

DYNAMIC CAPABILITIES, DIGITAL TRANSFORMATION AND VISION OF SUSTAINABILITY: A REVIEW

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Abstract: The success of a business is mainly dependent on technological innovations and transformations continuously in such a volatile globalized environment, especially for firms having technology as a core competency. This study aims to review studies in the domain to find the impact of digital transformation of business on sustainability. In today's dynamic world, merely having a bundle of resources is so not sufficient for the success of the firm, but the firm's ability to transform itself to meet the market requirement is a must. The resources of a firm can be applied to create strategies that give a competitive edge to a firm in important operational areas. These dynamic capabilities are unique to a particular firm but when these are identical across firms, these are termed as 'Best Practices'. If these capabilities are unique to a particular business, then these would be helpful in developing a competitive advantage for a business, digital transformation of a business contributes towards environmental sustainability and is not only limited to corporate financial benefits but ultimately can be a significant contributor towards nature and humankind.

Keywords: Dynamic Capabilities, Digital Business Transformation, Innovation, Environment, Sustainability.

1. INTRODUCTION

E-business faced an emotional downturn during April 2000. Despite this, the importance of e-business transformation cannot be ignored as a competitive advantage over those lacking behind. E-business can be helpful with better customer support, removing market boundaries and better relationships

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with key suppliers (Daniel and Wilson, 2003). But, in the present dynamic environment, there are several challenges for the managers as their task is to focus on the renewal of the sources to attain competitive advantage rather than just protecting these. Capabilities required by the firm to gain competitive advantage are termed Dynamic Capabilities (DC) and these are critical for a successful firm in such a volatile environment of e-business. All internal (processes, manpower, material, etc.) and external factors (such as competitors, suppliers, customers, Government, etc.) must be taken care of in business transformation. Companies need to keep in mind that any change in these factors will affect others so the businesses need to combine various skills and resources in such a manner so that it can respond to the dynamic business environment promptly and meet all the market needs in a stipulated time. Capabilities are what differentiates organizations from their partners and competing organizations. For example, there are different firms operating within one industry but the performance of all the firms is not the same in one industry, it might be different for different industries, and the performance of firms in the industry cannot be explained by the industry itself, rather the difference in the performance of firms depend on the output of various resources and competencies owned by the firms (Stornen et al, 2017).

Organizational transformation can be attained through technology and a firm's competence. Dynamic capabilities which are necessary for digital transformation are supported by the ability to generate and integrate new IT and innovation (Kipongi, 2019). Traditional businesses and their operational models cannot be easily incorporated in the new working environment as the requirements and needs of the new environment are different from those of the previous ones. Therefore, businesses need to transform themselves to meet the needs of the changing environment; otherwise, they will be pushed out of the competition by others who have transformed their models to grab the profitable opportunities available in the new business environment. Lewin in the 1940s, proposed a "trilogy" concept of "unfreezing-change-refreezing", which explains the process of business transformation and organizational change (Qingfeng et.al, 2008). The theory developed by Lewin in 1950s related to organization development became an important model for Organizational transformation. Whereas in the 1980s, many changes took place in the technology and external environment of the organization change occurs in many forms. The new era saw the emergence of internet which changed the previous form of marketplace, where the customers and other market players were required to interact face to face, this new phase of internet

development removed physical boundaries, but today wireless technology is emerging at a very fast pace, leading to innovations every time. A firm must be able to reconfigure, gain and dispose of its resources and capabilities to meet the needs of ever changing business environment.

The Resource Based Value (RBV) of the firm can be predicted by the “resources and capabilities” of the firm and these capabilities can be long-lasting. If these capabilities are not possessed by any of the competitors, then this becomes a competitive advantage for the firm. The firm that does not have any of these capabilities will have to face the cost and time disadvantage which affects the profit earning capability of the firm. These capabilities and resources are immovable and provide a competitive advantage to firms in a sustainable manner. These resources and capabilities cannot be replaced or created easily if there is no clarity about how these resources or capabilities have been created. These capabilities somehow depend on the culture of the organization and its reputation among suppliers, customers, competitors etc. which cannot be created so easily (Daniel and Wilson, 2003).

Digitalization has created a demand for electronic goods and services. Recent developments in processes, products, society, technology, markets etc. require the configuration of processes, technology and resources by the organizations to operate efficiently (Chen and Jaw, 2009). With the use of technology different industries and activities can be integrated which used to be unrelated in the absence of technology and digitalization of businesses is not only limited to the automation of various practices and products whereas it includes actions of all the stakeholders and has an overall impact on society. Digitalization models to be adopted by various businesses must be analyzed in terms of environmental and economic sustainability in attaining sustainable development goals defined by the United Nations (Bican et al,2020). The development of digital practices will further be beneficial for the environment and people. But is digitalization sustainable? On one side there is a reduction in wastage and emissions, lesser exploitation of natural resources, increased productivity, quality, and job satisfaction but on the other hand, increased automation of business practices results in job losses and increased energy consumption is taking a toll on the environment. A comprehensive study is required to find out the impact of such digital practices on sustainability. This study aims to investigate the role of dynamic capabilities in the digital transformation of a business and attaining sustainable development goals through such automation of various business activities.

2. DYNAMIC CAPABILITIES

“Dynamic Capabilities” (DCs) are defined in the paper titled “Dynamic Capabilities and Strategic Management” by “David Teece, Gary Pisano and Amy Shuen”, published in 1997 as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments”. DCs Operational capabilities are different from DCs because these are essential for the operations of a business whereas DCs “refer to the capacity of an organization to purposefully create, extend, or modify its resource base” (Helfat et al., 2007). The importance of a firm’s DCs can be determined by its quick response in utilizing business resources and business models towards customers” needs. For this purpose, business must be capable enough to sense any opportunities and seize them efficiently. But in practice, a firm doesn’t need to be strong across all the dynamic capabilities, a firm might be good at sensing opportunities in the market but it might not be capable enough to exploit all the available opportunities, on the other hand, a firm might be better in development of business models but lacks on successful implementation of these business models (Teece, 2018). An organization having powerful dynamic capability will be capable of developing and constructing new assets, new business models and re-configuring them as per the changes and needs of the market.

These DCs are based on the framework that the short-term competencies of the firm will be used to earn short-term gains over its competitors whereas the business must focus on developing long-term competencies by modifying its core competencies to gain a competitive edge. Teece’s concept of DCs include: “(i) Capacity to sense and shape opportunities and threats (ii) capacity to seize opportunities and (iii) maintaining competitiveness through enhancing, combining, protecting and reconfiguring the business’s tangible and intangible assets whenever required”. Researches have shown that dynamic capabilities and organizational learning have a positive impact on firm performance. However, this relation is mediated by innovation (Giniuniene and Jurksiene, 2015). Shumpeter (1934) was first identified innovation as a “new product or processes and new sources of supply, new markets or new ways of organizing a business”. Therefore, innovation is a process of developing new products, new markets, providing new services, developing new means of operating business and new business models to gain an edge over its competitors. The essence of DCs is that these capabilities cannot be bought rather these capabilities can be built. A firm’s basic capabilities help it to perform efficiently the activities it sets

out to perform. If a firm is making the right product efficiently, targeting the right segment of the market and if its plans are sufficient to meet the market needs is determined by its dynamic capabilities. To cope with innovation, a firm needs new capabilities. If organizations fail to meet up with the new technical innovations, they fail to create capabilities that are sustainable in nature and helpful to build competitive advantage.

3. BUSINESS TRANSFORMATION

Business transformation includes the changes in the fundamentals of the business which are crucial for the operations of the business. It includes manpower, processes and technology. All these help in running the business efficiently and achieving a competitive advantage.

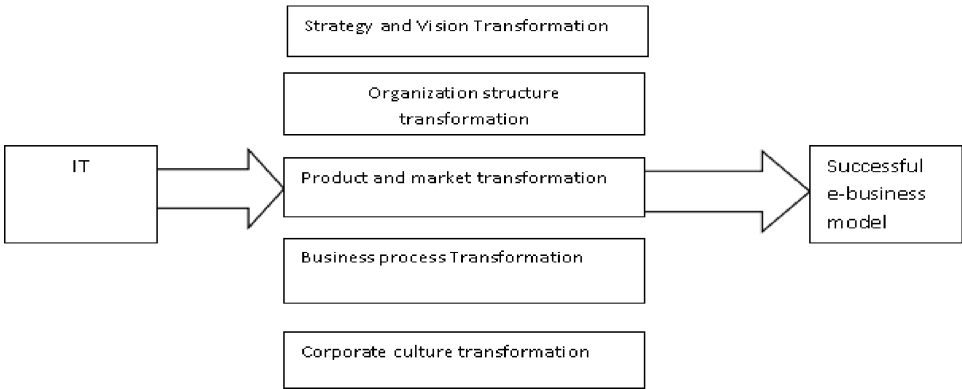


Figure 1: E-Business transformation process model

Source: Qingfeng, ZENG et.al (2008). E-Business Transformation: An Analysis Framework Based on Critical Organizational Dimensions.

Figure 1 above shows the changes which occur during the transformational change in a business. Information Technology is the driving force of e-business transformation which can be obtained through the transformation of the strategy and vision (being able to predict what the customer will demand and how best to achieve that), organizational structure (it includes redefining authority responsibility relationship worker’s participation in management etc.), business process (this transformation includes new methods of doing work with better utilization of the scared resources and to achieve the desired results in a cost-efficient manner) and corporate culture (this is the hardest one to transform, it includes the different practices and beliefs prevailing amongst

the employees in an organization). Transforming these capabilities and resources of the firm results in successful e-business transformation. The digital business transformation includes using technology to gain a competitive advantage. It mainly focuses on collecting and sharing data to use in efficient ways mainly focusing on new product development and offering better customer services.

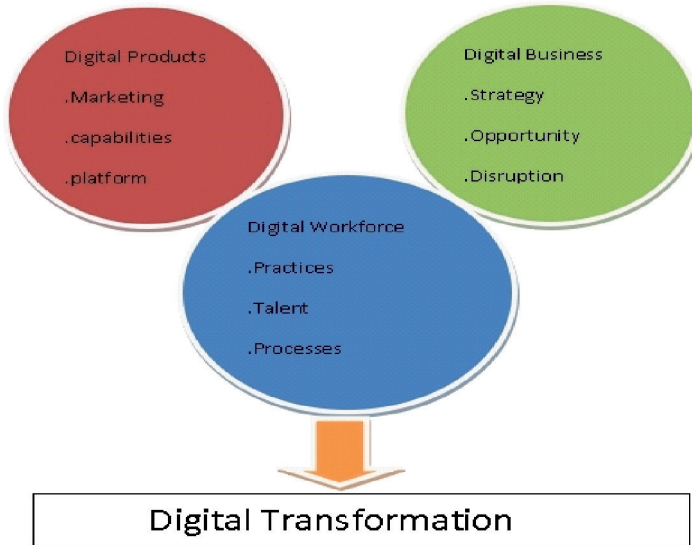


Figure 2: Digital Transformation of the Business

Source: Sacolick, Isaac. Defining Digital Transformation, Strategy and other Digital Terminology

Figure 2 shows that the digital transformation in the business can be achieved through digital products, digital processes and digital workforce.

Different researchers have emphasized on role of DCs in “digital business transformation”. A review of different studies was done to study the importance of DCs in E-business transformation. Farhoomand and Wigand (2003), provided insight into how companies transform themselves into networking organizations capable to detect and respond in a competitive globalized environment. Companies can reorganize the structure of various activities and resources to work efficiently to achieve a complete business transformation. Daniel and Wilson (2003) used the analytic induction approach introduced by Znaniecki (1934) for data collection and identified five cases in the domain of e-transformation for the purpose of study (all of the units were UK based). A total of eight dynamic capabilities were identified out of which first five

capabilities are innovative in nature and next three are integrative. They concluded that if a company possess the capability or resources not possessed by competitors, then it can become a competitive advantage for the firm

An electronic commerce innovation mode was used by Wu and Hisa (2008) to study the “differences in technological knowledge, business model and dynamic capability”, they suggested four “core business capabilities” for U-commerce such as “envisioning customer value”, “executing business innovation”, “matching with business opportunities” and “building relationships”. Lin and Hasia (2011) support a “tri-core” concept of business innovation proposed by Swanson (1994) highlighting three core competencies such as business technology, business model and value network. They concluded by identifying 13 core competencies essential for the success of business and to gain a competitive edge. Strong dynamic capabilities help in creating and developing strong business models. The size of the organization also has a significant impact on its dynamic capabilities. The strength of a business is highlighted when business models are resulted in business transformation (Teece, 2018). Innovation is a mediating variable between DCs and performance of the firm. (Giniuniene and Jurksiene, 2015).

Kipongi (2019) DCs for digital change in manufacturing firms can be classified in six categories: Dynamic business environment is crucial for “Digital Transformation” and DCs play an important role in managing the changes to attain digital transformation. Capabilities in a wind power generation business can be classified as general and core capabilities. If a business has the right resources and capabilities which are not easily acquired by others or are not replaceable, it can successfully develop dynamic capabilities. These dynamic capabilities are helpful for a business to gain an edge over competitors which will further help the business to gain superior returns over others (Ritthiphruk and Salgado, 2012). Stronen et al. (2017) reviewed various theories about the relationship between DCs and innovative capabilities through a case study of an “Innovation Clinic” at a major University Hospital, with four innovation projects and concluded that DCs comprise structured growth of operations, methods and routines in order to explore and gain new opportunities. Amit and Zott (2001) explored the theoretical base of value creation in e-business. A model of value creation was developed which focuses on four independent dimensions i.e. efficiency, complementarities, lock-in and novelty. Dynamic capabilities essential for e-business transformation can be categorized into two broad groups amongst which one focuses on the need for innovation and the

second focuses on integrating e-business in existing business operations. The most important thing for organizations is to maintain a balance between these two different groups of dynamic capabilities (Daniel and Wilson, 2003).

Digitalization can be used as a powerful tool in restructuring the operations of an organization to achieve managerial and organizational effectiveness. A transformational change can be achieved only if it is led by managerial and entrepreneurial capabilities aiming at increasing organizational value in the long term (Cannas, 2021). Alkhamery et.al (2021) developed a TOE (Technological, Organizational and Environmental) framework to identify the importance of organizational capabilities in organizational success in such a volatile business environment. ICT capabilities and favourable organizational culture are key to digital transformation in a successful manner. A review of the various studies concluded that DCs are crucial for the success of business transformation as an E-business, to gain sustainable competitive advantage and to earn superior returns. It might create tension between different sets of capabilities but the business has to balance out various capabilities and achieve its objective of earning a good market share, better customer support, and exploiting the new opportunities as soon as these emerge.

4. SUSTAINABILITY

The term ‘Sustainability’ has been gaining popularity for last two decades and ‘sustainability’ can be used in the context of people, practices, economies, resources and ultimately ‘sustainable development goals’. The term was first coined in 1712 by a German Forester “Hans Carl von Carlowitz” in his work emphasizing the management of forests on long-term basis. But the term gained popularity in academic literature in 1980s due to increasing concern towards the environment in the late 1960s and 1970s (Scoones, 2007). “Sustainability” is defined as “Meeting the needs of the present without compromising the ability of future generations to meet their own needs” by the “United Nations Brundtland Commission (1987)”. Sustainability means “the ability to maintain something at a certain rate or level. It is the avoidance of the depletion of natural resources in order to maintain ecological growth” (Gupta, 2018).

5. RESEARCH METHODS

The present study is based on the analysis of both quantitative and qualitative data analysis to understand the role of E-business transformation on sustainability. The quantitative analysis of data is done through bibliometric analysis using

Vos-Viewer software, and secondary data for the study is extracted from the Scopus research database and review papers from different journals. Key terms, inclusion and exclusion criteria for the papers in the present study are included by using key terms such as “digital business transformation” and “sustainability” and using the following search string using the Scopus database. The key terms used in data extraction are “digital AND transformation AND sustainability”. Further, the database is limited to articles from research journals in areas of “Business, Environment, Economics”. A total of 408 records were found and after limiting for “Publication stage”, “Language”, “Discipline”, “Type of Publication”, “Access” etc. seventy-two records were selected and screened manually for the study. From the extracted resources close to the objective of the study, all important articles have been reviewed for this purpose. However, there are certain gaps observed that require academic attention. The PRISMA diagram of the methodology adopted for Systematic Review of data is exhibited in Figure 3.

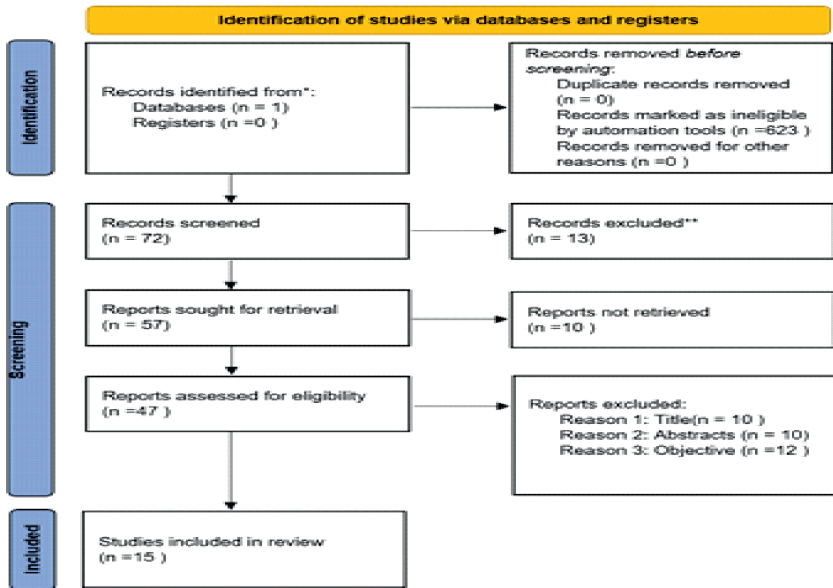


Figure 3: PRISMA diagram of the studies reviewed

Source: Compiled by the authors.

(a) Bibliographic Analysis of the Data

Figure 4 shows key term occurrence analysis of data using vos-viewer software. It is evident that “sustainability” is reflected many times in the data followed by “digital transformation”, “sustainable development”, “innovation”, and so

forth which shows the term is gaining popularity in academic literature and business transformation.

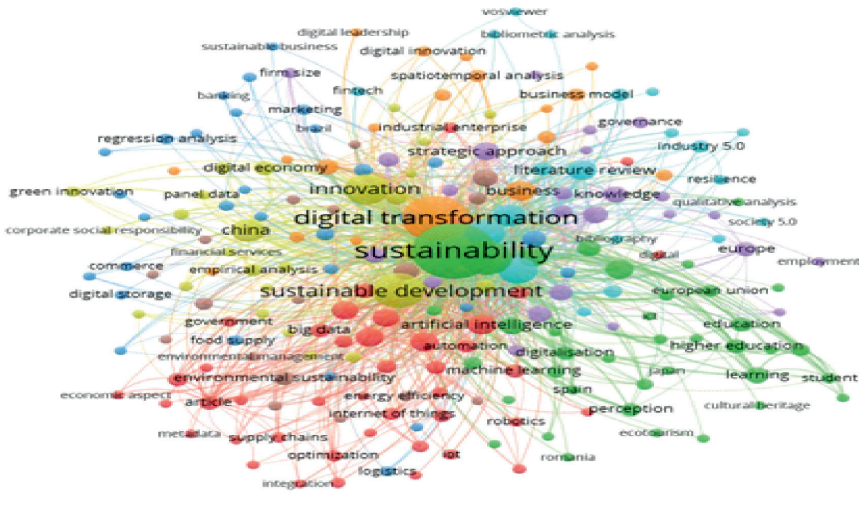


Figure 4: Key term occurrence analysis

Source: compiled by the authors.

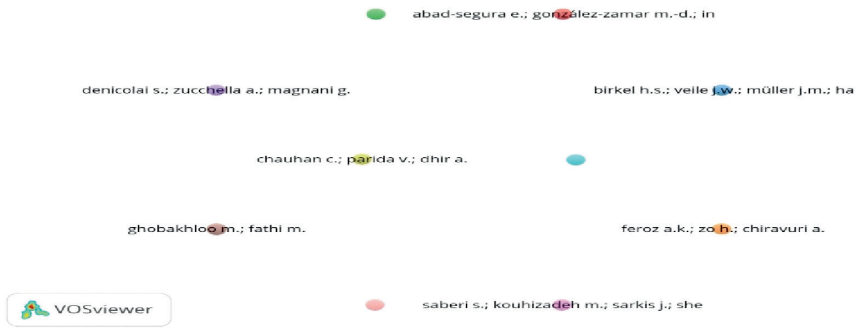


Figure 5: Top authors in the domain

Source: Compile by the authors.

Figure 5 shows 10 leading authors in the domain of “business transformation” and “sustainability” based on the number of citations.

Figure 6 highlights the top countries conducting studies in the domain of “Digital transformation and sustainability”, only two Asian economies

“China” and “India” conducting studies in the above domain which also provides a scope for research in the domain of sustainability in Asian economies context with special reference to India. Figure 6 directly indicates that India has an opportunity to work in the domain of “Business Transformation and Sustainability”, and requires additional efforts to reach among top order.

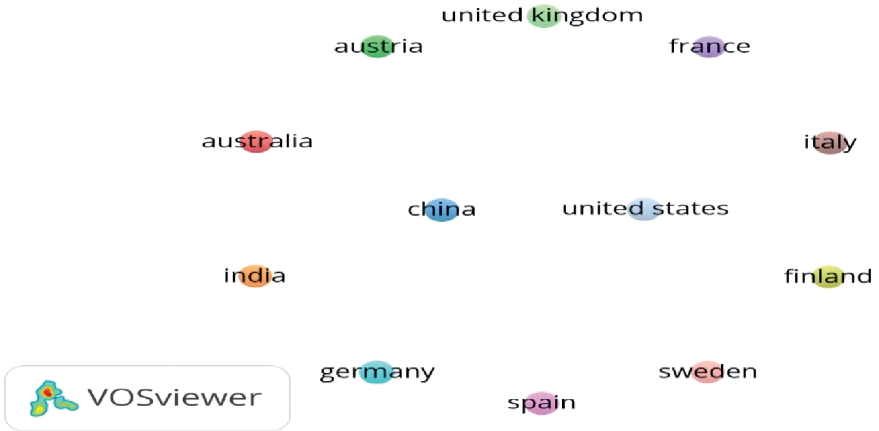


Figure 6: Top Countries publishing papers in the domain

Source: Compiled by the authors.

Figure 7 depicts co-authorship across countries and the countries that are collaborating- Norway, Sweden, United Kingdom, Italy, Denmark, Finland and India which indicates that majorly only the Western world is contributing towards co-authorship amongst nations only a few Asian economies are collaborating. India shows the collaboration with Australia, the US, and France majorly.

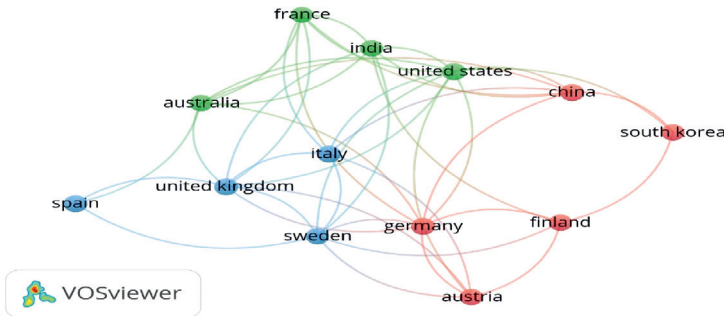


Figure 7: Co-authorship across Countries

Source: Compiled by the authors.

6. SUSTAINABILITY THROUGH DIGITAL BUSINESS TRANSFORMATION

Digital business transformation plays a crucial role in attaining sustainable development goals. As pointed out without the transformation of the business, economic and environmental aspects of sustainability cannot be achieved. Digitalization has a mixed effect on resources as on one side automation leads to optimum use of resources whereas on the other hand, it may have negative effects on the environment such as events of introduction of Crypto-Currencies (Bican and Brem, 2020). The major outcome of global economy is improving people's lives which is in line with the attainment of SDGs proposed by the United Nations. Production and pricing of energy in a sustainable manner is the major concern for many countries so there is a need to look for alternative sources of energy production to meet the needs of present and future generations. Some global issues introduced by the digitalization of economies require immediate attention such as power control posed by technological barriers and control over the data of consumers of such digital platform firms. Many Asian economies turned digital during COVID-19 pandemic due to that there has been a surge in online delivery services which may be seen as an optimum utilization of resources and the effect of such digitalization can be seen post-pandemic as well. It is due to digitalization that no place has remained as remote and inaccessible as most people have access to all information and government services which is also addressing poverty reduction which is a major concern for most Asian economies and the developing world (Li et.al.,2020). Even though implementing a Smart Manufacturing System (SMS) will lead to optimum production but sustainability still remains the major concern. Implementation of SMS in SMMEs will lead to better productivity, reduction in costs, improvement in quality, time-saving and integration of social and ecological sustainability (Kamble et al, 2020). Protecting the environment and reducing the exploitation of natural resources is the major challenge that requires digital transformation of various activities.

Environment is one of the major aspects of sustainability which focuses on not sacrificing the environment just to satisfy our needs and the focus should be on maintaining ecological balance to meet the demands of future generations. Degradation of natural resources and increasing environmental pollution due to various activities of the business is putting constant pressure on the Government and policymakers to adopt more sustainable practices. Organizations are now adopting AI and big data-based practices in order to ensure environmental

sustainability such as “Smart Water Management Systems”, “Plant Village” etc. Studies report that the use of such AI based practices has been proven successful in reducing carbon emission and damage to the environment (Feroz et al, 2021). Stakeholders and policymakers are focusing on Triple bottom line as an expected outcome of industries defined in terms of economic, ecological and social goals. Different dimensions of sustainability needs to be emphasized in various strategies of the organizations in implementing industry 4.0 practices. Digital practices adopted by organizations lead to reduced wastage of resources and better recycling processes and product life cycle management. Industry 4.0 practices also result in reduced emission of greenhouse gases, CO₂, and better human-machine interface results in increased employee satisfaction (Birkel et al, 2019). Automation of various operating activities results in reduced human error and fewer industrial accidents. Repetition of work can be avoided and the focus of the workforce can be shifted towards more important and productive activities resulting in better job satisfaction and fewer injuries (Sjödin et al., 2018). Employing Big Data in supply chain practices of business can result in increased internal sustainability, reduced wastage and gas emissions and optimum utilization of resources. The usage of big data in supply chain practices can also result in better productivity of the workforce which will further help in achieving the ESG goals (Giudice et al., 2021).

7. CONCLUSION AND IMPLICATIONS

Rapid developments in innovations and communication technology over the past decade have changed the competitive scenario for both new and well-established organizations. Firms that have incorporated these technologies in their operational structure are called E-businesses. They conduct their various business operations through electronic means. These technology-enabled firms have developed various means of communication channels, innovative products and services for better customer satisfaction. These businesses are more likely to develop competitive advantage over those having not adopted these so far. To achieve this competitive advantage, it is required that business uses their dynamic capabilities in an innovative and integrated manner but not at the cost of society and the environment. Environmental concerns have been gaining popularity all over the world during the past few decades so the digitalization of business processes requires urgent attention from the policy makers for ensuring sustainability. The present study is based on the review of the past research and the available literature in the field, no exploratory study was carried out to test the association between digital transformation

and sustainability. Results of bibliometric analysis also showed that the concept of sustainability is gaining popularity all across the globe but there is a lack of extensive studies in the domain with special reference to the Asian world. There is a scope for further work to identify the core dynamic capabilities that provide a sustainable competitive advantage to the firm over others. There is a need to conduct an extensive study concerning the issue of “digital transformation and sustainability” in the Asian context with special reference to India.

Credit Authorship and Contribution Statement

Sonia Kamboj: Conceptualization, Review, Analysis, Writing Original Draft, and Referencing.

Pankaj Kumar: Conceptualization, Analysis, Editing the Draft.

Data availability: On Demand.

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