

Digital Transformation For Sustainability : A Qualitative Analysis

Parneet Singh Bhasin* and Kamaldeep Singh Chopra**

** Punjabi University B.D.D.N. Campus, Jhunir (Mansa)*

*** Punjabi University B.D.D.N. Campus, Jhunir (Mansa)*

Abstract

Finding a new way to do business becomes necessary in the digital age. A few of the many factors forcing businesses to modify their business models and adjust to the new market realities are the threat of disruption, fierce rivalry, altered client behavior, and resource constraint. A more contemporary idea, known as "digital transformation", enables businesses to make the maximum use of digital capabilities including big data, the internet of things, cloud computing, and artificial intelligence. The goal of this study was to perform a qualitative analysis of three large organizations in order to add to the body of knowledge about this idea and to explore whether or not businesses could achieve sustainability while undergoing transition. The three in-depth case studies demonstrated that the four aspects of digital transformation that have an effect on a company's sustainability efforts are : Consumers, Data, Competition and Innovation. At the conclusion of the essay, we offered a five-hypothesis research model for the future, which will be verified by an empirical investigation.

Keywords

Qualitative analysis, Digital transformation and Sustainability.

INTRODUCTION

The term "digital transformation" is frequently used in today's culture by academics and practitioners alike. It can be understood as a fundamental shift in how a company provides value to its clients (Boulton, 2019). According to El Hilali and El Manouar (2018), transforming a company's business model

digitally entails making significant adjustments that allow businesses to realize new types of value.

In this unstable world, digital transformation becomes essential for survival. Today's businesses are vulnerable to any revolutionary technology that has the potential to transform an entire sector. Better customer experiences, competitive advantage, and the exploitation of digital capabilities like big data and cloud computing to create and capture new types of value tailored to the digital era are the anticipated outcomes of a digital transformation (Ivani, Vuki, and Spremi, 2019).

Although, there have long been publications on digital transformation, it has just recently attracted more scholarly attention (Kohli and Johnson, 2011; Zhu, Dong, Xu, and Kraemer, 2006). Collaboration between professional specialists from consulting firms and research institutions produced numerous articles on this topic. For instance, MIT and Capgemini Consulting released a report on the topic in which they suggested a framework that aids businesses in succeeding in their digital journey. However, businesses are still searching for the "secret sauce" that will enable them to strike a balance between their economic ambition, their social impacts on communities, and their environmental carbon footprints. Different companies have different motivations and drivers for pursuing sustainability. According to a McKinsey Global Survey (Bonini, Görner, and Alissa Jones, 2010), the main factors pressuring businesses to adopt a sustainable mentality include reputation, brand image, cost savings, innovation, employees' ethics, and stakeholder pressure.

- To carry out an all-encompassing assessment of the three pillars of sustainability — the economy, society and environment — and how the digital transformation affects each of them.
- To put out empirically supported recommendations for creating a framework to drive businesses towards sustainability in the course of their digital transformation.

In order to accomplish these goals, a qualitative study of three Indian businesses functioning in three different industries was carried out. The findings indicated that these organizations' focus during their digital transformation has been primarily on four axes: consumers, data, innovation and competitiveness. The three businesses were successful in growing their bottom lines and leaving a bigger social and environmental footprint while doing so.

The organization of this article is as follows :- We go on to outline our process after the introduction. After our three case studies, we present. We then go over our findings and provide an argument for how businesses might achieve

sustainability by focusing on four dimensions discovered through our in-depth interviews. We conclude by making some last points and suggesting possible lines of inquiry for further empirical investigation.

NEED OF STUDY

Business environment is ever changing aspect. It is more important when we are living in digital world. Changing shape of doing business disrupts the business at very fast phase, upgrading business digitally according to the needs of customers, helps survive and flourish. Under qualitative approach we search for correlation between sustainability and digital transformations. In present scenario, quantitative analysis is already done on same industry or particular company. More studies are available under quantitative aspect, not much emphasis is given on qualitative aspects, also on different companies/ industries. In this present study, we look for qualitative aspect of going digital and its sustainability on three different companies from different industry.

METHODOLOGY

By conducting three case studies, we used a qualitative approach to search for any connections between sustainability and digital transformation. The case study is an example of a qualitative research method that is frequently used in management disciplines. It is frequently utilized as a quantitative survey's exploratory phase (Damgaard, 2001). When "how" or "why" questions are asked, when a current occurrence is being examined in a practical setting, this approach should be used (Yin, 2003).

In the discipline of management, case studies really have the advantage of facilitating theory formation and building more so than quantitative research methods (Tsang, 2014). They can also explain intricate relationships between occurrences and their surroundings (Dubois and Gadde, 2002). Additionally, case studies provide the opportunity to gather and assess various types of data, enabling a deeper comprehension of the issue being studied (McCutcheon and Meredith, 1993).

• Case Choice

This study focused on three sizable Indian corporations that operate in three distinct industries. Before digitally modernizing their businesses, the three organizations were mature enough and had enough experience performing traditional tasks. With an emerging economy, the country context does not fully utilize digital potential.

Throughout this article, alias names will be utilized for privacy and confidentiality purposes. The first business, Firm 1, is a telecom operator with around 8000 staff members. Due to the gradual reduction in revenue from traditional services and the shift in consumer behavior, the telecom industry has placed a significant emphasis on digital transformation. The second example company, known as Firm 2, has more than 20000 people and works in the mining and fertilizing sector. A digital transformation is necessary in the turbulent and difficult mining economy. In order to improve their operational methods, embrace new business models, and change their strategy, mining companies are embracing digital tools and capabilities like big data analytics, cloud-enabled mobility and IoT (Long, 2019). Case 3 is a traditional bank, and it will be known as Firm 3. Banks all over the world are already aware of the potential benefits of utilizing digital technology to draw in new clients and boost client retention and satisfaction (Cortet, Rijks, and Nijland, 2016). An overview of the three selected businesses is given below :

Industry	Firm 1 Telecommunications	Firm 2 Mining/ Fertilizers	Firm 3 Banking
Number of Employees	8000	20000	7700
Revenue in 2018	26520 Crores Rs.	39000 Crores Rs.	13650 Crores Rs.
Net Income in 2018	5647.2 Crores Rs.	3010.8 Crores Rs.	2886 Crores Rs.
Year of Starting DT	2017	2016	2016
Formal Role of Chief Digital Officer	No	Yes	No

FINDINGS

We discovered during our investigation that the three organizations had taken three distinct paths towards digital transformation. Firm 1 has prioritized the client experience. They enlisted the aid of a reputable consulting firm to help them determine the adjustments they must make. The management of the strategic watch oversaw the project. The digital transformation was viewed by Firm 2 as a method to use technology to enhance operating procedures. In a joint venture with IBM, they established a digital lab to offer the company a range of services as they embarked on their digital transformation path. Also emphasizing the consumer experience was Firm 3. In order to explore and generate

novel solutions, they established a "digital business unit" that operated as a company.

We were able to pinpoint four aspects of digital transformation that have an impact on businesses' sustainability efforts thanks to the numerous case study technique. Customer, data, competition and innovation are these dimensions.

CUSTOMERS

Firm 1

Firm 1 has viewed the digital transformation as a chance to go from a company that is product-centric to one that is customer-centric. The main objective was to enhance the client experience. Instead of thinking of customers as segments of a market, think of them as a dynamic network. As any unfavorable experience may become viral through social networks, this dynamic network could either enhance or impair the brand's reputation (Rogers, 2016).

Both a mobile application and an internet website are available for accessing the self care solution. In addition to using online payment methods, Firm 1 restricted the use of cash and installed numerous self-service payment terminals.

The business chose to invest in an adapt business, which is online banking, to move it to the next level. According to Firm 1, customer data is the most valuable asset a telecom may own. A competitive advantage that might be used to persuade customers to open a bank account with the telecom is the ability to successfully manage sensitive customer data (connected to call detail records). Firm 1 made significant investments in mobile payments as well, enabling customers to conveniently pay with their phones.

Additionally, Firm 1 began to view its clients as content producers. The telecom operator keeps in touch with its clients via their social media official accounts to generate suggestions for new deals and services to provide.

Last but not least, in its transformational path, the operator is also adopting the trend set by thinking platforms. In fact, Firm 1 is considering introducing a C2C solution that would allow users to trade airtime credits and unused data buckets. Customers who have collected and unused airtime credits or data buckets will be able to borrow money through this site. As a result, a win-win scenario will develop, creating a shared value where both customers and the telecom will benefit (Porter and Kramer, 2019).

Firm 2

The mining firm saw digital transformation as a chance to muddy the lines between conventional customer considerations in the mining and fertilizer sectors. Customers and farmers are eager to gain from technological advancements that will help them better predict disasters and the whims of the weather, as well as follow and present market data in real-time (sales, prices, volumes...).

The mining company made the decision to issue a challenge to nearby startups in order to achieve that and to think creatively in order to enhance the client experience. The three axes of the challenge were supply chain performance improvement, customer relationship definition and people management enhancement.

Additionally, Firm 2 has provided the farmers with digital access to useful information about the weather, farming inputs, and commodities in order to assist them in improving their everyday activities. The business has also given farmers access to an online marketplace through which they can advertise their goods and services.

Firm 3

The traditional bank Firm 3 saw the digital transformation as a crucial safeguard against disruption. Digital disruption is affecting the financial sector on every level. With the rise of FinTech companies today, incumbent banks have become more exposed (Accenture, 2019).

Firm 3 put a lot of effort into redesigning their client experience in this environment. Today, a self care solution is used for all transactions (such as opening an account or applying for credit).

To keep up with changing consumer behavior, our bank has also placed a bet on mobile banking apps. (GASCOIGNE, 2018) claims that over the past five years, client activity on banking apps have increased by 354%. The bank also made an investment in a mobile payment system that enables free, quick and secure money transfers between mobile devices. The solution enables various payment procedures as well as monitoring recent transactions on the electronic wallet. To ensure that as many of their customers as possible could access the fundamental banking alternatives, Firm 3 saw this solution as a new brick in the bank's digital offering.

To lower turnover and boost loyalty, firm 3 had to undergo a digital revolution. Because FinTech firms have cheap switching costs and low entrance hurdles, banks generally considered themselves as being at the mercy of any

disruptive technology that can cause disruption across the board. The manager who was being questioned said that concentrating on consumers was the best way to remain competitive. This focus is demonstrated by improving customer services and the customer experience by moving beyond cross- and multi-channel thinking to omni-channel.

DATA

Firm 1

Data, in the opinion of the telecom operator, is a crucial component for boosting both its financial and social footprints as well as for lowering its adverse environmental externalities.

Terabytes of traffic data are analyzed everyday to extract useful information using a Hadoop and Map Reduce-based system that the corporation extensively invested in. The telecom operator had a great chance to get a more complete picture of their business and customers, thanks to big data analytics. For the purpose of identifying phone usage trends and identifying suspect call behaviors, near real-time data analysis is carried out. Thanks to big data capabilities, reconciling data across several platforms and databases has evolved, and only takes a few hours to complete.

Internet of Things (IoT) is another tool, the operator is utilizing to increase operational effectiveness. Firm 1, is deploying sensors to keep an eye on power generators, air conditioning and other passive infrastructures at remote cell tower sites, because they also contain auxiliary equipment in addition to the main telecommunications equipment. For Firm 1, a crucial component of remote management is anticipating their failure. The Telco, uses sensors to track its carbon footprint as well.

Additionally, Firm 1 is certain that social networks may be used as gold mines because the internet offers a wealth of important knowledge. In order to gain insight into what people want and expect, as well as how they are responding to the company's commercial offers, the operator invested in a sentiment analysis solution that is also based on Hadoop. This solution uses content from forums, blogs, and other social media sites.

The Telecom also saw it as a chance to develop a shared values mentality (Porter and Kramer, 2019). Firm 1, was able to identify the most crucial educational resources that students use and chose to provide them free using big data skills. By doing that, the Telco, not only enhances the perception of its brand but also develops a base of future devoted clients.

Firm 2

Firm 2, uses data to power machine learning algorithms that aid the organization in gaining crucial business insights. The first step taken by the business is to implement a big data solution that forecasts the high demand for fertilizers in India. To predict, foresee, and be well-prepared for any future growth in consumption, the approach is to combine historical data with satellite images and weather forecast. The managers of Firm 2 state, "Thanks to this solution, we are able to anticipate any changes in the market to serve our customers in the best possible way."

On the other hand, defects might appear in machines while they are in use, leading to delays, extra costs for the business, and other detrimental effects. Firm 2, switched from conventional condition-based maintenance to predictive maintenance for this reason.

The data gathered from the sensors utilized by Firm 2, has been used to perform predictive maintenance, which is one of the key digital enablers of industry 4.0 (Ntalaperas, Vergeti, Apostolou, and Boursinos, 2019). The objective of predictive maintenance is to foresee whether an item of equipment will break in the near future at time "t" using the data available up to that point (Alwis, 2017). Firm 2, uses regression models to anticipate the remaining useful lifetime by combining static and historical data with current occurrences. By doing so, the corporation not only cut maintenance expenses, but also its carbon footprint and other harmful environmental externalities.

Firm 3

Firm 3, also took advantage of the digital revolution to invest in machine learning and artificial intelligence (AI), improving the banking experience as a result. Instead of waiting for attempted fraud to occur before taking action to stop it, Firm 3 can catch and detect it in real-time, thanks to big data and machine learning algorithms.

Additionally, loan processing has grown more effective as a result of AI and machine learning algorithms. In fact, Firm 3, trained its robots to learn from errors and continuously improve itself using the large quantity of past client data it had. Firm 3, can now identify which application poses a significant default risk and which customers are more creditworthy. A quicker, more precise system that responds to consumer requests is the end result.

Similar to Firm 1, our bank reads through consumer comments on social media regarding the business using a sentiment analysis tool. Whether the overall emotion is good, negative, or neutral can be determined by the solution.

Firm 3, can improve their customer experiences and customer acquisition by knowing how clients are interacting with the bank.

COMPETITION

Firm 1

The telecom provider is aware that customers are becoming more environmentally conscious in the digital age (Joshi and Rahman, 2015). Firm 1, is using big data and analytics to remain on top of the market's competition and its rivals' community-focused social actions. Using information acquired from forums, blogs, and social media texts, the company was successful in creating a competitive intelligent knowledge repository. "The idea is not to copy our competitors, but to think of smarter ways to reach the audience, we are all targeting", the manager who was being questioned reaffirmed. The telecom's response to a rival offer that was made just for students, serves as an illustration of this. In fact, a rival has introduced a highly alluring deal that offers PCs/mobile handsets in exchange for a 4G subscription. The offer was a big success and went viral. Firm 1, discovered that students are potential clients and that a razor and blades business model presents a viable opportunity. After considering the experiences of its rivals, our operator made the decision to provide 4G subscriptions and inexpensive tablets in a package at highly appealing pricing. By doing that, the telecom not only realized a new value, but also helped advance education in India.

Firm 2

Firm 2, has long held the monopoly in the kingdom when it comes to mining and phosphate derivatives like fertilizers. The company's digital transformation is driven mostly by the need to improve operational efficiency due to the intense competition within the industry and its status, as one of the major players on the global market.

Firm 2, focused their digital approach on the farmers in order to stand out from the competitors. The business made the decision to make its data and analytics available to the farmer. Firm 2 is developing a common value by doing that (Porter and Kramer, 2019). The innovative technology that Firm 2 invested in, will benefit the farmers, and the business is enhancing its reputation as a company that prioritizes the prosperity and well-being of low-income households.

Firm 3

Firm 3, has realized that in order to stand out from the competitors,

the business must be distinctive and creative. Adopting integrated reporting, whereby, the corporation agreed to include its social and environmental efforts in its annual report, was one of the key decisions made (De Villiers, Unerman, and Rinaldi, 2014). The manager who was being questioned said the objective was to demonstrate to all parties involved, how the bank's social and environmental initiatives align with the overall digital strategy, the business developed.

For instance, the report for 2018 noted, how the bank had expanded the capacity of its data centres to accommodate the shift to digital. In order to reduce its expanding environmental effect, the corporation took advantage of this opportunity and invested in the optimisation of these data centres, particularly the cooling system by using smart sensors. It was crucial for the bank to include this information in the integrated report in order to demonstrate to the stakeholders, how seriously the company takes sustainability issues.

INNOVATION

Firm 1

Firm 1, has also started an open innovation programme named "Telecom Challenge" as a part of its digital transformation approach. The organization wants to find innovative entrepreneurs in India and abroad and work with them to co-create digital solutions that address the company's strategic and operational problems.

According to a contemporary concept known as "open innovation, " businesses can and should leverage both internal and external ideas as well as internal and external channels to market, when innovating (Bogers, Chesbrough, and Moedas, 2018). The managers of Firm 1, understood that fresh and specialized knowledge and abilities were needed, not only more research to sustain the competitive advantage. Firm 1, took advantage of the digital shift to reimagining its internal research and development procedures. They think that doing this will help them stand out from the competition and mark the beginning of a blue ocean strategy that will help the business make more money.

Firm 2

Firm 2, saw the chance to alter the way things were done traditionally as part of its journey towards digital transformation. The company's managers were aware that they needed to stay current on the newest inventive techniques and cutting-edge technologies, in order to remain competitive in the fertilizing

market. Therefore, Firm 2, made the decision to cooperate with research labs and work hand in hand with the academic world. The manager who was questioned claimed that Firm 2, had more than 270 research collaborations both with Indian colleges and internationally. These collaborations also aim to strengthen the country's intellectual ecosystem.

For the purpose of helping the business hire the brightest young people in India, the company has created a unique and very exclusive school. The concept was to give those with IT talents in the disciplines of AI, data, and programming a second chance to be hired by the company after failing in their academic endeavors. Anyone between the ages of 18 and 30 is "totally free of charge, open to, and accessible to the school. There is no requirement for an IT degree or for intensive IT training. A top management of Firm 2 stated that "CREATIVITY" is the only need for entrance. By funding such a programme, the corporation created a shared value and widened its social impact on society.

Firm 3

Our bank adopted Firm 1's strategy. Firm 3, made the decision to introduce a ground-breaking programme named "Fintech challenge" after seeing that the banking ecosystem of the future will differ significantly from the one we currently have and go well beyond financial services. By doing so, Firm 3, ensures the utilization of cutting-edge information and assists new businesses in integrating themselves into the market at the same time.

Our research, on how activities taken during a digital transition affect sustainability is summarized in the table. Economy, Society, and Environment are each represented by the initials EC, S and E, respectively.

Table
The Impacts of the Digital Transformation on Sustainability

	Customers			Data			Competition			Innovation		
	EC	S	E	EC	S	E	EC	S	E	EC	S	E
Firm 1	*	*		*	*	*	*			*	*	
Firm 2	*	*		*		*	*	*	*		*	
Firm 3	*			*	*			*	*		*	

DISCUSSION

Our research has determined that the four key forces driving the digital transformation are customers, data, competition and innovation. The discovery

of these dimensions lends credence to related publications (Kane, Palmer, Phillips, Kiron, and Buckley, 2015; Kohnke, 2017) that contend that digital transformation involves much more than the application of cutting-edge technology. A proper business model that enables organizations to capture new value tailored to the digital era is the primary result of a digital transformation (El Hilali and El Manouar, 2019).

The three companies have all undergone different business transformations as a result of their digital transformation journeys. The three pillars of sustainability — the economy, society and environment — were affected by several initiatives.

First, the three businesses have increased their customers' loyalty by rediscovering the customer experience. Customers were more satisfied and saw much less turnover when better solutions, such mobile and self-care applications, were designed and made available. The three organizations made their consumers the centre of their operations, developing a real customer-centric culture in the process. In the cases of Firms 1 and 2, a market place and a knowledge-sharing platform were used to produce and capture value for both parties. The social impact of the companies has grown as a result of these two actions.

Second, the three businesses have been successful in maximizing the value of data, the driving force behind the digital era. In actuality, the three businesses succeeded in reducing their negative externalities while also increasing their financial figures by enhancing operational effectiveness and reducing costs. The three businesses monitored their equipment using data gathered from sensors to lower their carbon footprints. Additionally, in order to better understand what clients anticipate from them, Firms 1 and 3 are parsing unstructured data and performing sentiment analysis utilizing cutting-edge technologies.

Third, the three businesses made investments in sustainable practices to set themselves apart from the competitors. Firm 1, was compelled by the competition to make students adequate offers at reasonable pricing. To help farmers, Firm 2, shared its knowledge with them. In order to improve the perception of its brand, Firm 3, implemented integrated reporting. Our results are consistent with other research that found competition, is a major motivator for businesses to invest in sustainability (Berns *et al.*, 2009; Bonini, Gorner, and Jones, 2010).

The three businesses, also saw innovation as a way to improve their social footprints and financial performance. The three businesses are attempting to take use of new technology and expertise in order to stay ahead of the

competition by collaborating with the academic community and acting as business incubators for fresh and potential entrepreneurs. The society gains additional value as new firms and the academic community gain access to finance and other resources.

IMPLICATIONS OF STUDY

In our qualitative study, it is revealed that the three businesses underwent a digital transition in three distinct methods. Customers, data, competition, and innovation are the four main axes along which the actions taken can be categorized. Working on these initiatives has helped the three businesses' financial standing, social impact, and environmental externalities. As a result, we suggest the following research paradigm for an upcoming empirical investigation that will experimentally support our findings :

- H₀₁ : Customer behavior in the digital age has a favorable impact on businesses' commitment to sustainability.
- H₀₂ : Competition in the digital age influences businesses' commitment to sustainability in a favorable way.
- H₀₃ : Data in the digital age improves interactions between businesses and consumers.
- H₀₄ : The digital era's data strengthens businesses' dedication to sustainability.
- H₀₅ : Corporations' commitment to sustainability is mostly fueled by innovation in the digital age.

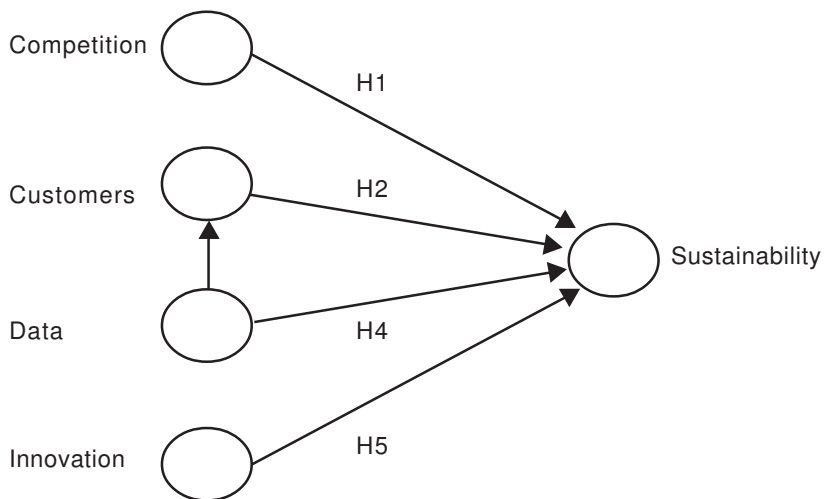


Figure : The Suggested Research Design

CONCLUSION

This essay explores the connection between sustainability and digital transformation through qualitative research. Three sizable Indian organizations were chosen as case studies, to analyze their digital transformation processes and determine whether or not these changes strengthened these companies' commitment to sustainability. Our research reveals that the three organizations worked on four axes — customers, data, innovation and competition — in various ways during their changes. These initiatives have improved their financial and social footprints while lowering their negative environmental externalities.

A novel research model that will be validated by empirical study and regression modeling has been suggested as a future research direction. Our conclusions will be supported empirically by this subsequent study.

References

- Abu-Tayeh, G.; and Myrach, T. (2016), *Properties of Sustainable Information Systems*, Accenture (2019), Digital Transformation in Banking, Retrieved July, 29, 2019, from <https://www.accenture.com/pl-en/digital-transformation-banking>
- Alwis, R. (2017), *Machine Learning Techniques for Predictive Maintenance*, Retrieved August 29, 2019, from <https://www.infoq.com/articles/machine-learning-techniques-predictive-maintenance/>
- Berns, M.; Townend, A.; Khayat, Z.; Balagopal, B.; Reeves, M.; Hopkins, M. S.; and Kruschwitz, N. (2009), The Business of Sustainability : What It Means to Managers Now, *MIT Sloan Management Review*, 51(1), 20-26.
- Bogers, M.; Chesbrough, H.; and Moedas, C. (2018), Open Innovation : Research, Practices, and Policies, *California Management Review*, 60(2), 5-16. <https://doi.org/10.1177/0008125617745086>
- Bonini, S.; Görner, S.; and Alissa, J. (2010), How Companies Manage Sustainability : McKinsey Global Survey Results, Retrieved May 23, 2018, from <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/how-companies-manage-sustainability-mckinsey-global-survey-results>
- Bonini, S.; Gorner, S.; and Jones, A. (2010), How Companies Manage Sustainability : McKinsey Global Survey Results, *McKinsey Quarterly (March)*.

- Boulton, C. (2019), What is Digital Transformation? A Necessary Disruption, Retrieved July 17, 2019, from <https://www.cio.com/article/3211428/what-is-digital-transformation-a-necessary-disruption.html>
- Cortet, M.; Rijks, T.; and Nijland, S. (2016), PSD2 : The Digital Transformation Accelerator for Banks, *Journal of Payments Strategy and Systems*, 10(1), 13-27.
- Damgaard, T. (2001), Qualitative Methods in Business Studies, In V. Freytag Per and G. W. Arch (Eds.), *Getting Better at Sense Making* (Vol. 9, pp. 143-186) : Emerald Group Publishing Limited, [https://doi.org/10.1016/S1069-0964\(00\)09005-0](https://doi.org/10.1016/S1069-0964(00)09005-0)
- De Villiers, C.; Unerman, J.; and Rinaldi, L. (2014), Integrated Reporting : Insights, Gaps and An Agenda for Future Research, *Accounting, Auditing and Accountability Journal*, <https://doi.org/10.1108/AAAJ-06-2014-1736>
- Dubois, A.; and Gadde, L. E. (2002), Systematic Combining : An Abdicative Approach to Case Research, *Journal of Business Research*, 55(7), 553-560. [https://doi.org/10.1016/S0148-2963\(00\)00195-8](https://doi.org/10.1016/S0148-2963(00)00195-8)
- Eccles, R. G.; and Krzus, M. P. (2010), *One Report : Integrated Reporting for a Sustainable Strategy* : John Wiley and Sons.
- El Hilali, W.; and El Manouar, A. (2018), *Smart Companies : Digital Transformation as the New Engine for Reaching Sustainability*, Paper presented at the The Proceedings of the Third International Conference on Smart City Applications, <https://doi.org/10.1145/3286606.3286812>
- El Hilali, W.; and El Manouar, A. (2019), *Towards a Sustainable World Through a SMART Digital Transformation*, Paper presented at the Proceedings of the 2nd International Conference on Networking, Information Systems and Security, <https://doi.org/10.1145/3320326.3320364>
- GASCOIGNE, C. (2018), *Banking : Digital Transformation is Revolutionizing Customer Experience*, Retrieved July 27, 2019, from <https://www.raconteur.net/business-innovation/banking-digital-transformation-revolutionising-customer-experience>
- Gray, B.; and Stites, J. P. (2013), *Sustainability Through Partnerships*, Capitalizing on Collaboration, Network for Business Sustainability, Case Study.
- Ivancic, L.; Vukšić, V. B.; and Spremic, M. (2019), Mastering the Digital Transformation Process : Business Practices and Lessons Learned, *Technology Innovation Management Review*, 9(2), 36-50, <https://doi.org/10.22215/timreview/1217>
- Joshi, Y.; and Rahman, Z. (2015), Factors Affecting Green Purchase Behaviour and Future Research Directions, *International Strategic Management Review*, 3(1), 128-143, <https://doi.org/10.1016/j.ism.2015.04.001>
- Joyce, A.; and Paquin, R. L. (2016), The Triple Layered Business Model Canvas : A Tool to Design More Sustainable Business Models, *Journal of Cleaner*

- Production*, 135, 1474-1486. <https://doi.org/10.1016/j.jclepro.2016.06.067>
- Kane, G. C.; Palmer, D.; Phillips, A. N.; Kiron, D.; and Buckley, N. (2015), Strategy, Not Technology, Drives Digital Transformation, *MIT Sloan Management Review and Deloitte University Press*, 14(1-25).
- Kohli, R.; and Johnson, S. (2011), Digital Transformation in Latecomer Industries : CIO and CEO Leadership Lessons from Encana Oil and Gas (USA) Inc., *MIS Quarterly Executive*, 10(4).
- Kohnke, O. (2017), *It's not Just About Technology : The People Side of Digitization Shaping the Digital Enterprise* (pp. 69-91), Springer, https://doi.org/10.1007/978-3-319-40967-2_3
- Long, G. (2019), *Digital Transformation, The Future of Mining*, Retrieved July 11, 2019, from [https://HYPERLINK \"http://www.accenture.com/us-en/insight-resources-digital-transformation-future-mining\" \h/www.accenture.com/us-en/insight-resources-digital-transformation-future-mining](https://HYPERLINK \) Maidment, G. (2016), *The Full Story on Digital Transformation for Telcos*.
- McCutcheon, D. M.; and Meredith, J. R. (1993), Conducting Case Study Research in Operations Management, *Journal of Operations Management*, 11(3), 239-256, [https://doi.org/10.1016/0272-6963\(93\)90002-7](https://doi.org/10.1016/0272-6963(93)90002-7).
- Nidumolu, R.; Prahalad, C. K.; and Rangaswami, M. R. (2009), Why Sustainability is Now the Key Driver of Innovation, *Harvard Business Review*, 87(9), 56-64.
- Ntalaperas, D.; Vergeti, D.; Apostolou, D.; and Boursinos, V. (2019), *A RAMI 4.0 View of Predictive Maintenance : Software Architecture, Platform and Case Study in Steel Industry*, Paper presented at the Advanced Information Systems Engineering Workshops : CAiSE 2019, International Workshops, Rome, Italy, June 3-7, 2019, Proceedings.
- Porter, M. E.; and Kramer, M. R. (2019), *Creating Shared Value Managing Sustainable Business* (pp. 323-346), Springer, https://doi.org/10.1007/978-94-024-1144-7_16
- Rogers, D. L. (2016), *The Digital Transformation Playbook : Rethink Your Business for the Digital Age*, Columbia University Press. <https://doi.org/10.7312/roge17544>
- Rothenberg, S. (2007), Sustainability Through Servicizing, *MIT Sloan Management Review*, 48(2), 83.
- Tsang, E. W. K. (2014), Generalizing from Research Findings : The Merits of Case Studies, *International Journal of Management Reviews*, 16(4), 369-383. <https://doi.org/10.1111/ijmr.12024>
- Westerman, G.; Calm ejane, C.; Bonnet, D.; Ferraris, P.; and McAfee, A. (2011), Digital Transformation : A Roadmap for Billion-Dollar Organizations, *MIT Center for Digital Business and Capgemini Consulting*, 1, 1-68.
- Yin, R. K. (2003), *Case Study Research : Design and Methods*, SAGE Publications.
- Zhu, K.; Dong, S.; Xu, S. X.; and Kraemer, K. L. (2006), Innovation Diffusion in Global Contexts : Determinants of Post-Adoption Digital Transformation of European Companies, *European Journal of Information Systems*, 15(6), 601-616. <https://doi.org/10.1057/palgrave.ejis.3000650>.