Digital Transformation Frameworks - Applicable for Disruptive Technologies?

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Abstract

This paper has a two-fold aim to analyze the need of the digital transformation framework, and to understand the its impact on disruptive technologies by means of a structured review of the literature. The results of this research reveal that the digital transformation demand has developed a lot and there is seen a growing interest of its implementation in digital era of business and technology. However, results derived from an in-depth review show that there is a dire need for DT in developing countries and for more collaboration between researchers and practitioners. The paper highlights that business and digital marketing is fragmented due to disruptive technologies and shared platforms and furthermore outlines the strategies of digital transformation as a tool to be implemented among all new enabling technologies. To sum up all, it is concluded that without any doubt digital transformation is proven as tailored strategic option to impact creation, value and delivery of products and projects in almost every industry. These impacts have led to the improvement of digital marketing strategies, online business world along with employment of a variety of new successful business models, crucial to be successful in today's and future competitive digital era demanding for innovation.

Keywords: Digital Transformation; Technology; Disruption.

1. Introduction

Many industries utilize a huge sum of their resources in order to keep themselves updated regarding technology. All these investments are in vain if disruption occurs and makes way for irresistible consumer manifesto. Many research papers have covered this topic but there is still insufficient information and tools to overcome this threat. Intelligent and connected products are changing the world and transforming it from the industrial age to digitalized age.

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But this change comes with consequences and competition. Developing economies are greatly affected by Innovation. Organizations are undergoing a digital transformation in order to obtain sustainable competitive advantage. Information technology also impacts sectors that are not intertwined with IT. The digital transformation give rise to various challenges at different levels of leadership and data governance. The process of integrating technologies for transformation of organizations is also a challenging task. No one would have imagined such kind of things happening. The sustainability of traditional business models is being put to test as digital transformation is taking hold. In recent years, digital transformation (DT) is a topic of interest when we talk about research related to Information Systems [1]. At upper level, digital transformation makes use of digital technologies to encircle the intense changes taking place in society[2]. At corporation level, innovation needs to be carried out with technologies discussed [3]. In this paper, we acknowledge ourselves with the recent developments in this field work towards finding a tool that helps in recognizing imminent disruptive technologies and working towards a strategy to adapt to these changes.

2. Research Methodology

In this research paper, a literature review is done in order to collect data on research study regarding digital transformation framework and disruptive technology. Systematic review is opted as a transparent and reproducible, multi-stage review strategy to ensure high quality review [4]. For data collection, focus is only limited to the academic journals, conference papers and articles referring to authors discussions on digital transformation and disruptive technologies. Additionally, research queries are run against major electronic data bases which are as: Scopus, Science direct, Google scholar, Association for Information Systems Library (AIS e-library) and Social Sciences Citation Index (SSCI). The application of this digital transformation frameworks approach is further illustrated by means of two case studies. We adopted a two-step approach while reviewing literature on technological disruption, digital transformation and corporate entrepreneurship. The first step was to review and analyze existing articles on DT and synthesize them. The second step was to ensure that these findings were in-coherence with the latest research on technological disruption. A separate analysis and contrast of research stream was done for two reasons. First, it provides coherence on the state of affairs of digital transformation knowledge. Second, such a structured approach regarding digital transformation leads to the future research opportunities being highlighted.

3. Digital Transformation Framework

Although the generic concept of digital transformation has been studied and discussed often. This literature covers the novel concepts behind the application of digital transformation frameworks as a strategy for disruptive technologies. In this context, digital business strategy and digital transformation strategy are covered. Ever aging digital technologies when contributed alone in the organizations, impose much little value [5]. Potential ways for creation and outshining of value are paved by the specific use of technologies within context enabling the firm, organization to be consistent in enduring the emergent phenomena of organizational change [6]. Indeed, although in a majority of studies, DT is treated as an endogenous phenomenon having purposefully composed initiatives in response to opportunities and hindrances offered by disruptive technologies. Some authors are consistent with the view that DT is a "journey" [7] rather than a project which seems to be more

truthful. Through a series of social and economic negotiations and selection processes, a dominant and favorable design is formulated.

3.1. Need for Transformation

In many countries, digital technology is part of everyone's lives. Our lives are greatly influenced by it. But the technology is not the reason behind the need for an organizations' digital transformation. The driver behind an organizational digital transformation is the people (customers and employees) and their expectations from those organizations. As people go towards embracing technology, their expectations increase that organization they are involved with, whether they are their employee or consumer, will also follow the same path and adopt that technological change. People have an aptitude for technology. They expect organizations to follow latest technology. And technology is always evolving. It's a circle of arguments. The cycle keeps going on. The whole argument is about the fact that technology evolves. This evolution constantly affects the expectations of people. This change is being driven by the customer instead of the organization solely [8]. For example: In the last decade, the demand for new technology has been greater than ever before. This culture forces organizations to rapidly transform according to emerging technologies.

3.2. Benefits of Digital Transformation Framework

Foundational change at organizational level is necessary for the digital transformation of a corporation. According to an expert opinion "a digital transformation requires instilling a culture that supports the change while enabling the company's overarching strategy" (Hemerling, Kilmann, Danoesastro, Liza Stutts, & Ahern, 2018). "The singular focus should be on customers and their needs" (Schwertner, 2017; Dahlstrom, Erikson, Khanna, & Meffert, 2017). Citing Bloomberg (2018), "digitization and digitalization are essentially about technology, but the digital transformation is not. Digital transformation is about the customer". "The processes of the organizational change and incorporating of a digital culture should be initiated and supported by executives" (Gillin, 2016; Schwertner, 2017; Hemerling and his colleagues 2018) [9].

4. DT and the modern era

The escalated build-up of technologies that we see today is something the world has never seen before. All the transforming industrial revolutions of the past were based on one primary technology. But Today, there is a whole variety of technologies that can influence any business or industry. In past it would take years to make a change in industry. Today, all it takes is a few months and whole industries can be disrupted. And it's no longer the large organizations with vast resources that are object to that change. Today, the people have the democratic power to affect any industry of part of society. The operational procedure of long-standing organizations results in decades of success. It's responsible for the survival of organization at a particular time. Over the period of time, the company followed the same path of operating and it resulted in prosperity. For all companies, the environment has been optimized according to their operation. Hence, if there's a rapid or over time change in that environment, the companies are not equipped to adapt to these changes. Expectations of customer and employees are among the few external factors leading to disruption. When some of these conditions prevail, the

traditional ways of working won't deliver the same results. That's when digital transformation frameworks come in play, helping the leaders direct the organization towards the success of business. In today's world, the companies that are adaptable to change are the most successful. The need for a digital transformation is more influenced by factors like profit margins, expectations of employees and customers and competition in the market rather than factors like in which industry the organization exists. In order to ensure successful transformation, it is necessary to establish a digital transformation framework. The process is not as easy as following a simple checklist. It's an extensive process including convergence of events that results in organizations embedding innovation into their business model.

5. Disruptive Technology- An introduction and history of evolution

The word 'Disruption' refers to the process, not a product or service, that occurs from the fringe to mainstream comprising of series of external factors undergoing current change. It mainly originates in low-ends or scenarios where new market footholds that never existed before. As for technology, disruptive technology is basically an enhanced technology or completely an innovation displacing the existing technology, established leading firms, markets. It brings about disruption in existing technology, renders it obsolete, sweeps away the systems and radically alters the way in which businesses, industries, markets or consumers operate. The functioning ways of market, business or industry all are affected due to the application of disruptive technologies as it has attributes that are recognized by superior. In some cases, business models for companies and organizations are adapted to new technologies to improve value and generate new markets. All of this results into disruption of well-established organizations, sectors and companies. The idea of disruptive technologies firstly got recognition over 20 years ago, by the American scholar M. Clayton Christensen who published it in 'The Innovator's Dilemma', in 1997. He initially described this concept by referring to the kinds of technology with attributes that were mostly valued by consumers. Moreover, some neglected attributes were also focused alternatively. With time, it gained significance and also got highlighted in start-up businesses as a buzzword with the intensive measure to create a product with mass appeal. Later, this concept was taken further into a broader concept as disruptive innovation. It is a broader concept that along with referral to disruptions in technology also encompasses the other related aspects of disruption. Further, it is strengthened by means of strategies adaption for flourishment of products and business models. Now a days it has been called as widely applied, most discussed and influential business idea of the early 21st century. Previously electronic services were considered as disruptive technologies but now all ecommerce apps, travel apps, blogging and news sites are considered as disruptive technologies.

5.1. Impact of Disruptive Technology

In an era of digitalization, disruptive technology is ubiquitous. With the emergence of new technologies, market disruptions have always been there. It impacts operations, engagement, production, customer behavior and experience, marketing and even collaboration and partnering. Markets and customers, industries and economies, organizations and companies and indeed entire value systems get affected as a result. This changing trend is already impacting several organizations at some point in their journey. As reviewed from several studies, about ninety percent of business executives stated that their industries are supposed to face disruption by digital trends.

This framework of digital transformation is built upon the strong interaction and relationships emerging out of disruptive technologies. The digital technologies not only are responsible for disruptions that usually tend to trigger the organizations strategies. Here DT frameworks play their central part in effective creation of technologies but also reinforcing effective means to build strong blocks for the organization through at both society and industrial levels.

5.2. An insight into successful disruptive technology

Technologies are not usually disruptive on their own. Disruption happens when all of the attention and focus is given solely to one factor in the whole value chain. Like a company, organization or industry introduces a technology to cater to only customer value chain. In order for a disruptive technology to be successful, there is a need to pay attention to not only technology but also other inter-related aspects like consumer behavior and expectations. For example, several start-ups now are formulating their business models by means of setting technology as a foundation and additionally a driving force for success like the users need via mechanism of digital transformation frameworks. In fact, before boarding the tech train, there is a dire need for organizations and companies to figure out that they should include DT framework as a managing tool in their business model. Research of Harvard Business School professor Clayton Christensen depicts that there are certain factors that lead to successful disruptive technology and digital transformation framework is one of them. These factors are as:

- Enabling Technology: Technology should be an innovation or invention and should have potential to make the product accessible and affordable for wider range of population.
- Innovative Business Model: Technology should be derived from a unique business model to target and capture new customers other than those in exiting market.
- Coherent Value Network: A properly managed network run by transformation framework strategies should be proposed so that on prosperity of disruptive technology, customers and suppliers all should be better off.

The solid and foremost reason for failure in fast enough adaption to disruptive technologies by most of the companies is the lack of management strategies and transformation framework tools, due to which the organizations and companies are subjected to the negative and at times dire impacts of disruptive technologies. In order to tackle with the disruptive technologies, a structured approach is to be followed. There is a need of developing the prototype in such a way that it is aligned with the consumer desires and aspirations. To combat with it, digital transformation framework has emerged as powerful strategy. Strategy consultants, a decade ago, solemnly advised all the organizations to act upon the approach, "a business and management strategy first, enabling technology second". However, in today's world technology is central to strategy. Organizations and business executives now for shaping their industries and projects, put the idea through strategy of digital transformation framework before finalizing. the underlying business [10].

5.3. Disruptive technologies affecting business

In the markets where firms operate, when disruptive technologies are introduced, the employees can demonstrate resistance brought about by them resistance, leading to the severe impacts on organizations and firms [11, 12].This resistance places demand for strategies implementation to the ways and pace at which the introduction of disruptive technologies is carried out. The literature review highlights some reasons for the cause of this resistance and hindrance imposed by disruptive technologies and also suggests preventive measure for it. In one of the studies, "innovation fatigue" has been highlighted as one of major causes of resistance imposed by disruptive technologies [13]. In another research, digital transformation frameworks are leveraged as a position to promote the usage of digital technologies in an effective way, ensuring the consistency of technology with the organizational culture and acceptance favor by customers [11].

5.4. Strategic Responses to Digital Disruption

We all have now become aware of the fact that "both game-changing opportunities' and 'existential threats' are provided by digital technologies to the firms, organizations and companies [3]. In light of all these disruptions imposed by technologies, ways must be devised by firms and organizations to remain competitive [14].Thus, strategic development and response becomes a robust discipline in digital world. For old times and certain fields, traditional approach served as a compelling way in determination of business direction. But, in today's and future world of digitalization and disruptive technologies, the traditional approach becomes less effective.

6. Interaction of Digital Transformation and Disruptive Technologies

To ensure the consistency of technology with the organizational culture and acceptance favor by customers, digital transformation and disruptive technologies should have a strong relationship in the ecosystem in which they interact. To have a strong connection with customers, basically every business, firm or organization need to operate in an ecosystem comprising of all entities required. Customer preferences and satisfaction, other intangibles like interest rate and all governing bodies and concerned stake holders like competitors and service providers and so forth are included in it. Thus, to adapt well to all changes and resistances imposed by disruptive technologies in the eco system, several firms, companies, organizations and sectors have embarked upon an exercise called digital transformation frameworks and strategies with the intensive measure to survive in the competitive world full of customers demanding more than that in the past.

6.1. Digital transformation frameworks-A need for organizations

When an organization decides to undergo digital transformation what happens is that they start brainstorming ideas to solve the problem they are facing but usually they ideas and the whole process of brainstorming in not in-line with the context of business. They don't consider the mechanisms required for the successful implementation of their solution. A significant risk has always been there along with disruptive technologies in investment by companies to either create or adopt the technology. As a consequence of the risks involved, many technologies considered to be disruptive either undergone several years to be accepted by organizations or businesses or firms or they are not adopted at all. DT is depicted as a higher-level phenomenon that disrupts the competitive environment and demands a response from the part of the organization. Even limited resources-

based start-ups have also an opportunity to focus on managing disruptive technology by means of digital transformation framework. However, set up businesses and established organizations adopt the strategy of DT frameworks to have focus solely on pursuing incremental improvements and doing the best in order to successfully cater the demands of customers.

Thus, the transformation of an organization with digital framework leads to achievement of well-defined goals, improvement of operational efficiencies, satisfaction of customers regarding experience and successful launching of innovative products or services through a smooth process[15]. However, in this regard, basic aspects are to be followed:

- Complete and deep understanding of current state
- Modelling the desired future sate
- Identification of the targets leading to the best in future

The framework perspective of digital transformation perspective contributes to development of sustainable competitive environment for the firms and organizations. So that, they must overcome resistances and barriers hindering their transformation effort by implementing structural changes. All of these changes result in positive impacts not for disruptive technologies but also organizations as well as whole digital market and industry.

6.2. Impact of Digital Transformation Framework

In the epitome of chaos offered by disruptive technologies, the right digital transformation framework serves as a guidance pillar without no doubt. And it is must to say that any organization suffering from this metamorphosis will be subjected to state of turbulence or flux. A digital transformation framework serves as guiding beacon by equipping everyone with a sense of progress leading towards the end goal of revitalized and successful organization. It basically highlights all the changes to run as a driving force in overlapping areas of an organization. Moreover, it also serves as a bench mark to deliver results for the multi-faceted program. Without any sense of progress, the organization, company or firm is severely impeded to the risk of change fatigue. Ultimately, it will result in crippling of organization and total loss of its momentum. However, with no positive end left in sight for the organization being stuck in cycle of endless change, this change fatigue can be avoided at its best by implementation of digital transformation framework. Thus, all those companies who as a foremost action in advance, adopt the DT frameworks as effective strategy for disruptive technologies a take first actions to adopt technologies are less likely to suffer and ultimately prosper and become dominant later after survival and prosperity. While on the other hand, those organizations who refuse to implement DT framework as strategy would be most likely to suffer and fail ultimately.

7. Case Studies
7.1. Blockbuster

Blockbuster was one of the biggest giants in the video business owning over 9000+ video-rental stores. In 2010, they filed for bankruptcy and after that till date they almost ceased to exit. Now let's go in a bit of detail to

understand what actually happened. In late 90s, video-rental business was highly profitable. It was an era of VCR's and cassettes and the VCR cassettes were priced at around a $100 making it difficult for everyone to buy them. This gave a boost to the rental business model. Rental stores purchased these cassettes and used to rent them to people at an affordable and cheap rate. At that time, it was a profitable business because as soon as the initial investment of a video-tape was cleared, every time it was rented, pure profit was generated. This business was a success and blockbuster were among the big guns at that time. Then came the internet-era. A subscription-based entertainment company- Netflix started capturing the market by aligning its business model according to the change in need of its consumers. Blockbuster sensed this change in technology but couldn't understand the disruption and made the wrong decisions. The change that Netflix imposed was the availability of on demand entertainment via subscription, while blockbuster's model was full of friction. When the facilities being offered by Netflix were absent, customers endured friction but as soon as Netflix entered the market, the customers shifted to their services. No addressing the issues and disruptions led blockbuster to bankruptcy in 2010 and Netflix emerged as a successful on demand video entertainment service.

7.2. Microsoft

Let's take a look at another case study to develop better understanding of the concept. IBM is a well-known company, anyone having basic knowledge of computing history knows that IBM ruled the computing industry during the mainframe era. In 1980, the concept of PCs got a bit famous and personal computer industry gained potential. Observing this shift in interest from mainframe to PC, IBM tried to catch up by signing a deal with a Microsoft which was a small company at that time. Microsoft and IBM made a deal in which IBM was given the right to use Microsoft's operating systems while Microsoft could license that OS to other companies too. IBM made a mistake by missing the crucial change that was the shift of computing industry from hardware to OS that linked the hardware and software. IBM thought the change was the deviation of people's interest from mainframe to PCs. Microsoft took advantage of this opportunity and over the upcoming decades, developed Windows. They understood the importance of GUIs and realized that it was the answer to broadening PC adoption. Several software manufacturers were offered partnerships to put their software on the PCs running Windows. In this way, Microsoft became the successful company that revolutionized the computer and software industries. In 20th century, as technology progressed and people became familiar with the concept of Internet and the Web, the people were able to reach and do something outside the Microsoft environment. Similarly, smartphones were introduced and they began to capture consumer interest this decreasing the need for a PC. Like IBM, now Microsoft faced a disruption pattern and if not handled properly, it would have led the company to its collapse. A new CEO was appointed and he realized the need for a digital transformation and began with making Microsoft Office available on iPad. He realized that the PC era was over and now smartphones have taken that place. The assumption that Windows was to be the center of all computing experiences was no longer practical and Microsoft evolved by realizing the evolving needs of consumers and aligning their goals according to them.

8. Findings

As a topic of interest, digital transformation frameworks have emerged and reflected in a lot of research papers.

All of the research conducted indicate in regard to disruption technologies, DT frameworks have become a basis of strategies being adopted by organizations and firms. Moreover, the growing trend of digital innovations has also led to the digital transformation strategies based on the nature of resistances and issues offered by disruptive technologies. Although different viewpoints and arguments exist about digital transformations and disruptive technologies so far. However, some important issues have not been still addressed and wide ranged and in-depth consensus is yet to be made in order to have more accurate and precise views. In order to address all these issues and barriers, conceptualization and exploratory regional study become necessary to clarify the concepts further so that organizations can become well aware of real connotations of digital transformation framework and suffice value can be derived from disruptive technologies.

9. Recommendations

For the firms to compete and successfully innovate, a better understanding of the phenomenon, despite the current relevance of digital transformation frameworks for managing disruptive technologies is needed. Due to the existence of most studies in technological contexts, lack of practical and managerial implications was observed in most of the firms. Moreover, managerial implications and measurement issues with regards to disruptive innovation and technologies or entrepreneurship, especially in the current context of digital transformation, remain unexplored. For which, implications of the implementation of digital transformation frameworks for disruptive technologies in different contexts must be developed with additional insights. Additionally, future research should also focus on examining the effect of DT and observing how their effective starts-up and spin-offs harness the power of disruptive technologies with the aim of successful innovation.

10. Conclusion

In regards to the advent of digital technologies, there is no doubt that digital transformation frameworks have the potential to foster disruptive technologies, disruptive innovation or disruptive entrepreneurial activity in a wide range of firms, companies, sectors and organizations both in provision of services and manufacturing of products as well as in commercial, educational and social domains. For an organization, firm or company to undergo a successful idea or business implementation, it must take control of the disruptive technology of its market. It can be done by adaption to the digital transformation frameworks as well as through their effective implementation. Moreover, to get ahead of competitors, competitive pace needs to be kept and, in this vein, digital transformation frameworks, their dynamic capabilities along with existing knowledge assets, such as valuable and rare resources, can play an important role. Digital transformation framework is thus a strategy that changes the bases of competition and rendered as effective means for established technologies obsolete and disruptive technologies. Moreover, it is also concluded that any innovation, entrepreneurial activity or technology is not made disruptive by simply launching of new product or service. But unsatisfied needs of market segments or certain demand conditions from potential new market segments prevail and either become the cause for disruption.

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