

DIGITAL TRANSFORMATION STRATEGY: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Digital transformation strategy has been an issue highlighted by many researchers and has become a topic of importance to be discussed. The purpose of this paper is to present the results of a review of 20 selected studies which include 14 different frameworks and models of different digital transformation strategies. The main focus of the study is on the frameworks and models in measuring digital transformation strategies. The findings indicate the measurements applied in digital transformation strategies vary between industries and organisations. The findings reveal that most existing frameworks and models provide incomplete illustrations of digital transformation strategies that very little research discussed on frameworks or models to measure digital transformation strategies. Thus, it is evident that research about digital transformation strategies needs more attention by researchers to explore in the future.

Keywords: *digital, digital transformation strategies, search, appraisal, synthesis, and analysis*



INTRODUCTION

Technological advancement has opened the door to the digital age all over the world and hunger for quick access to information that aims of meeting modern needs (Omar *et al.*, 2020). Many organisations have used emerging technologies to facilitate and improve their performance, services, and business transactions. It is also a cultural change that requires organisations to adapt with flexibility, efficiency, and responsiveness to improve the sustainability and maintainability of the organisation (Borangiu *et al.*, 2019; Faisal *et al.*, 2019). For these reasons, organisations therefore need to adapt to digital transformations.

Digital transformation is a complex issue that affects many segments within an organisation (Hess, Benlian, *et al.*, 2016) but it becomes an important aspect for the organisation to improve processes, values, and competitiveness (Zineb & Bounabat, 2019). It is a phenomenon all over the world to engage in organisational activities to achieve excellence in operation and efficiency (Grab *et al.*, 2019). The goal is to value and prioritise customer experiences on new capabilities and functions of the organisations through the new application or technology (Saeed, 2020). It involves the organisations to start the transformational change by substantially integrating digital technology into their activities or transaction (Tekic & Koroteev, 2019).

As such, organisations need to adopt digital transformation strategies to be competitive and at the same time can offer added value to their customers (Kitsios & Mitroulis, 2019). However, despite the implementation of digital transformation in multi-sector namely business, government, education, health care, and private life, there is still a lack of digital transformation strategies. It is important to formulate and evaluate the digital transformation strategies even though it is not fully investigated, with immature literature and inadequate understanding (Kitsios & Mitroulis, 2019). Most literature in this field focused on the definitions, concepts, phases, and components of digital strategies but few studies provided an analytical review on the framework and models that could provide guidelines for digital transformation strategies. Therefore, it is suggested that both academicians and practitioners need to further investigate these issues on digital transformation strategies (Kitsios & Mitroulis, 2019).

The emphasis of this paper is to review, consolidate, and assess the various framework models on digital transformation strategies from various sectors. This study is based on the systematic literature review method in an attempt to give some insights into the latest thinking and developments on the topic in question and emphasizes the importance of digital transformation strategies to practical implementation. To formulate this study, the following questions emerge to frame the study:

1. How many studies have been conducted to explore digital transformation strategies?
2. What types of methodology did researchers use to explore the digital transformation strategies?
3. What are the attributes that contribute to digital transformation strategies?
4. What are the models or frameworks used as an approach to digital transformation strategies?

This paper is organised into four main sections. Section 1 introduces the digital transformation strategies literature. Section 2 describes the research process and approach. Section 3 presents the result of the systematic review, and finally, Section 4 provides the findings and suggestions for future research.

RELATED WORKS

Digital transformation strategy means to systematically address digital transformation by adopting the formation in the organisation (Chaniyas & Hess, 2016). It involves the functional or organisational strategies to coordinate with many independent drivers in supporting organisations' transformation (Bumann & Peter, 2019) and includes all organisation segments and characteristics to coordinate organisation activities and operations (Saeed, 2020). In this case, the digital transformation strategies can be successfully implemented with strong top management support (Tekic & Koroteev, 2019), and it should be driven by the top-down management to influence the adoption of the strategies (van Dyk & van Belle, 2019). Organisations need to have the knowledge and clear understanding of the digital structure requirements and the challenges to come of formulating a digital transformation strategy.

There are several studies carried out on digital transformation strategies on the development of framework models. Some of them are digital transformation framework Matt *et al.* (2015); Hess, Benlian, *et al.* (2016); Chanas *et al.* (2019); Wang *et al.* (2020); Ghosh *et al.* (2018); Hess, Matt, *et al.*, (2016); and Kitsios and Mitroulis, (2019), digital maturity model (Saeed, 2020), transformational affordance framework (Senyo *et al.*, 2021), exogenous and endogenous factors (Colli *et al.*, 2020), IT Governance (Zineb & Bounabat, 2020), digital strategies framework (Jin *et al.*, 2020), Integrated Methodological Framework Digital Strategy (IMDFS) (Zineb & Bounabat, 2019), typology digital (Tekic & Koroteev, 2019), digital transformation strategy star (Grab *et al.*, 2019), digital strategy implementation framework (Correani *et al.*, 2020), strategy building blocks (Setzke *et al.*, 2021), activity-based process model (Chanas & Hess, 2016), evaluation model (Güler & Büyüközkan, 2019), and theoretical framework (Zoppelletto *et al.*, 2020). Despite the studies that have been carried out, there are no specific guidelines and formulation for organisations to implement and evaluate their digital transformation strategies (Zineb & Bounabat, 2019) and both academicians and practitioners need to explore these issues further (Kitsios & Mitroulis, 2019). Therefore, more research needs to be conducted by the practitioners and academicians to enhance a clear understanding that leads to digital transformation including the causes of changes, the impacts, the processes, the requirements, and the challenges as the specific guidelines for organisations in framing their approach to digital transformation strategy.

Thus, it appears that there are lacking in the implementation of digital transformation strategies by holistic approach initiatives via a bottom-up process by top management (Chanas & Hess, 2016; Ghosh *et al.*, 2018; Dyk & Belle., 2019); established frameworks for the management to monitor the implementation (Zineb & Bounabat, 2019); companies maybe failed to extract value due to poor strategy formulation and strategy implementation (Correani *et al.*, 2020), limited studies to facilitates digital platformisation (Senyo *et al.*, 2021), and organisations need to assess and investigate their infrastructures in addressing current and future need for its digital transformation strategy (Saeed, 2020). In fact, in developing the digital transformation strategy the approach on its processes and activities must provide an in-depth understanding to affect its formation (Chanas & Hess, 2016). This raises ambiguity for the organisations regarding the holistic digital transformation approach to digitise and transform their businesses

as to create new chances and opportunities to radically change and improve their business operations.

The above discussions on the literature suggest an agreement on the lack of specific guidelines for the organisations to build and monitor the digital transformation strategy (Zineb & Bounabat, 2019; Hess, Benlian, *et al.*, 2016; Dyk & Belle., 2019); Vial (2019) and there is no holistic approach to it (Zineb & Bounabat, 2020; Chaniias & Hess, 2016). It is indeed a complex phenomenon that is booming in the academic and practitioner communities and therefore needs to be investigated (Tekic & Koroteev, 2019; Kitsios & Mitroulis, 2019). Based on this review, this paper was conducted to identify the works in the context of digital transformation strategy with the aim to provide further evidence on its conflicts and contributions that affirm the need for further research.

RESEARCH METHOD

This present study uses the systematic literature review based on SALSA framework which involves four main stages namely search, appraisal, synthesis, and analysis (SALSA) as illustrated in Figure 1. The methodology of SALSA is determined by the searching protocol that enhances the accuracy, systematic, and reproducible (Grant & Booth, 2009; Mengist *et al.*, 2020; Siksnylyte *et al.*, 2021) and guarantees precision and completion (Grant & Booth, 2009; Mengist *et al.*, 2020). This approach minimises the publication bias and increases the acceptability of the works (Mengist *et al.*, 2020; Moher *et al.*, 2010).

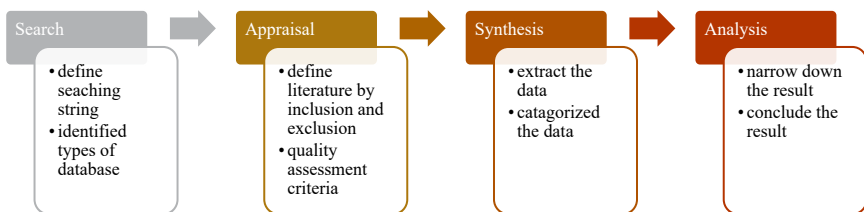


Figure 1: The Illustration of SALSA Stages (Source by Author)

To start the research, it is important for the researcher to define the scope of the study and identify the keywords to be used in the searching

process. To start the search process, the databases were identified, and a literature search was carried out in Science Direct, Scopus, Emerald Insights, and Web of Science (WoS) databases. The search was performed by using the title, keywords, or abstract of these keywords: ‘digital transformation strategy’ or ‘digital transformation strategies’.

In the appraisal step, the inclusion criteria of the articles are as follows: i) the paper should be written in English, ii) the articles must be subscribed journals, iii) the articles approach in digital transformation strategies, iv) the articles must be published between the year 2015-2021. Articles with the following criteria are excluded from the analysis: review articles; editorial letters; non-English articles, and articles which were not categorised as primary research.

The next step was synthesis where quality data was extracted and categorised to evaluate the rigor and credibility of the articles. The following criteria have been set for the articles:

- i. Does the article discuss digital transformation strategies?
- ii. Does the article have an adequate literature review?
- iii. Does the article include the study on the framework or model of digital transformation strategies?
- iv. Does the study valuable for research?
- v. Does the article discuss adequately the research aims?
- vi. Does the paper provide the limitations and future suggestions?

Based on the above questions, each of the articles will possibly; mentioned all the above, adequately mentioned, slightly mentioned, or not mentioned at all (only provide abstract) (Henriette *et al.*, 2015). Thus, it is important to analyse the articles to meet the quality score. Finally, the process involves the selection of articles to be analysed and followed by data extraction.

The results of the analyses were performed to select the qualified 20 articles with framework or models that were considered, processed, and analysed to study the factors that influenced digital transformation strategies. The illustration in Figure 2 illustrates the literature search, selection, and assessment processes of database searching.

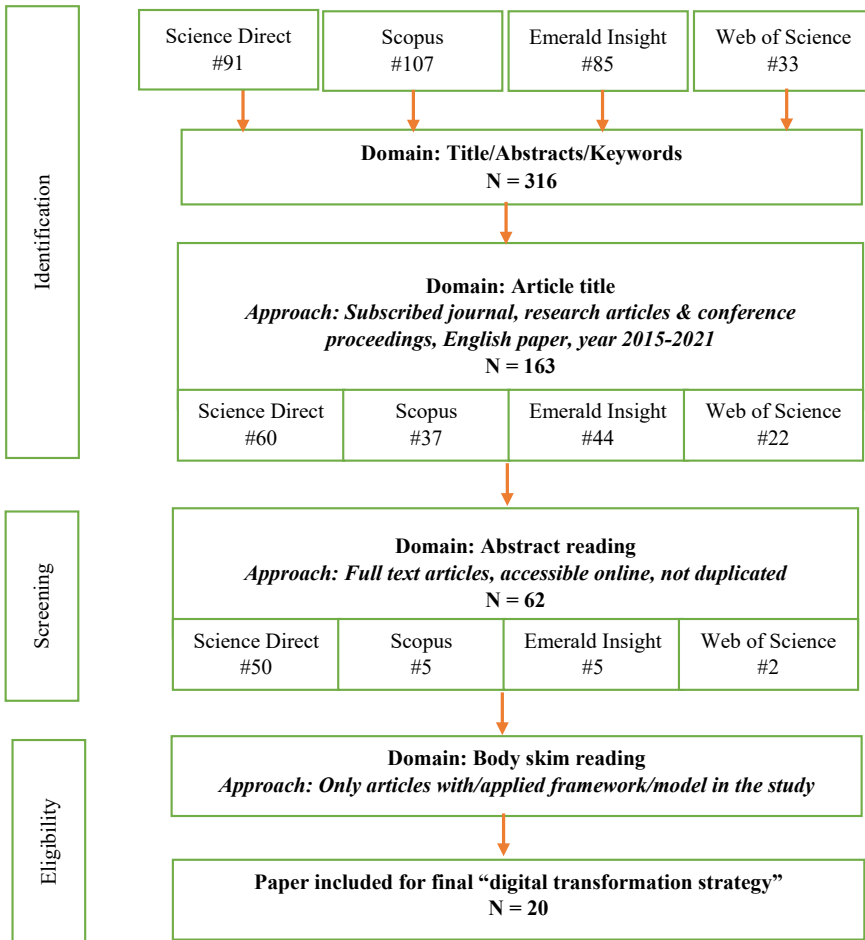


Figure 2: Process of Systematic Literature Reviews
Source: Modified from Mengist et al. (2020)

Thus, based on the above steps and characteristics that are determined in each of the processes, the articles have then been analysed to identify publications of articles by years, methodology used in the articles, the frameworks or models applied by the researchers, and the details on each of frameworks or models. The results are then shown in the next section.

RESULTS OF ANALYSIS

This section presents the overview of the findings of the analysis of the 20 selected articles on digital transformation strategies from various sectors.

Publication of Articles by Year

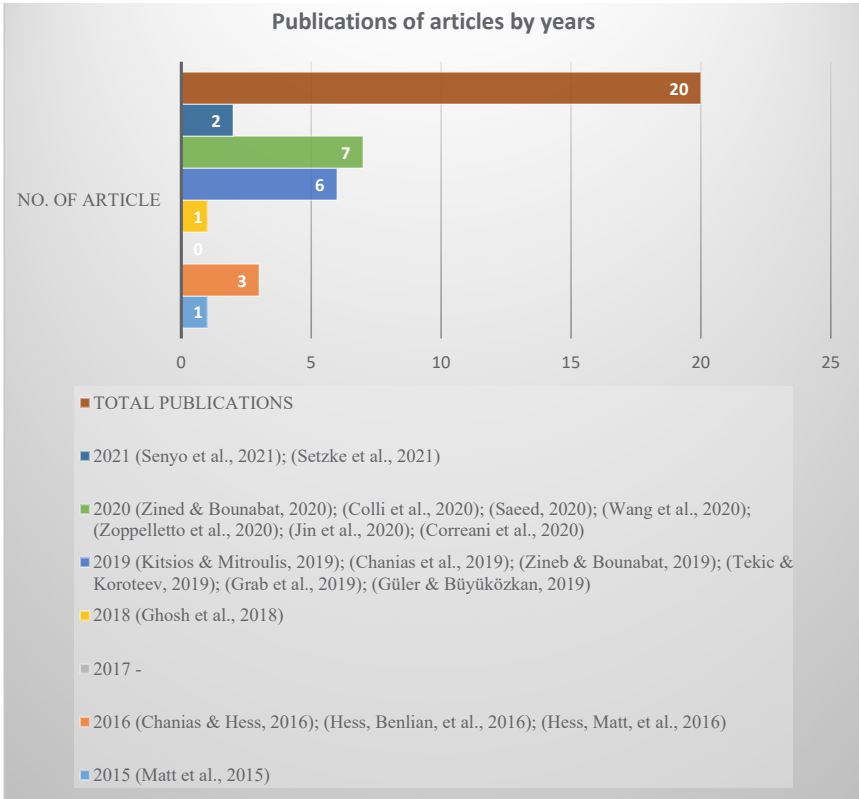


Figure 3: Publications of Articles by Years

Figure 3 indicates the number of articles in digital transformation strategies published from the year 2015 to 2021. With the specific keyword ‘digital transformation strategy’ the researchers finally ended up with 20 articles to analyse. Based on the content analysis of these selected articles it is evident that there was little attention to matters pertaining to digital transformation strategies in the past and therefore academic research seems

scarce in this field. Even though the study in digital transformation strategy was published in 2015, there was only a minimal increase in numbers by 15% in 2016 with no study published in 2017 as the time of writing. Since 2019 and above, it was evident that academic studies began to bring attention to digital transformation strategies issues with the significant increase of about 65% of publications in 2019 and 2020. It is perhaps due to the Covid-19 pandemic that has pushed organisations and companies to respond quickly to digital transformation strategies in order to meet flexibility and efficiency in managing the pandemic (Jones *et al.*, 2021).

Publication of Articles by Methodology

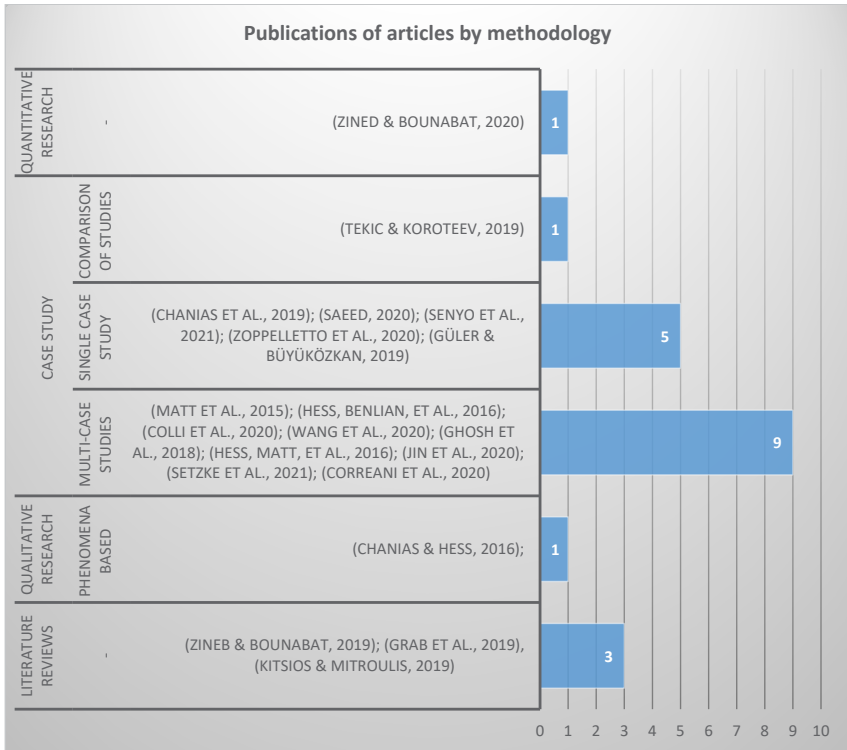


Figure 4: Publications of Articles by Methodology

Figure 4 presents the methodology performed by the researchers in their articles. Basically, the methodological pattern used by the researchers

can be divided into four ways: quantitative research; case study (multi-case studies, single case study, and comparison of studies); qualitative research (phenomena based); and lastly literature reviews. From the above figure, it can be seen that the majority of the articles in digital transformation strategies used case study methods with (15 out of 20 papers) to explore the subject of their investigation by the following fractions; nine studies using multi-case study, five studies using a single case study, and one paper using comparison of study. The main reasons for the researchers to use the case study method were to collect insightful information (Colli *et al.*, 2020; Hess, Benlian, *et al.*, 2016); to explore and analyse phenomena (Zoppelletto *et al.*, 2020; Chantias & Hess, 2016); to gain reasons for adopting the actions (Hess, Benlian, *et al.*, 2016); and allowing in-depth study of strategy formation (Senyo *et al.*, 2021). From the Figure 4, three articles focused on conducting literature reviews. It is noticeable, only one study in the selected article adopted the quantitative method, and the rest of the articles were based on a literature review. However, it is highlighted by Zineb and Bounabat (2019) that digital transformation faces many challenges and it is still an ongoing area of research that leads this field to immature literature and inadequate understanding as a whole. Thus, it is important to investigate the formation of digital transformation strategies and develop well-designed frameworks or models for the initiation of a holistic digital transformation strategy (Chantias & Hess, 2016). The next sub-topic focuses on the contents of the framework or models applied or proposed by the researchers in each of the 20 selected articles.

The Frameworks or Models Applied by the Researchers

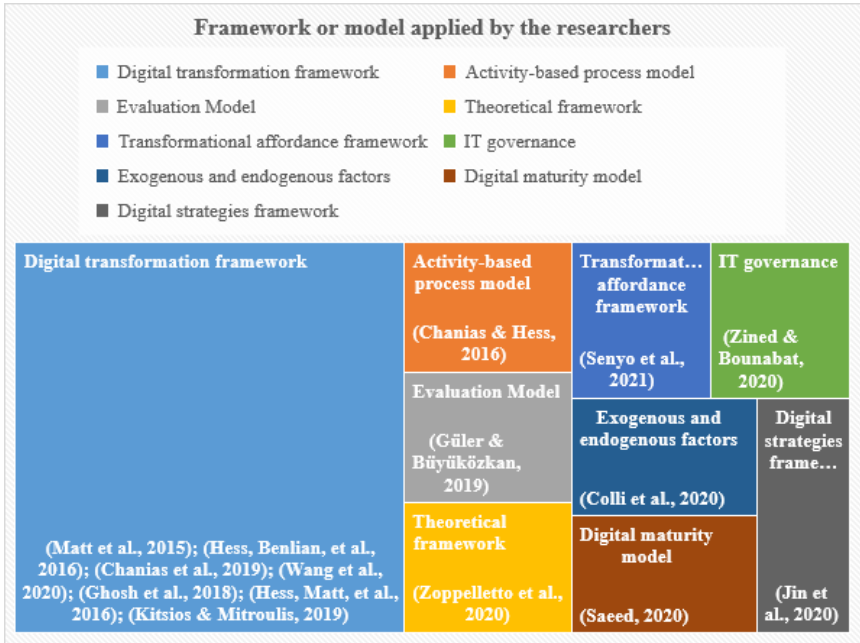


Figure 5: Framework or Model Applied by the Researchers

Figure 5 shows the frameworks and models used by the researchers in their research. It shows a significant number of the research using ‘digital transformations framework’ in their study (seven articles). The rest of the articles used different frameworks and models in their studies. However, there were no repetitive frameworks and models to measure the digital transformation strategies except for the ‘digital transformation framework’ which is repetitive by other researchers in measuring the digital transformation strategies. On the other hand, most of the researchers agreed that there are no rigorous frameworks and clear guidelines on digital transformation strategies (Korachi & Bounabat, 2019; Kitsios & Mitroulis, 2019; Matt *et al.*, 2015; Hess, Benlian, *et al.*, 2016; Hess, Matt, *et al.*, 2016; Setzke *et al.*, 2021; Correani *et al.*, 2020; Jin *et al.*, 2020; & Ghosh *et al.*, 2018). It is clearly highlighted that there were immature and scarce frameworks or models that can be referred to as guidelines in the development of digital transformation strategies. Zineb and Bounabat,

(2019) emphasized that there is no clear and thorough global model to describe the general concepts and guidelines to frame the efficacious digital transformation even though extensive research and assessment had been conducted. The next section highlights the contents of each framework or model.

The Details on Each Framework or Model

The details in Figures 6, 7, and 8 provide significant evidence that all identified frameworks and models in the selected 20 articles understudy pursued different dimensions and attributes in describing digital transformation strategies. The researcher has to separate the frameworks and models for a clear and better understanding to show all the different frameworks and models underlying different dimensions and attributes in each article. There are no consistent frameworks and models in describing the digital transformation strategies even though digital transformation frameworks or models have illustrated significant repetitive studies in various sectors but the content in each of the studies is often inconsistent. The details on each of the frameworks are illustrated and described below:

Digital Transformation Framework																										
Dimensions & Attributes		References	Sectors	Use of technologies				Changes in value creation				Structural changes						Financial aspects				Changes in customer experience				
				Attitude	Technology Competence	Infrastructure	IT providers	Transforming Products	Transforming Services	Knowledge	Communication	Transforming Transaction	Organization/Corporate	Processes	Digital services	Digital Products	Skills	Culture	Digital Competencies	Leaderships	Cost	Resources	Value/benefits	Customers	Competitors	Shareholders
		(Matt et al., 2015)	Business	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Hess, Benlian, et al., 2016)	Media company/German	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Chantas et al., 2019)	Financial services/Europe	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Wang et al., 2020)	Enterprises/China	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Ghosh et al., 2018)	Healthcare/US & Canada	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Hess, Matt, et al., 2016)	Business/US & UK	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
		(Kitsios & Mitroulis, 2019)	Systematic Literature Reviews	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Develop a conceptual model with all 5 dimensions																										

Figure 6: Details on ‘Digital Transformation Framework’

The comparison of the digital transformation strategy framework (Figure 6) provides interesting findings. This figure synthesizes the data obtained based on the digital transformation strategy framework to explore the dimensions and attributes that employs in the framework. From the literature, it is clearly found that digital transformation frameworks consist of four dimensions namely i) use of technologies, ii) changes in value creation, iii) structural changes and iv) financial aspects. Remarkably, the findings show that this is the only framework that is relatively popular in the study of digital transformation strategies and has been repeatedly applied by many researchers to be studied in other fields (this has been compared through the mapping in Figures 7 and Figure 8). However, Kitsios and Mitroulis (2019) have proposed another dimension in their study i.e. v) changes in customer, only Chantias *et al.* (2019) has applied the dimension in their study among the 20 selected articles. Interestingly, the dimensions have been shed on different attributes and contents due in varied sectors and countries. It is stressed by Hess *et al.* (2016); Matt *et al.* (2015) as cited in Mariam *et al.* (2017) that there is still a lack of clarity about strategic digital transformation endeavors. Figure 7 and Figure 8 map the other framework or model in digital transformation that identifies the dimension and its sub-dimensions or attributes.

Model		Activity-based process model	
Reference		Chanias & Hess, 2016	
Sector		Automotive/Europe	
Dimensions and sub-dimensions:			
1. Triggering Event	2. Strategy initiation	3. Deliberate strategy	4. Emergent Strategy
<ul style="list-style-type: none"> ▪ Competitors ▪ Digital offers ▪ Digital Services ▪ Culture 	<ul style="list-style-type: none"> ▪ Leadership ▪ Corporate strategy 	<ul style="list-style-type: none"> ▪ Transformation ▪ Digital initiatives ▪ Stakeholders ▪ Operational 	<ul style="list-style-type: none"> ▪ Financial ▪ Productions ▪ R&D
Model		Evaluation model	
Reference		Güler & Büyüközkan, 2019	
Sector		Banking	
Dimensions and sub-dimensions:			
1. People-centred strategy	2. Value-based strategy	3. Collaboration and innovation strategy	4. Integration & alignment strategy
<ul style="list-style-type: none"> ▪ Customers ▪ People 	<ul style="list-style-type: none"> ▪ Organization ▪ Business Models 	<ul style="list-style-type: none"> ▪ Technology ▪ Culture 	<ul style="list-style-type: none"> ▪ Communication ▪ Ecosystem ▪ Strategies ▪ Capabilities ▪ Resources ▪ Management systems
Framework		Theoretical framework	
Reference		Zoppelletto et al., 2020	
Sector		Business network/Italy	
1. Participatory architecture	2. Network-level organizational integration	3. Digital Tools	4. Sustains social responsibility
<ul style="list-style-type: none"> ▪ Cooperative Approach ▪ Digital Infrastructure ▪ Decision Process ▪ Learning Process ▪ Communication 	<ul style="list-style-type: none"> ▪ Adaptive ▪ Coordination ▪ Business activities ▪ Explicit Information ▪ Sharing Resources ▪ External Stakeholders 	<ul style="list-style-type: none"> ▪ Data Visualization 	<ul style="list-style-type: none"> ▪ Culture ▪ Social Responsibility

Figure 7: Details on ‘Activity-Based Process Model’, ‘Evaluation Model’, and ‘Theoretical Framework’ for Digital Transformation Strategies

Figure 7 identified different frameworks and models to approaches in describing digital transformation strategies namely activity-based process model, evaluation model, and theoretical framework. Each framework and model pursue different dimensions and sub-dimension in the related studies. Whereas Figure 8 shows multiple mapping of frameworks and models in describing the digital transformation strategies. It is also evidence that each of the frameworks and models in the related studies applied different attributes. This presentation provides significant evidence of immature and scarce digital transformation strategies frameworks and models across all studies in the 20 selected articles.

Model	Digital maturity model	Attributes: <ul style="list-style-type: none"> Strategy Leadership Operations Culture People Products Technology 	Framework	Digital strategies framework	Attributes: <ul style="list-style-type: none"> Services Products Technology Process Value creation
Reference	(Saeed, 2020)		Reference	(Jin et al., 2020)	
Sector	Manufacturing/Arab Saudi		Sector	Industry/China	
Model	Transformational affordance framework	Attributes: <ul style="list-style-type: none"> Process Efficiency Innovation Knowledge 	Model	Typology digital	Attributes: <ul style="list-style-type: none"> Leadership Risks Transformation Skills
Reference	(Senyo et al., 2021)		Reference	(Tekic & Koroteev, 2019)	
Sector	Public Sector/Ghana		Model	Digital Transformation Strategy Star	Attributes: <ul style="list-style-type: none"> Operations Information Risks Employees Organization
Model	Exogenous & endogenous factors	Attributes: <ul style="list-style-type: none"> Strategy Technology Process Innovation Knowledge Financial Experts Resources Regulations Governance Competence Transformation 	Reference	(Grab et al., 2019)	
Reference	(Colli et al., 2020)		Framework	Digital strategy implementation framework	Attributes: <ul style="list-style-type: none"> Data Sources (internal/external) Data Platform Information Customers Partnerships People Artificial Intelligent Transformation Procedures Process Knowledge
Sector	Manufacturing/Europe		Reference	(Correani et al., 2020)	
Model/Framework	1. IT Governance 2. Integrated Methodological Framework Digital Strategy (IMDFS)	Attributes: <ul style="list-style-type: none"> IT Strategy Business Strategy IT Budgeting IT Organizational IT Steering Committee IT Reporting IT Investment Decisions IT Project Prioritization IT Reaction Capability Management Strategy 	Sector	1. Electrical business/Switzerland 2. Agricultural equipment/Netherlands 3. Telecommunications/UK	
References	1. (Zined & Bounabat, 2020) 2. (Zined & Bounabat, 2019)		Model	Strategy building blocks	Attributes: <ul style="list-style-type: none"> Operations Information Risks Employees Organization
			Reference	(Setzke et al., 2021)	
			Sector	Business/Italy	Attributes: <ul style="list-style-type: none"> Leadership Partnerships Digital Business Services Innovation Threat

Figure 8: Variety of Frameworks and Models for a Digital Transformation Strategy

With regards to the presentation of the frameworks and models (Figure 6 to Figure 8), it depicts inconsistency of dimensions and attributes in describing the digital transformation strategies that can be found across all examined frameworks and models. Even though the analysis suggests there

are guidelines to some extent, but they were often vague as there was lacking of standard approaches of describing digital transformation strategies even within the top domain (manufacturing and business). Mariam *et al.* (2017) highlighted that there is still a wide gap in the implementation of digital transformation that needs to the strategic and formulation to achieve the realisation of a successful digital transformation strategy. Therefore, the assessment to have an understanding and clear reference points need to be established to provide a clear map of potential guidelines of digital transformation strategies.

CONCLUSION

Digital transformation strategies are considered to be an issue in most industries and organisations due to the unclear development of frameworks and models to be referred to as guidelines to facilitate the implementation of the strategies. This paper is part of an academic reflection underway on digital transformation strategies to provide a better understanding of the field. It neatly constructs previous research works based on analysis of 20 selected articles by comparing digital transformation strategies frameworks and models.

Nonetheless, this research is limited by several factors such as the chosen keywords used to identify the articles under study. The research design only involved the search criteria using the limited terms of ‘digital transformation strategy’ or ‘digital transformation strategies’. The research also focuses only on four databases (Science Direct, Scopus, Emerald Insight, Web of Science) to gain an initial understanding of the coverage offered by literature in various industries and organisations. In addition, the limitation of the analysis strategy in the present study is only based on several elements and aspects in the literature review process.

Conclusively, from the intensive systematic literature review methods of SALSA, it is found that most frameworks and models provide an incomplete picture, scarce, and inconsistent of digital transformation strategies across the selected 20 articles analysed. The findings indicate that the research in this domain with its dimensions is not sufficient and needs further investigation on the process of developing practical frameworks and

digital transformation strategies. In addition, future research should focus more attention on 1) developing clear and consistent frameworks and models in digital transformation strategies, so that a holistic approach to framing the digital transformation strategies could be established, 2) frameworks and models should be explored in various sectors for comparative analysis, 3) clearly defined dimensions and their attributes should be developed to be integrated systematically in digital transformation strategies frameworks and models for possible implementation.

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ETHICS

The authors confirmed that this manuscript was originally developed by the writer and all references were cited and no ethical issues were involved.

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