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Digitalization and Sustainability: An Integrative Literature Review through Taxonomy Development

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Abstract

Since the last decade, the world economy has been transitioning towards digital transformation and sustainability. Both concepts have been viewed to solve the grand challenges, especially climate change. This study aims to explore the literature integrating digitalization and sustainability in top-ranked business journals. Drawn upon the appropriate dataset, findings show a tremendous increase in literature, specifically since 2018. Using the taxonomies, we observed prosperity (SDG7, SDG8. SDG9, SDG10, SDG11) is highly focused in literature, while scant research is available on *peace* and *partnership* of sustainable development goals (SDGs). Conversely, digital technologies are used for *sustainable development and SDGs*. Whereas digital devices such as *platforms and ecosystems*, *blockchain*, *big data and analytics* are widely applied to evaluate *prosperity* and *overall sustainability*. This study extends the existing literature by providing important directions for future research.

Keywords: Digital Transformation, Sustainability, Literature review, taxonomy development

1 Introduction

For sustainability, organizations are consistently pressured by the stakeholders (government, investors, suppliers, communities etc.) to fulfil their commitments towards the environmental challenges [1]. With the launching of the United Nations Sustainable Development Goals (SDGs) 2030 agenda, it has invited the considerable attention of academics and practitioners [2]. Sustainable development has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs [3]. The SDG framework includes the 17 SDGs ranging from social, economic and environmental aspects of sustainability [4].

The second trend is the rapid digitalization of the economy through the deployment of digital technologies. Recent statistics calculate that digital technologies like artificial intelligence will support the 14% (USD 15.7 trillion) share of the world economy [5]. The common objective behind the digital transformation is to improve the business

performance [6]. Digital technologies have potential to improve the firm competitiveness [7] and transformation of business models and rules [8].

Currently, digital technologies also catalysing new innovating business models especially for circular economy [9] and enabling industry 4.0 revolution. Digitalization is defined as "the transformation of business models as a result of fundamental changes to core internal processes, customer interfaces, products and services, as well as the use of information and communications technologies" [10]. The debate on digitalization or digital transformation has witnessed tremendous increased in recent years [11] and this trend seems to be continue in future [12]. Recently, the literature has started to focus on the relationship of digital transformation and sustainable development [13, 14].

The potential convergence between the two challenges have gained the considerable attention both in public and private sectors [15]. Past literature has indicated that digital transformation have great potential to contribute towards the society and sustainability challenges [16, 17]. Digitalization and sustainability has been considered game-changers, which are triggering transformation by providing the opportunities within and across the organization [18]. The conjunction between the digital transformation and sustainability demanding the more toward the solution of grand challenges especially natural resource management. A stream of recent research has indicated that digital transformation comprises on digital technologies (blockchain, IoT, AI) can support the performance management of sustainability [17, 19]. However, the scope of both domains is yet to be explored [20].

There are several literature reviews exploring digital transformation and sustainability issues separately [2, 21] and few considering the both phenomena together [17, 22–24] but no contribution provides a set of dimensions useful for exploring both phenomena. This paper intends to fill this gap and proposed a set of dimensions by highlighting the literature features. Thus, the aim of this paper is to understand the literature features integrating the digital transformation and sustainability through the taxonomy development approach. This paper contributes to the existing literature by providing the significant insights for the research community.

The structure of this study is as follows: first we presented the methodology which we have adopted for the data set selection, screening, refining and then we, described the process of taxonomy development process. Thirdly, we presented the preliminary analysis and reported the findings related with research based-characteristics and topic-based characteristics of digital transformation and sustainability. Finally, we presented the discussion of results followed by conclusion and future research directions.

2 Research Methodology

In this study, we performed the structured literature review (SLR) by adopting the taxonomy development approach. SLR has been considered a best fitted methodology in identification of research trends [25, 26]. Past literature suggested different mechanism for the selection of appropriate data set [27, 28]. For this study, we have followed the four-step method prescribed by Massaro et al. [25]. We applied the first two steps in our study and rest of the analysis was performed though the taxonomy development process described by the Nickerson et al., (2013). According to Massaro et al., [25],

transparent systematic literature review required the research questions, data set protocol, papers coding mechanism and analysis. Following this method, we first identified the following research questions for this study.

RQ1: What is the literature focus integrating digital transformation and sustainability?

In the quest of above research question, we adopted the following research protocol (Figure 1).

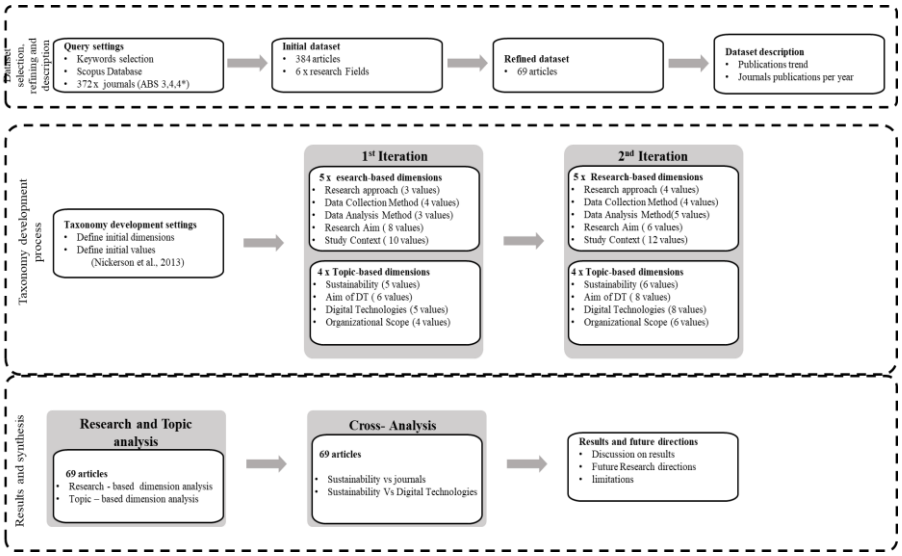

Fig. 1. Research Protocol

2.1 Dataset selection, refining and description

In the first step, we opted the SCOPUS database for the selection of our initial data set. The main reason for the SCOPUS selection is that it has been recognized an authentic source for peer-reviewed journal due to its wide access to 20000 main journals with almost 70000 traceable record [30]. In Addition to this, SCOPUS also includes the almost 97% of paper which are indexed in Web-of-Science [31]. The focus of our literature review is on the business and management field. For this purpose, we only selected the research papers from ABS journals related with the accounting, human resource management and employee studies, entrepreneurship and small business management, general management, ethics, gender and social responsibility, and information management innovation. In SCOPUS, we applied the key words sustainab* AND digita* along with ISSN of the journals of 3,4, and 4* categories falling in these six fields.

The query was performed on 26 May 2023, and we limited our data set to only English language research publications. We only limited our query to the journal papers

and excluded the book chapters, conference papers, editorials, commentaries and research notes. By performing this query, initially we retrieved total 384 contributions.

2.1.2 Data Refining

For the data refining, we started to analyze the title, abstract and keywords of each article. For the data transparency and controlling of biasness, we performed the several iterations on our dataset and build consensus. This method is widely used in the recent literature reviews [2]. Our sole purpose was to finalize the data set which is providing intersection of two emerging topics sustainability and digital transformation. For the robustness of dataset, we have used rigorous inclusion and exclusion criteria. Initially, in 1st iteration, we applied the criteria on the 384 documents. During this analysis, we found that 76 papers are close to our topic and 308 papers are out of topic. During the 2nd iteration, we further excluded 07 contributions which were not fulfilling our criteria.

After these iterations and repeated considerations, we identified the articles on which the consensus was developed by our research team. For this purpose, we reconciled the results of data and finally, we selected the 69 research articles for our dataset.

2.1.3 Data Description

This section presents the preliminary analysis of our data set. In the following section, we presented the detail of publication trends and most productive journals.

2.1.3.1 Publication Trend

The following Figure 2 indicates that literature on sustainability and digital transformation is stated to emerge from the year 2011. From the year 2011 to 2017, the publication trends have been stagnant ranging from 1 to 2 publication. Since the year 2018, a sharp increase has been noticed on this research domain.

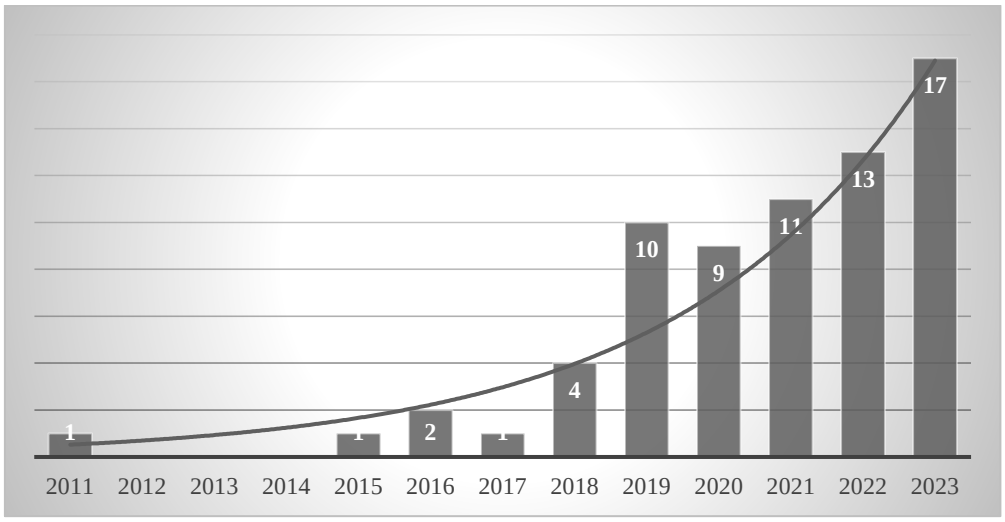

Fig. 2. Publication trend

There were no publications attributed to the years from 2012 to 2014. From the year 2018, the no of research publications on the emergence of digital transformation and sustainability are increasing exponentially. This is witnessed from the year 2023 that 17 publications are linked with year 2023 and this is only published in the five months of period. Since this information is incomplete for the year 2023 yet. Exponential line indicates the increasing trend of research publications on this topic in future.

2.1.3.2 Publication Vs Journals

In Figure 3, we conclude that *Journal of business research* is leading journal which is publishing articles on the intersection of digital transformation and sustainability followed by *international journal of information management*. Interestingly, 71% research Papers (49/69) are published in the 12 journals with limit of at least 2 publications in each. Out of 12 journals, 04 journals have covered 8 publications having 02 in each. The remaining 20 research articles were published in 20 journals having a single publication in each one. The highest number of publications were found in journal of business research (12/69) which belongs to ethics and ethics gender and social responsibility. We found a large number of journals from the Information Management field with leading International Journal of Information Management.

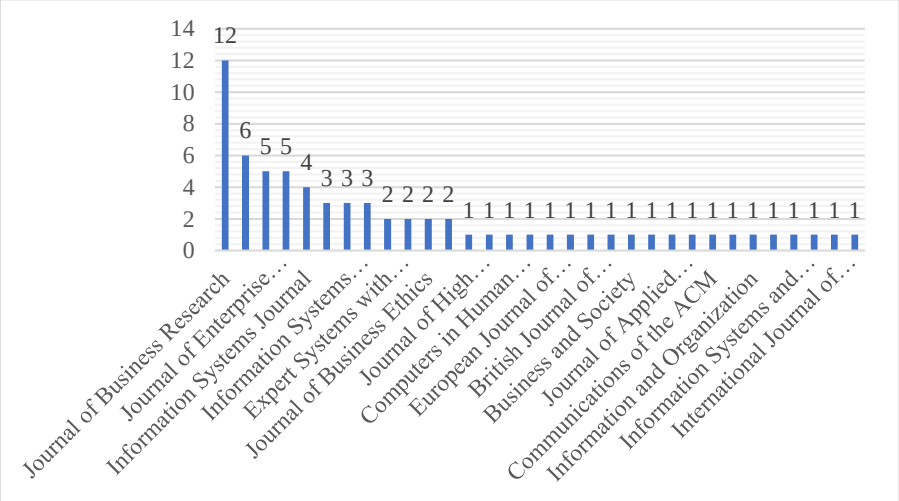

Fig. 3. Publication vs journals

2.2 Taxonomy Development Process

The aim of this literature review is to examine the literature focusing on the integration of digital transformation and sustainability. For this purpose, we breakdown our main study objective in different classifications including the research and topic-based characteristics. We adopted the widely accepted taxonomy development approach of Nickerson et al., [29] for the classification of literature. This section explained the complete process of taxonomy development for our dataset.

By adopting this method, we reviewed the past literature for the classification of each dimension of our topic. Nickerson et al., [29] prescribed the two main iteration approaches namely conceptual to empirical and empirical to conceptual till the placement of topic into the clear categories [32, 33]. Following this method, first we identified the meta-characteristics and subjective and objective ending conditions. The key words both digital transformation and sustainability were possible meta-characteristic in this study. Whereas, subjective and ending conditions of the possible iterations process (conceptual to empirical vs empirical to conceptual) was defined. It is pertinent to explain here that exhaustiveness of each dimension and values were attained until the ending conditions were met clearly during the iterations.

In the next process, we performed the 1st iteration for the taxonomy development of research-based characteristics. First of all, we identified the meta-characteristics along with subjective and objective ending conditions. Meta-characteristics includes the type of research, aim of research, data collection method, data analysis method and study context. We performed the *1st iteration (conceptual to empirical)* for all these five dimensions of research characteristics. In sum, we found values under the dimensions including research type (03), data collection method (04), data analysis method (03), study context (08) and research aim (10). In the *2nd iteration (empirical to conceptual),* we found the additional values such as conceptual papers in research type. For the data analysis, we found two more values which were open-interpretation analysis and concept-centric analysis. For the dimension of research aim, we merged the sustainable development and climate change in one value. Similarly, community development was merged with urban development and knowledge management was merged with education. Value creation was merged with innovation. In total, we found total 06 values in this category. Finally, we found the two more values and in total we have total 12 values in the dimension of study contexts.

In the second phase of topic-based characteristics, we started the 1st iteration from *conceptual to empirical*. we identified evidence from the past literature concerning the digital transformation and sustainability. Past literature provides the conceptual clarity on the phenomenon under investigation and researcher should emphasize the past theoretical considerations [34]. From the past literature, we get idea that sustainability is comprises on the three dimensions including the economic, social and environmental. In 2015, United Nations General Assembly presented the 17 sustainable development goals (SDGs) and 169 targets [35] United Nations further classified the 17 goals into the 5 P's categorized *people*, *planet*, *prosperity*, *peace* and *partnership*. The values of people include the 5 SDGs (SDG1, SDG2, SDG3, SDG4 and SDG5). The value of prosperity covers the SDGs (SDG7, SDG8, SDG9, SDG10 and SDG11). The SDGS falls under the planet includes the (SDG6, SDG12, SDG13, SDG14 and SDG15), peace and prosperity have separate independent goals titles as SDG16 and SDG17 respectively. In Sum, we have 05 values under the sustainability dimension.

For the classification topics (digital transformation), possible dimensions including the organizational scope, digital technology and aim of DT were identified from the review of past literature. For the organizational scope, we determined the four possible values consist upon the individual, business unit, inter-organization businesses, operations and whole business. The aim of scope dimension is to identify the business level

on which digital transformation is being implemented. For the identification of digital technology, we identified the five possible values including the social media, platform and ecosystem, Internet of Things (IoT), overall digital devices and analytics. Past literature has identified the different dimensions of digital technology [21, 36]. Vial, (2019) considered digital technology as a sequential coordination between more than one technology which is central to analyzing the digital transformation. We selected social media, mobile and analytics from the past literature [21]. In the classification of DT aim, theory of digital aim suggest that digital transformation is to affect the product and services, processes, strategies, capabilities and interfirm relationships of a business [36]. it includes all the business elements which are affected by DT. In line with these past directions, we found the five possible values such as product and services, process, strategies, capabilities, interfirm relationship and organizational change. Finally, we have total values in sustainability (05), aim of DT (06), Digital technologies (05) and organizational scope (04).

In the 2nd iteration from *empirical to conceptual*, we again reviewed the values of sustainability, Aim of DT, Digital technologies and organizational scope. We found the additional more values in each dimension. Finally, we have total values in sustainability (06), aim of DT (08), Digital technologies (08) and organizational scope (06). After meeting the ending conditions in line with meta-characteristics, we classified our dataset for the further analysis.

By following the above rigorous process, we achieved mutual and collective exhaustiveness. All the dimensions and values have attained the properties of taxonomy development such as robustness, conciseness, comprehensiveness, extendible and explanatory [29]. Following table, 1 presents the complete detail of classification and description of each values.

Table 1. Description of Taxonomy development Framework and Values

Dimensions	Values	Description of Values
Type of Research	Quantitative	Research used the quantitative approach based on objective and data collection method etc.
	Qualitative	Research used the qualitative approach based on objective and data collection method etc.
	Conceptual	Research study based on the researcher conceptual knowledge and experience
	Mixed-Method	Research involving both type of qualitative and quantitative research approach etc.
Data Collection Methods	Literature Search	Data collected based on literature search/ through research data base etc.
	Interview	Data collected through structure or unstructured interview
	Questionnaire	Data collected through the survey/ questionnaire to obtain the respondent opinion
	Document/Contents	Data collected though the organizational policy documents/contents, communication and observation of researcher.
Data Analysis	Statistical Analysis	Data analyzed though the use of any statistical method, descriptive, ANOVA, Chi square, regression, correlation, time series, etc.

	Open Interpretation	The analysis based on researcher's practical & theoretical experience on different aspects of a research topic.
	Bibliometric Analysis	Analysis performed by using the bibliometric analysis approach providing information about publications in a specific scientific field.
	Concept-centric Analysis	The theoretical/ conceptual interpretation by the researcher on a specific research phenomenon/topic.
	Content Analysis	Data analyzed based on the examination of contents extracted from interview/document/audio etc.
Research Aim	Education & Knowledge Management	Education and knowledge management aim supported through DT
	Smart city/rural/Urban/ community Development	Smart cities, rural, Urban development and community development aim supported by DT
	Innovation & Value creation	Innovation and value creation aim supported by DT
	Climate change & SD	climate change & sustainable development aim supported by DT
	Circular Economy	Circular economy aim facilitated by DT
	Network & Co-production	Networking and co-production aim supported by DT
Context of study	Education	Organization which are delivering education services and learning e.g. schools, colleges and HEIs etc.
	Manufacturing	Organizations which used the raw material, process and tangible produce for the use of end users.
	Healthcare	Organization which are delivering health services
	Waste management	Organization which are dealing with the waste management etc.
	Food & Agriculture	Organizations which are dealing with Food, agricultural, livestock and fisheries related business
	SME	Organization which are operating in SME business
	Tourism/Fishing/Retail	Organization which are operating under the tourism fishing and retail industries.
	Banking	Organizations which are providing financial services
	Local government/cities	Organizations which are dealing with local government issues and problems of cities.
	Overall economy	Studies which are addressing the global economy challenge
	Multiple industries	A study in which data collected from more than one but different industries
	Not Applicable	The studies which have not focused on any industry
Sustainability	People	SDG1, SDG2, SDG3, SDG4, SDG5
	Prosperity	SDG7, SDG8. SDG9, SDG10, SDG11
	Planet	SDG6, SDG12, SDG13, SDG14, SDG15
	Peace	SDG16
	Partnership	SDG17
	Overall SD	Research study focused on the all the SDGs/ other issues related to sustainable development

Aim of DT	Product & Services	Improvement of product and service though DT
	Process	Improvement of processes through DT
	Access to Information	Access to information through DT
	Covid-19	Tracing, tackling and re-treating of Covid-19 though DT
	Efficiency of Resources	DT aim to ensure the efficiency of resources
	Sustainable development/SDGs	DT aims to solve the challenges of sustainable development and its aligned goals.
	Inter-firm relationship	DT aim to improve the inter-firm relationship
	Organizational Change	DT aim to support the organizational change
Digital Technology	Social Media	Social media used for DT phenomenon
	Platform & Ecosystem	Platform and ecosystem deployed for DT phenomenon
	Augmented/virtual reality	Augmented/virtual reality technology used for DT phenomenon
	Blockchain	Blockchain technology used for DT phenomenon
	Artificial Intelligence (AI)	AI employed for DT phenomenon
	Internet of Things (IoT)	IoT deployed for DT phenomenon
	Digital Devices (IS, software, mobile etc)	Application of information system, software applications, mobile technologies and other digital devices
	Big Data & Analytics	Big data and analytics used for DT phenomenon
Organizational Scope	Individual	DT phenomenon supported the individual level
	Business unit	DT phenomenon supported the single business unit
	Inter-organization Business	DT phenomenon supported the inter-organization business operations and strategy
	Operations & SCM	DT phenomenon supported the operations and supply chain management
	Intra-organization Businesses	DT phenomenon supported the business operations among multiple organization
	Not Applicable	DT phenomenon does not support any type of business operations

3 Results and Synthesis

In this section, we present the findings of our dataset comprising on the research - based characteristics and topic-based characteristics. The main aim of current study is to explore the literature integrating the digital transformation and sustainability in business and management top journals. To analyze the research-based characteristics, we identified the five dimension such as type of study, data collection method, data analysis method, research aim and context of study. To understand the topic-based characteristics, we identified four different dimensions concerning with digital transformation and sustainability.

In the following section, we presented the main contribution of our research aim. This section is comprising upon two sub sections. The first section explains the analysis of research-based characteristics and second section presents the topic-based characteristics of digital transformation and sustainability research.

3.1 Research- Based Characteristics

By following the taxonomy development approach by Nickerson et al., (2013), we classified each contribution according to five dimension of research characteristics. We coded all the articles according to the description provided in Table 1.

Table 2. presents the complete detail of all the five dimensions selected for research-based characteristics. It is revealed that more than 50% of research studies adopted qualitative research (37/69) whereas the quantitative research is used in (19/69) papers.

Table 2. Research Based Characteristics

Type of Research papers	***Values***
Quantitative	19
Qualitative	37
Mixed Method	03
Conceptual paper	10
Data Collection Methods	
Literature search	27
Interview	07
Survey questionnaire	10
Observation/ Reports/Documents	25
Data Analysis Methods	
Bibliometric Analysis	05
Concept-centric Analysis	08
Open Interpretation	06
Statistical analysis	20
Content analysis	30
Research Aim	
Education & Knowledge Management	07
Smart city/Rural/Urban & community development	12
Innovation & value creation	07
Climate change & SD	36
Circular economy	02
Networking & co-production	05
Study context	
Education	03
Manufacturing	07
Healthcare	03
Waste management	02
Tourism/Fishing/Retail	03
Food and Agriculture	02
SME	05
Banking	02
Local government/Cities	11
Overall economy	09
Multiple	13
Not Applicable	09
Total	**69**

Conceptual studies were found to be large in numbers (10/69) while the mixed-method approach was used in only (03/69) research papers. The presence of more qualitative studies indicates that researchers are mostly trying to understand the experiences, behaviors, interactions and social contexts of the digital transformation [37].

For the data collection methods, we found that literature search (27/69) and secondary data sources (observation/reports/documents) (25/69) are widely applied in our data set. other methods include survey questionnaire (10/69) and interview (07/69) studies. The main reason for the high number of secondary data sources and interview is attribute with the high presence of qualitative studies.

For the data analysis method used in our data set, we observed that content analysis was mostly used method (30/62) followed by statistical analysis (20/69). Other methods used were concept-centric analysis (08/62), open interpretation (06/69), bibliometric analysis (05/69).

Analysis of research aim, we found that that our dataset is widely associated with the aim of sustainable development and climate change value. We observed that more than 50% studies focused on the climate change and sustainable development (36/69). Other contributions aim to solve the problems of smart cities, rural/urban/ community development (12/69) through the application of digital technologies. The other values hold the equal numbers such as education & knowledge Management (07/69), and innovation and co-production (07/69). The values of networking & co-production (05/69) and circular economy (02/69) were least focused.

Lastly, the analysis of study context revealed that there is total 12 types of contexts in which our data set studies were conducted. We found the high focus on the involvement of multiple organizations (13/69) and local government and smart cities (11/69) were highly focused. Considerable studies focused on the overall economy in their context. Notably, we found the many studies (09/69) without any involvement of context due to the conceptual and literature review papers. Other contexts include education (03/69), manufacturing (07/69), healthcare (03/69), waste management (02/69), Food and agriculture (02/69), SME (05/69), and banking (02/69). We found one study in each tourism, fishing and retail (03/69) industries.

3.2. Topic- Based Characteristics

For the topic based, characteristics, we identified the four dimensions including the sustainability, organizational scope, digital technology and aim of digital transformation. These all dimensions were coded according to their respective values and results are presented below Table 3.

Sustainability is widely discussed in multiple interdisciplinary research fields. Following the triple bottom line, it has three main dimensions such as economic, environmental and social. United Nation's Sustainable Development Goals (SDGs)' 2030 agenda demands the international cooperation through global indicators and collaboration of governments, civil society, private sector and institution [4]. The 17 SDGs are addressing the social, economic and environment challenges [38]. Environmental sustainability is defined as " human needs without compromising the health of ecosystems [39]. Social sustainability is defined as "a quality of society that encourages durable circumstances for human well-being, particularly for susceptible persons or

groups"[40]. Finally, the economic sustainability is referred to as "Economic sustainability is the ability of an economy to support a defined level of economic production indefinitely" [41]. After the three-dimensional concept of sustainability and introduction of 17 SDGs, the United Nations further introduced the fundamental principles by classifying these 17 goals into 5 P's. these goals are classified into the people, planet, prosperity, peace and partnership. These five fundamental principles are synergetic, inseparable and represents the 17 SDGs. In our study, we used these 5 principals for the integration of sustainability concept. we also included one generic value of overall sustainability to achieve the robustness and comprehensiveness of our dataset.

Every digital adventure has an aim, which is established before the implementation of digital phenomenon. The digital aim is closely linked with the business elements which are supposed to be affected by the digital transformation. Bahrdwaj et al., (2013) has provided the theory to define the aim of digital transformation. Following this notion, we identified the eight possible aims which are found in our dataset. It includes the product & services, process, access to information, covid-19, efficiency of resources, interfirm relationship, organizational change and not defined. We assigned value to each contribution in our dataset.

We identified the involvement of digital technology for our data set. For this purpose, we followed the guidelines from the previous literature [21, 36]. The phenomenon of digital transformation is supported by the combination of digital technology involved in the process [21]. In our data set, we found the seven digital technologies including the social media, platform & ecosystem, software application, blockchain, mobile technologies, digital devices and big data and analytics.

Finally, organizational scope explained the business operation level on which digital transformation is being implemented. In our data set, we found five business operational areas such as individual business unit, inter-organization businesses, operations and supply chain management, intra-organization businesses and not defined. Below table 3, presents the detail of our topic-based characteristics.

The above table revealed that prosperity (27/69) and overall sustainability (22/69) are highly focused pillars of sustainability. We found less studies addressing the Planet (10/69), people (06/69) and partnership (04/69) in our dataset. Interestingly, we have not found any study discussing the 'peace' values of sustainability.

Next, we found that digital transformation is highly focused on the attainment of sustainable development or SDGs (31/69) and efficiency of resources (09/69). The other least concerned aims of digital transformation are process change (12/69), product and services (06/69) and access to information (04/69). Others aims includes the interfirm relationship (02/69), organizational change (03/69), covid-19 (02/69).

In the analysis of digital technologies, we found that digital devices (including the technologies such as information system, software applications, mobile technologies and general digitalization) (47/62) were widely applied in the research of digitalization and sustainability. At individual level, other technologies classified and used are platform and ecosystem (05/69), platform and ecosystem (05/69), big data and analytics (04/69), blockchain (04/69), social media (04/69), AI (02/69) and IoT (01/69).

Table 3. Topic Based Characteristics

Characteristics	Values
Sustainability	
People (SDG1, SDG2, SDG3, SDG4, SDG5)	06
Planet (SDG6. SDG12, SDG13, SDG14, SDG15)	10
Prosperity (SDG7, SDG8, SDG9, SDG10, SDG11)	27
Peace	00
Partnership	04
Overall sustainability	22
Aim of Digital Transformation	
Product & Services	06
Process	12
Access to information	04
Covid-19	02
Efficiency of resources	09
SD/SDGs	31
interfirm relationship	02
Organizational Change	03
Digital Technologies	
Social media	04
Platform & ecosystem	05
Augmented/Virtual Reality	02
Blockchain	04
Artificial Intelligence (AI)	02
Internet of Things (IoT)	01
Digital devices (mobile, IS, software & digitalization)	47
Big data and analytics	04
Organizational Scope	
Individual level	07
Business Unit	02
Inter-organization business	20
Operations & supply chain management	14
Intra-organization businesses	16
Not Applicable	10
Total	**69**

Finally, findings of organizational scope revealed that value of inter organization business (20/69) and intra-organization business (16/69) are highly adopted areas of digital transformation. Further values of operation and supply chain management (14/69), individual level (07/69) and business unit (02/69) were focused at the organizational levels for digital transformation. We found the 10/69 papers in not applicable value for the reasons of conceptual and literature type research contributions which does not have any organizational involvement.

3.3 Sustainability Vs Research Journals

We analyzed each individual value under the sustainability dimension in our dataset. We have developed the taxonomy of sustainability into 06 values. Figure 3.

shows that *journal of business research* (12/69) and *International Journal of Information Management* (06/69) are leading journal in publishing the digital transformation and sustainability research. *Journal of Enterprise Information Management* (05/69) and *Government Information Quarterly* (05/69) have equal publications.

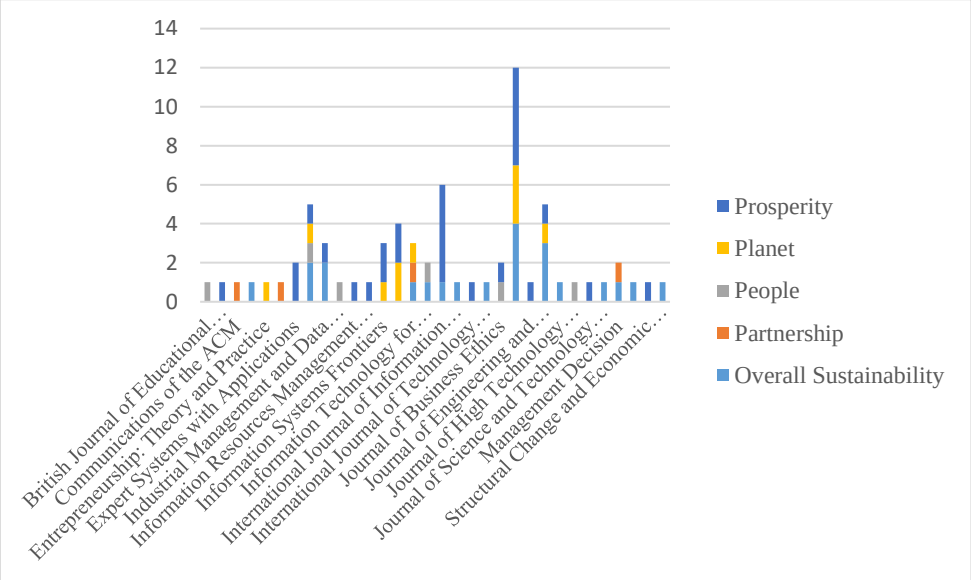

Fig. 3. Sustainability Vs Journals

At individual level, *journal of business res*earch and *journal of international journal of information management* have more tendency towards the prosperity pillar of sustainability. On the other side, *Journal of business ethics* and *Journal of Enterprise Information Management* have more coverage for the *overall sustainability* issues. For the value of *planet*, journal of business research is again highly focused journal. Rest of the journals has consistent focus on the sustainability pillars. We have not found any study on the *peace* pillar of sustainability published in the journals.

3.4 Sustainability Vs Digital Technologies

We analyzed the intersection between sustainability and digital technologies for our data set. Table 4 presents the findings of this cross analysis. It has been witnessed that over all sustainability is widely supported through the digital technologies (IS, mobile applications, software etc.). Platform and ecosystem, Big Data & Analytics blockchain and social media are also widely used to solve the challenges of sustainability pillars. At individual level, digital technologies are widely used for the prosperity, planet, people and overall sustainability issues. We found the less support of AI, Augmented/virtual reality and IoT for the sustainability pillars. Interestingly, there is no technology use for the peace pillar of sustainability. similarly, less technology use is found for the people and partnership pillars of sustainability.

Table 3. Sustainability Vs Digital Technology

Digital Technologies	Overall Sustainability	Partnership	People	Planet	Prosperity	Grand Total
AI	1				1	2
Augmented/Virtual Reality	1				1	2
BD & Analytics	2			1	1	4
Blockchain	3			1		4
IoT		1				1
Other Digital Technologies (IS, Mobile applications, Software etc.)	12	3	6	6	20	47
Platform & Ecosystem	1			1	3	5
Social Media	2			1	1	4

4. Discussion of Results and Future Research Directions

Our findings suggest that research on digital transformation and sustainability is increasing exponentially. We found that the *Journal of business research* is the most productive journal followed by *International Journal of information Management*. We identified the five dimensions for research-based characteristics and four for topic-based characteristics.

In the taxonomy of research-based characteristics, we found that qualitative research approach (37/69) is dominant in digital transformation research. For the data collection method, literature search (27/69) and secondary data sources (25/69) are more used method. Content analysis method (30/69) is dominant for the data analysis methods. Both the publication trends and large number of conceptual contributions indicate that research on digital transformation is at an emerging stage. We identified the multiple aims of research and found that climate change & SD (36/69) and smart city/rural, urban & community development (12/69) are main focus of research community in this domain. Finally, we reported that multiple organizations (13/69) and local government/cities (11/69) are the leading business contexts for the digital transformation and sustainability research.

For the taxonomy of topic-based characteristics, we identified that prosperity (27/69) is a highly addressed pillar of sustainability in research as compared to people (06/69), planet (10/69) and partnership (04/69). Interestingly, peace is the widely ignored pillar of sustainability in context of digital transformation. Our findings indicate that the major aim of digital transformation is to support sustainable development including goals (31/69) and efficiency of resources (09/69). Nest, we found that digital devices such as IS, mobile technologies and software applications (47/69) are dominant technologies used for the sustainability. Individually, we found that social media (04/69), platform & ecosystem (05/69) are supporting the sustainability challenges. Finally, the findings highlight the different organizational scopes on which digital transformation is implemented. It is revealed that inter-organization business (20/69), Intra-organization businesses (16/69) and operations & supply chain (14/69) are the main concern of digital transformation phenomenon.

Cross analysis between sustainability and research shows that research discussed sustainability and digital transformation since 2011 but a sharp increase is witnessed from 2018. Scant research is available on peace and partnership as compared to prosperity and planet in literature. The cross-analysis shows that all the digital technologies are used for sustainable development and SDGs. Whereas digital devices such as platforms and ecosystems, blockchain and BD and analytics are widely applied to evaluate prosperity and overall sustainability. Finally, all the digital technologies are being equally used for the purpose of digital transformation and sustainability challenges.

Apart from the interesting findings, there are some limitations related to this study. First, we explored the dataset from the six ABS journals of ranking 3, 4 and 4* category. An analysis with a large dataset is needed to better understand research in this field. Secondly, we might be missed some important articles by specifying our research query to limited journals. Consequently, a bibliometric analysis is proposed for a better understanding of this debate in this research field. Thirdly, this study was limited to the specific dataset, future research can apply the deeper content analysis to establish a framework. Fourthly, we identified the particular set of research and topic-based characteristics; future research may investigate this research phenomenon by applying the different dimensions and values. Finally, we applied the taxonomies with our understanding. Future research may be conducted with different taxonomies for better clarification, as taxonomies are never perfect [29].

In the end, we proposed practical and theoretical implications for the practitioners, researchers, and decision-makers. For researchers, we invited more research by using mixed-method research with the application of multiple data collection methods in different contexts. We acknowledge the scholars in this field for their consistent contribution, and we invite them to focus on the challenges of digital transformation and sustainability from its performance management perspectives. For decision makers and practitioners, we invited the top management support for the strategic support for digital transformation and sustainability challenges.

5. Conclusion

The aim of this study was to explore the literature integrating the digital transformation and sustainability in business fields. For this purpose, we collected the 384 research contributions from top research journals (total 372) in the business and management fields. Though the examination of different taxonomies, we highlighted the dimensions of research and topic-based characteristics which are key to the research domain under examination. Our findings confirms that research on digital transformation and sustainability has grabbed the considerable attention of research community. The use of digital technology to solve sustainability challenges is increasing exponentially.

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