Significant indicators of company performance by impact of big data, sustainability and digitalization measures

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Abstract: Companies nowadays are certainly dealing with huge amounts of data, not just to go about taking important decisions but also infuse data driven decision making into their day to day activities. Handling large volumes of data from various sources without missing any significant opportunities, companies of today need to devise strategies and also figure out how to use and effectively manage big data to best of their ability and advantage. In order to face the major challenges and unseen situations arising in the business environment just embracing the advantages of big data is not enough. Also investing in viable digital technology is no longer seen as giving a significant competitive advantage is seen as a standard one. Today digital technology has certainly forced entrepreneurs to reconsider their business models. Digital customer experience is another dimension that a company can improve based on customers' needs is necessarily the key to analyse the data of customer journey and also to adjust digital tools of e-commerce accordingly. However in the path of evolution, the interest of companies (in terms of profit) on one side and also interest of society (social and environmental aspects) on other side should generally find a common point in order to pursue their interests in such a way that will not affect future generations. Digital transformation and resulting business model innovation have all fundamentally altered and changed inroads into consumers' expectations and behavioral attributes, thus putting immense pressure on traditional firms and also distributing numerous markets. The research is based on the secondary data in the form of existing literature on the subject. Research articles are collected from the databases like EBSCO, JSTOR, EMERALD, SAGE, PROQUEST, etc. and analysed to build up the theoretical constructs and arguments in a systematic manner. Sustainability by far is the approach towards this future, which does allow companies to grow and make or reap profits but also at the same time also provides benefits for the society. The research would lead to some pertinent outcomes which would help business firms to create differentiation among competing market forces and help them develop effective strategies

Keywords: Sustainability, big data, digital transformation, digital tools, competitive advantage, value

Introduction

Today big data is indeed changing the way business is done and executed. Big data is also helping managers to manage and also measure with desired results. Managers are also able to understand and know their business and this knowledge later is translated into an improved decision-making process and enhanced increased performance as suggested by McAfee & Brynjolfsson (2012). Same authors have also opined that big data is changing various traditional business models companies which have been created in the digital era are necessarily being aware of potential of big data, understand their data, how to use it and also major opportunities for gaining significant competitive advantage.

McAfee & Brynjolfsson (2012) also claim that big data as such is a phenomenon which creates revolution in management ideas, expertise, past experience and practice of management will be changed in big data analytics. Based on the research conducted by Mckinsey and MIT center for digital business the results were however that companies which make use of data in their decision-making process are performing better on various operational and financial results when compared with their peers and subordinates

According to McAfee & Brynjolfsson (2012) using big data as a major basis for making decisions is not quite enough because on one instance big data is not substituting human vision insight and on the other instance executives must find right balance between using data, their experience and intuition when organizations take important decisions. Companies off late are benefitting from investing in big data in order to see what is the impact of big data on its operations. Davenport and Bean (2017) conducted a survey on executives working in companies from Fortune 1000 to ascertain and taking into consideration investments in data starting from 2012. Survey conducted was successful in that the executives surveyed claimed that their investment in big data was quite successful. However Bean (2017) claimed that even though big data initiatives do have a high percentage of success major challenges such as data driven culture do prevent successful adoption of big data initiatives.

Above figuring showing **Big data initiatives and success rate Source**: Davenport and Bean (2017)

A few years ago big data was a turning point. Sometimes ago majority of their companies and their executives had difficult and ardent task to figure out opportunities and also to have an

impact on business of big data. Bean (2016) claims that for now big data is quite emerging as a corporate standard but executives of companies

still lack the needed metrics for big data. Bean (2016) also pointed out another aspect as big data is seen as a tool that which enables significant opportunities for innovation due to the major agility it does bring to organizations, loading large amount of data thus recognizing links and patterns is quite possible. However results in innovation due to the occurrence of big data are few stages occurring in this stage according to Bean (2016)

Wessel (2016) argues through his studies that in some cases, to obtain significant amount of value companies need huge amount of data, however for innovators size associated doesn't matter but yes having right data at the right time and place is important. According to Wessel's opinion instead of seeking the right data companies are spending too much time, money, energy and resources on gathering huge amount of data

Capelli (2017) suggests that real value comes for those companies who spend most of their money on HR departments and in order to make it more analytic companies should focus on delivering increased attention on the use of big data in HR. According to Capelli (2017) eventough big data is quite a changing factor in business; in some most likely areas such as HR it is not that important. HR doesn't need special software or tools in his opinion for big data because HR doesn't have big data. When dealing with hiring process or performance management in majority of cases as seen in many companies the HR department is using all the data.

Other major reason that certainly makes big data quite difficult or even more impossible to apply in HR related characteristics of HR data that which creates some limitations for data analysis and legal boundaries for companies especially operating in EU, where data related to employees cannot be legally or just easily moved across certain boundaries. Similar situation in US where employee's data might actually disclose a negative impact on selected protected groups according to Capelli (2017). However these issues are not present in other such areas of business.

Biesdorf, Court and Willmott (2013) suggested that organizations and companies should pay attention to main issues which are related to big data and advanced analytics which are technical in nature in order to necessarily avoid ineffective and costly investments even tough by far evidence shows that important advantage however is by exploiting the data. However in order to avoid the above situation. The authors did recommend a big data plan in order to avoid the present situation. The authors claimed and substantiated through their studies that when companies wanted to implement big data they missed out availing big data step. The authors opine that a simple plan that which includes analytical models, data and various other tools necessary to understand how to create business value is needed. It also allows various people involving executives, IT specialists, managers and data scientists to discuss, analyze and also figure out much needed areas that would yield greatest return and also to start from. The authors further suggest and opine that making the above mentioned plan only is not enough but they also suggest that companies are also facing challenges and managers should solve them. Investment is by far one of the major problems because adapting to big data will bring in more cost for new data architecture an impeccable aspect that senior executives must necessarily take into consideration.

Research Problem

The present study explores the significant concept of big data and whether and to what extent it might affect R&D management in future days. To dissect the nature of big data through extensive discussions to arrive and achieve a common understanding of what it represents, a research framework is constructed to analyze the significant impact of big data based on its potential to inform, enable and also transform or even disrupt R&D across four major dimensions: people, strategy, technology and process integration. A detailed literature review is carried out which indicates that big data demonstrates that this phenomenon will have significant implications for R&D and also innovation management although nature and extent of that impact is quite uneven among different industry sectors.

Research Methodology

The research is based on the secondary data in the form of existing literature on the subject. Research articles were collected from databases like EBSCO, JSTOR, EMERALD, SAGE, PROQUEST, etc. and were later analysed to build up the theoretical constructs and arguments in a systematic manner.

Significance of the present study

Big data as such is increasingly pervasive, changing as to how we understand the world. There are sensors embedded in major consumer products and elsewhere as researchers have used big data gathered from social media streams thus to identify problems with newly launched products before they escalate and also develop ideas for significant enhancements to existing products based on their observed performance indicators. The significance of big data has enabled many organizations to access and analyze data which has become more common. Sooner or later big data will be dealt by all R&D organizations to deal with for their sustainable competitive advantage.

Are companies prepared for digitalization?

According to Unruh & Kiron (2017) for executives working around the world the significant effect of digitalization on business environment is causing major concerns. Also digitalization has certainly disrupted the way of doing business in several industries. For instance, In retail sector it's the other way round wherein companies like Alibaba, Flipkart and Amazon have hit hard the shopping malls and classic commerce. The authors also suggested that the effect of digitalization in retail sector will shortly move to other sectors of activity like hotels, energy, and transportation and even to manufacturing in future days. Besides in order to face the opportunities and challenges, implications associated with digitalization executing are creating strategies so that they can be necessarily prepared to deal with digitalization related aspects.

Digital technology and digital mediums and its related gadgets and various services on one hand and other needs of customers which are quite evolving and also act as a very important influencers of the market and the forces that drive digitalization as Unruh and Kiron (2017) claim. Few authors also suggest that in order to have a "better digital future" as executives should act with much huge responsibility regarding digital technology. Further authors also opine that major risks and opportunities provided by the digital technology must be taken into consideration. Authors call this as 'digital transformation on purpose'. In order to accomplish and address this purpose, Umruh and Kiron (2017) proposed a framework for better understanding of digitalization concepts. R&D organizations today are increasingly moving into the realm of big data- some certainly driven by advancements in technology that which have increased the significant amount of data gathered in single or multiple experiments to a level that requires special handling. Few companies however have considered what the changes in this data landscape will generally mean for R&D and R&D management.
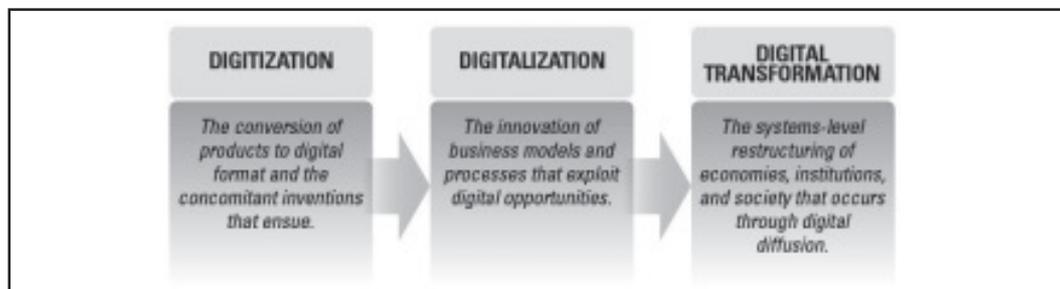

Figure 2: Showing Digitalization Framework Source: Unruh and Kiron (2017)

First stage is digitalization which implies the 'conversion of various products and services into a digital format along with concomitant inventions with result from digitalization'. The conversion process however takes more time for tangible assets and products. The second stage is however linked to the first stage because it uses digitized products and services obtained in the first stage but in this stage new business models and other such processes are developed. The last stage or the third stage where digital transformation happens when 'new digital models and other such processes restructure economies is backed up by technology and as a result technology is integrated by people in their lives.

Ross (2017) in his article regarding digital transformation argues that if leaders don't make a significant difference between digital, digitization and digital transformation which could result in a major costly mistake. If digital mediums address concerns regarding cloud, technology, internet of things, mobile accessibility features besides how companies should transform themselves in order to benefit from various opportunities created by this technologies. The author also claims that digitalization as such is the major facilitator for business organizations to go digital while digital transformation measures aim to reconsider a company's value proposition.

Noterdaeme, Caylan anad Naik (2016) through their studies suggested that for industrial sector big data analytics along with digitalization and internet of things brought up opportunities to increase the sustained industry value chain. The success of digotal revolution is proved strongly by majority of retail companies like Amazon, Alibaba etc but the authors also argue that not only for e-commerce but there is also huge potential for all industrial sectors. In order to support their idea the authors created a map that showed eight value drivers in the industry as shown in figure 3 below.Majority of the industrail sectors when compared with other sectors made small and significant steps towards digitalization path even though the potential of digital transformation was huge.

According to bughin, Labergeand Mellbye (2017) digital technologies although might have penetrated retail, media or high tech industries having less than 40% on average are digitized. The authors further also claim that companies having digital strategies and digital technologies will benefit the most. Bughin, Laberge and Mellbye claim that even though several industries are already impacted in terms of economic performance as can be seen in figure 4, this is just a beginning

As per Mckinsey survey (2016) investments in digital strategy are focused more on marketing and distribution aspects (49%) as shown in below figure 5. The explanation however also points out that the significant impact of digitization was quite huge on customer interactions which drew results

However majority of the winning companies going ahead with digital transformation are specifically in terms of revenue growth, EBIT growth and return on digital investment, companies that which change their corporate strategy in order to tie necessarily with digital strategy. Bughin, Laberge and Mellbye (2017) do claim that in order to accomplish that some companies do changed their business model fundamentally. Besides the same authors also suggest that a strong organizational culture is certainly necessary in order for a successful change.
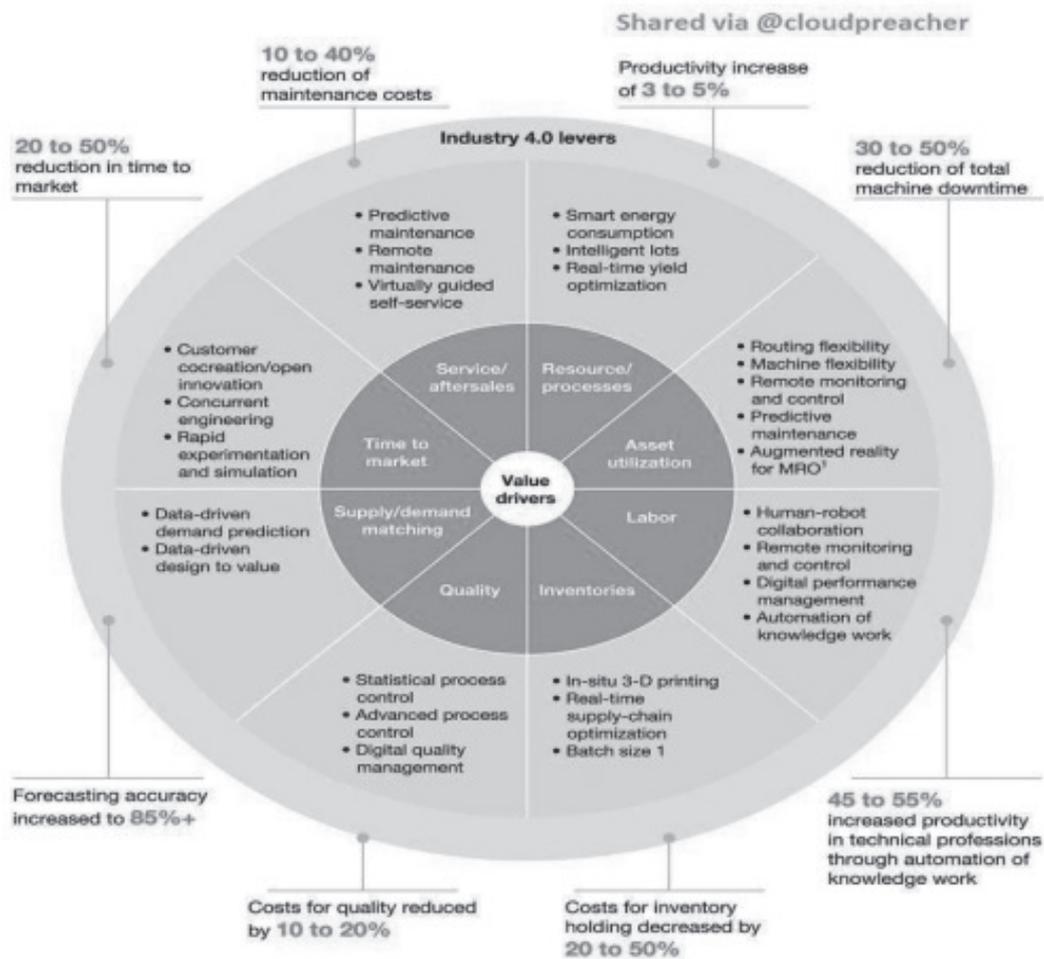
Digital however not only means to optimize company's existing operations. The power to disrupt value chains, enter new sectors and also create innovative business models also gives both attackers and incumbents favorably. Established companies do face threats from new competitors like Amazon and Alibaba business which offers millions of products from industrial lifts, automotive components and ramps to lab products, other such protective gears and electrical components. To overcome threats like this, industrial companies can necessarily use digital mediums to transform and extend their own business models before change is imposed on them by certain attackers reshaping their

respective industry. Digital platforms are joined by some incumbents and B2B marketplaces to aggregate demand and also sell directly to end users. For example, BASF was the first chemical company to sell products online via Alibaba. Other major businesses such as 3-D printing start up Sculpteo are selling services rather than products. As a service to third parties other industries are offering their manufacturing capacity.

Figure 3: Showing McKinsey's Digital Compass Maps –Source: Caylar, Noterdaeme and Naik(2016)
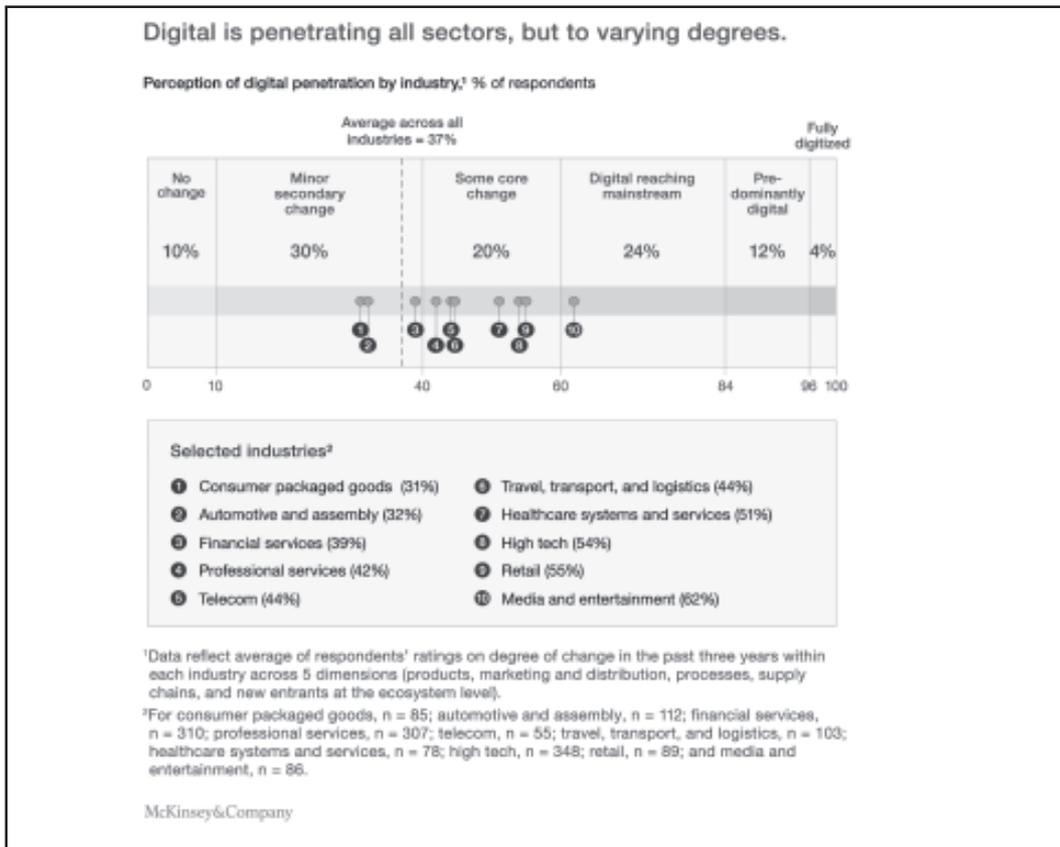
Figure 4: Perception of digital penetration by industry wise (% of respondents) Source: Bughin, Laberge and Mellbye (2017)
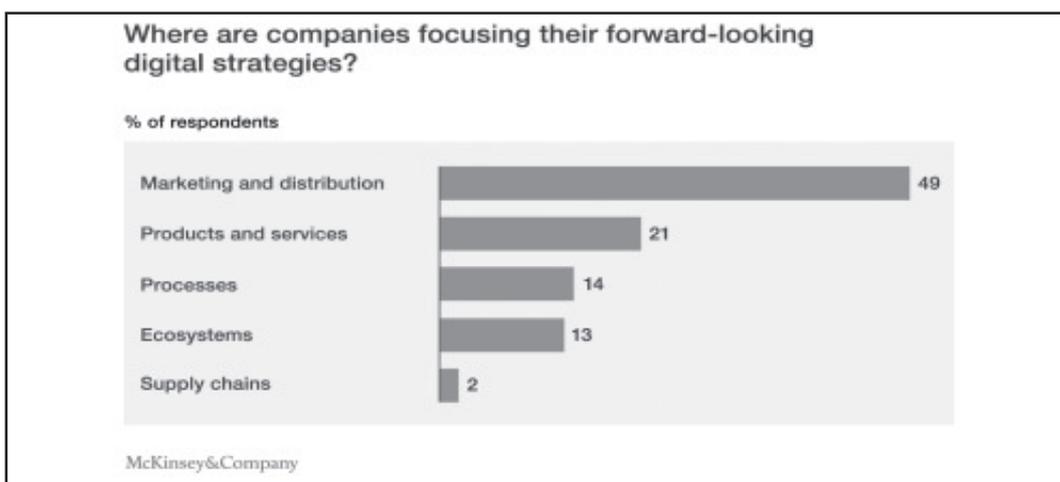

Figure 5: Where are companies focusing their forward-looking digital strategies? (% respondents) Source: Bughin, LaBerge & Mellbye (2017)

Does sustainability matters much?

The fact that business landscape and horizons has changed, environmental, social and psychological issues have become a major priority for the organizations ever since 2001 when European commission did introduce the notion of CSR-'Corporate social responsibility'. Organizations as a response to this began to include in their annual reports certain data about social and environmental concerns and also their impact on performance aspects. Sustainability reporting is the need of the hour and has also become a common practice when stakeholders involved pressurized for more vital information due to the relevance of CSR for their companies.

The studies related to CSR started from the early 1950's and thenmoved from one perspective to another i.e., from 'macro-social' perspective to 'organizational level' perspective and also from ethics to performance perspective (Lee,2008). The studies on accounting alongside CSR theories also started emerging during this period (Durden 2008). When quality was such a big issue and concern back in 1980's for executives, manufacturers and their companies did found a way to address this problem by including quality initiatives and quality metrics related to their incentives. However according to Burchman and Sullivan (2017)as a result of these changes quality improved significantly. Few others do suggest that with sustainabilitythe issue occurred is similar. Eventhough in US there are some conflicting messages' occurred regarding climate change, shareholders and customers of some US companies, sustainaility is getting more and more to their attention. Burchman and Sullivan (2017) claim through their studies that due to lack of metrics regarding sustainability adding compensation factor for executives becomes a difficult task in case of the negative effect of sustainability on damaging company's overall reputation and business. However in case of any situation as mentioned above the board has the right to cut compensation for executives.

Unruh (2016) through his studies conducted argues that in 1990's sustainability report was seen as 'Logical extension of traditional financial reporting'. He also claimed that GRI's standards (Global reporting initiative) which is an Independent international organization dealing with financial reports has thus pioneered sustainability reporting since 1997 has made working executives focus their attention on certain said issues of sustainability reporting. Financial metrics does provide a comparison between companies over a period of time but it has got relevance from relative performance does suggest that they should be used in comparing companies with similar characteristics and also from the same industry. According to Unruh (2016) sustainability metrics are quite more problematic to deal with. The author also claims that concept associated with materiality is a solution. As such this concept of financial reporting was developed when dealing with 'what merits reporting' but however the concept becomes larger including concens related to sustainability. In addition to this environmental and social issue have also become more important for investors but also for stakeholders. Materiality matrix was developed as a response which is a "management tool that which plots sustainability issues in major two dimensions". However on one axis some important issues for business are found and on other axis issues important for stakeholders are seen.

Conclusion

The purpose of this research paper was to highlight some of the major factors that which have a huge impact as to how conduct of busineesses are done by developing companies by inclucating game-changing strategies that have implications for the near future. Big data certainly brings opportunities for those companies who are prepared to include bigdata as part of their strategy in day to day operations. Digitalization likewise requires a deep understanding, investment in building IT architecture quite necessary to take advantage of tools and other such services provided by digitalization and also an organizational culture in order successfully adopt it. Not only at the company level, but also at the government level around the world sustainability is an issue importantly with lack of

metrics and the differences between theory and practice, regarding sustainability and other such challenges for companies. Big data as such is profoundly affecting R&D, changing both what innovation does look like and also how it is managed. Companies are trying to exploit the capabilities although R&D has not been at the forefront of big data apllications. Heavy investment initiatives in data analytics by GE for its aircraft engine unit and other such businesses (Wing 2016) is indeed one such manifestation of that trend. Thus with increased interest of academics and organizations like GRI which provide guidelines regarding sustainability, progress as such will be made in the future towards path of sustainability.

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