). However, a significant part of the ongoing reasoning corresponding to the reception and dispersion of developments is fairly straight and deterministic.

A progressive change in perspective is well under development in our opinion about business designs and administration as an outcome of disruptive technology and innovation also called DTI. Innovative advances like Artificial Intelligence (AI), blockchain, VR, AR, or the Internet of Things (IoT), and appropriate record frameworks, for example, blockchains, have prompted phenomenal changes, frequently upsetting the manner in which services or the products have generally been created and consumed. The capacity to deal with huge volumes of digitized information in quick and complex ways through these advances has additionally expanded our reliance on more open, multi-stage, arranged structures that empower different developments, for example, shared economies and digital currency markets portray this as the "Industrialization 4.0", foreseeing that it will prompt discount changes in whole frameworks of creation, the board and administration. An essayist features that a "problematic innovation is an innovation that changes the foundations of the contest by changing the measures along which firms contend" (Petetin, et al., 2011). Therefore, for bookkeeping or accounting and managing finances, the executives and other administrative experts, the advancements present unprecedented concerns for data and administration frameworks that call for additional coordinated, exceptional, and modern methodologies. At the end of the day, associations really must broaden their insight limits about the possible threats or risks as well as effects of DTI and be responsible in answering to

the problems likewise or be bound to come up short (Hopp et al., 2018).

One of the critical attributes of disruptive innovations is the developmental cycle that progressively expands the appeal of such advancements to standard clients (Bai, et al., 2020). Understanding of this development interaction by the chiefs significantly affected future ventures of an association (Elbeck, 2018). It is additionally contended that understanding was the main capacity the associations perform, and every other hierarchical action and the result was subject to the translation cycle (Vorbach, et al., 2017). Various partners decipher any innovation or development in another way, which ultimately directs the comprehension of issues and their answers. On more significant levels, it was suggested that the achievement and disappointment of occupant firms generally rely upon their inward social viewpoints, particularly visionary administration that expects the changing business sector elements and will tear apart existing resources to serve clients in the new market fragments. Creators contended that business, risk-taking, adaptability and imagination ought to be made a fundamental piece of inside culture to work with the advancement of problematic developments (Nadkarni & Prügl, 2021). It is additionally mentioned that the contentions of Christensen, that individuals who are in connection with the market, as well as the advancements in technology, are an undeniably more useful wellspring of imaginative ideas for new business development than subject matter experts, examiners, or business improvement, divisions. Reliable with these considerations, researchers inferred those disruptive innovations are interaction and business venture endeavours and activities are pivotal to its turn of events.

The scholars mention that during the beginning or initial phases of business development, the leaders must support innovative thoughts and ideas while outsmarting the impediments of authoritative methodology and approaches. The proposed methodology is reliable with the perspective, as contended by authors, that senior administration may not understand the capability of troublesome advancements in light of the fact that their convictions and manner of thinking are profoundly settled in and to a great extent founded on previous encounters and skills. This

conviction is upheld by verifiable contextual analyses. For instance, In Intel Corporation in the mid-1980s, Les Kohn gained from a few additional clear endeavours at the RISC processor endorsement process that a methodology which upheld as opposed to rocking the boat would be bound to succeed. He did not approve of the product and sold the RISC processor plan to top administration in Intel as a co-processor as opposed to an independent processor fully expecting to get the product endorsement. When the top administration acknowledged what their co-processor was, the client base already agreed to procure an independent processor. A period comes when an up-gradation is required in the way of execution or performance for essential credits of the development on a disruptive trajectory that meets the level of performance demanded by the standard clients. Participants in disruptive technology and innovation work on the exhibition of their performances with respect to innovation and step by step acquire particularly superior quality clients and challenge the predominance of the occupants by also bringing about an overall transformation.

#### Objective of the Study

1. Identifying the role played by the Disruptive technologies in the managerial decision-making.

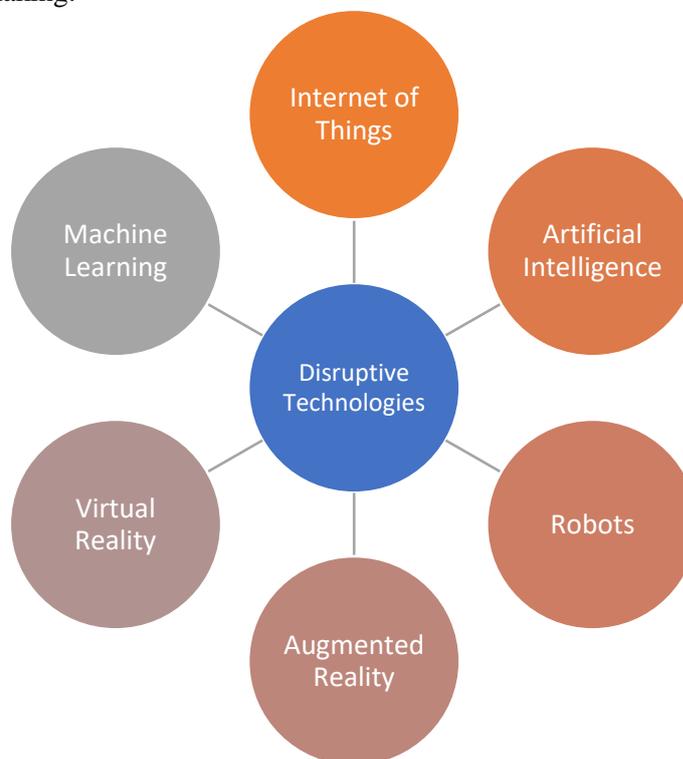
2. To ascertain how disruptive technologies help in decision-making process in a business.

#### Methodology

The nature of the study is empirical. The number of respondents who participated in the study was 169. To collect the data from respondents, a structured questionnaire was used. To identify the outcome of the study Mean and t-test was applied. The method of sampling was convenience sampling.

#### Study's Findings

Table 1 shows Respondent's gender, male respondents are 53.25% and female are 46.75%. Looking at the age group, those respondents between 30 to 35 years were 34.91%, respondents who were 35 years to 40 years are 37.28% and those who are more than 40 years are 27.81%. Regarding the Sectors, Finance are 33.72%, Manufacturing are 36.09%, and Information Technology are 30.19%. With reference to the Level of Management, Low level management are 23.08%, Middle level management are 34.32%, Top level management are 24.26%, and others are 18.34%.



**Figure 1: Various Components of Disruptive Technology**

**Table1. Respondent's Demographic Details**

<b>Variable</b>	<b>Number of respondents</b>	<b>%</b>
<b>Gender</b>		
Male	90	53.25%
Female	79	46.75%
<b>Total</b>	<b>169</b>	<b>100 %</b>
<b>Age</b>		
30 to 35 years	59	34.91%
35 to 40 years	63	37.28%
40 years & above	47	27.81%
<b>Total</b>	<b>169</b>	<b>100 %</b>
<b>Sectors</b>		
Finance	57	33.72%
Manufacturing	61	36.09%
Information Technology	51	30.19%
<b>Total</b>	<b>169</b>	<b>100 %</b>
<b>Level of Management</b>		
Low level management	39	23.08%
Middle level management	58	34.32%
Top level management	41	24.26%
Others	31	18.34%
<b>Total</b>	<b>169</b>	<b>100 %</b>

**Table 2 Role of Disruptive Technologies in Decision-making process**

<b>Sr. No.</b>	<b>Statements of Survey</b>	<b>Mean Value</b>	<b>T-Value</b>	<b>Sig.</b>
1.	Disruptive technologies have the potential of lowering down the barriers of entry in industry	4.22	16.139	0.000
2.	Emerging disruptive technologies helps in business model innovations	4.10	14.644	0.000
3.	Companies who have already adopted innovative technologies have higher profitability rates	4.29	17.446	0.000
4.	It improves the abilities of decision-makers to assess the situation to take correct decisions	4.17	15.504	0.000
5.	Emerging disruptive technologies could alter the choices of decision-makers as per the flexibility, and reliability	3.22	2.963	0.002

6.	Many Emerging disruptive technologies have the potential of reshaping international politics	3.29	3.840	0.000
7.	Increases the efficacy of offensive and defensive decisions of cyber operations of business	4.30	17.378	0.000
8.	Emerging disruptive technologies improves the capabilities of decision-makers in understanding external environment	4.09	14.635	0.000
9.	Provides decision-makers deep and accurate insights of the situation	3.17	2.255	0.013
10.	Emerging disruptive technologies support decision-makers by generating alternative course of actions	4.12	15.117	0.000

Table 2 shows mean values of the “Role of Disruptive Technologies in Decision-making process” the first statements of T-test is “Disruptive technologies have the potential of lowering down the barriers of entry in industry” it has scored the mean value of 4.22, next statement says that disruptive technologies help in business model innovations “Emerging disruptive technologies helps in business model innovations” has the mean value of 4.10. Third statement is “Companies who have already adopted innovative technologies have higher profitability rates” the mean value is 4.29, next statement “It improves the abilities of decision-makers to assess the situation to take correct decisions” with the mean score of 4.17, fifth statement is “Emerging disruptive technologies could alter the choices of decision-makers as per the flexibility, and reliability” the mean value is 3.22. Statement “Many Emerging disruptive technologies have the potential of reshaping international politics” the mean score is 3.29, seventh statement “Increases the efficacy of offensive and defensive decisions of cyber operations of business” has scored the mean value of 4.30, statement “Emerging disruptive technologies improves the capabilities of decision-makers in understanding external environment” has the mean value of 4.09. The last two statements “Provides decision-makers deep and accurate insights of the situation” and “Emerging disruptive technologies support decision-makers by generating alternative course of actions” has scored the mean value of 3.17 and 4.12. T-value of each statement of survey in the context of Role of Disruptive Technologies in Decision-making process is found to be significant as the t-value of each statements are positive and significance value is found to be less than 0.05.

## Conclusion

The technology which has the power to transform an organization, or an entire industry is unpredictable. However, it is worth giving a shot to letting it do tasks which are manually done by humans. The scope of innovation and the building of new automated systems within organizations have proved to be a significant measure in identifying the true potential of businesses. The managers in the present scenario have well-analysed the situations and are of the view that disruptive technology has proved to be a boon for companies who have been able to incorporate them into their organizations. However, at the same time, the inability to adapt to the VUCA world has pushed many far-superior companies to the lower grounds. The automated systems which are an outcome of disruptive technology in the industries have helped in easing manual labour which consumed a lot of time and effort of the managers. There was hardly any time left to ponder upon prominent issues and make strategic decisions for the betterment of the company. In this scenario, disruptive technology and innovation have led managers to superior levels where they now have the time and potential to think over issues which are less redundant and more useful to the growth of the enterprise. T-test has been done to find out the outcome of the research, all the statements are found to be significant as the significant values for all statements is less than 0.05.

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