DIGITAL TRANSFORMATION -CHALLENGES FACED BY SME ICT SERVICE PROVIDERS

by

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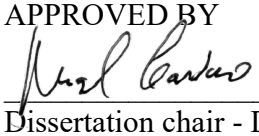

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Dedication

This dissertation is dedicated to all SME ICT service providers and leaders.

Acknowledgements

I am grateful to God for granting me the life, strength, knowledge, and wisdom to successfully complete this research despite encountering several challenges. My sincere gratitude also goes to Dr Giacomo Marzi, my supervisor at the Swiss School of Business and Management, Switzerland, for guiding and providing me with valuable comments to complete this research successfully. I am also grateful to all my family members and friends for their moral support. I am also thankful to the survey coordinators who helped get the participants' consent. Finally, I thank all SME members who participated in the survey with their rich knowledge and experience.

ABSTRACT

DIGITAL TRANSFORMATION: CHALLENGES FACED BY SME ICT SERVICE PROVIDERS

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Organizations need to adopt digital transformation to sustain themselves in the market. The current pandemic situation is also forcing all organizations, big and small, to embrace digital transformation. SME ICT service providers help their customers in digital transformation. They face challenges in their transformation because digital transformation is more than merely implementing new tools and technology. It is the process of adopting new technologies to modify or create new business processes, customer experience and culture to meet the evolving needs of the business. This paper will study SME ICT service providers' challenges in adopting digital transformation and address the gaps. The proposed study will use both qualitative and quantitative methods for data collection and focus more on the processes and people-related factors imperative

for Digital transformation. The study analyzes various frameworks, models and approaches for SME ICT service providers for digital transformation using the literature review. Linear regression and Pearson co-efficient was done using the survey data to find the relationship between the drivers and barriers. Both positive and negative relationships were found using survey data. Drivers and barriers that are found to be related to each other are found to be people and process-centric characteristics. This study encourages further research on the same problem in a different setting or context.

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INTRODUCTION

1.1 Introduction

Digital transformation is the process of adopting new technologies to adjust or build new company procedures, cultures, and consumer experiences in response to shifting business requirements. This is the new norm for any company in the pandemic era. The most common definition is integrating digital technology into every aspect of business, fundamentally changing how businesses operate and deliver customer value. It is also a cultural shift that requires organizations to continually experiment, challenge the status quo, and get comfortable with failure.

Small and Medium Enterprise ICT service providers employ less than 200 workers, providing information and communication technology-related services governed by the agreement. The current pandemic situation is forcing them to adopt digital transformation to survive. SME ICT service providers face challenges in their digital journey because it involves more than just putting new tools and technology into action. The people, process, responsiveness, leadership, and culture make the difference in sustaining the business operations. Transformation must be happening not only at the receiving end but also at the provider end.

Digital transformation is the key to sustainability, and SME ICT service providers must identify the challenges before embarking on their digital transformation journey. It must be an end-to-end transformation for survival. This paper will study SME ICT service

providers' challenges in adopting digital transformation and address the gaps. The focus will be more on the processes and the human factor imperative for Digital transformation. This study encourages and proposes a further survey of the same research problem in different settings or contexts.

1.2 Research Problem

Digitizing is converting from analogue to digital data. Digitalization is the implementation of products and services using ICT. Digital transformation is how to digitalize the product, process, and services, i.e., how to proceed with digitalization. Digital transformation refers to adjustments made to an organization's working practices, job descriptions, and product offers as a result of its use of digital technologies. (Heilala et al., 2020).

Digitalization and automation are generating knowledge-based, non-routine work (SECO 2017, as cited in Hubschmid-Vierheilig et al.,2019). As organizational teams become more diverse and multi-disciplinary, digital competence is not the only requirement, but also cross-sectional abilities such as communication and other soft skills.(Bughin et al., 2018; Aepli et al. 2017; SECO 2017 as cited in Hubschmid-Vierheilig et al.,2019).

Digital transformation is less about adding new technologies and more about transforming every facet of the business from process to culture, beginning with the individuals' mindset and as a collective organization with new strategic initiatives and leadership to transform and adopt digitization. Most neglected are the human factors and the process. The process and people management usually vary on a project basis or based

on the manager. Service providers' digital transformation involves agility, centralization of the business operations, process, knowledge, resources, and change management.

The study will investigate the challenges faced by SME ICT service providers in adopting digital transformation and will address the subsequent research questions.

What are the challenges faced by SME ICT providers in digital transformation?
The research objectives are:

1. What are the drivers of Digital Transformation?
2. What are the challenges/hindering factors in adopting digital transformation in SME ICT Service providers?
3. What are the approaches, methods, tools, and competencies required to overcome the digital transformation challenges in SME ICT Service Providers?
4. Identify the implementation gaps.
5. How can SME ICT providers accomplish digital transformation?

1.3 Purpose of Research

The current study aims to identify challenges SME ICT service providers face from various literature reviews. Identify multiple types of models, frameworks, roadmaps, approaches, and best practices to overcome those challenges from literature review articles and different internet-based papers published by reputed consulting firms, case studies and surveys. The result of this study will be immensely valuable to the SME ICT

service providers and related software providers in developing better practices, models, frameworks, and tools for embracing and embarking on their digital transformation journey.

1.4 Significance of the Study

Technology not only makes life better, but it also simplifies daily tasks. Digital transformation is significant not only to big organizations but also to SMEs. This study will analyze and provide valuable insight to SME ICT service providers on how to adopt, transform, and adequately manage digital transformation.

1.5 Research Purpose and Questions

The current study intends to identify challenges SME ICT service providers face from various literature reviews. Identify multiple types of models, frameworks, roadmaps, approaches, and best practices to overcome those challenges from literature review articles and different internet-based papers published by reputed consulting firms, case studies and surveys.

The result of this study will be valuable to the SME ICT service providers and related software providers in developing better practices, models, frameworks, and tools for embracing and embarking on their digital transformation journey.

CHAPTER II:

REVIEW OF LITERATURE

2.1 Theoretical Framework

IDC defines digital transformation as "the continuous process by which enterprises adapt to or drive disruptive changes in their customers and markets (external ecosystem) by leveraging digital competencies to create new business models, products, and services". Digital transformation enables enterprises to seamlessly merge digital and physical business and customer experiences while enhancing organizational performance and operational efficiencies. Hubschmid-Vierheilig et al.(2019) has cited Demirkan, Spohrer and Welser's (2016) definition of digital transformation (DT) as “the profound and accelerating transformation of business activities, processes, competence, and models to fully leverage the changes and opportunities brought by digital technologies and their impact across society in a strategic and prioritized way”.

Al-Ruithe et al.(2018) cites Lankshear and Knobel (2008) Digital transformation is defined as " achieved when the digital usages which have been developed enable innovation and creativity and stimulate significant change within the professional or knowledge domain”. It is defined as “the use of technology to radically improve the performance or reach of enterprises”. Another comprehensive explanation of Digital Transformation is that it can be understood as the change technology brings to all human life.

Lately, the rate of technological advancement in ICT has started to intensify the pressure on SMEs to undergo digital transformation since the rivals are continuously adapting new technology, which has also empowered consumers to demand, for example, improved

and quicker service with any device, anywhere, at any time (Fitzgerald et al. 2013). Thus, it can also be defined as the "use of technology to radically improve performance or reach of enterprises", as cited in Nieminen, J. (2014).

Small and medium-sized firms, or SMEs, are essential to the majority of economies worldwide and play a critical role in the creation of jobs and the advancement of the global economy. According to the OECD Report 2017, they effortlessly contribute to about 70% of total employment and are the '*major contributors to value creation, generating between 50% and 60% of value added on average'*.

ICT Service providers operate, manage or provide information and communication technology-related services governed by the agreement. Small and Medium enterprises are the backbone of the economies, providing ICT services (employing less than 200 workers) adopting digital transformation are very few. The current pandemic situation is forcing them to embrace digital transformation to survive.

Digital Transformation is not just the implementation of new technology or tools. The people, process, responsiveness, leadership, and culture make the difference in sustaining the business operations. Sometimes, the terms "Digitizing", "digitalization", and "digital transformation" are combined and used interchangeably.

Digitizing is converting from analogue to digital data. Digitalization refers to the use of information and communication technology (ICT) to implement products and services. Digital transformation is how to digitalize the product, process and services, i.e. how to proceed with digitalization. Digital transformation means changes in work processes,

roles, and business offerings due to the integration of digital technologies within an organization (Heilala et al., 2020).

Digitalization and automation are leading to the creation of non-routine and knowledge-based jobs (SECO 2017, as cited in Hubschmid-Vierheilig et al.,2019). As organizational teams become more diverse and multi-disciplinary, not only digital proficiency is required, but also cross-sectional skills such as communication and other soft skills (Bughin et al., 2018; Aepli et al. 2017; SECO 2017 as cited in in Hubschmid-Vierheilig et al.,2019).

More often, ICT service providers help their customers in digital transformation. When it comes to their transformation, they face challenges. Transformation must be happening not only at the receiving end but also at the provider end. This literature review emphasizes that digital transformation is less about adding new technologies and more about transforming every facet of the company, from procedures to culture, beginning with the mindset of the individuals and as a collective organization with new strategic initiatives and leadership to transform and adopt digitization.

Most neglected is the human factor and the process. The process and people management usually vary on a project basis or based on the manager. Service providers' digital transformation involves agility, centralization of the business operations, process, knowledge, resources, and change management. The sections that follow will focus more on the literature review of the theories, methodologies, models and the human factor imperative for Digital transformation. It will be used to explain the research findings in

later chapters and, thus, eventually contribute to the aim of this study. The literature review will be carried out on the following topics relating to the research questions:

1. How do SME ICT providers face the challenges in digital transformation?
2. What are the drivers of Digital Transformation?
3. What are the challenges/hindering factors in adopting digital transformation in SME ICT providers?
4. What are the approaches, methods, tools, and competencies required to overcome the digital transformation challenges in SME ICT Service Providers?
5. Identify the implementation gaps.
6. How SME ICT providers can accomplish digital transformation.

This literature review identifies the drivers, challenges, models, processes, roadmaps, and common framework of Digital transformation that are applicable for SME ICT Service Providers based on the discussions, review from various Literature review articles as primary data and from various internet-based papers published by reputed consultants and organizations as secondary data. The specific focus of this literature review will identify the challenges faced by SMEs and other types of industry sectors in adopting digital transformation that is common and applicable to SME ICT service providers. Various kinds of models, frameworks, and best practices are defined and published in articles by consulting firms and researchers related to SMEs and more prominent organizations specific to other domains and contexts adopting digital transformation.

2.2 Drivers

Drivers of digital transformation are both internal and external factors. The most common drivers identified by Osmundsen et al. (2018) are customer behavior and expectations , changing business landscape, and digital shifts in the industry. Digital transformation is more about transforming people, services and organizations led by people than digital. Technology is a tool, but the actual strength and catalyst is the organization's human capital. Soft skills are identified as intangible investments to aid successful digital transformation. It is one of the key drivers of digital transformation (Gulati et al., 2020).

The essential skills for managing digital transformation include critical thinking, complex communication, creativity, collaboration, flexibility and adaptability, productivity and accountability, building a thriving team, fostering a growth mindset, influence, the ability to navigate innovation and change, and effective collaboration with leaders and across teams.

Drivers are categorized as internal and external drivers of digitalization. The most prominent external drivers are technological development like the emergence of big data, artificial intelligence, business intelligence, ERP systems, CRM systems, BPM systems, Digital marketing and other Industry 4.0-related technologies. Development of new business structures is the internal driver (Strutynska et al., 2019). According to Heilala et al. (2020), Digitalization is driven by notable advancements in technology trends, industry pressure, consumer expectations, policy and regulatory considerations, and industrial pressure. Six drivers identified are i) technology and innovation, ii) global trade and investments, iii) institutional framework, iv) sustainable production, v) human

capital, and vi) demand environment. These six drivers represent the factors and conditions necessary to leverage emerging technologies and transform production systems. Nachi et al. (2021) have identified Technological context (technological infrastructure and skilled workforce), organizational context (management support, financial readiness) and environmental context (customer readiness, governance, policies) as the three main drivers of digital transformation and COVID-19 as a catalyst of DT.

The urgency of small and medium-sized enterprises (SMEs) digitalization has significantly increased due to the COVID-19 pandemic, which has also accelerated trends. Many SME ICT service providers have started using collaboration tools (teams, zoom, slack, skype) and moved towards modernizing their applications and infrastructure (cloud, AI). Many of them are forced to adopt a digital workplace. According to Hubschmid-Vierheilig et al. (2019), four trends drive digital transformation: technological trends, customer demands, industry pressure and drivers, regulations and policies. Further classified them to six drivers: i) technology and innovation, ii) global trade and investments, iii) human capital, iv) institutional framework, v) demand environment, and vi) sustainable production. These six drivers symbolise elements and conditions necessary to capitalize on emerging technologies and transform production systems.

Safadi (2021) has identified six main drivers for the decision to embark on the digital transformation journey: data analytics, technology, maturity, organization's culture ,customer-centricity and business capabilities. The competitive advantage of the SMEs depends on effective use of digital solution and its ability to seamlessly exchange information with its partners and networks by replacing manual process with automated

process, analytics and intelligent data processing enriched by artificial intelligence. (Hubschmid-Vierheilig, E., Rohrer, M., & Mitsakis, 2019).

Boston consulting Group (BCG 2022) in their publication on digital transformation have cited leadership, technology , agile governance, talented people and integrated strategy with clear transformation goals as the 6 main drivers of digital transformation. LaBerge et al. (2020), published in McKinsey, identified COVID-19 as a key driver of accelerating digital transformation. According to his survey there is a speedup in creating digital or digitally enhanced offerings. On average, there is a seven-year increase in the rate at which companies are developing these products and services across regions. 80% of the customer interactions have moved online. There is an increase in the digitized products and digitized services offered all throughout the world. The client-facing elements of organizational operating models are not the only ones affected. Core internal operations of the company, such as back-office, operations, and R& D process, have reported similar accelerations in digitization. The survey shows there is a growing usage of remote work, changing customer needs and migrating to the cloud. Technology is another crucial driver cited in McKinsey LaBerge et.al.(2020) survey. Those experimenting with new technologies (72%) have reported revenue growth during the pandemic. The mindset shift of the people (48%) is also vital for digitalization.

Remote Working and remote skills have developed due to the pandemic. According to Amankwah-Amoah et al. (2021), COVID-19 has accelerated the trend towards the digitalization of business models coupled with the shift of activities from predominantly offline to online. For many organizations, it has completely changed how they operate. When an employee works remotely, they carry out their employer's tasks from a distant

virtual location rather than their physical office. Although many technologies enabling remote working have existed for at least a decade, the majority of the businesses choose not to adopt them, or options were provided only to a few key employees. Management previously had concerns regarding loss of control and employee trust issues. The pandemic has forced everyone to accept new and developing technologies and shift to remote working and skills development activities.

Paperless and virtual office are increasing in the Pandemic years. People are used to paperwork and physical workspace. Today, businesses are increasingly embracing emerging digital technologies to improve their operational efficiency and effectiveness. Value chain activities in the digital space have increased to not only minimize the adverse effects of COVID-19 but also to enhance competitive advantages and long-term sustainability. By digitizing operations, companies reduce reliance on paper, allowing all employees to access information without incurring costs associated with physical paper flows. Businesses can enhance operations and cut expenses related to administration and processing by switching from a physical paper-based strategy to one that is digitally focused for information storage, distribution, and processing. Pandemic has also forced organizations to move from traditional on-premises deployments to clouds. (Amankwah-Amoah et.al., 2021).

2.3 Challenges

The amount of literature on digital transformation is growing. Various literature reviews have been conducted to better understand the length, width, results, and implications of digital transformation literature. Many of these reviews use different perspectives to

discuss topics across various domains, including technological disruption and corporate entrepreneurship in multiple sectors (Jones et al., 2021).

Below is the list of hurdles or challenges faced by SME in DT as identified by Afonso Amaral, Paulo Peças(2021) are economic benefits, skilled labor, willingness to changes and financial benefits based on real time case studies. Some challenges Schwertner (2017) identified are not technologies but human factors, culture and employee opposition to change, lack of knowledge and good practices. Security issues related to data, lack of control and lack of interoperability with existing IT systems were also identified. The main challenges and barriers to overcome are limited understanding, insufficient resources and gaps in bringing digitalization into practice (Hubschmid-Vierheilig et al., 2019).

A review of DT models and framework by Safadi (2021) States that a solid digital transformation framework dismisses a myth that DX is about digitizing processes and choosing disruptive technology. The essence of digital transformation lies in transforming people rather than just technology. The article indicates that 75% of obstacles hindering digital transformation success today are non-technical factors. The article names culture as the most prominent hurdle an organization faces in realizing digital shift, citing the report published by consulting firm Capgemini.

According to the research article published by Altimeter, a research and strategy consulting firm based on the survey data from executives, states Low digital literacy or expertise among employees and leadership (31.4%) as the top most challenge in digital transformation followed by digital transformation viewed as a cost center (30.9%)

,Company Culture (30.5%) ,Lack of budget (30.5%),Lack of staff resources (30.1%) ,Legal and risk management or compliance concerns (24.6%) ,Human barriers (e.g. politics, egos, sabotaging, fear) (23.7%) , No sense of urgency (19.7%) ,ROI to justify value of digital transformation(10.6%), No leadership driving efforts (6.1%), Respondents have not experienced any of these challenges (4.2%).Shafiee Nahrkhalaji et al. (2019) has cited availability of resources(27%), development of new capabilities and skills(37%), corporate culture(33%), finding the exemplary leadership(33%), engagement of employees(24%), market uncertainties(15%), complexities of strategic and organizational challenges(34%), new competition and collaboration patterns(28%), changing current customer behavior (10%)and creating a vision (20%)as the main challenges in Digital transformation journey.

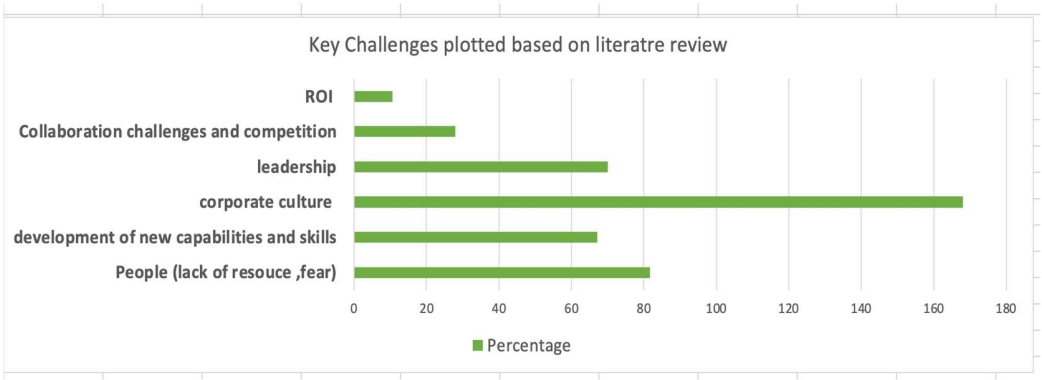


Figure 1 -Consolidated graphical representation of the challenges -own illustration.

Internal Factors affecting Digital transformation are identified as resource fit , change in business models and capabilities fit while the external factors are external capabilities and resource fit, regulation, maturity, needs and expectations of the customers (Tarute et al., 2018). SMEs are compelled to seek new business models and opportunities and enhance existing products and services using cutting-edge technologies such as cloud, big data,

IoT and AI. The COVID-19 pandemic has been speeding up the digital transformation in SME ICT Service providers.

Typical SME barriers and pain points of digital transformation are skills shortage, need to learn new capabilities, knowledge gaps and resource constraints are slowing down the DT process. According to Heilala et al., (2020) the main challenges and barriers are limited understanding of digitalization and digital transformation benefits, dependency on manager /owners' passion for technology, shortage of skilled workers, difficulty in finding cost effective solution and tools to implement digital transformation into reality.

According to Nieminen, J. (2014) based on case study conducted on organizations identified the following challenges. Internal communication of business requirement (60%), lack of collaboration (47%), not understanding the possibilities that digital technology enables (40%), legacy systems not supporting new business requirements (40%), change resistance and risk-averse culture (33%),Not understanding the dependencies of decisions regarding digital business (33%), insufficient budget(20%) , legal issues (13%) and inefficiency(27%). According to the article published in freshdesk based on surveys from leading consulting firms (Ida Jessie Sagina ,2019) -Charting a detailed transformation strategy(26%) , organizational culture (21%) , lack of skilled employees (26%), meeting changing customer demands(47%), data-driven (24%), can use data in a better way(86%), too much dependency on legacy systems and operational models, cyber security. Hubschmid-Vierheilig et al. (2019) citing Goerzig and Bauernhansl (2018) have highlighted iterative development, customer involvement and increasing business orientation as challenges that arose from digitized products and services, all of which require new approaches and methods. The introduction of new IT

infrastructure alone is not sufficient for digitalization. Process automation reduces pressure on head count and creates a lean process and may not return a positive ROI. SMEs still need to bear the high cost of maintaining quality and professional standards.

Three major dilemmas of digital transformation are organizational capabilities, closeness to customers and technological simplification. Non-technical barriers are capabilities, internal resources, customers and information adaptability and value proposition. Typical barriers identified by Peillon & Dubruc Peillon & Dubruc (2019) include lack of technical skills, insufficient IT structures, inadequate business processes, and high costs. From a global perspective, digital transformation may necessitate a significant shift in the company's organizational culture, involving the acceptance of novel technology and the acquisition of new skills. Technology barriers are core to digitalization. They include varied technologies (cloud, AI , analytics, big data) and sound technical infrastructure to support offering ICT services in the form of process and product to their customers by re-designing their technical infrastructure and business model.

Strategy drives digital transformation not technology. Offering new products, value and services requires new resources, collaboration, and capabilities. They often require radical change at the organization level. People’s unwillingness to accept change is underestimated by organizations. It required cultural transformation as well. Human resource related matters like lack of skillful employees, digital competencies are added barriers of digital transformation (Peillon & Dubruc 2019). Ambiguous customer needs, customer data security and privacy are customer-related barriers identified.

Köffer (2015) identifies four core aspects as challenges: collaboration, compliance, mobility and technostress. SMEs must quickly grasp, adjust to, and predict customer needs (Lindner et al., 2017). Relying on past knowledge and procedures is no longer feasible as existing concepts are inadequate to address entirely new challenges and settings. Instead, companies need skilled employees with technological expertise, analytical skills, creativity, and out-of-the-box thinking to tackle DT challenges (Pavlou and El Sawy 2010 as cited in Hubschmid-Vierheilig et al. (2019)).Amankwah-Amoah et.al.(2021) has cited four main barriers :Technology infrastructure, institutional constraints(policy, regulation and law),security and privacy concerns, organizational level constraints(people, resistance to change, lack of technical expertise).

Organizational transformation is equally a critical challenge of DT. Organizations are being transformed in bits and pieces rather than systematically and strategically. SMEs need cultural change (pro-digital culture), agility, and insert technology, data , and digital deep into the organization's DNA by re-organizing and building cross-functional diversified agile teams to push forward for sustainable growth(Küng, L. 2017). Nieminen, J. (2014) identified 6 challenges from Westerman et al.(2011) :

- lack of sense of urgency to start the change
- leadership and coordination issues
- lack of collaboration
- Resistance to change
- Cultural issues
- lack of vision

Long standing hurdles of ICT SMEs in going for digital are absence of knowledge and awareness, digital skills gaps and inadequate funding to finance the transformation for a large share of the SME population. In addition, they encounter increased difficulties in overcoming challenges in the wider business environment, such as rapidly changing regulatory frameworks, addressing digital security and privacy issues, or gaining access to high-quality and affordable digital infrastructure. Additionally, many of these firms are unaware of government subsidies that could support their digital transformation at low or no cost.

According to PWC global industry survey (2016), the primary obstacle to successful implementation is not inadequate technology, but rather an absence of digital culture and expertise within the organisation. While investing in the appropriate technologies is crucial, a wider range of people-focused criteria will ultimately determine success or failure rather than particular sensors, algorithms, or analytics programmes. Companies must create a strong digital culture and ensure that the C-suite is leading transformation in a transparent manner.

The lack of digital skills is a widespread challenge for most SMEs and is emerging as a critical obstacle to SME digitalization. Benefits of digitalization and digital transformation are not fully understood both by management and the employees. Nachit et al. (2021) has categorized DT barriers as structural and cultural. Managerial support,

lack of skills, regulatory and compliance are structural, while employee habits and lack of technological know-how are cultural barriers to DT. While there are common challenges for SMEs to go digital, a one-size-fits-all approach or universal strategy for SME digitalization is not adequate. Speed is also vital to provide the appropriate support during a crisis. Therefore, the utilization of digital technologies is proving critical in aiding SMEs in these unprecedented times.

Cannon Business Process Services Article (2022) has cited the workforce as a critical challenge. Many organizations face a "people problem" when it comes to digital transformation. In order to succeed in any transformation, it is crucial to have the right people with the right skills working effectively as a well-integrated team. Companies must address at least two workforce challenges: acquiring and retaining key talent and managing the changing demographics of today's workers to thrive in digital transformation initiatives.

2.4 Models and Frameworks

Many established organizations ,consulting companies and research articles have proposed numerous framework and models that are either tested practically in their own organization or used by their clients or theoretically proven methods for digital transformation approach. We have reviewed some of the frameworks summarized with their strategies and steps.

2.4.1 A five-step approach

1. Position the company within digitization.
2. Define the roadmap.
3. Create a Supportive Environment [create digitization culture, create awareness, involve employees]—Iterative process.

4. Prepare digital projects [Select digitization goal, identify & select opportunity, project planning & perform resource, build expertise]- Iterative.
5. Solution Implementation

According to study done by Barry Libert, Megan Beck and Yoram (Jerry) Wind for Harvard Business Review (2016), Big Companies have successfully created networks and shared value creation using external entities. Uber depends on a driver network, Airbnb on a property owner network, and eBay on a seller network. By using these external networks or communities these companies are able to achieve outstanding profitability.

Managers are hesitant to work with entities that are external to their chain of command. It takes a new kind of cooperative and co-creative leadership to work with external organizations. It will also help the organization to tap on underutilized resources and an enormous pool of resources and capabilities that may not be available in their organization.

2.4.2 A Two-Pronged Model

The two sides of digital transformation are: the new agile IT and the existing operational system. The day- to-day work of the SMEs to create additional value depends on the exiting operational system while Innovation and digitalization thrives on the new agile IT. The daily tasks of the SMEs to create additional value depends on the exiting operational system while Innovation and digitalization thrives on the new agile IT. ICT SMEs implement the new agile and modernization only when operation is running

securely and reliably. With the traditional IT and legacy systems and processes that have evolved in the enterprise over the years, and the new, agile IT designed to meet the needs of the future. Instead of immediately rebuilding and updating their existing IT infrastructures and processes all at once, many companies find it more effective to implement innovative, parallel digital solutions that provide the necessary speed, agility, and transformation in stages (Scheer, 2017).

Simple, Secure, Scalable, and affordable solutions and services are expected from SME ICT providers. SME ICT service providers can offer catalogues of IT structures and business processes. They can also offer a variety of specializations, implement numerous excellent cloud solutions that meet their own business model as well as for their customers. Many of the SMEs supporting and maintain critical systems and business processes where the criteria are high availability are slowly adapting hybrid cloud model upgrading or replacing the on-premises infrastructure with cloud. This enables the migration of crucial business operations between various cloud service types when requirements change (Scheer, 2017). Hybrid cloud is the best example for a two-pronged approach.

2.4.3 Reasonable Model

A theorical model (R-model) was constructed by Arianto Muditomo and Indra Wahyudi based on qualitative analysis on documentary review of 2020 articles during the pandemic for SME digital transformation. The reasonable model has 3 steps that are generic for any SME.

First step is identification of drivers (external and internal), second step is defining reasonable phases (set goals and milestones), and the last step is management's decision to choose a strategic imperative to change the business model based on DT implementation defined in the previous phase.

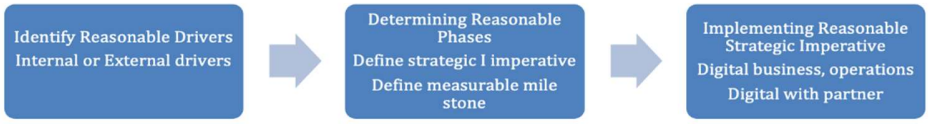


Figure 2 Reasonable digital transformation for SME (R-DT Model)

Davenport & Redman (2020) has described Technology as the engine of digital transformation, data as the fuel, process as the guidance system, and organizational change capability as the landing gear. Digital transformation needs them all, and they must be in excellent working order and work together. There is no point automating a process that doesn't solve the purpose. Process improvement and re-engineering is the 1st step towards digital transformation. Technology, data, and process must proceed in appropriate sequence. In some cases, depending on the nature of the project or domain, data comes first. Define the goals and then develop the sequence of steps most appropriate to achieve the goals. Expertise or talent possessed in 4 key domains (technology, data, process, and people) are needed to execute and create success on any technology-driven transformation.

"The human capital of organizations undergoing digital transformation plays an essential role in the process " according to Heavin & Power (2018) .Changes in employee behavior and thought patterns will make it increasingly important for the workplace of the future to support knowledge-intense work. Gimpel et al. (2018) has cited holistic and concrete framework with six action fields: customer, value proposition, operations, data,

organization, and transformation management for managers to consider when engaging in digital transformation. Teresa Guarda et al. (2021) have identified business model, operational process, and user experience as the 3 keys areas to concentrate for digital transformation.

2.4.4 Dimension and Maturity Model

Leipzig et al.,2017 citing Azhari et al.(2014) have identified a digital eight dimensions of digitization, namely strategy, leadership, products, operations, culture, people, governance and technology. These dimensions can be fulfilled to varying extents. Five levels of digital maturity are defined according to which companies can classify themselves.

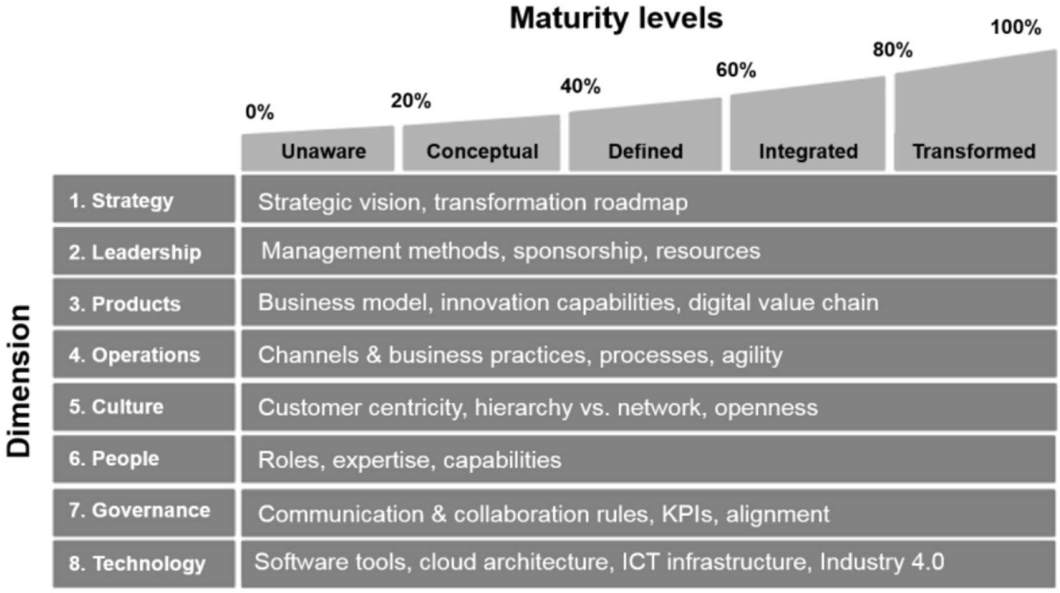


Figure 3 -from source Leipzig et al.,2017.

The first level, “unaware”, describes companies in which there is no strategy for digital transformation, nor are there any digital competencies available. These companies do not

yet offer any digital products or services and are lacking an overall organizational awareness for the need for digital transformation. Companies classified by the "conceptual" level, are those which offer a few digital products, but are still without a digital strategy. Those with a "defined" level of digitization, are the companies who are able to consolidate experiences gained from pilot implementations into partial strategy. At this stage, a culture of digital thinking is taking root in the company. The profitability of these partial strategies and the effects of the pilot implementations are assessed and used to develop an overall digital strategy. At this point, where a clear digital strategy is developed, the company falls into the "integrated". maturity level. Only once this strategy has been implemented across all products and business processes, can the company be classified as "transformed".

2.4.5 Digital Maturity Model

Deloitte and the TM forum (2017) have proposed the Digital Maturity Model (DMM), a tool used to achieve digital transformation." *One of the things holding the communications industry back from broader progress in digital transformation is the lack of a clear, industry-oriented roadmap. The Digital Maturity Model is an effective tool to provide guidelines for a clear path throughout the transformation journey*."

DMM has five business dimensions: customer, strategy, technology, operations, and organizational culture, as shown in Figure 4 (Deloitte Digital, 2017).

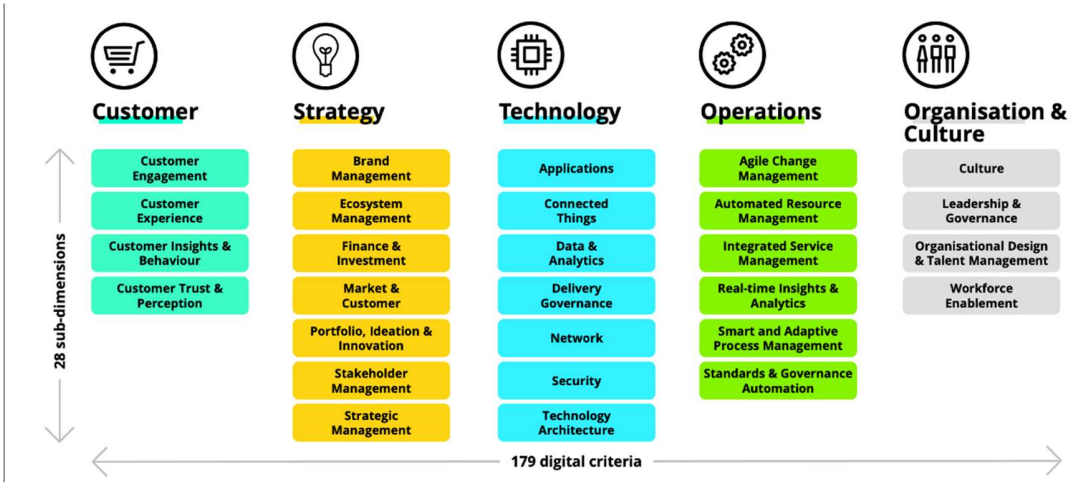


Figure 4 Digital Maturity Model -taken from Deloitte Digital 2017

The DMM is meant to serve as a reference and not as a framework. It can assist in identifying the gaps in every area at each stage of change. The level of maturity in each of the five regions depends on each company's strategy, business model and industry (Deloitte Digital, 2017).

2.4.6 3E Model

Heilala et al. (2020) has cited a 3E (envision, enable, and enact) model mapped with maturity level as a model for Digital transformation for SMEs. Three phases are mapped to the maturity model with five levels: initial, managed, defined, transform and detailed business model. The matrix of development phases and maturity levels is presented in Figure 5.

Maturity level	Envision	Enable	Enact
Detailed Business Model	Future challenges	Road map also includes disruptive product/service ideas	Ambitious project portfolio where some failures are potential, but the expected rewards are high
Transform	Opportunity map described for I4.0	Customer segments and expectations, MVP, technologies and resources defined	Actual and future project portfolio
Defined	Develop understanding with specific capabilities and resources	Customer segments, expectations and value proposition defined	Projects evaluated and resource and collaboration needs identified
Managed	Company-specific Industry 4.0 vision	Customer segments and expectations defined	Portfolio of projects without prioritisation
Initial	Company-specific vision does not exist		

Figure 5 from the source Heilala et al. (2020)

In the first phase, Envision, an understanding of the business is gained, and capacities and resources are analyzed. In the "Enable" phase, a roadmap is constructed, and the requirements and technologies are identified. The “Enact” phase implements training, risk management and development projects.

2.4.7 Zachman Framework

Zachman Framework was adopted for agile digital transformation based on the study that was done by Bondar et al. (2017) . It’s a two-dimensional matrix model containing the goals, process, functions, actors, and relationships with the details involved in digital transformation. It is a proactive tool for business that helps manage business transformation by modeling the current components, operations, and procedures of an organization. The six rows of the framework contextual, conceptual, logical, physical and detailed are mapped against their corresponding objectives, their current state, how to attain the future state and how to achieve that state, when it will be performed and by whom it will be done and why the solution was chosen (motive). This framework can be used as a planning tool, problem-solving tool, evaluation tool,

	Why	How	What	Who	Where	When
Contextual	Goal List	Process List	Material List	Organizational Unit & Role List	Geographical Locations List	Event List
Conceptual	Goal Relationship	Process Model	Entity Relationship Model	Organizational Unit & Role Rel. Model	Locations Model	Event Model
Logical	Rules Diagram	Process Diagram	Data Model Diagram	Role relationship Diagram	Locations Diagram	Event Diagram
Physical	Rules Specification	Process Function Specification	Data Entity Specification	Role Specification	Location Specification	Event Specification
Detailed	Rules Details	Process Details	Data Details	Role Details	Location details	Event Details

Figure 6 Current Zachman Framework (Source: Wikimedia Commons)

2.4.8 Plan-Do-Check-Act

PDCA the traditional continuous improvement model is proposed as conceptual model for digital transformation by Leipzig et al.,2017 which was validated successfully in German service sector.

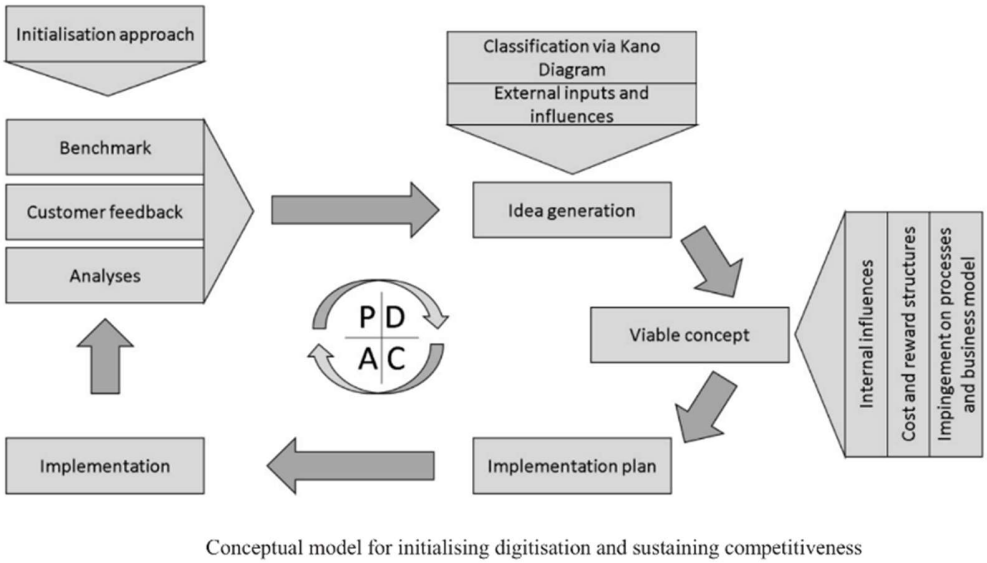


Figure 7 - from source Leipzig et al.,2017.

The model's execution begins by defining the initialization approach based on the specific industry. This could involve starting with operational processes, the business model, or the customer contact points. In the following step, multiple analyses are conducted, and feedback is obtained. Conducting a benchmark helps to create ideas. Benchmarking enables a business to align itself with its competitors quickly. Benchmarking regularly enables companies to assess their digital level and drive innovation. Self-assessment and best practices can help identify areas where no one has succeeded, and with experience, may lead to generating innovative ideas. Outside influencers inputs are also provided as input for idea generation. Once each idea from the idea pool is evaluated based on implementation costs, potential rewards, and its impact on the company's current business model and processes, internal factors such as budget, available resources, and overall company vision are taken into account to prioritize and select ideas for implementation. In the next iteration of the model, assess how quickly or slowly progress has been made in their digital transformation compared to their competitors. This again feeds back as an input once more. If all competitors are improving at a faster rate quickly, the company in question needs to increase the rate of change, and if they are moving at a quicker rate in comparison to rivals, they may choose to continue at this pace in the hope of surpassing competitors, or slow down and discharge some resources for other company tasks.

2.4.9 Digital Lean Transformation model

Digital Lean Transformation model is one of the DT models cited by Bellantuono et al. (2021) from cited Romero et al. (2019). It is a framework for Digital Transformation. According to Bellantuono et al. (2021) it provides a practical approach for digital

transformation with lean principles. The Digital Lean Transformation Framework (DLTF) was validated in a manufacturing company. The five pillars of DLTF are digital, process re-engineering management, strategic management, change people management, digital technology management and digital risk management.

A long-term vision and goal should be provided by effective strategic management for successful digital transformation. It is the fundamental pillar of DLTF. Breakdown vision into achievable targets, identify the gaps, resources, capabilities, and improvements for digital sustainability. Re-engineer the business process to align with the digital business strategy through appropriate technology and personnel selection. Allocate the resources and lean tools and re-structure the organization to achieve digital strategy. This framework creates a collection of values and culture at the personal and organization level, enabling new digital ways of thinking, working, and collaborating and interacting with the business units, employees, and customer and with new digital tools creating a new digital culture in the organization.

2.4.10 Agile Change Management

Agile Change Management (ACM) is also proposed as one of the frameworks for the Digital Transformation journey (Bellantuono et al.,2021, cited Le Grand et al., 2019). ACM is based on the study conducted by the author. The proposed model has 3 phases: define, experiment and anchor. The first phase, known as "define," is a diagnostic one that should be completed prior to the start of the digital transformation process. It is during this phase that the actors involved, and the context of the change are specified. Tools, required resources, capabilities and digital readiness are suggested in this phase. The experiment phase is at the heart of the ACM, and it contains two cycles -the

workshop cycle and the control cycle, to be performed in parallel and interdependently. The former includes participatory workshops that allow stakeholders to become aware of the digital transformation journey to involve them in designing the change as well as formative cycles, namely training programs for the people that will be affected by the change. The latter cycle consists in carrying out, at different intervals, measures of change in progress, by surveying individuals who are the beneficiaries of change. The final phase anchor provides a global vision of the projects carried out, in progress and to come, as well as an analysis of an organization's ability to change. A transformation dashboard and business change-assessment grids are tools suggested for this phase. This is an accurate validated model of digital transformation conducted in bank (fundamental case bank digital transformation).

Digital transformation leads to innovations and provides new way working models for Organization and operations. The key to successful digital transformation is the quick response of managers and leaders, followed by strategic flexibility.(Tayazime J. & Moutahaddib A. 2022).

Agile principles are widely adopted in digital transformation due to its effective management of complexity, collaboration and delivering value to customers. Application of Agile principles in digital transformations is the key to its success. Prioritizing customer satisfaction, collaborating with stakeholders, embracing change, delivering working software frequently and promoting self-organizing teams are its principles. Agile organizations adapt to changing requirements and market conditions and ensure that their digital transformations goals are aligned with business goals. Main advantage of agile is faster time-to-market, as it enables teams to deliver incremental value to customers in

shorter cycles. It promotes collaborative teamwork and shared responsibility. Agile promotes project transparency by providing visibility into the progress, challenges, and priorities of the project, enabling stakeholders to make informed decisions and adjustments as needed. On the whole, the practical applications of Agile in digital transformations demonstrate its effectiveness in driving organizational change, delivering value to customers, and improving project outcomes and drives the cultural shift (Popoola, O. A et al. ,2024).

Agile has multiple frameworks like SAFe (Scaled Agile Framework), LeSS (Large scale Scrum), Scrum, Kanban that are designed to help organizations to scale Agile principles. The future of Agile in digital transformation lies in its seamless integration of its principles into the organization and the culture. Agile's future lies in the integration of other methodologies and practices. Hybrid model -Agile with Lean principles is practiced widely to reduce waste. It is a shift towards a holistic approach to project management and product development. Agile serves as base framework that is tailored according to the organizations need in their digital transformation journey to enhance its ability to innovate, respond to change and deliver value.

Agile has replaced authoritarian management with a more flexible and social approach, known as agile leadership, which places a greater emphasis on individual relationships (Bushuyeva, N. et al., 2019). It provides a human, social, and almost familiar vision of the organization. It constantly influences the team's behavior by guiding and defining a shared vision of the organization. Agile leadership promotes shared responsibility, effective problem recognition, decision-making, an adaptive system, and a flexible structure. Agile leadership is crucial for successful digital transformation in businesses,

led by visionary leaders with strategic and critical thinking.(Tayazime J. & Moutahaddib A.,2022)

2.4.11 Maturity-Process-RoadMap Model

Leone et al. (2020) has proposed a systematic approach for SMEs Digital Transformation journey. It is a suitable model for SMEs without any management process and capabilities for identification of gaps. It is a three-stage process.

Maturity assessment (stage 1)-maturity of the organization concerning people, process, technology, strategy, product, and services are assessed and strategic vision is defined.

Process-as-is analysis (stage 2) - each process considered, analyzed and mapping the fundamental elements (activities, input and output, digital data, and technological infrastructure) is carried out.

Roadmap (stage 3) -roadmap is developed for the digital transformation journey and integrated with the organization's strategic vision.

2.4.12 McKinsey Model

McKinsey proposed a six building blocks model for digital transformation.
Create business-led technology roadmap-Before developing the road map leader should assess their capabilities, resources and potential partnership required to achieve their digital vison. The fundamental question should be "How can digital help us transform core business processes or generate new opportunities?". Defining a digital strategy involves transactions, considering new engagement and fulfillment guidelines as well as

pricing issues. When developing the roadmap, organizations must consider the implications and disruptions for the business.

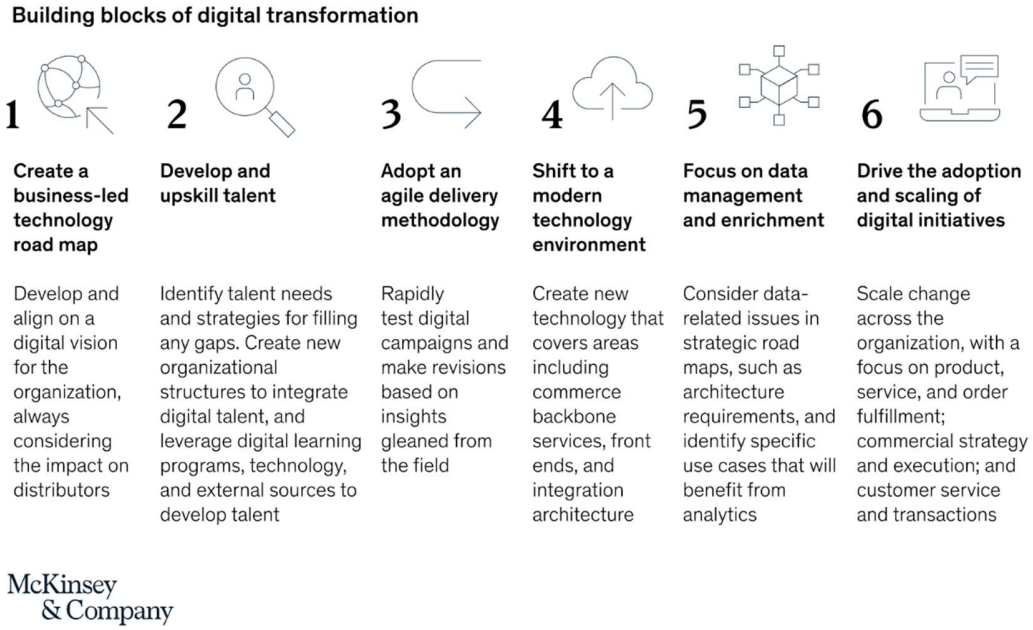


Figure 8 McKinsey Model taken from McKinsey Article site.

Developing and up-skilling talent- Companies must identify the principal roles necessary for a digital organization before implementing their road maps. They should first evaluate their talent needs and identify gaps by looking at immediate and long- term needs. Based on their needs they should either upskill employees or recruit externally. In the first case, digital-learning programs to increase knowledge and capabilities across the organization should be provided.

Agile delivery methodology - Company must also create an agile environment that makes it possible to test new approaches or technologies quickly and then iteratively make improvements based on customer feedback.

Shifting to a modern technology environment-New digital technologies form the core of any digital transformation. Companies need to establish a new technological framework that encompasses back-end services, front-end, integration architecture, and infrastructure. These technologies must be described in the roadmap, and to facilitate rapid scale-up, companies should try to draw on legacy systems when building new capabilities rather than replace them entirely. They must also identify gaps that might prevent them from achieving their goals, as well as new opportunities.

Focusing on data management and enrichment - companies should consider data-related issues, data-architecture requirements and gaps, data compliance, security, and governance in their road maps. The data solution must provide a solid foundation and meaningful insights across different business units.

Driving the adoption and scaling of digital initiatives-Companies must implement organization-wide programs for real impact, although digital initiatives can yield good returns. Scale-up will require new organization-wide business processes, with a focus on changes in three areas: product, service, and order fulfillment; commercial strategy and implementation; and customer service and transactions. The adoption and scaling phase are typically the most challenging aspects of any digitization effort. To succeed, industrial companies must continuously reevaluate their priorities for domains, value levers, solutions, and use cases. Company must involve leaders to ensure company's strategy and business processes fully support digital programs.

2.4.13 Digital Factory

The Digital Factory concept was proposed by (Stoldt et al., 2018) as a model for SMEs' digitalization journey. It is an incremental strategy to implement digitization in an organization one by one on a selective basis using a 4-step model. Step1 is Identification of present state. The first crucial step involves identifying the current position and the actual state of the enterprise within its present internal and external environment. The second step is to define the desired target state through analysis, including potential and feasibility studies. The third step is the “Realization” phase, during which the organization identifies its strategic position by implementing prototypes and designing business models. Rollout and change management processes are necessary to make final adjustments across the entire organization, which is done as the final step. The last three steps are typically performed iteratively. The Digital Factory aims to reduce redundancies and improve cooperation, offering economic advantages by parallelizing and reducing implementation and change costs. It also ensures quality, reveals performance discrepancies, and may serve as a basis for new process designs. This model encourages and recommends use of various tools during the digitization process across multiple domains to measure and implement digitization are data acquisition, data security, workflow management, authorization, authentication, cybersecurity, compliance, system performance and security. All these can be built-in as a standard in the prototype rollout.

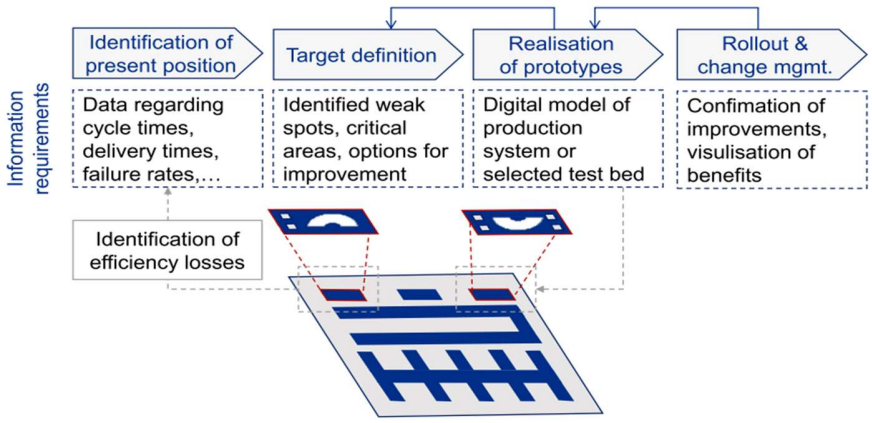


Figure 9 Digital Factory Model taken from article 'Planning for Digitalization in SMEs using Tools of the Digital Factory.'

Digital Factory uses reusable tools and repeatable processes to create specific "products" or "boilerplates" in the form of new experiences, services, or solutions. The key to the Digital Factory's success is its small teams, which work closely with the business side and function as a start-up accelerator (McKinsey, 2020). It works with an agile mindset.

2.4.14 Objectives and Key Results (OKR)

OKR Model adopted by big companies like Google, Intel, and Adobe is also suitable for SMEs. Objectives and Key Results (OKR) is a framework used by individuals, teams, and organizations to define measurable goals and track their outcomes. The development of OKR is generally attributed to Andrew Grove, who introduced the approach at Intel. The framework consists of guidelines to help employees prioritize, align, and measure their efforts. Initiatives involve projects and tasks focused on achieving key results. As the name implies it has only two components (objectives and key results). Structure of OKR:
I will (Objective) *as measured by* (this set of Key Results).

Objectives are concise, inspiring, and engaging qualitative descriptions of what you aim to achieve, motivating and challenging the team.

Key Results are a set of metrics that measure your progress toward the Objective. You should have a set of 2 to 5 Key Results for each Objective. Having more than that would make it difficult for anyone to remember them. All Key Results have to be quantitative and measurable.

OKRs are often set, tracked, and re-evaluated, typically quarterly. OKR is a straightforward, fast-paced process that leverages each team's perspective and creativity. OKR assists companies in closing the gap between strategy and execution, shifting from an "output" to an "outcome-based" approach to work.

Agile goals -OKR allows shorter goal cycles.
Simplicity-Easy to understand and straightforward.
Transparency- The main purpose of OKR is to create alignment in the organization.

OKRs are public — All levels of the company have access to OKRs. Everybody can see each other's OKRs.

OKR helps to create focus, accountability, transparency, and alignment within an organization. One of the main benefits of OKR is creating alignment within the organization, ensuring that everyone is moving in the same direction with clear priorities, and maintaining a consistent rhythm. The results of all these efforts include improved performance, increased employee engagement, a shift in company culture, strategic alignment, focused execution, and more engaged employees. Objectives are set annually

while the review cycles are set at shorter intervals (quarterly). This helps organizations to change direction, if certain tactics are not driving progress towards the company's OKRs for the year. Many OKR tools and resources are available in the market to adopt and track OKR. OKRs are an essential tool for companies to accelerate digital transformation, and for good reason. When used correctly, they're the company's best friend. By incorporating them as part of an organizational strategy and considering team and customer happiness, they can help steer you in the right direction.

2.4.15 Joint Digital Transformation Framework

Joint Digital Transformation Framework (Matt et al., 2015) was formulated based on four dimensions: use of technology, structural changes, changes in value creation and financial aspects. The joint digital transformation framework integrates transformational dimensions and dependencies to help organizations assess their current capabilities and formulate a digital transformation strategy.

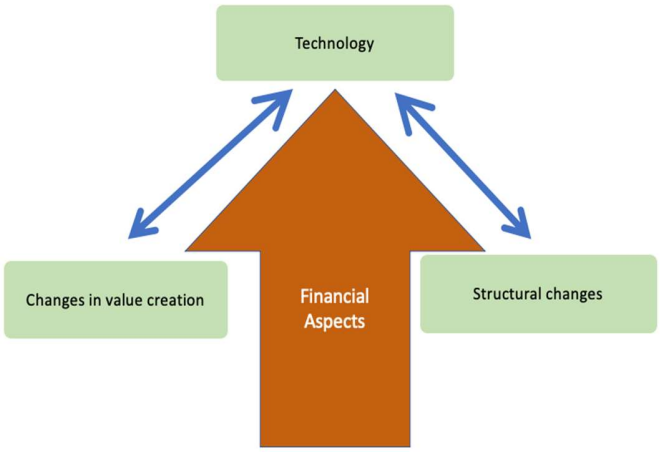


Figure 10 Joint Digital Transformation Framework -own illustration.

Structural changes are required to provide a sufficient foundation for new operations, especially with new value creation and various new technologies. Changes refer to

variations in a firm's organizational setup, especially concerning the placement of the latest digital activities within organizational structures. Evaluating how the changes will affect the products, services, and capabilities is equally critical. The three dimensions can only be transformed only when there is enough financial aspect. The economic aspect also includes the firm's urgency to act on core business and its ability to embark on a digital journey. Financial aspects are a key driver and a bounding force for digital transformation. To fully leverage the intended effects of a digital transformation strategy, it is crucial to closely align four dimensions: technological usage, changes in value creation, structural adjustments, and financial aspects.

The study by Westerman et al. (2011) identified three fundamental dimensions of digital transformation: customer experience, business processes, and business models. These are further divided into three sub-elements as shown in Figure 11.

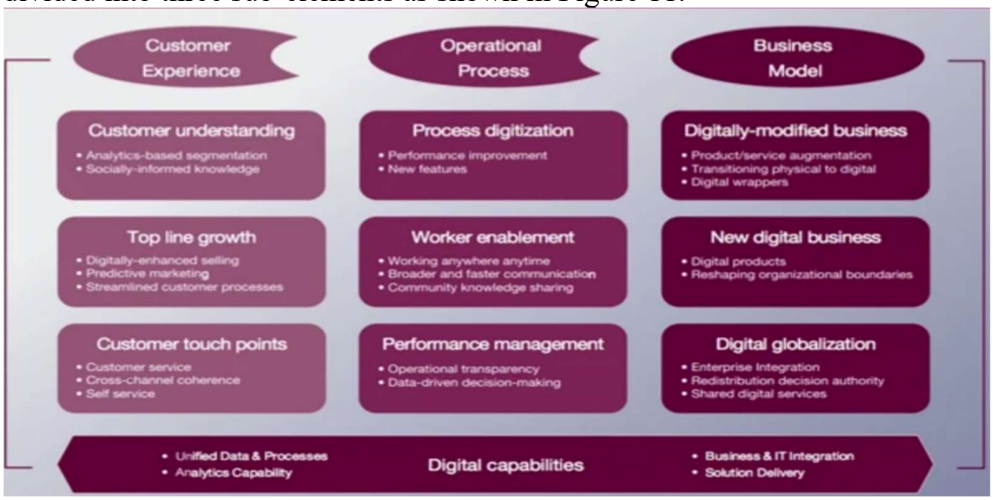


Figure 11 Building blocks of Digital Transformation (Westerman et al., 2011) from ZDNet article 'Is - marketing-ready-for-digital-transformation')

Holistic customer experience using digital technologies, tools, digital sales, and marketing while streamlining processes to understand the new needs of customers in the

digital domain. The operational process transformation is divided further down into three segments: process digitization, worker enablement and performance management(Nieminen, 2014).

The use of digital formats for operational processes enables organizations to monitor and manage their performance using Key Performance Indicators (KPIs). These KPIs can be easily shared across the organization to improve transparency and aid in more accurate decision-making. Worker enablement is the most exciting part of the operational process. It gives the workers the resources they need to perform their jobs more effectively. From the authors' point of view (Westerman et al.,2011) the most crucial aspect, however, is the ability to share knowledge and communicate across organizational boundaries. This is a constant challenge in all organizations and is crucial for employees to perform at their best (Nieminen, 2014).

The third area of transformation is business model—changes in business model offering new business landscape and boundaries due to adopting new technologies and processes. The foundational block underlying these three business domains for digital transformation is digital capabilities. From a practical perspective, an organization could utilize the model to strategize their approach, particularly in the context of digital transformation. They might consider whether to begin with enhancing the customer experience and subsequently focus on streamlining operational processes and refining the business model, or vice versa.

2.4.16 LEVEA Model

Sagayarajan, S., & George, A. S. (2021) has cited DT model based on five significant drivers of digital transformation as shown in Figure 12.

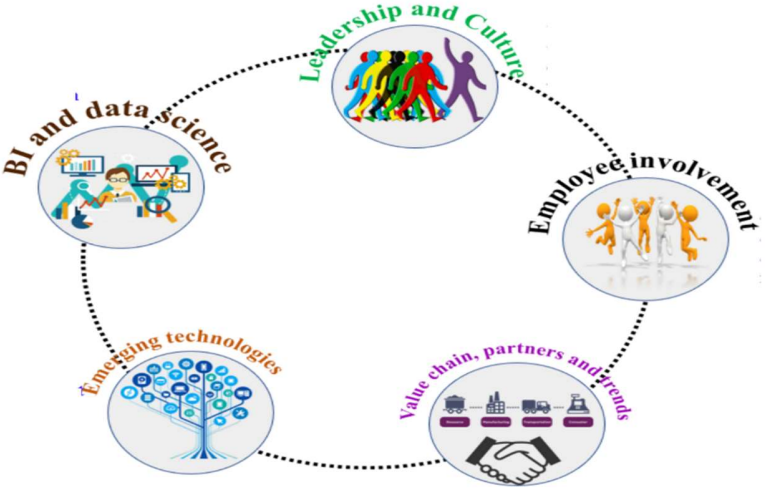


Figure 12- source Sagayarajan,S & George.A.S (2021)

Leadership and culture (L)

Company needs a good leadership where all are treated equally with mutual respect for everyone's opinions and , where people are given the space and the chance to do their best.

Employee Involvement (E)

The organization could push digital excellence by ensuring that employees are fully involved in the process.

Value-chain, partners, and trends (V)

Companies must have an in-depth understanding of digital developments and they must work together with partners and vendors to enable the organization to concentrate on changing trends that are most crucial to the success of the enterprise.

Emerging technologies (E)

Make the best use of both new and emerging technologies available to enhance business operations and performance.

Business intelligence and data science (Analytics)

Using analytics information to notify and guide decisions is the next phase of constant improvement.

2.5 DT Frameworks from top consulting Firms

AI Multiple

Consulting firm AI Multiple have defined frameworks with five key areas that organizations need to improve for digital transformation. First and foremost, SMEs need to identify the objectives for digital transformation. It could be improving customer experience, improving the process, operational efficiency, creating new products and services etc. The objective varies based on company needs.(Cem Dilmegani ,2021)

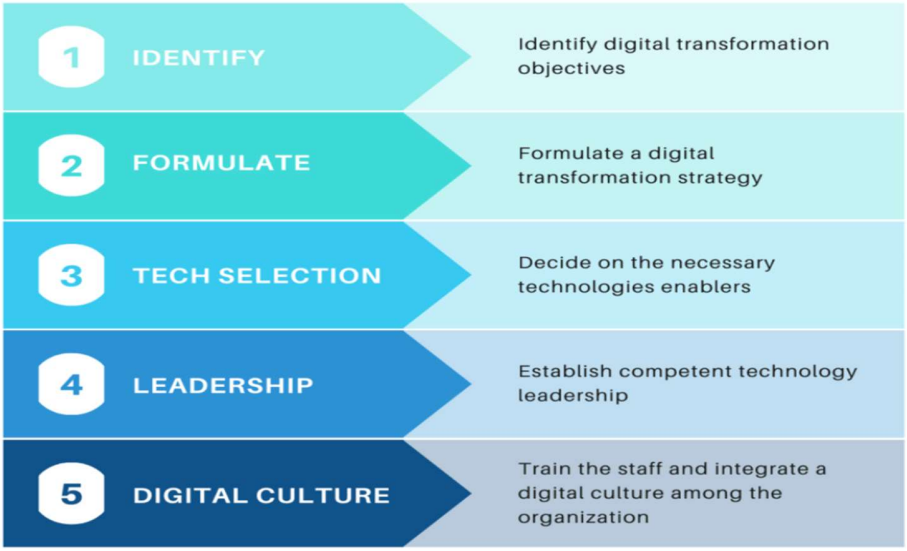


Figure 13 from source site research. multiple

The second step is to formulate a digital transformation strategy. Plan the path to achieve the objectives defined in the previous step. There are three paths that an organization can choose from. Path 1- Start by creating and integrating digital operations, then enhance the customer value proposition based on new processes. Path 2- First, improve the customer value proposition with digital content, insight, and engagement, then focus on integrating digital operations.

Path 3-Develop new capabilities around the revised customer value proposition and operating model. The third step is deciding the technologies that will enable you to achieve your objectives. The fourth step is to establish a competent tech-savvy leadership. 87% of businesses believe that digital will disrupt their industry. 87% acknowledged that they lack exemplary leadership. Success in digital transformation relies on leadership as much as on technological capabilities. Leaders must have an agile and continuously improving mindset. They must adopt design thinking and action oriented. The final step is training the workforce and integrating digital work culture.

BCG

Boston Consulting Group (2022) have published in their digital transformation article how they help their client to embrace and transform into a bionic company. They have developed a framework to blend human capabilities and digital technologies and apply them to all business aspects. The First step is identifying the digital readiness of the company. Where it stands today start and where it wants to go. Then, the framework considers its people, technology, and data, as well as culture, leadership, and governance.

Second step is implementation of outcomes by prioritizing goals and create value using three stage process -innovate (build proof of concept and validate business), incubate (launch a minimum viable product and test and learn with agile sprints), and industrialize (run the technology and business process at scale).This is an iterative process. The third step is managing talent and building digital skills. Digital transformation is about evolving and augmenting. It is not about replacing human capabilities. Small and medium-sized enterprise (SME) service providers need to find the right balance between handling tasks in-house and outsourcing them.

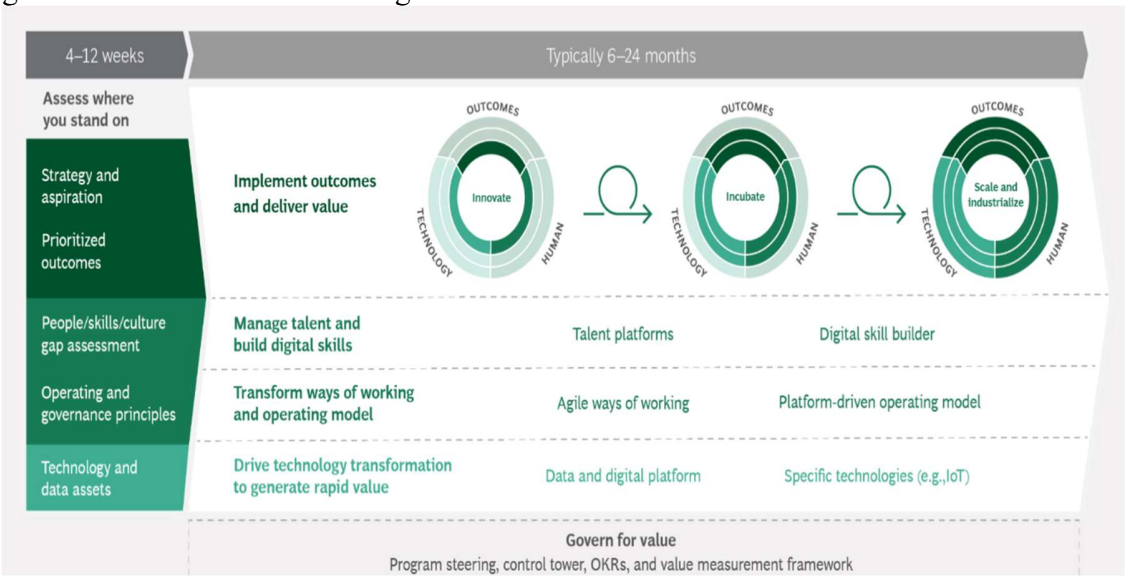


Figure 14 from source BCG Analysis

The human capital team should promote employee training, on-the-job learning, coaching, and upskilling. The fourth step is transforming working ways and the operating model. Agile methodologies empower companies to swiftly adapt to change. Cultivate collaborative behaviors and culture to support cross-functional teamwork, iterative development, and a learning approach that fosters adaptation and innovation at digital speed. The fifth step is about data and technology. Create a data and digital platform (DPP) and governance process to deliver new capabilities and values. The last step is "govern for value" by using the right KPIs to monitor the progress and outcome.

Wipro Designit

Wipro Designit, one of the digital transformation service providers has developed a framework for digital transformation. Wipro's framework has 6 primary building blocks- customer engineering, strategy, design, technology, insights, interactions, integrations, and innovation. The customer is at the centre of a multidisciplinary, agile approach: alignment of strategy, design, and technology around the customer journey, enabling innovation of the product and service experience through iterative, incremental activations and delivering continual enterprise transformation at speed and at scale. Build a digital organization design, digital strategy, and digital fitness for the company. Enable digitized operations, platforms and solutions. Use insights into the enormous amounts of information (data) for better decision-making. Place people at the center of the design process and create things that matter. Align business functions with the customer's journey. For businesses operating at scale, this necessitates new working methods that combine technical agility with a relentless focus on the customer.

Cognizant

Cognizant's DT Framework comprises four main components: customer relations, processes and systems, products and services, and organization. Providing personalized products and services to customers is a key for successful customer experience digitization. Insert a digital tag to analyze client behaviour and communicate with them, with the goal of selling them a journey rather than a product. Digitalize operations by automating the processes and become more economical and agile. Agility is crucial for a company, as the increasing competitiveness in the market demands organizations to act faster. Achieve a new organizational model (Digitizing Organization) which involves human and machine together. The workforce should shift towards roles emphasizing design, auditing, and innovation instead of operational tasks. A culture that prioritizes improvement and is open to change is crucial for navigating digital transformation. Organizations should encourage innovation to incorporate new technological capabilities, empowering employees to adapt to the digital realm and gain the essential skills and knowledge for transformation (Cem Dilmegani ,2021).

Accenture

Accenture's digital transformation framework has five main areas that companies must address in parallel. They are strategy, operations, adopting new practices for agility and experimentation, a flexible technology core for sustainable change, and People change management. Put technology at the heart of business strategy. This approach has the potential to minimize operating costs and inefficiencies. It could even alter the course of business. A unified model across business and technology makes it easier to achieve future ambitions. It is crucial to succeed in transforming business processes and adopting new ways of working for agility and experimentation. Technology must be accessible,

and people must be adaptable to adopt new practices for agility and experimentation. It's important not to get locked into just one technology. A modular strategy allows both rapid and long-term development, and maintaining focus on client demands is essential. To embrace and incorporate new technologies into daily life, digital foundation, digital operations, and a workforce with digital skills all require the support of leaders and a culture that is in line with those technologies (Accenture insightsss,2022).

IBM

According to IBM report on business transformation (2020), Companies around the world are recognizing that true transformation involves strategically and fundamentally changing an organization's operations to enhance effectiveness and realize substantial value. It requires the proper alignment of business decision-making, operations, and data. The aim is to anticipate and respond to sudden disruptions, adjust to evolving customer needs, and capitalize on critical market opportunities in real-time. IBM has identified three main domains: building intelligent workflows to move from siloed, agile operations and static processes to integrate; creating customer experiences that deliver personalized value and build lasting relationships; and empowering employees with a culture of continuous learning and upskilling. IBM also has a unique framework to accelerate digital transformation called "IBM Garage". It assists in the generation of new ideas and provides you with the expertise, processes, and technologies necessary to quickly convert those ideas into commercial value. It concentrates on client problems and gives the team the freedom to take calculated risks. It is based on co-innovation, methodology, technology, scale, speed, expertise, and partnership. Teams co-create, co-execute, and co-operate to co-innovate. The Garage methodology prioritizes a human-centered, outcome-driven approach by utilizing design thinking and agile development. It encourages the use

of partner technologies and emphasizes the need for robust architecture to establish a secure, resilient, and scalable infrastructure and applications. Use best practices to maximize speed to value. Scale new ways of working and build teams capabilities. Transformation team must have Multidisciplinary expertise and teams work in collaboration to exchange of ideas, knowledge, experimentation and support (IBM 2022). According to IBM Institute the key areas include reconfiguring the customer value proposition (what is being offered) and reshaping the operating model (how it is delivered). organizations have concentrated on one of these areas through a collection of specific initiatives. Each has its own unique set of challenges and opportunities.

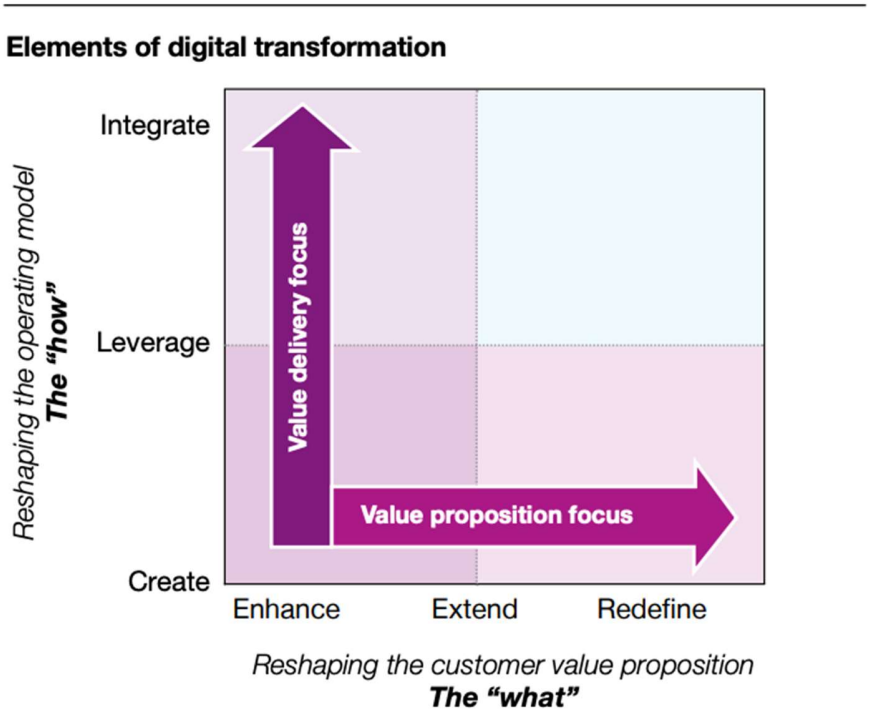


Figure 15 -Source IBM Institute for Business Value Analysis

IBM has indicated, based on its research and client experience, that strategic routes to transformation can be summarized by three basic approaches. One approach focuses on customer value propositions, while another focuses on transforming the operating model. The third approach takes a more holistic and integrated approach, combining both of the previous approaches. This involves simultaneously changing the customer value proposition and organizing operations for delivery.

Digital transformation involves strategically developing the value proposition and the operating model through three proposed paths. Path 1 involves creating and integrating digital operations, then focusing on the customer value proposition to achieve total transformation. Path 2 entails enhancing, extending, and reshaping the customer value proposition with digital content, insights, and engagement, followed by the integration of digital operations. Path 3 focuses on building new capabilities based on the updated customer value proposition and operating model. The best path for a specific company depends on its strategic objectives, industry environment, competitive pressures, and customer expectations. Many companies realize the importance of focusing on both their customer value proposition and operating model. Digital transformation capabilities, business model innovation, customer and community collaboration, cross-channel integration, analytics, digitally enabled supply chain, and networked workforce are essential for reshaping business and operating models. These transformation paths require a clear vision, the right skills in the right place, and tenacity to overcome cultural resistance to analytically based decisions across the organization.

2.6 Roadmaps

Roadmaps are highest level visual representation of strategic plan to achieve organization goal. It includes the major steps or milestones to achieve the goal. Based on both primary and secondary data, have summarized simple,adoptable roadmaps for SMEs.

According to a report by the consulting firm Capgemini, which Ayman El Safadi (2021) quotes, a skills deficiency might cause gaps in an organization's digital transformation plan. Tanguy Catlin et al. (2017) have defined a 3-stage gate process with guiding principles as a road map for digital transformation.

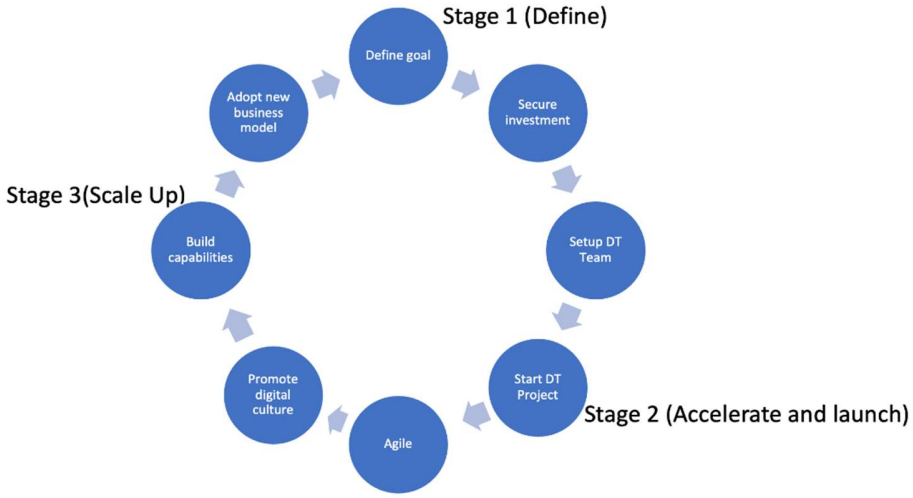


Figure 16 -own illustration.

The stages of digital transformation vary throughout various firms. The simplest is defining the goal, setting a standard and prioritize the task, and implement the project. Take the lessons learned from one project as inputs for another project and

improvements. Companies discover the most suitable means for themselves as they "learn by doing".

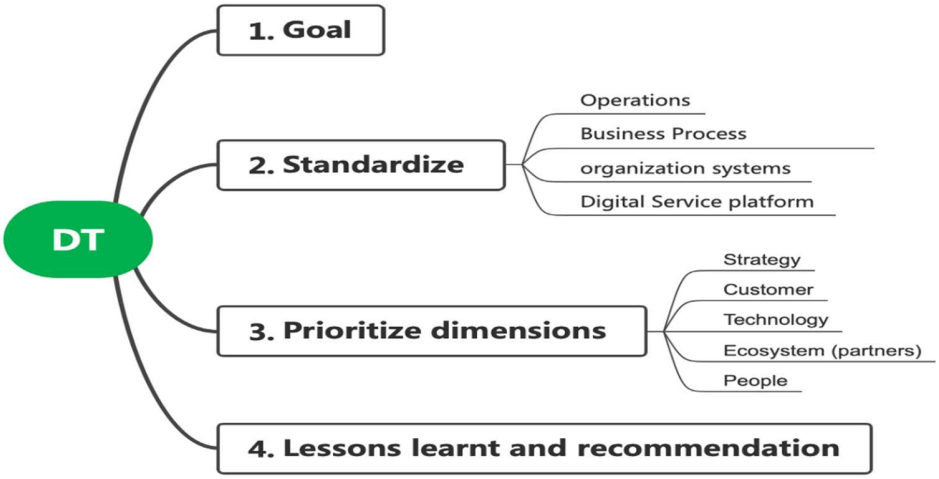


Figure 17 -Digital transformation own illustration.

A study by the Massachusetts Institute of Technology (MIT) concluded that the starting point of the digital transformation is the vision from the top management (Lanza Blengini et al. (2020), citing Fitzgerald et al., 2013). Several authors emphasize the significance of reorganizing the business model around the customer journey to keep pace with digital natives. Lanza Blengini et al. (2020) have identified 6 critical capabilities required for Digital transformation. They are as follows.

- Digitization of the customer journey and internal daily tasks
- Intelligent process automation.
- Introducing innovative technologies and machine learning to increase efficiency.
- Use Analytics to improve decision making processes.

- Outsourcing particular tasks, preferably those not related to the strategic value of the company.
- Lean approach to better organize processes, increase efficiency and promote an organizational culture for continuous development.

Lanza Blengini et al. (2020) have advised that managers must adopt a roadmap starting with smaller projects and build a framework to deliver the strategic goals. Managers must collaborate with external parties when their needed capabilities are not found within the company (Lanza Blengini et al .(2020), has cited Bughin, LaBerge, & Mellbye, 2017). Managers must build a supportive environment to address the changing demands of the customers, internal process and employee demands in-order for them to flourish (Lanza Blengini et al. (2020), citing Schenker, 2019).

Almawi et al.(2020) cited an essential roadmap for digital transformation. A plan based on timelines that outlines the current status of the digitalization process, including the transition from legacy systems to an integrated digital system, with the ultimate goal of digital transformation and the approach to achieve it. In the first stage

Figure 18 -Source Almawi et al.(2020)

companies must consider the 3 primary drivers technology, customer and competition and assess the status of their digital maturity. In the second stage, we need to create a plan. It is essential for companies to prioritize transparency, integration, competition, sustainability, service improvements, employee empowerment, and innovation to achieve greater efficiency and flexibility. These factors play a significant role in driving digital transformation, integrating customer satisfaction, and promoting healthy competition. In the final stage work towards the goals to deliver the digitalized processes by arranging and relocating human resources, materials, inventory, and equipment to its intended destination.

“Executing a transformation, end-to-end, iteratively. True transformation starts with ambition. Define your ambition by getting the right focus, design it by getting the concept right, and achieve your ambition by rapidly getting your business to scale.”-Deloitte.

Deloitte Digital TM forum (2017) has proposed a simple road map to use along with digital maturity model tool for end-to-end digital transformation adaptable for any organization.

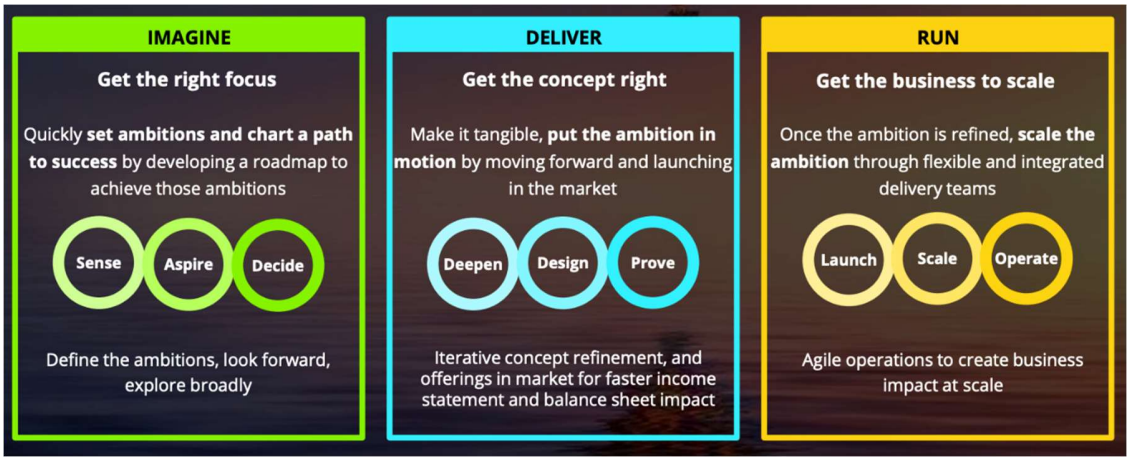


Figure 19-Taken from Deloitte Digital Document.

Gartner (2020) In "The IT Roadmap for Digital Business Transformation" has proposed Ambition, Design, Deliver, Scale and Refine as 5 stage roadmaps for successful digital transformation with cross-function teams as the people executing the digital transformation.

Figure 20 -Own Illustration of Gartner (2020) Digital Transformation.

Ambition -Defined Organizations DT ambition, strategy, assess DT maturity and readiness and understand the capabilities and competencies.

Design-Design and build products and services and new revenue models with strategic advantage.

Deliver-Prototype ready and communicated. Identify talents and skills needed for successful execution of DT. Define KPI to measure success. Understand the cultural changes required to transform.

Scale-Measure the proof of concept and assess changes required if any. Build a detailed plan to move forward based on the prototype assessment.

Refine-Assessments, optimize and re-evaluate and ensure organization has the agility to reset strategies and plans to reflect DT journey.

Cotrino et al.(2020) in their review have proposed a six-step road map for SME. The roadmap begins by identifying hindering factors affecting overall efficiency. The search

for hindrance involves evaluating Key Performance Indicators (KPIs). This assessment will provide answers to the following questions: “Why do we need to act?” and “Where are we now?”. In the next stage develop a strategy to propose long-term solutions for the identified bottlenecks using latest technologies that best suits the purpose. Small and medium-sized enterprises (SMEs) need to take into account the maximum available budget when developing this strategy. “Where do we want to go?”, “How do we get there?”, “What should we do?” and “By when? are answered by second stage. The third stage is “ideas and prototype” , where ideas are converted to prototypes and rolled out to a specific user group instead of the entire production line. The success of the prototype must be evaluated within a given time range. If the prototype produces unsatisfactory results, the process must return to step 1 to offer alternative long-term countermeasures. The process moves forward to implementing the solution across the entire production line if the outcomes of stage 2 (ideas & prototype) are satisfactory. This constitutes the fourth stage of the roadmap, where the prototype is approved by users, put into use, and personnel are trained to use the new tools and technologies. In the fifth stage analysis of data and KPI for better insight is done and new KPI is introduced. In stage six SMEs need to monitor the use and progress and control sustainment.

Figure 21-Reproduced from Industry 4.0 roadmap, Cotrino et al.(2020)

Accenture (2019) has published a research article on the transformation survival roadmap. Creating lasting value entails planning, organizing, and overseeing the transformation process from start to finish. This method consists of three stages: Vision and Approach, Shape and Plan, Accelerate and Control (see Figure 22).

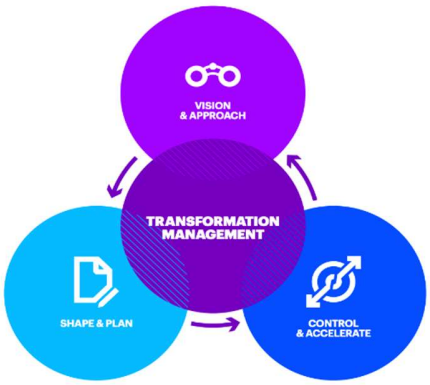


Figure 22 -Source -Accenture Transformation Survival Kit Research Article (2019)

Develop a clear vision and plan for transforming the entire company. Define the path to the future state for a large-scale transformation. During the design and planning phase, outline the transformation journey, investment plan, resource allocation, and program foundation to maximize value in the core and create investment capacity for a balanced transition to the new state. In the control and acceleration phase, execute complex, transformative changes at scale with speed, control, risk management, and security.

Digital MasterMind framework of "Open Roads" provides a holistic framework for digital transformation journey. The model has three main aspects design thinking, business and transformation.

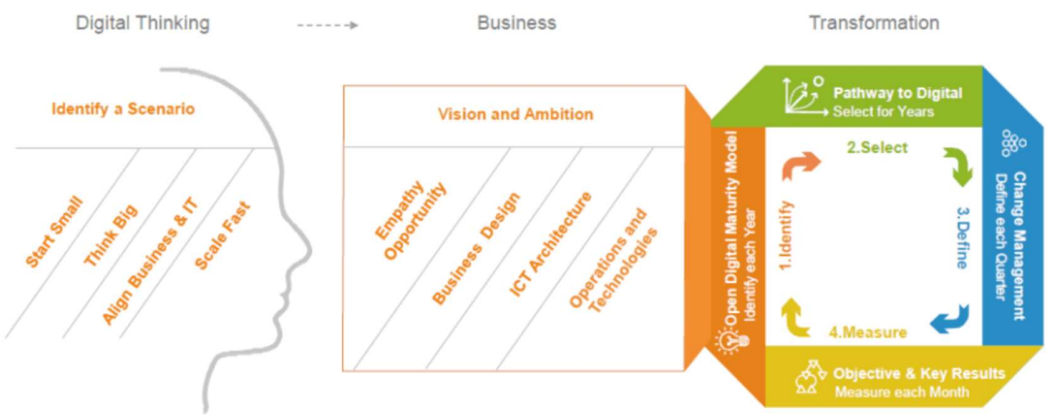


Figure 23-Source Open ROADS Community

Digital thinking is scenario analysis, thinking big, starting small, coordinating IT and business, and scaling quickly at all levels. Empathy with customers and understanding their emotional, structural, social, and financial ties to your company's product or service. Empathy is essential for bringing disparate teams within an organization together as well

as for better understanding the demands of the client. Use the right tools to work together and simplify the business model from the customer viewpoint. This requires a change in organizational mindset. ICT architecture, operations, and business design controls critical decisions such as brand, price, data ownership, products, services etc. and customer knowledge (John et al., 2018). A dedicated transformation team should prioritize transformation activities on the right of Figure 23. Supporting the organization to benchmark its current digital maturity, defining a clear direction for transformation, and then managing the change and tracking progress. This will enable the business team to concurrently embrace Digital Thinking through the approach on the left, transitioning towards becoming an increasingly digital business (RCR Wireless,2018).

PWC provides a roadmap to transform business into digital and social enterprises. It consists of five stages Evolve, Accelerate, Know, Protect, and create with customer as the center of focus. It is evolving business through customer experience, streamlining the business process and digital strategy.

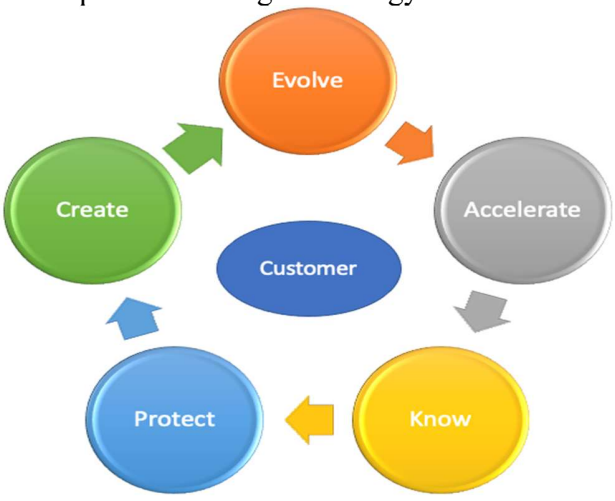


Figure 24- own illustration.

“Create” stage creates new innovative ideas and transforms them into MVPs for business to test without impacting the operations. Protect your digital assets for the future by increasing resilience. Reduce the risks associated with online security and cybercrime. Accelerate through technology and deliver using agile. Know the customers and understand their expectations and manage digital data.

Strategic Management

SME ICT service providers must discover inventive methods to incorporate new digital technologies and their capabilities to improve the process, human resource engagement and skill, and generate new business models in order to compete and survive in the digital economy. Digital transformation is a journey, not a race to the top with the most technology. It needs to have a clear plan for the growth of the business and be backed by the technologies and structure that offer the best chance in relation to the selected approach to realizing the goal. This has been cited in the article by Rassool & Dissanayake (2019).

Strategy is before technology. Managing organizational change involves planning and implementing the change with minimal employee opposition and cost, while maximizing its effectiveness. Strategy for re-engineering and system optimization of business process, centralized system connecting all the teams and business units with clear goals and implementation plan for digital transformation would be an appropriate strategy according to Schwertner (2017). In comparison to a structure of larger firms, SME ‘s organizational structure tends to be more negligible, primarily flat or small verticals structures with faster decision cycles and empowering the DT team with required authority to work cross domain across silos will help.

Schwertner (2017) also state that well-founded strategy is required with a good leader having sufficient skills and culture for Digital transformation though it is difficult to provide a common strategy valid for everyone. Stich, Volker et al. (2020) have identified 4 main domains (resources, information systems, culture, and organization structure) for successful implementation of DT for any SMEs.

According to Harvard Business review done by Davenport & Redman digital transformation has 4 key domains and it requires talent for successful implementation of digital transformation. It requires talented teams in technology, data, process and the right people to work together with a strong leader to bring about the change. Bumann & Peter (2019) have identified 6 main action fields or dimensions and derived generic DT framework. The framework dimensions include business strategy, the organization, culture, technology, the customer and people.

Ivančić Lucija, Vuksic Vesna, Spermic Mario in Technology Innovation Management Review article published in February 2019 have concluded that in addition to technology adoption, essential factors for successful digital transformation are the ability of an organization to change and operational excellence in the integration of external digital services with internal IT support. Based on holistic research they have identified strategy, people, organization, customer, ecosystem, technology, and innovation as 7 main domains /dimensions of digital transformation.

The strategy dimension encompasses the enactment of digital strategy and other means for ensuring proper governance. Digital ambition is a more critical factor for successful transformation, since the ultimate goal is to have “digital” instituted constituting clear

goals, streamlined operational activities, enhanced process, standardization and integration of applications. They have also cited that change-management process is perhaps more important than ever in this digital age. Employees get used to specific work patterns and changing their habits without communicating and implementing such changes properly can undermine digital efforts. Change management, HR conversations with employees, and education help employees adapt to change and contribute to a digital culture in the company.

Kudzai Mapingire et al. (2021) has mentioned four elements quoting Berman.S article: use of digital or disruptive technologies, customer value creation, structural organizational changes, and financial aspects. Kudzai Mapingire et al. (2021) has concluded that there are 4 components of DT "*customer experience, products and services, employee ways of working, business processes, achieve competitiveness through digital technology, grow the organization through digital transformation, realize business strategy through digital transformation and innovate with digital technology.* "

Gimpel et al. (2018) recommended that organizational agility involves using approaches such as agile project management, process flexibility, lean start-up, design thinking, continuous deployment, and integrated development and operations. Work in the digital economy requires dynamically gathering collaborative people into project teams that compete in real-time for high-value tasks all over the world. Changes in employee behavior and thought patterns will make it increasingly important for the workplace of the future to support communication- and knowledge-intense work. Work in the digital economy requires dynamically assembling people into project teams that compete in real-time for high-value tasks all over the world. Thus, the workplace of the future should

foster collaboration models that emancipate work from factors such as time and location (Brynjolfsson & McAfee, 2014). For digital transformation, an organization relies on intelligent, creative employees with a digital, boundary spanning skillset, including skills such as striving for the latest technical development or mastering data analytics (Schmidt & Rosenberg, 2014). Partnering fresh digital talent with experience and with stimulation from outside the organization can boost the organization's creativity and innovation.

Dilber Ulas (2019) recommended Digital Supply Chain which SME ICT providers can also adopt. DSC is composed of those systems (e.g. software, hardware, communication networks) that support interactions between various globally distributed organizations and orchestrates the activities of the partners in supply chains. "DSC activities include buying, making, storing, moving and selling a product. DSC aims to achieve; speed, flexibility, global connectivity, real time inventory, transparency, intelligent, scalability, innovative, proactive, eco-friendly". By adopting DSC , SME can rely on other SME for skilled people, products and services and provide ICT services using their digital supply chain.

Roshan Rassool and Ravindra Dissanayake (2019) have cited that a recent study done by Singapore Management University – Executive Development (SMU-ExD), Tata Communications, DBS Bank and KPMG in Singapore have launched a report on a new study entitled "Cultural Transformation in the Digital World" that looks at the digital transformation journeys of significant businesses (Enterprise Innovation editors, 2011). The report confirms that Culture determines transformation, not technological know-how and is based on 87% of respondents agreeing that the "way of life" created more considerable limitations to digital transformation than technological know-how and 70%

agreed that their leaders had the ability to provide leadership on digital transformation, but solely 50% believed that they had been appreciative of implementational issues. The study also confirms that Digital transformation solely succeeds if it's rooted in behavioral alternate and teams will solely embrace change if they understand why transformation is wanted and if they have faith in their leaders. Each path of conversion is distinctive, but the study indicates prevalent cultural characteristics for influential people – openness, flexibility, and agility.

According to Olivia Fachrunnisa et al., (as cited in Mu, J. , 2013), companies must form a network and establish connection to develop network of working relationship and gain access to resources and capabilities. These externally accessible resources are able to influence the company's performance. Such network communities provide positive relationships and competitive advantage (as cited in Havila & Medlin, 2012; Mirtega et al., 2012; Mu, 2013).

A good leader is someone capable of making effective and quick strategic decisions when the situation arises in a small amount of time to make the most effective and efficient decision for the growth of the company. A leader has a vital role in an organization and this pandemic digital era needs an agile and sensitive leader in all aspects. The ability of a leader will produce a strategy, which will make the SME ICT service provider grow and sustain in the market. A Leader should be able to influence his team and able to complete the work as per the needs of the company (Olivia Fachrunnisa et al. 2020).

Agile leadership is an agile leader who can guide his team and continually influence team behavior by defining, spreading, and maintaining organizational vision (Perker et al.,

2015). In the current era all managers are required to be agile leaders. An agile manager who has a lot of skills with flexibility and speed can facilitate the achievement of success and prepare to face the challenges of the world today (Buhler, 2010). Olivia Fachrunnisa et al. 2020 concludes that agile leadership is an agile leader who can guide the team and continuously influence team behavior.

The transformation of the workforce is a fundamental change in circumstances, and it requires a shift in culture, behavior and mind-set (Olivia Fachrunnisa et al . 2020 citing Shaughnessy, 2018).Workforce transformation is the creation and alteration of one form to another entirely new form functionally or structurally. Olivia Fachrunnisa et al. (2020) also states that managerial capabilities, work process design, business strategy training, human resources investment are also essential for digital transformation journey. Human resource development maps future skill needs through skills training and development (identify best practice, learning and sharing knowledge, identification of opportunities and challenges ahead, and increased coordination and consultation for all stakeholders), so that it creates strategic flexibility for the company.

A company must build dynamic capabilities (sensing ,adaptive, innovation ,networking , coordinating and learning) and it will enable them to respond and adapt to the changing environment quickly. It is only possible when the SME ICT service provider has a good leader and business process along with a talented pool of resources readily available to combat the situation.

The most common dimensions of digital transformation for strategic management are tabulated below based on the literature review.

Author	People(skills ,capabilities)	Strategy	Leadership	Culture	organization	Ecosystem	Operations ,data , Process (prod & services)	Technology	Inoovation	Customer	No of Dimensions
Jimmy Bumann,Marc K Peter	■	■		■	■			■		■	6
Ivančić Lucija ,Vuksic Vesna , Spremic Mario	■	■			■	■		■	■	■	7
Thomas H. Davenport and Thomas C. Redman	■						■	■			3
Kudzai Mapingire, Hanlie Smuts and Alta Van der Merwe	■	■					■	■	■	■	6
Gimpel, Henner & Hosseini, Sabiölla & Huber, Rocco & Roeglinger, Maximilian & Probst, Laura & Faisst, Ulrich.		■	■		■	■	■			■	5
Measures for a successful digital transformation of SMEs	■			■	■		■				4
Teresa Guarda, Joel Balseca, Kevin García, Jairon González, Fabian Yagual, and Hernán Castillo-Beltran	■						■			■	3
Maria Victoria Lanza Blengini		■		■	■		■	■		■	6
Fachrunnisa, O., Adhiatma, A., Lukman, N., & Ab. Majid, M. N	■	■	■	■	■		■				6
Deloitte		■	■	■	■	■	■	■		■	8

Figure 25- Digital Transformation Dimensions cited from Literature reviews.

According to the analysis of literature review cited by Korachi Z & Bounabat B (2020) the common essential elements of digital transformation strategy are Strategic Awareness, Business Strategic Planning, IT Organizational Structure, Steering committee, IT Prioritization Process, IT Investment Decisions, IT Strategic Planning, IT Budgeting, IT Reporting, IT Reaction Capacity and Management Strategy. These elements are structured and presented as cycle. The point of start of this cycle is strategic awareness. Organizations should start their digital transformation journey by the definition of key planning issues, determination of planning objectives and the identification planning teams.

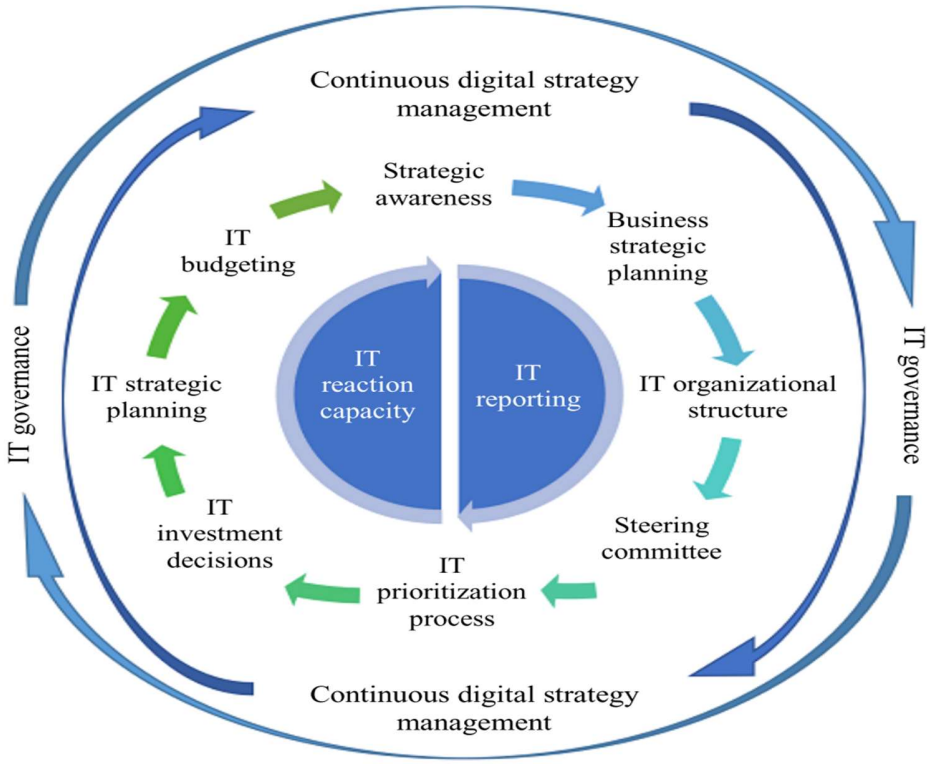


Figure 26- Source Korachi Z & Bounabat B (2020)-Digital transformation strategic approach.

This cycle approach allows continual improvement of the digital transformation strategy, and it is regulated and governed by IT Governance. Strategic Management and IT governance drive digital transformation strategy.

Vendigtial has created a roadmap that can be adopted as a blueprint for any organization to achieve digital transformation. The first step is creating awareness and understanding of the value that digital transformation brings to their company, process, services, products and customers. They must shift to agile and make data-driven decision models for digital transformation. Focus on the culture and mindset, along with the organizational activities, processes, competencies and operating models. The second step

is leadership and training. Company needs effective leadership to drive change management, and the goal must be aligned with business strategy. The skills gap must be addressed by acquiring new talent and upskilling existing employees. The third step is accessing the value of technology. Use the right technology to put in place the right operating models focusing on IT infrastructure, internal capabilities and processes. Use data driven approach for customer insights and decision making. The fourth step is developing a framework. Once the value creation potential of the company's digital transformation vision has been fully assessed, a framework for delivery should be developed. Each business must establish its own framework as this will vary according to its current operating model and strategic vision for the future. The fifth step is to enhance value creation through the integration of digital technologies. An integrated digital transformation strategy will provide a clear vision backed by a set of strategic imperatives and tangible business outcomes. The last step is tracking the benefits of digital transformation.

Build dynamic capabilities to compete constantly in an evolving environment, SMEs need to adopt open Innovation and involve customers and stake holders directly at an early stage of the development process. Most important is the mindset. This can be achieved by resorting to agile methods: client focus, iterative and incremental working methods enable a faster product cycle and increased customer satisfaction with substantial positive effects on business outcomes (Lindner et al., 2017 as cited in Hubschmid-Vierheilig et al.,2019). Scuotto et al. (2017) as cited in Hubschmid-Vierheilig et al.,2019 have shown that agility can impact an SME's innovation performance more than twice provided their workforce is competent enough to meet the challenges and drive the business forward.

Dynamic capabilities are a term that refers to "… higher-level competences that determine the firm's ability to integrate, build and reconfigure internal and external resources/competences to address, and possibly shape, rapidly changing business environments" (Teece 2012, as cited in Hubschmid-Vierheilig et al.,2019). It is applicable for both employees and management, and it supports changes to business models, organizational strategy, culture by building strategic business alliances.

Service providers now play a more significant role, making their capabilities important. In the new context, service providers require a uniquely different set of dynamic capabilities to handle end-to-end business functions on behalf of their clients while delivering digital value propositions. Six salient and essential capabilities identified are consultative, orchestration, insights, network management, knowledge access, and standardization.

The nature of dynamic quality mapped to each of these capabilities are sensing, sizing, reconfiguring, and learning mechanism. These capabilities enable SME ICT service providers to deliver an efficient and agile business operation for their customers, driven by their knowledge of their client processes (Mazumder & Garg, 2021). SMEs running the client's business process is required to have an adaptive response to embrace quickly digital technologies (D'Emidio, Dorton, & Duncan, 2015) and address complexity through technical and business innovations, and, in the process, enable the client to add value for its customer. SMEs Performance becomes critical, as its efforts drive the adaptability of the client through efficiency and innovation in service delivery. SMEs

providing simplified and customized ICT services will, while keeping the customer at the center of everything they do, will be best positioned to survive.

Address SMEs knowledge gap by outsourcing and accessing the relevant digital skills and get training, within their ecosystems and communities such as through stronger links with crucial knowledge providers, Education Institutions, technology partners, training centers and innovation hubs. They are reshaping customer value propositions and transforming their operations using digital technologies for greater collaboration and customer interaction. SMEs need a new set of capabilities to grow along both the dimensions (Berman, J.S., 2012).

Skills and Competency are at times mixed and inter-related. Skills are the ability to fulfill tasks in a particular environment applying knowledge while competencies relate to a person's ability to act in a specific situation, impacted by its personal attributes, experience, and motivation (Peter et al., 2019). Skills can be acquired by learning and practicing over a period. One of the significant challenges faced by SME ICT service provider is to identify the proper set of skills and competencies that is required for a holistic digital transformation approach for the environment and situation of a particular company.

Both the HR and Project teams work closely together and develop a framework in hiring the skilled work force and provide necessary training to existing employees. Develop framework with rigorous screening process, grooming the existing talent with motivation, continuous learning and retain the talent with rewards and appreciation after the completion of the work instead of waiting till the appraisal time. In the literature review ,

the consulting firms' DTMs use rewards for accomplishments to promote acceptance of digital transformation; Accenture and McKinsey have mentioned rewarding people who obtain better digital performances.

The framework must be incorporated in Strategic Management. The framework must enforce agile mindsets and allow them to explore and innovate and learn on-the-job which will benefit the organization. SMEs can maintain a skills inventory or form a network of SMEs to get the required individuals possessing the requisite abilities and proficiencies. Core abilities and competencies identified in various literature review for holistic digital transformation other than technology know-how are business acumen, soft skills, entrepreneurship, critical thinking, agile mindset, and customer-centric design capabilities.

Top Managers Model

According to Wrede, M., Velamuri, V. K., & Dauth, T. (2020) in the research findings published in 2020 on the role of top managers in digital transformation and how they influence the strategic decision and their influences on the firm's digital transformation. The research analysis shows that top managers rely on three distinct actions. First and foremost is understanding digitalization. Second is setting the context for digital transformation, and the third is leading the change. Commitment and support are needed to enable the change process and strategic actions throughout the organization.

As cited by Wrede, M., Velamuri et al (2020) , research analysis review suggests digital transformation has 3 phases. First is analog to digital conversion (digitization), second involves the use of digital technologies to change the existing business process

(digitalization) and the third phase is adoption of new business logic for value creation (digital transformation).

Digital transformation, a process that permeates the entire firm, brings about visible and tangible changes at all levels of the organization. The pivotal role of top management in this journey cannot be overstated. They act as catalysts, offering the essential support and resources for digital transformation. Our study revealed that top managers engage in a profound internal reflection of their firm's digital transformation journey. They seek advice from both internal and external sources, deeply involved in the business and the affected process. They also rely on both internal and external benchmarks to drive better performance.

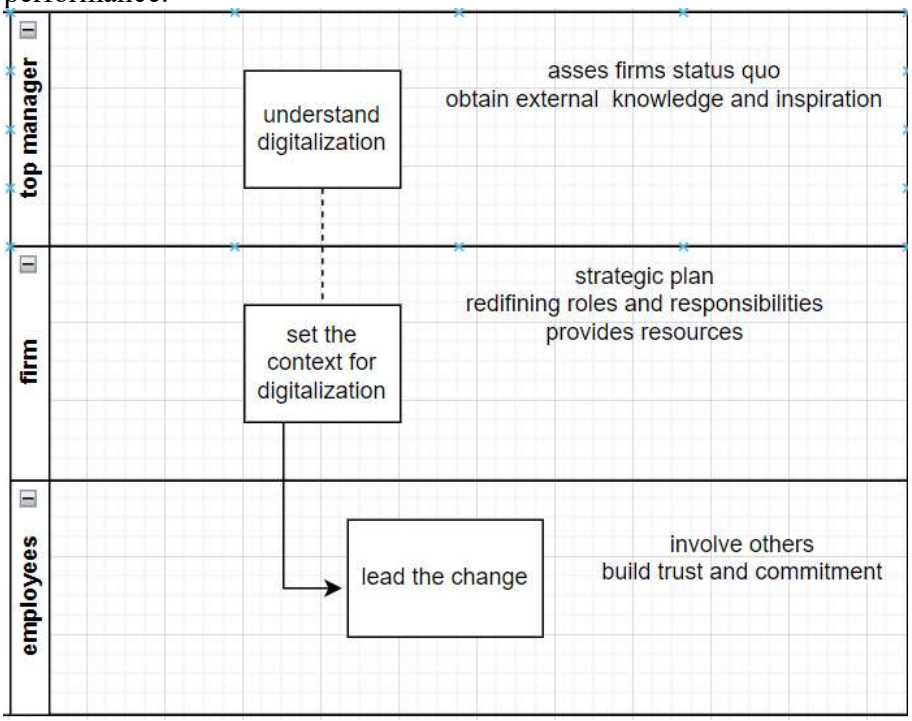


Figure-27 Top managers model for digital transformations.

A Four level Approach

In the context of small and medium-sized enterprises (SMEs), digital transformation (DT) encompasses the process of digitizing the entire organization and its business processes. It leads to an innovative and cultural approach and builds a sustainable roadmap for the organization. DT has four evolutionary stages, as cited by Peter, M., Roche et al. (2019) and Kante et al. (2019). 1). The process consists of four stages: (1) a preliminary exploration of digital transformation (DT) causing minimal changes in the organization, (2) the development of digital initiatives, characterized by increased attention to DT while the company remains focused on its business, operational, and strategic model, (3) digital maturity, involving the deliberate adoption of DT in all organizational actions and goals, and (4) becoming a digital organization, representing the aspirational behavior of complete digitalization involving the company's environment and ecosystem.

According to Peter M. Roche et al. (2019), research findings have a four-level approach to Digital transformation. 1) digital awareness- Initial stage creating awareness among the stakeholders 2) digital enquirement: Technical solutions and functionalities are presented at this stage. 3) digital collaboration: SMEs collaborate with other SMEs, vendors and partners to sustain their business.4) digital transformation: This stage is the final stage that implements the goals by adopting new technologies, implementing business solutions, and creating values.

Hybrid by Design

IBM Institute for Business Value emphasizes the importance of hybrid approaches for future success. In the context of SMEs, hybrid by design refers to integrating different business models, technologies, and practices to create value. SMEs can combine

traditional and digital approaches to enhance their competitiveness. Companies adopting hybrid designs have delivered more than 3X higher ROI from their digital transformation. It speeds up Continuous and speedy innovation, integrates and automates operating models, streamlines priorities, accelerates value and adds Generative AI at scale. Most cloud transformations are undelivered or have a slow adoption rate while digital challenges continue to rise. IBM explored the common challenges and studied the success factors.

The common challenges are.

1) Ineffective collaboration within a federated organization structure.

2) Analysis paralysis churn due to lack of common standards

3) Continuous alignment between platform capability and application workload needs

4) Development lifecycle inefficiencies, ineffective cross-org participation

5) Effective realization of well-architected applications

6) Lack of strategic, roadmap, and execution approach.

The hybrid by-design framework is built on the platform with five core principles. Build a product-centric approach for business priorities, build architecture to accelerate and scale business, build consistent development and operations across platforms, empower teams, and harness the power of data and Gen AI deployment. Focus on customer KPIs and continually improve and innovate.

According to IBM IBV, Hybrid by design, accelerates digital transformation, maximizes value through product-led transformation and breaks the ROI bottleneck. Consistency across platforms, processes, and people unlocks value. It is less siloed tech, more sharable skills, faster DevOps cycles. It is anticipated to be increased by the extensive use

of Generative AI. Hybrid design had an impact on talent (40% HR productivity), customer service (70% support cases) and application modernization (30% Productivity gain in application modernization). Challenges faced in hybrid by design framework are multi-model workflows in different IT stacks, expensive resources in hybrid multi-cloud environments, complicated data governance due to multiple workflows, scalability and replicability limited by heterogenous environments, Data quality and access. restricted by distributed data.

Platformization

As the name suggests, "platformization" is derived from platform. Different products and processes required to run the business are integrated and available to users under a single roof or platform. It is called platformization. The new model or trend is to use platformization to ease business as usual, increase productivity, improve data analytics, improve decision-making, increase customer satisfaction, and increase ROI. SME ICT service providers also use platformization for successful digital transformation. Digital platforms represent the digital infrastructure, business strategies, and processes that facilitate more significant interactions between providers and consumers (Pankaj Setia, Franck Soh and Kailing Deng 2020). Platformization involves shifting to digital platforms to offer products and services. Organizations are opening up their boundaries, increasing user and developer participation, and giving them access to data and applications in the process of platformizing operations. Platformization is used in various sectors of the industry in different forms. Uber uses it to provide and link actual-time consumers with drivers. In the ICT sector, it is used by Apple, Firefox, IBM, etc.

Open Innovation

The new methodology adopted by SMEs for successful digital transformation is Open Innovation. Digital transformation (DT) is a broad concept that involves the integration of digital technologies into all areas of an organization. It has changed the dynamics of entrepreneurship and management. DT is the main priority for organizations of all sizes. It enhances productivity, improves decision-making, and helps to sustain the marketplace. It helps to face challenges and creates opportunities. SMEs often face challenges when integrating various digital technologies, mainly due to their limited financial resources and manpower compared to larger organizations (Horvath & Szabo, 2019; Masood & Sonntag, 2020; Nguyen et al., 2015). Thus, small and medium-sized enterprises struggle to leverage digital technologies for a competitive edge due to various factors, such as the requirement for a skilled workforce, stakeholder recognition of the value of digital technology, and managerial readiness to implement innovations (Proksch et al., 2021). SMEs can impede the realization of the full potential of digital technologies.

Open innovation is a decentralized method of managing shared knowledge across organizations, utilizing it to its full potential for the growth of the business (Chesbrough and Bogers, 2014). In order to successfully implement digital transformation, it's essential to consider engaging a larger community of stakeholders, adopting an industry-based perspective, cooperating with multipliers and intermediaries, focusing on specific business segments and scenarios, and identifying pilot projects to demonstrate the benefits of digital transformation implementation (Crupi et al., 2020).

The Open Innovation management model was developed and tested as a practical-oriented framework (Appio.F.P.)It is an iterative learning approach with four main stages.

Stage 1 is Analysis and framing. Identify the scenario or problem statement.

Stage 2 is project planning, which involves a wide range of stakeholders collaborating with external stakeholders and sharing knowledge and understanding.

Stage 3 is the execution of the plan. This is an iterative phase in which inputs from the previous cycle, best practices, and previous experiences are combined to implement and transform digitally. The outcome of this phase could lead to a roadmap.

Stage 4 is reflection and learning. It provides a systematic analysis of all stages.

SMEs often lack the resources required to implement digital transformation (DT) strategies, while the exterior surroundings are abundant with the necessary resources. This pushes SMEs to adopt open and systemic collaborations. Future research could investigate the importance of establishing an ecosystem-oriented approach to help SMEs access free financial capital and a wider talent pool. Finally, with regards to the third paradox (size), new digital technologies are redefining the parameters of entrepreneurial action. This allows small and medium-sized enterprises (SMEs) to access global markets, value chains, and human resources. The local context continues to have a significant influence on SMEs in the early stages of transformation. Future research could explore the mechanisms involved in creating and managing ecosystems or collaborative networks that aid SMEs during their transformation phases and assess their impact. The findings of this study have crucial implications for policymakers seeking to foster an environment conducive to the digital transformation of SMEs. It is imperative to recognize that while

free financial capital is undeniably crucial for SMEs, a broader systemic approach is required. Furthermore, recognizing the paramount importance of collaborations and ecosystems in the digital transformation (DT) process, it is crucial to implement policies that unequivocally support open and systemic collaborations. This is essential for empowering small and medium-sized enterprises (SMEs) with limited resources to access the necessary tools and knowledge. In essence, adopting a comprehensive policy approach that addresses financial, legal, and collaborative aspects can undeniably enhance the external environment and decisively drive the digital transformation of SMEs.

Implementation Gaps

“Gap” is the grey area, demonstrating the difference between where you are and where you want to be. When identifying gaps in your organization's operations and business units, it's crucial to align your future goals with the current state for the same time period. For instance, if your future goal is three years away, projecting your current state three years into the future helps accurately pinpoint the gap. Be specific about the gap, determine why the gap has occurred, and find the root cause of the gap using the five whys or a gap analysis tool. Commonly used analysis tools are SWOT (strength, weakness, opportunities and threats), fishbone for cause and effect analysis, McKinsey 7S model (structure, strategy, shared values, systems, style, skills, staff) or Nadler-Tushman’s Congruence Model (people, work, structure and culture) or Burke-Litwin Causal Model(change that shows where change arises and how it flows between different

parts of organisations). The following elements are categorised as complex elements and soft elements.

Hard elements

- Strategy – The plan of action that will help your business gain a competitive advantage.
- Structure – the organizational structure.
- Systems – business and technical infrastructure employees use to carry out their daily tasks.

Soft elements

- Shared values – a set of beliefs or traits the organization upholds.
- Style – the leadership style of the organization and the culture of interaction
- Staff – the general staff
- Skills – critical skills of employee

Based on the information discovered during gap analysis, devise improvements and choose a framework to achieve the organization's goals. Analytics can assist small and medium enterprises (SMEs) in tracking the progress of their digital transformation efforts and identifying any deficiencies in processes or software. Once these gaps are identified, SMEs can utilize tools such as the Digital Adoption Platform to enhance technology adoption and boost employee productivity.

Critical Analysis of the existing capabilities - what you have regarding resources and talent and what you aim to achieve when adopting the new plan. Remember to examine why you are doing it instead of just asking how to do it. Gap Analysis must be done before deciding the roadmap on the following areas: customer servicing, efficiency, technology, tools, ability to attract talent, growth obstacles, market research for products and services, leadership team knowledge, skills gaps, and team buy-in for digital transformation.

Set Realistic Goals-Achieving good results often requires careful planning, strong execution, and learning from failure. Simply investing in digital tools will not automatically improve your company's performance. While digital tools can enhance performance, they need to be integrated with the rest of your organization. Before starting, it's crucial to ensure that objectives are specific and measurable, and that technology is not being used as a substitution for necessary organizational changes. It's important to involve everyone in the company in the plan to avoid separate initiatives working independently.

Close communication gap-Digital transformation requires better planning and communication. Leaders must ensure consistent communication at all levels of the organization. Clear communication should be maintained both within and across management levels. It's important to actively listen to employees, as they often have valuable customer insights and understand how changes may impact the overall business performance. Information gathered from front-line employees should be effectively communicated up the chain of command. Additionally, objectives, goals, and benchmarks should be established and communicated throughout the entire organization (Michael et al.,2021).

Introduce an experimental culture by accepting failures and mistakes. Adapt to a culture where mistakes are tolerated as long as you can learn something from them. Sometimes, the fastest way to close the gap is by simply trying. There needs to be a risk-taking approach to digital transformation. Objectives, goals, and benchmarks must be in place

and communicated across all levels of the organization. This will help to reduce the knowing-doing gap (Michael R. Wade & Jialu Shan,2021).

Practical maturity tools are helpful for organizations to understand their viewpoints and current digital status. They will be beneficial when organizations are willing to adopt digital transformation and progress towards a goal. They will help identify the vital areas where progress has been made and the weak areas for improvement. Tools provide the digital readiness status of the organization and where it stands in its digital transformation journey.

Adopting digital technology should not be for the sake of technological use. It must help to grow business. The fear of failing to implement a digital tool should not hold you back. It may be better to fail fast, learn from experience, and eventually gain confidence. Focusing on business priorities will help decide which solutions are genuinely needed and perhaps even uncover overlooked gaps. Countries like Singapore have “SME digital hubs” and “SME centers” where experienced business advisors will work with SMEs to understand the company’s needs and facilitate technology adoption. There are a lot of free web tools available on the internet that SMEs can utilize to assess their digital readiness. They provide an instant graph illustrating the present state and development areas based on the answers provided by the respondents. In some countries (Singapore), the government has initiated a digital transformation program and a Better Data-Driven Business (BDDB) program to encourage SMEs to adopt and implement digitalization and provide free consultancy and assessment services to SMEs (https://smedigitalisationstudy.experian.com.sg/self-assessment). BDDB supports small and medium-sized

enterprises (SMEs) in understanding their customers better and expanding their businesses by using data responsibly. It offers complimentary resources to assist SMEs in protecting their customers' personal data and leveraging data more efficiently to stay competitive in the digital economy.

The BDDB program aims to support two types of SMEs: those who are just starting to learn how to use data to generate insights, and those who are seeking to apply and share data for more complex purposes. It guides SMEs to safely collect necessary data, combine data across systems with protection, and share data with partners and suppliers safely, in line with PDPA guidelines.

Accomplishing digital transformation is a challenge for any organization, not just for SME ICT providers. Capgemini engineering (2022) has cited four critical rules in their insight on digital transformation. First and foremost is defining clear goals and establishing transparent governance. Second is adoption from the earliest stages of development, third is the expected commercial value and the fourth training up the talent ecosystems. Mckinsey (2018) survey has identified five categories that are critical for accomplishing digital transformation and they are.

- empowering people to work in new ways.
- having the right, digital-savvy leaders in place.
- building capabilities for the workforce of the future
- giving day-to-day tools a digital upgrade.
- communicating often via traditional and digital methods.

Nearly 70% of the respondents stated that their organizations' top teams changed during the transformation, with the most common change being the addition of new leaders familiar with digital technologies to the management team. People in critical roles were involved in the digital transformation. The survey results revealed that fostering talent and skills across the organization (a fundamental step) for conventional transformations is crucial in a digital change initiative. Technology-innovation managers serve as integrators, bridging potential gaps between traditional and digital aspects of the business. People in these roles help develop stronger internal capabilities among their colleagues. Integrators are employees responsible for translating and integrating new digital methods and processes into existing workflows. With experience in both business and technical aspects of digital technologies, integrators are able to effectively bridge the gap between traditional and digital aspects of a business. Such organizations also invested the appropriate amount in digital talent. The survey also showed that most responded positively to cultural and behavioral changes, increased collaboration, and customer centricity, and empowered employees by continuous learning or open work environments and allowing key people in key roles to reinforce and embrace changes. Clear communication is essential during a digital transformation, particularly the

communication of a change story. This aids employees in comprehending the organization's direction, the reasons for the change, and the importance of the changes (Mckinsey 2018).

According to McCullie et al.,2021 based on research participant practical experience, “the biggest challenge has really been around the culture and mindset towards change, particularly when something works but is perhaps not optimal. It is about the short-term pain of learning and adopting new and unfamiliar processes for long term gain. But after some pilot studies and initial capability commences, it really starts to bring people along the journey and shows that change can be a good thing.”

Organizational change necessitates capable resources and leaders with both technical and people management skills. Rapid technological advancements and the swift pace of change are compelling organizations to undertake significant transformations in their business models and work designs, thereby expanding the role of human resource management processes. Companies must address two workforce challenges: acquiring and retaining key talent and dealing with the shifting demographics of today’s workers. In today's highly competitive job market, finding and retaining key talent is a significant challenge. Additionally, the demographic shift in the talent pool presents another obstacle. Research indicates that millennials have different preferences and characteristics compared to previous generations. Therefore, organizations need to develop new strategies to attract, manage, and retain workers from this generation. In order to address these challenges, start by evaluating your current teams, the resources available to them, and their organizational structure. Identify their strengths and weaknesses. Then, develop a strategy to fill any crucial talent gaps to optimize the team.

This includes aligning compensation with clearly defined and measurable business goals. In order to drive future organizational performance, HR leaders and professionals need to update their skills and competencies and acquire new ones. A digital transformation strategy that focuses on human capital, intellectual capital, and knowledge can help achieve a competitive advantage (Barisic et.al.,2021). Digital transformation involves the need to develop and adopt new HR competencies, new employment models, and agile HR processes. As a result, organizations are expected to establish procedures for constantly evaluating employee competencies and introduce new forms of work organization to keep up with rapid technological changes and developments. (Barisic et.al.,2021). Human resource team encourage employees to learn new skills and technologies and encourage them to pursue continuous learning. SMEs need to have an automation strategy with identified task and process for automation, create and follow a roadmap with a suitable framework with governance and security in place. Appoint a good tech savvy leader with an agile mindset to drive and accomplish digital transformation.

Practical approach to digital transformation with five main areas to focus are clear vision, proper process, right structure in place and investing in right technology (Vollmer, 2020). According to (Gurbaxani & Dunkle, 2019) Strategic vision (for a digital world), culture of innovation, know-how and intellectual property (IP) assets, digital capabilities (talent) ,strategic alignment and technology assets. Embracing digital transformation doesn't have to be difficult and it doesn't have to result in failure. Incorporating new technologies as part of your company’s continued success is achievable with a well-developed digital strategy. This strategy engages your entire organization and prioritizes communication,

clarity, and steady, measurable improvement using "The Three Cs" (Communication, Clarity, Continuity) as cited by Rob Biedron (2022).

Supportive culture must be adopted in the whole organization where joint business and IT initiatives can flourish. An organization that values openness to change fosters a willingness to accept, implement, promote, and establish a change-oriented mindset, which is essential for mastering digital transformation. An organizational culture emphasizing agility (rather than control) in order to support digital transformation, including internally and externally driven values.

People, the critical assets of organization play a crucial role in the ongoing digital transformation process. Along with digital capabilities, transformation management capabilities in terms of leadership, culture, change management, governance are also equally important. Employees as the biggest challenge and critical factor of digital transformation emphasizing employee's competency traps, difficulties with changing employee's mindsets and beliefs and employee's knowledge, skills, and capabilities. SMEs can deploy flexible work, through self-organization and multi-tasking skills, employ with cost and resource saving. Organizations develop succession planning strategies by identifying and rethinking critical roles and establishing contingency plans using effective communication to ensure employee readiness. Organizations need to develop HR models for talent acquisition and retention. SMEs provide employment contracts based on project needs with flexi-benefit schemes. Technology may be used to improve the orientation process through virtual office tours, without requiring new employees to be physically present. Using virtual and digital learning platforms will enable organizations to accelerate and make re-skilling and up-skilling processes more

efficient without investing in the infrastructure and logistics required for hands-on training Despite all the positive perspectives of digital transformation, human experience cannot be replaced (Barisic et.al., 2021).

Agreement and disagreement

On reviewing the Literature, we agree that people and process play a crucial role in Digital transformation and SME ICT service providers must look for new business models using innovation and collaborations. The Process used internally for day-to-day activities for the smooth operation and the people associated with the process play a critical role in digital transformation. It is not just re-engineering the process for the benefit of the organization but also the mindset of the people to allow and adopt to new ways of doing things to improve overall performance of the organization.

Changing people's mind set to pave way for the new process or improved process is a challenge for any organization in digital transformation. It requires good leadership with vision to implement digital transformation successfully. Though many articles emphasis on retaining skilled resource and building capabilities and leadership, there is no clear picture for retaining the skilled forces, creating leaders and training the people with the required skillsets internally within the organization. Organizations do require and promote leadership as part of culture. It should be embedded in company culture. This is the place where Human Resource Management (HR) of the company has an important role to play in Digital Transformation and it is a gap which has future research direction.

The top management support is essential throughout the whole transformation process. Since digital transformation strategies affect the entire firm, their execution may therefore

result in resistance from different areas of the company. To deal with such resistance, transformation leadership skills are essential and require the active involvement of the various stakeholders affected by the transformation.

Digital transformation strategies should be subject to continuous reassessment, the progress must be measured and evaluated. SME's must ensure and track the progress of their digital transformation. Based on personal experience, agree to the concept of digital factory and agile methods. Both these approaches adopted by start-ups and SMEs for their DT journey. They were able to implement the DT projects in their organizations as well for their customers as product development. Process improvement with embedded agile principles, values along with change management improves the business process and operational environment. This in turn adds value to the company with increased customer experience.

Agree to the concept of open Innovation and digital supply chain models proposed in the reviewed articles. SME must consider building communities of talented resources and share the resources and ideas between internal and external entities based on their project needs to drive the performance of their organization and promote open innovation and digital supply chain and not just relying on their internal entities. Participate in professional networks (associations) that offer learning opportunities to acquire digital skills, encourage participation into peer-to-peer learning schemes and joint digital solutions pilot projects.

For Digital transformation to work for SMEs, their leaders go back to the fundamentals: focus on changing the mindset of its members as well as the organizational culture and

processes before they decide what digital tools to use and how to use them. What the members envision to be the future of the organization drove technology, not the other way around. Start the digital transformation journey with the exiting processes and enhance them to use new technologies. Before starting the journey identify the existing process that needs to be digitized that has high value (MVP) and define the goals for the process improvements. Start with a prototype and release and test it as a pilot project. Obtain feedback and improve the process before releasing to the production. Focus on existing processes, services and products for modernization instead of creating a new product. Focus on process, people, culture and performance. Build a culture with reward system and continuous learning and an agile mindset. Focusing on short term goals with an incremental iterative approach to achieve the long-term goals will help to thrive and sustain in business.

New ideas and experiments that seem to be risky before COVID-19 crisis. SMEs are forced to adopt Digital transformation and try out new ideas. Resistance to change familiar operating models from those that will ultimately benefit from the changes before COVD-19 crisis has forced a mass transition to digital, which made rapid scaling and experimentation both a necessity and an expectation. Those failing to do will struggle to ride out the current storms, let alone thrive in the post-pandemic world. Worker enablement was done by COVID-19. mobile e-mail, collaboration tools, and video conferencing, eLearning have now become the norm in many companies. Employees routinely collaborate with people whom they have never met in person, in regions they have never visited. New employees onboarding and knowledge sharing among teams have become possible due to these virtual collaboration tools.

Agile and Flexibility leads to rapid changes. SME ICT service providers are less constrained, less formalized, and more flexible compared to larger organizations. They can capitalize and sustain growth and transform their business implementing digital transformation if sufficient support is provided by public funded units or by local governments. Companies that embrace these new demands will succeed, whilst others will disappear entirely. If we don't reinvent business, chances are somebody else will" (Bertolini et.al .,2015).

2.6 Summary

In this study, we conducted a thorough review of research articles on digital transformation. We evaluated the contributions in terms of research topics, their findings, and our research questions. The findings presented in this paper are limited to research articles and indirect case studies cited in the research articles. Research on digital transformation of SME ICT providers would benefit from including additional and comparative case studies across various organizations and industries. Through the literature review, we can conclude that most of the articles emphasize customers, operations processes, people, culture, and strategy as the key challenges faced by organizations in digital transformation. Although the customer plays a crucial role in digital transformation, it is imperative for SME ICT service providers to adopt DT within their organization and not just for their customers. Service providers are pushed to adopt DT due to pandemic situation and they need to identify the challenges and implement digital transformation in small steps. Based on reviewed articles, the drivers are COVID-19, technology, customer expectation and innovation and the key challenges are the process, people and the culture. The most important is the people mindset and the process.

Frameworks, models, and roadmaps reviewed through this literature review provided varied options for the SMEs for their digital transformation. Simple framework and models like Two Prong approach, Digital factory, Agile change management, OKR for digital journey are effective models. It requires good leadership capabilities to achieve the small goals in incremental journey. Each framework, model and roadmap reviewed in this article are unique and does not fit into one-size fits all concept. Although not all activities identified by the authors are relevant for every organization's digital transformation, different organizations create a unique path to digital transformation through various combinations of these activities.

Identifying digital transformation implementation gaps can be achieved by building a roadmap to envision the company's vision and begin the transformation journey using any of the models and frameworks. Embracing digital transformation does not have to be a struggle—nor does it have to end in disaster. Incorporating new technologies as part of your company's continued success is achievable through a well-developed digital strategy that engages your entire organization and prioritizes communication, clarity, and steady, measurable improvement. Before embarking on the journey SME ICT provider need to assess current digital readiness state, goals, vision, required capabilities and then decide on their own framework or adopt any of the existing framework that suits their organization. For some organizations, the transformation gap is a conflict, but for others, it's an opportunity. It all depends on an openness to change. For accomplishing digital transformation, organizations must provide a supportive work environment and agile digital culture and ensure the quality of life at work is maintained at the workplace. All these challenges can be transformed into steppingstones under the guidance of a good

leader using a roadmap and strategic approach by building dynamic capabilities and talented pool of communities to build new business models and strive in the market.

This study is beneficial for managers in practice. It provides an analysis and discussions of various findings, offering insights into the challenges, gaps, framework, implementation factors, and implications of digital transformation. These are issues that many organizations currently face or are likely to face in the near future.

The best approach for conducting this study would involve a combination of quantitative and qualitative methods. I would choose to use survey research, existing research articles, and case studies to study the challenges faced by SME ICT service providers and how to overcome process and people-related issues. By using survey research, we can uncover the challenges and their preferred solutions. This approach will enable a better understanding of the digital transformation challenges faced by SME ICT service providers. By combining the data collected and the proposed solutions from the existing articles, we can derive a new solution and approach for the challenges faced by SME ICT service providers in digital transformation. Future research works should identify and concretize common features to address the challenges and aspects that can be ascribed to the proposed digital transformation processes. Future research can address additional challenges, strategies, and approaches to strongly confirm the proposed hypotheses and to discover new elements of digital transformation.

In the following few chapters, a research methodology including research design, data collection method, sampling strategy, data analysis and validation method will be addressed in detail. The final two chapters will present empirical data, observations, and

findings from the research study. Finally, a fully comprehensive discussion of the results will be provided, along with explanations and rationales.

CHAPTER III:
METHODOLOGY

3.1 Overview of the Research Problem

Digitizing is converting from analogue to digital data. Digitalization is implementing products and services using ICT. Digital transformation involves the digitization of products, processes, and services, essentially defining how to proceed with digitalization. Digital transformation refers to the changes in the ways of working, roles, and business offerings resulting from the adoption of digital technologies within an organization (Heilala et al., 2020).

Digitalization and automation are creating unconventional and knowledge-based jobs (SECO 2017 as cited in Hubschmid-Vierheilig et al.,2019). As teams within organizations become more diverse and multi-disciplinary, digital competence is not the only requirement. Cross-sectional skills such as communication and other soft skills are also essential (Bughin et al., 2018; Aepli et al. 2017; SECO 2017 as cited in Hubschmid-Vierheilig et al.,2019).

Digital transformation is less about adding new technologies and more about altering all aspects of the business from process to culture, starting with the individuals' mindset and as a collective organization with new strategic initiatives and leadership to transform and adopt digitization. Most neglected are the human factor and the process. The process and people management usually vary on project basis or based on the manager. Service providers digital transformation involves agility, centralization of the business operations, process, knowledge, resource, and change management. The study will investigate the challenges faced by SME ICT service providers in adopting digital transformation and address the following research questions.

What are the challenges faced by SME ICT providers in digital transformation?

The research objectives are:

1. What are the key drivers of Digital Transformation?
2. What are the challenges/hindering factors in adopting digital transformation in SME ICT Service providers?
3. What are the approaches, methods and tools, competencies required to overcome the digital transformation challenges in SME ICT Service Providers?
4. Identify the implementation gaps.
5. How can SME ICT providers accomplish digital transformation?

The research approach for this study is a blend of both qualitative and quantitative methods. This study conducted a Literature review of existing research articles, whitepapers, articles published by reputed consulting firms as secondary data for qualitative method and survey research, and its data for quantitative analysis. Literature review of past, white papers, case studies will be used to discover the hypothesis. This study will review the digital transformation challenges, models, and approaches to overcome those challenges. Based on this understanding, identify the gaps and new challenges and strategies. In the second stage, the survey of SME ICT service providers was conducted to collect data about SMEs thoughts, preferences, agreements, and disagreements of digital transformation in a systematic manner to understand better their practical problems in digital transformation and the approaches used by them as industry practice for business as usual or for business improvement. Questionnaire are crafted based on literature review. It is structured interview with close-ended questions. The survey has three sections -administrative questions as section 1, Categorization questions as section2 and the final target questions as section 3. The target question section will be displayed based on respondents answer to classification questions. The survey is targeted for 30 to 50 SME ICT service providers. The survey contains set of 35 questions to assess the digital readiness of the SME in actual business scenario. The survey responses are nominal or ordinal data type, and the scaling type is simple category (yes/no radio), multiple choice and Likert Scale (agree/disagree) types.

Google forms was used for data collection as it is free and easy to create forms and analyse the collected data using google spread sheets. It also stores feedback and provides statistical analysis in real-time, using google analytics. In the third step, data collected will be analysed as case study approach to validate the hypothesis. Compare the survey data with the hypothesis and determine the gaps and derive new methods or techniques to identify and overcome the digital transformation challenges. This study will be conducted between May 2022 to November 2022.

3.2 Operationalization of Theoretical Constructs

The current study aims to identify challenges faced by SME ICT service providers from various literature reviews. Identify multiple types of models, frameworks, roadmaps, approaches, best practices to overcome those challenges from literature review articles and different internet-based papers published by reputed consulting firms, case studies and surveys research.

By using survey research, we can uncover the challenges and their preferred solutions. This approach will facilitate a better comprehension of the challenges in digital transformation that SME ICT service providers face. By combining the data collected and the proposed solutions from the existing articles, we can derive a new solution and approach for the challenges faced by SME ICT service providers in digital transformation. Future works should identify and concrete common elements to address

the challenges and aspects that can be ascribed to the proposed digital transformation processes. Future research can address additional challenges, strategies, and approaches to definitively validate the proposed hypotheses and discover new facets of digital transformation.

The result of this study will be valuable to the SME ICT service providers as well as related software providers in developing better practices, models, frameworks, and tools for embracing and embarking on their digital transformation journey.

3.3 Research Purpose and Questions

The primary purpose of this research is to find out the challenges faced by SME ICT service providers in adopting digital and provide insights into SME digital readiness in the actual business scenario.

1. *Does your organization provide any of these ICT services or products?*
2. *Type of organization*
3. *Does digitalization improve business and quality of life?*
4. *Do you have plans for adopting new technologies, tools, and new business models for the next 5 years?*
5. *Your organization possesses a well-defined and cohesive digital strategy.*

6. *What are the objectives of your organization's digital strategy?*

7. *Do you agree that digital technology has the potential to transform the way people work within an organization?*

8. *Does your organization use the following technologies?*

9. *Are digital technologies and capabilities necessary for your organization?*

10. *Which of the following are most important to your organization (process, people, or tech)?*

11. *What is the total number of employees in your organization?*

12. *Age of your business/company as an ICT service provider?*

13. *Describe your role in your organization?*

14. *Is your organization ready for digitalization, or has it already started its digital journey?*

15. *Is your organization constantly upgrading to the growing business needs or trends?*

16. *Is your organization willing to spend money on training?*

17. *Are your people willing to re-skill and upgrade?*

18. *Are your people afraid of new technologies? Do they see technology as a threat?*

19. *My organization provides my colleagues or me with the resources and opportunities to acquire the necessary skills to leverage digital trends.*

20. *We have a clear vision for the digital future, and we are taking the necessary steps to achieve the vision.*

21. *We want to enhance our products, services, and customer engagement using digital.*

22. *We have incorporated digital technology into all aspects of business and operation and realize its potential.*

23. *We use analytics and data-driven business decisions.*

24. *We are willing to partner with other SMEs, communities, and digital supply chains to utilize the required skills and resources for our business needs.*

25. *Is our existing culture good enough for transformation?*

26. *We are willing to build a new culture to achieve a digital transformation vision.*

27. *We have the right skills, process, people, and culture to execute the digital vision.*

28. *We have the exemplary leadership to drive our organization through the digital transformation.*

29. *We drive our digitalization from experiments to scale.*

30. *Our Management understands the technology and its need for our business.*

31. *We provide supportive work culture to achieve our digital goal.*

32. *We communicate our vision to our employees and ensure everyone in the organization understands the vision and work towards the goal?*

33. Does your organization accept ideas and feedback from people?

34. What barriers are impeding the progress of your digital journey?

35. What are the essential skills to drive digital transformation?

Hypothesis

People centric skills , followed by process (both drivers and barriers) are more important to overcome , transform and implement digital transformation.
People, process and technology are the pillars of the organisation. People and process centric skill are essential to drive digital transformation. At the same time if they not adequate also becomes the barriers.

3.4 Research Design

To address the proposed research questions, the study shall use a qualitative method.The study shall use a survey research (structured Close-ended interviews) to explore the behaviors and their happenings as opposed to quantitative methods in the challenges faced by SME ICT service providers in digital transformation. By using survey research, we would be able to uncover the challenges and its preferred solutions. This approach will lead to a better understanding of the challenges faced by small and medium-sized ICT service providers during digital transformation. By combining the data collected and the proposed solutions from the existing articles, we can derive a new solution and

approach for the challenges faced by SME ICT service providers in digital transformation.

3.5 Population and Sample

This study's population was SME ICT service providers based in India (Chennai). Permission was sorted from the research participants to conduct the interview. The criteria for the selection of the participants were that they had been personally involved in business directly as owners or work in sales, IT department or as managers in SME ICT. The participant's selection is explained below in the next sub-heading of the study.

3.6 Participant Selection

It is essential to maintain the confidentiality of the particiapnts and allow them to answer the questions in fully confidence and trust. The Survey link was sent to each particiapnt mobile phone only after they provided their verbal consent to participate in the survey. The survey submission were immediately reflected in the google forms responses. The selected participants have indepth knowledge of their organization , staff and their business.

3.7 Instrumentation

The data was extracted using both primary and secondary methods. The secondary data collection was done from Literature review of existing research articles, white papers and

articles published by reputed consulting firms.Data collection was done using online survey to capture the real business case scenario of the participants mindset and thoughts.The research survey used the structured interview close -ended questions as the primary source of data to get an overview of the challenges faced by SME ICT service providers. The primary data was collected through email survey.

3.8 Data Collection Procedures

Data collection was done using google forms from experienced employees /managers working in SME ICT companies. The research survey questionnaire was shared with the particiapnat after their consent. The survey data collection was assisted by a coordinator, who helped collect the permission of the participants to participate in the survey.

3.9 Data Analysis

Data analysis was a time consuming process. Interpretaion of data and understanding the data during the course of the analyis and also the understanding the results are equally tricky. Data analysis was done using google forms,Excel and JASP open source analysis tool.

3.9 Research Design Limitations

The limiation could be the no of survey participants. Though the number is small , the purpose is to collect meaningful data to study the concerns or the thought process of the

actual business users , the relatime use case users. It may not impact the study as it was conducted post pandemic when the industry has started to boom back to business as usual. It was the right time to capture the mindset of the people of the organization driving the business.

3.9 Conclusion

The study uses both qulitative and quantitative approach. Quantitative survey interview is applied as support to the qualitative reseach review .The structured interview with close ended questions helped to compare against the hypothesis. The data analysis methods, limitations are detailed in previous sections. The data was analysed using Pearson co relation to determine the relationship between various factors identifed in the survey.

CHAPTER IV:

RESULTS

Results of the survey responses for each of the questions are presented below.The response data collected was further studied to to strengthen the hypothesis using linear regression and find the co-relation and dependencies between various factors of digital

transformation.The survey was conducted with 50 particiapants between june 2022 to March 2023.

4.1 Research Questions

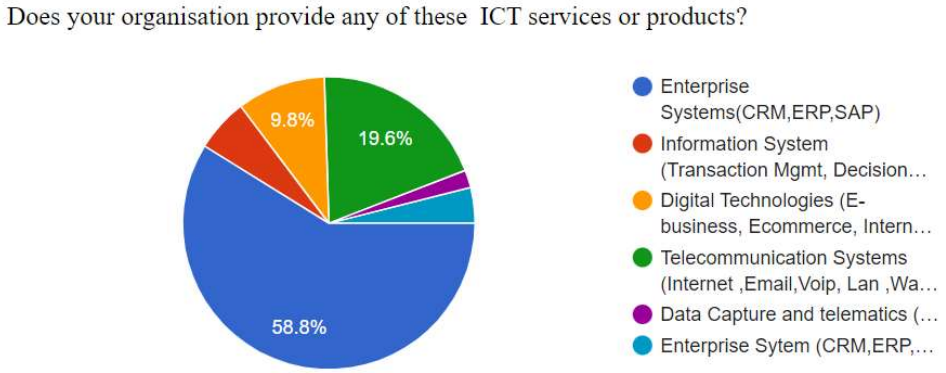


Figure 28 -Type of Services provided by ICT SME

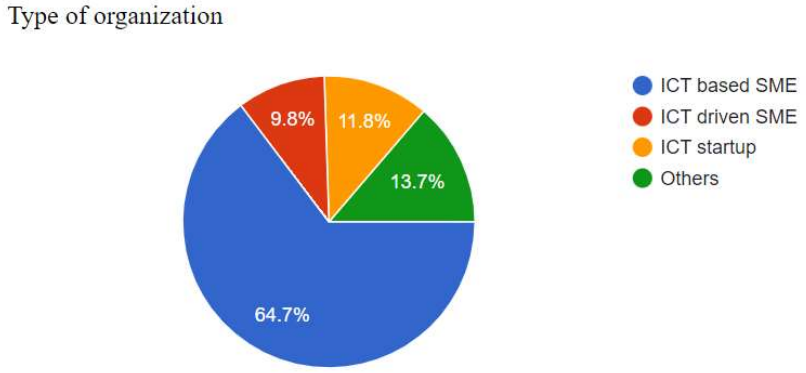


Figure 29-Type of Organization

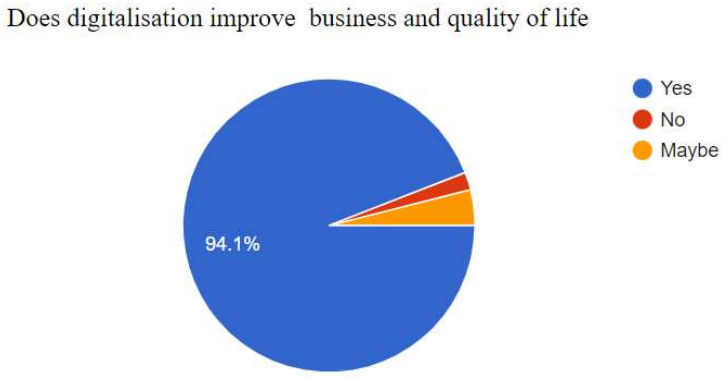


Figure 30-Improve business and quality of life.

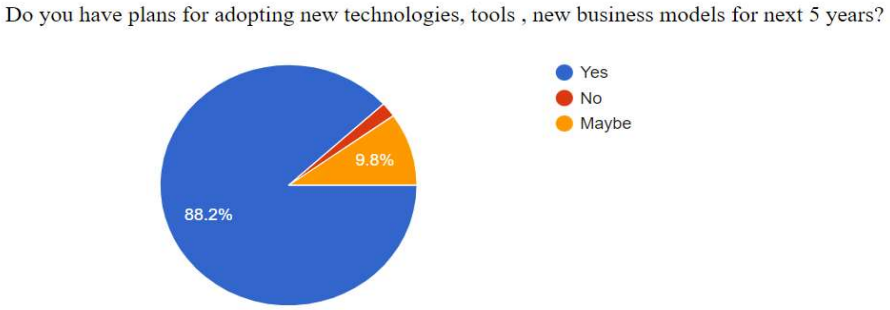


Figure 31-Future 5-year planning

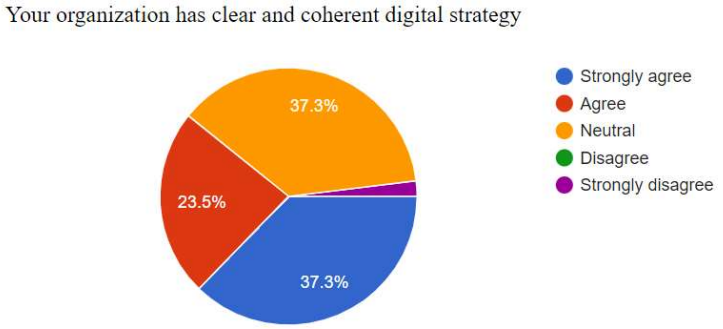


Figure 32-Business strategy exists.

Figure 33-Objectives of digital strategy

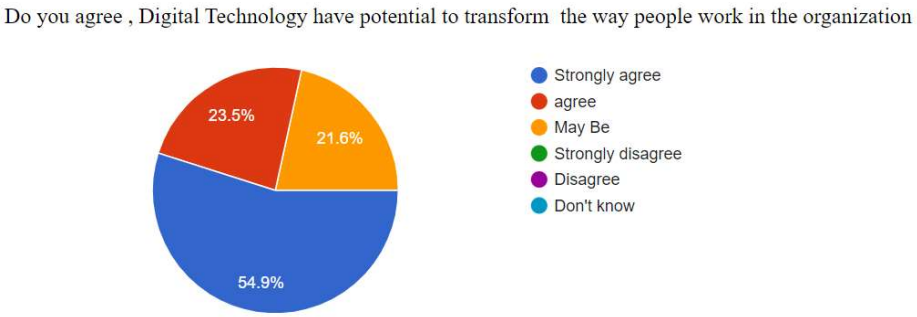


Figure 34-Does DT have potential to transform.

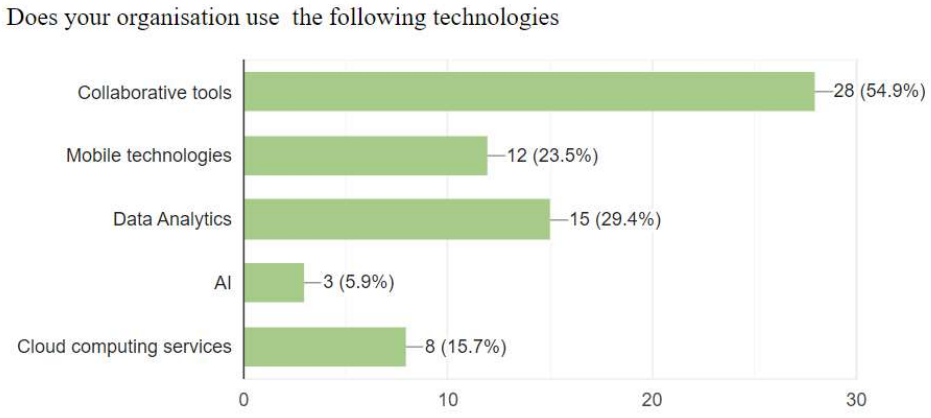


Figure 35-Technologies used by SME organization.

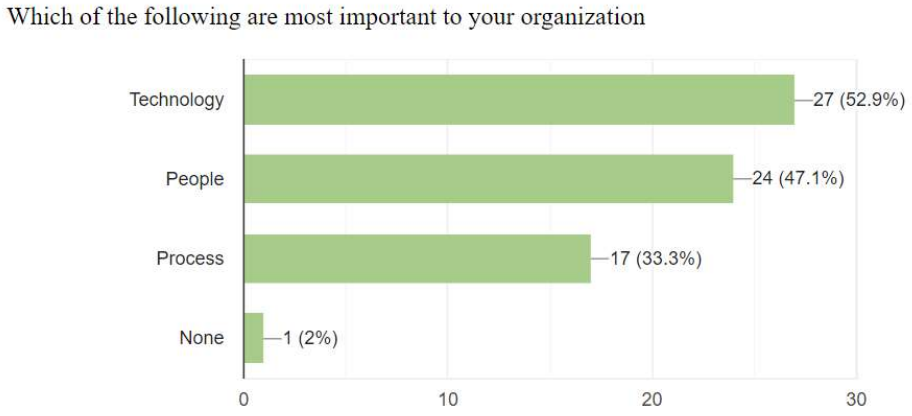


Figure 35-Importance of People, process and technology for the participant organization

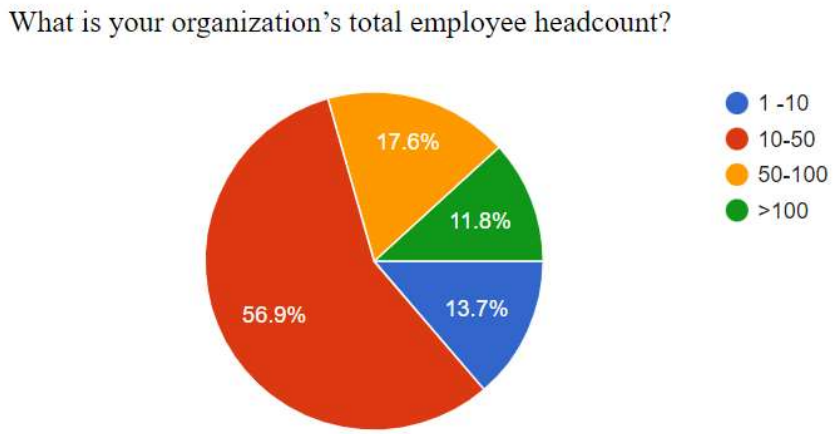


Figure 36-Participant Organization staff headcount

Figure 37-Length of business of the participants

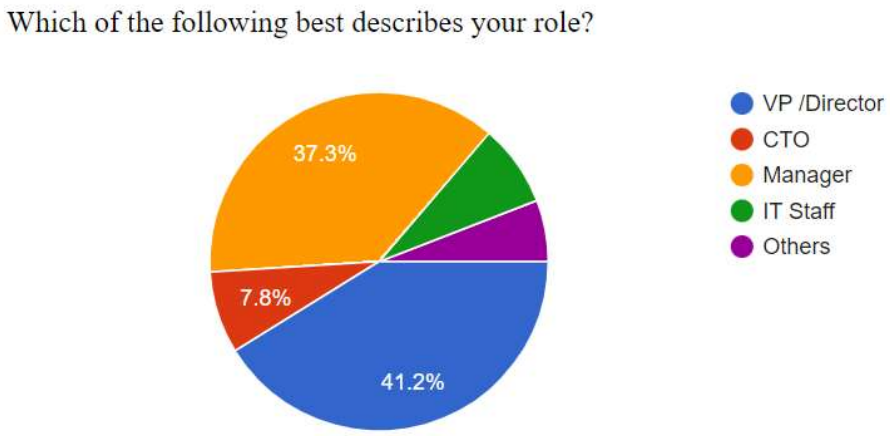


Figure 38-Survey participant role in their organization

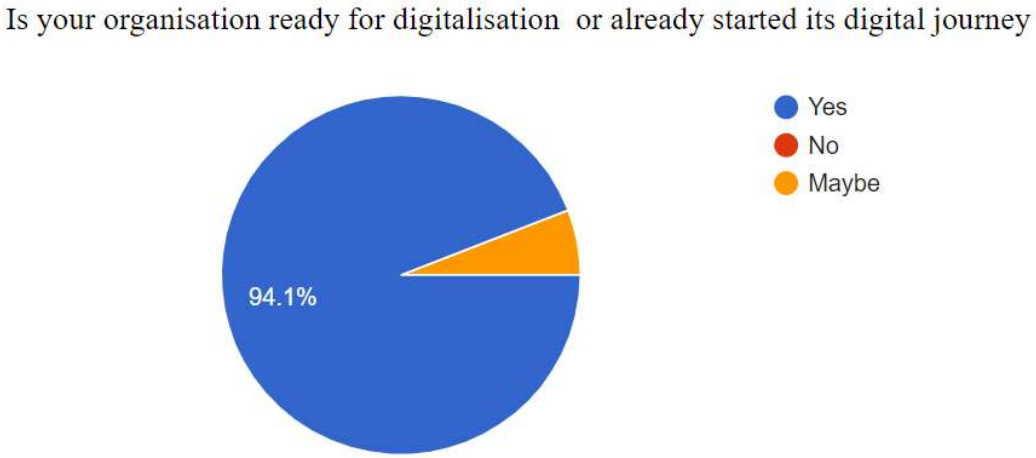


Figure 39-Digital Readiness of the participants

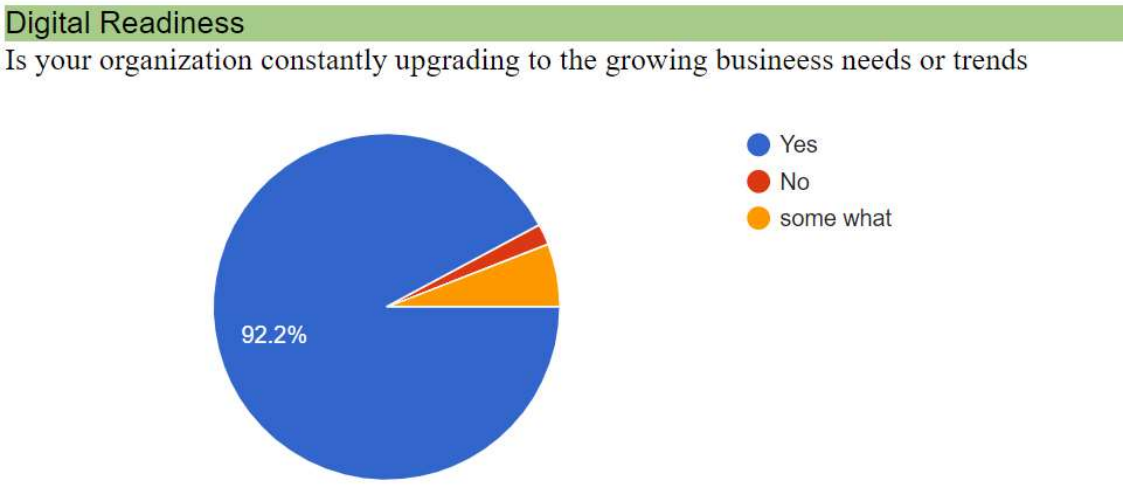


Figure 40-Digital Readiness of the participants

Figure 41-Participants willing to spend for training.

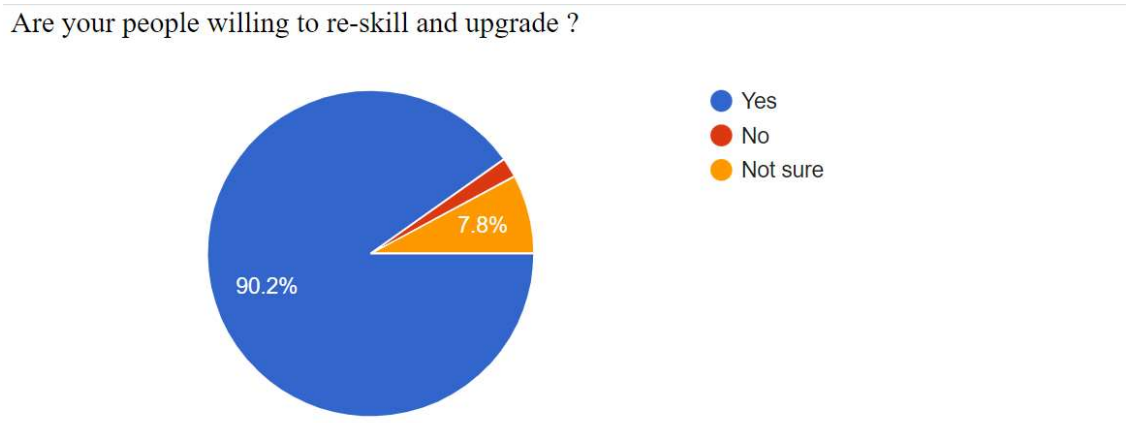


Figure 42-Participants willing to upgrade.

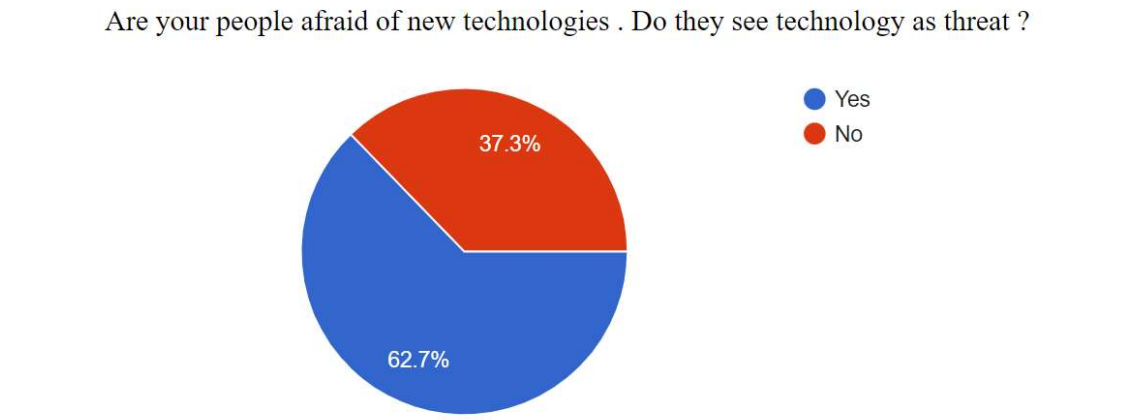
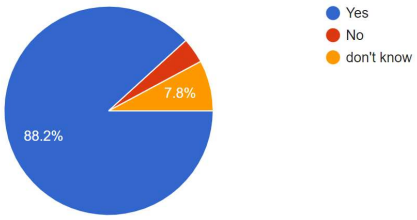


Figure 43-Participants afraid of new technologies

My organization provides me or my co-workers with the resources or opportunities to obtain the right skills to take advantage of digital trends



We have clear vision for digital future and we are taking the necessary steps to achieve the vision

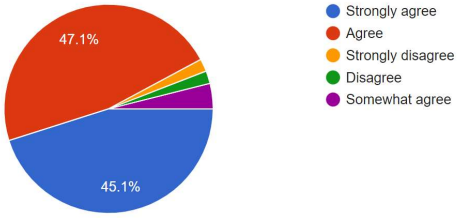
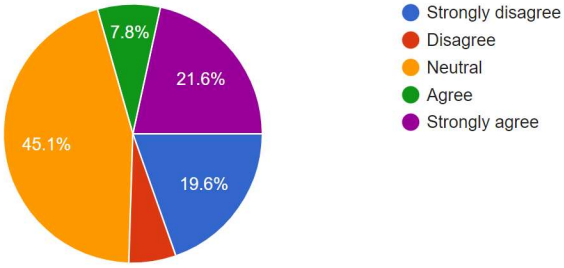


Figure 44-Participantants organization provide opportunities.

We want to enhance our product ,services and customer engagement using digital



We have incorporated digital technology into all aspects of business and operation and realize its potential

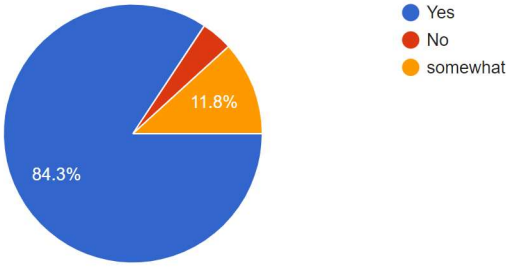


Figure 45-Participantants organization enhance their product and services with digital technologies.

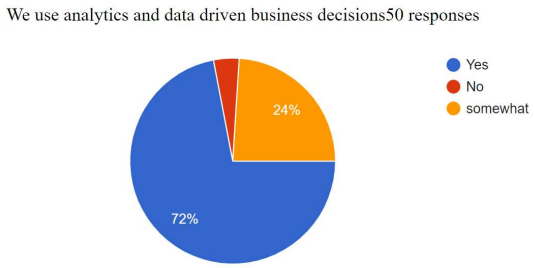


Figure 46-Data driven business decision.

Figure 47-Participantants organization ready for partnership.

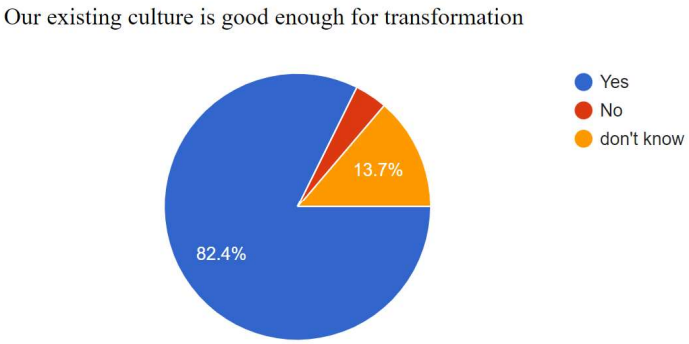


Figure 48-Participantants organization culture.

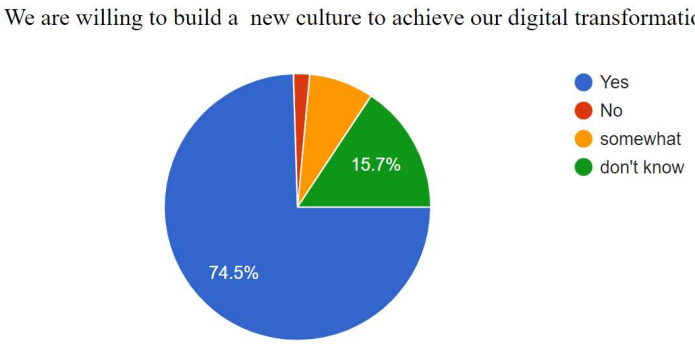


Figure 49-Participantants ready to build new work culture.

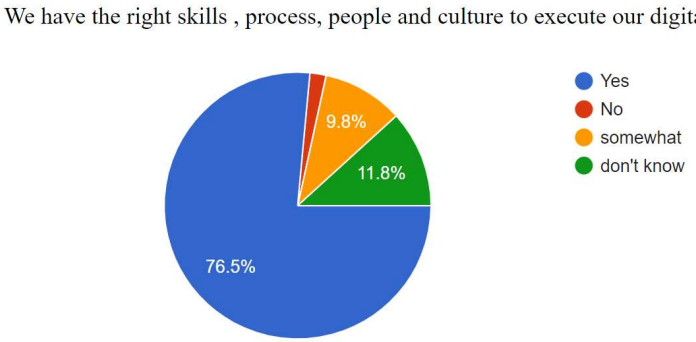


Figure 50- Participants feel they have right culture to execute digital transformation

Figure 51- Participants feel they have right leadership.

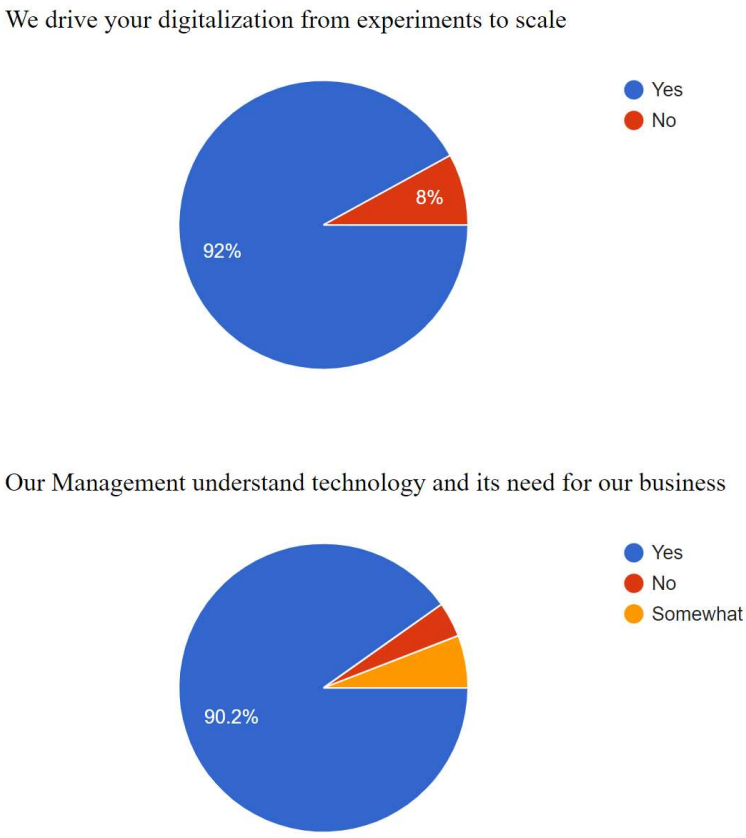


Figure 52- Management understands technology and they experiment to scale.

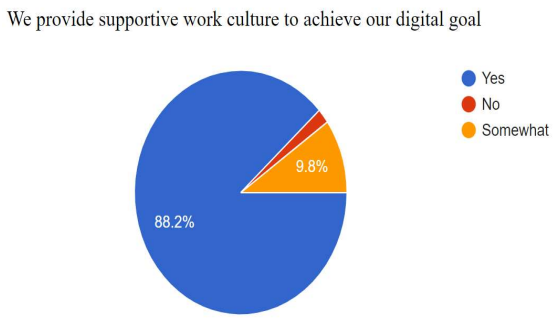


Figure 53- Participants feel they have supportive work culture.

Figure 54- Participants organization communicate organization vision.

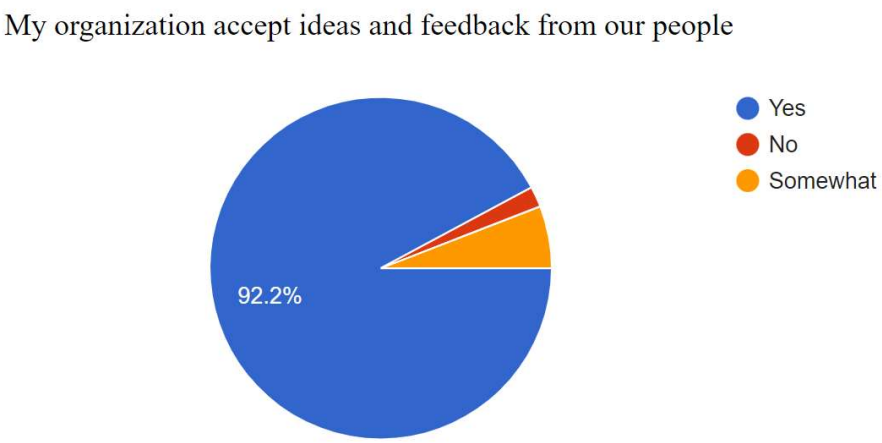


Figure 55- Participants organization accept feedback.

4.2 Drivers

Survey data was analysed using linear regression.

This table provides the R and R2 values. The R value represents the simple correlation and is 0.953(the "R" Column), which indicates a high degree of correlation. The R2 value (the "R Square" column) indicates how much of the total variation in the dependent

variable, effective drivers, can be explained by the various independent variables, (Teamwork, soft skills etc.). In this case, 90.8% can be presented, which is very large.

Model Summary - Effective Drivers

Model	R	R^2	Adjusted R^2	RMSE
H_1	0.953	0.908	0.869	10.796

Figure 56- Linear Regression Summary Model -Effective Drivers

Regression equation validates hypothesis, and it predicts the dependent variables as shown in ANOVA table below.

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	6854.273	14	489.591	4.201	< .001
	Residual	4195.727	36	116.548		
	Total	11050.000	50			

Figure 57- Linear ANOVA Model for Drivers

The table (Figure 57) indicates that the regression model effectively predicts the dependent variable. Pay attention to the "Regression" row and look at the "P" column. This value signifies the statistical significance of the regression model. In this case, the value of p is less than 0.001, which is lower than the typical cutoff of 0.05. This suggests that overall, the regression model can reliably predict the outcome variable, indicating that it is a good fit for the data.

The coefficients table (Figure 58) provides us with the necessary information to predict effective drivers from various factors such as teamwork, soft skills, problem-solving, decision-making, empathy, mentoring, willingness to learn, communication and organizational skills, strategic planning, etc. It also helps us determine whether these factors contribute statistically significantly to the model by looking at the "P" column. Furthermore, we can utilize the values under the "Unstandardized" column, as shown below.

Coefficients

Model		Unstandardized	Standard Error	Standardized[a]	t	p
H_0	(Intercept)	26.000	2.082		12.490	< .001
H_1	(Intercept)	38.068	5.209		7.308	< .001
	Teamwork (1)	-17.981	4.167		-4.315	< .001
	Softskills (1)	0.144	3.657		0.039	0.969
	Softskills (3)	-27.718	12.709		-2.181	0.036
	Problem-solving (1)	-4.304	3.850		-1.118	0.271
	Decision-making (1)	-1.012	3.787		-0.267	0.791
	Empathy (1)	4.719	4.356		1.083	0.286
	Integrity and Honesty (1)	5.679	3.843		1.478	0.148
	Mentoring (1)	0.560	4.032		0.139	0.890
	Willingness to learn (1)	-6.688	3.550		-1.884	0.068
	Communication (1)	-0.247	4.066		-0.061	0.952
	Organizational skills (1)	-2.057	3.621		-0.568	0.573
	Strategic planning (1)	0.591	3.877		0.152	0.880
	Adaptability (1)	-5.876	4.331		-1.357	0.183
	Emotional Intelligence (1)	-6.507	6.883		-0.945	0.351

Figure 58- Coefficients of Digital Transformation Drivers

Positive Correlation exiting between the various skillsets considered as drivers , that are required for digital transformation are tabulated in a simplified manner below. All tests one-tailed, for positive correlation greater than 0.95.

drivers	Mentoring	Teamwork	Soft skills	Problem-solving	Decision making	Empathy	Integrity and Honesty	Willingness to learn	Communication	Organizational skills
Teamwork	Y									
Soft skills	Y									

Problem-solving		Y	Y							
Decision-making	Y	Y	Y	Y						
Empathy	Y		Y	Y						
Integrity and Honesty	Y		Y	Y	Y	Y				
Willingness to learn	Y	Y	Y	Y	Y		Y			
Communication	Y		Y	Y	Y	Y	Y	Y		
Organizational skills	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Strategic planning	Y	Y	Y	Y	Y		Y	Y	Y	Y
Adaptability								Y	Y	Y

Figure 59- Co-relation of Digital Transformation Drivers

Linear Regression and co-variant analysis show a relationship exists between drivers of digital transformation. The above table depicts positive co-relation between mentoring, teamwork, skillsets, decision making, empathy, willingness to learn, communication, strategic planning and adaptability.

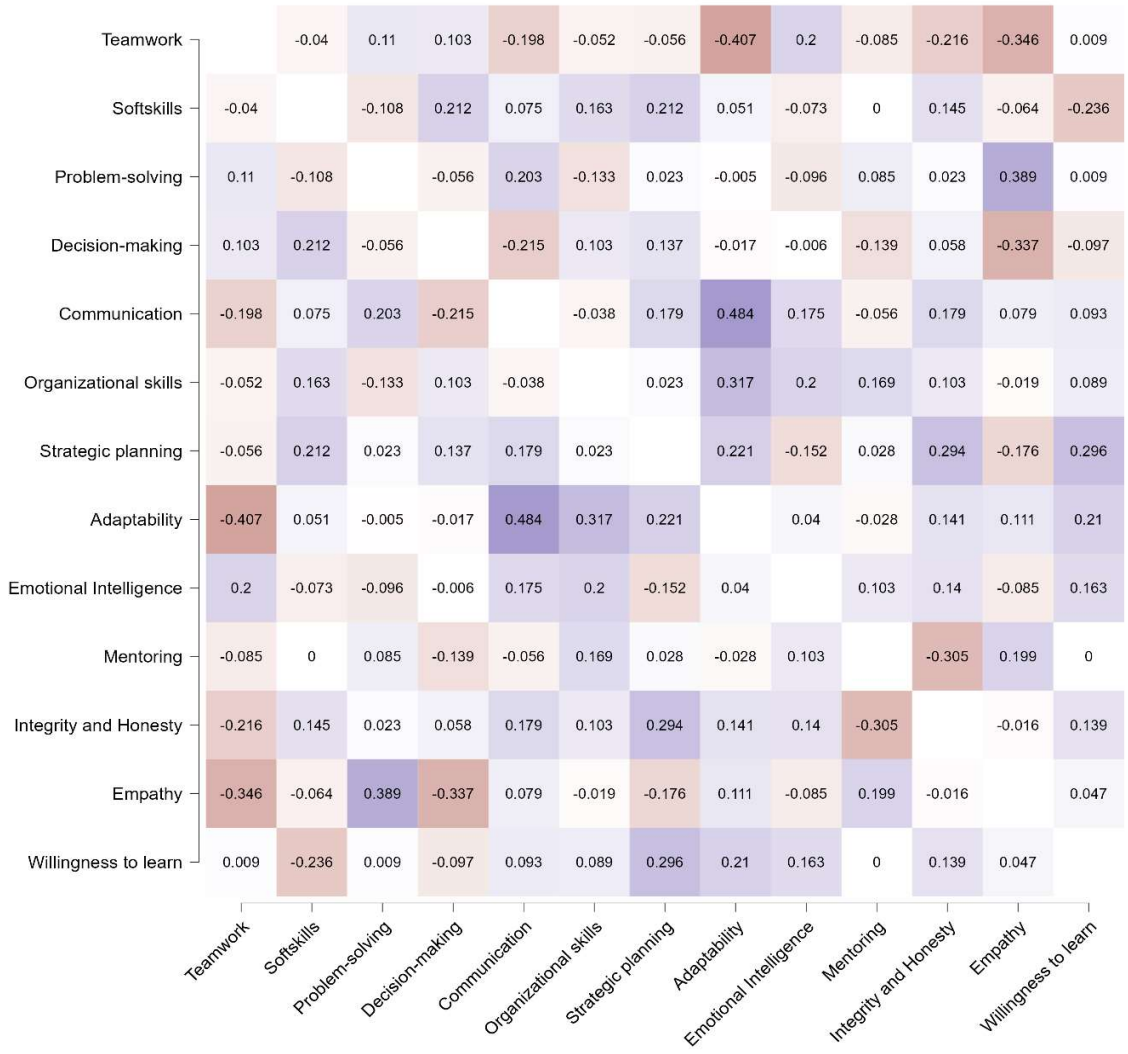


Figure 60- Pearson heatmap Co-variant Analysis of drivers

Co-relationship exists between various drivers of digital transformation. Positive relationship (blue shade) exists between strategic planning, organizational skills, adaptability , honesty and integrity . Negative relationship (red shade) exists between mentoring ,integrity and honesty, teamwork and mentoring, adaptability, empathy .

4.2 Barriers

People and process are essential factors in digital transformation. Though 52% of the participants responded technology as the most critical, linear regression of effective drivers showed human centric qualities (soft skills ,mentoring, teamwork, empathy etc.) and process and organizational related like organizational skills, adaptability, strategic planning, communication as more critical for digital transformation.

The table (Figure 61) shows the R and R2 values. The R-value, which is 0.982 in the "R" column, represents the simple correlation and indicates a high degree of correlation. The R2 value (in the "R Square" column) shows how much of the total variation in the dependent variable, barriers, can be explained by the various independent challenge variables (competition, collaboration challenges, security governance, leadership cultural issues, unsupportive staff, insufficient skills, lack of vision, lack of strategy, ROI, etc.). In this case, 96.4% of the variation can be explained, which is very large.

Model Summary - Barriers

Model	R	R^2	Adjusted R^2	RMSE
H_1	0.982	0.964	0.954	5.310

Figure 61- Model Summary of Barriers

ANOVA table (Figure 62) shows that the regression model significantly predicts the outcome variable, with $p < 0.001$, which is less than 0.05.

ANOVA ▼

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	24654.400	9	2739.378	97.141	< .001
	Residual	930.600	33	28.200		
	Total	25585.000	42			

Figure 62- ANOVA table for barriers

The Coefficients table (Figure 63) provides us with the necessary information to predict digital transformation barriers from various factors such as unsupportive staff, leadership and cultural issues, insufficient skills, etc. It also helps us determine whether these factors contribute statistically significantly to the model by looking at the "P" column. Furthermore, we can use the values under the "Unstandardized" column as shown below.

Coefficients

Model		Unstandardized	Standard Error	Standardized[a]	t	p
H_1	leadership& cultural issues (0)	28.245	1.676		16.852	< .001
	leadership& cultural issues (1)	30.620	3.367		9.094	< .001
	insufficient skills (1)	0.077	1.742		0.044	0.965
	security & governance (1)	2.000	7.510		0.266	0.792
	collaboration challenges (1)	12.854	5.567		2.309	0.027
	ROI (1)	-10.697	6.368		-1.680	0.102
	lack of vision (1)	-10.321	5.593		-1.845	0.074
	lack of strategy (1)	-1.462	6.562		-0.223	0.825
	competition (1)	-9.685	4.036		-2.400	0.022
	unsupportive staff (1)	30.620	3.367		9.094	<.001

Figure 63- Co-efficient table for barriers

The analysis shows P value significantly higher for insufficient skills, leadership, cultural issues, unsupportive staff.

Co-relationship among the barriers have both positive and negative relationship exists . Pearson heatmap depicts positive co-relation in blue and negative relation in red as

shown below. Insufficient skills in light blue have minor negative co relation with all the barriers.

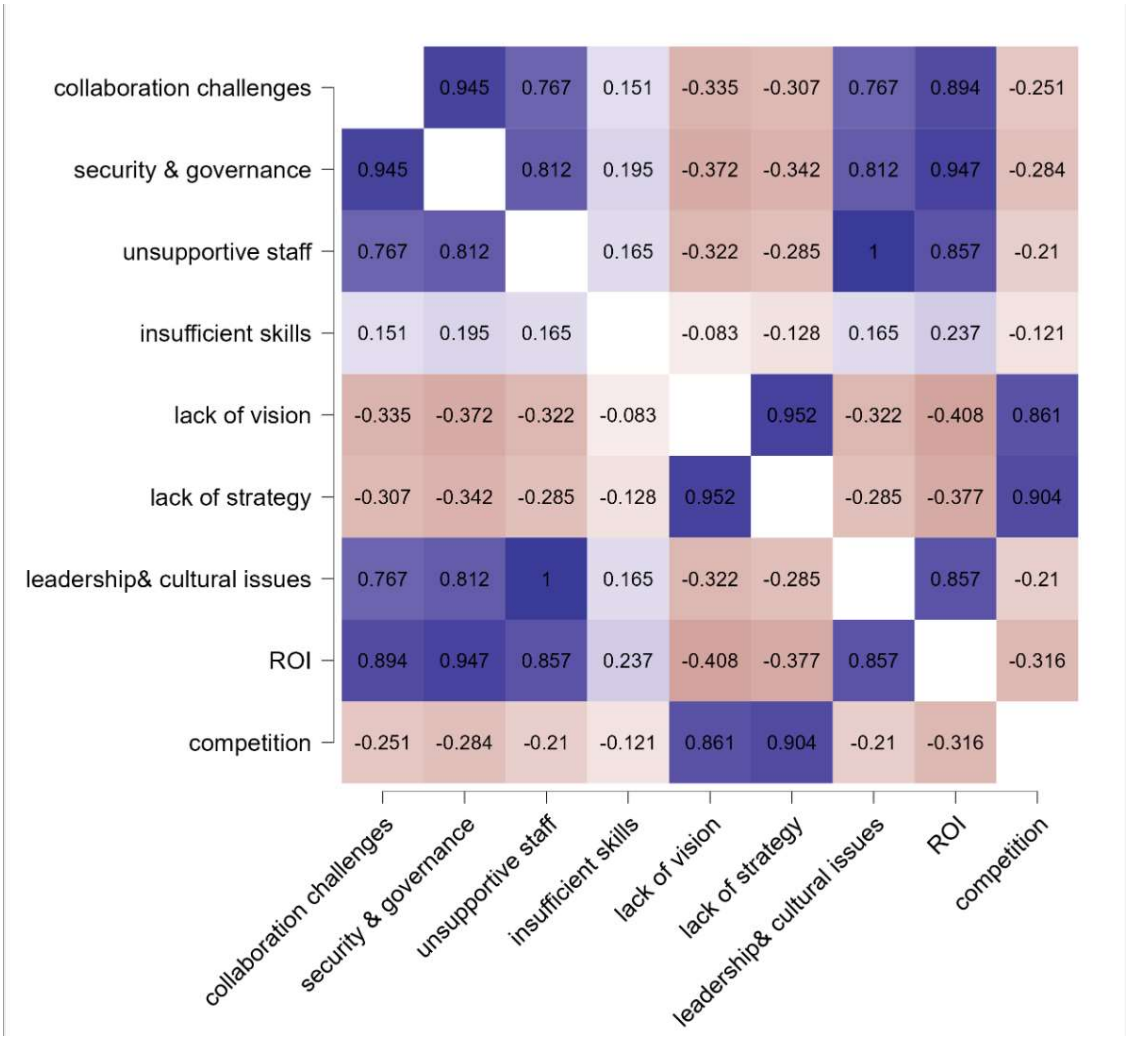


Figure 64- Pearson heatmap table for barriers

4.2 Summary of Findings

Insufficeint skills has positive corelation on competition,ROI,lack of strategy, unsupportive staff, collaboration challenges, security and governance.

Positive relationships exist between lack of vision, strategy ,leadership and cultural issues can lead to collaboration challenges which can have high impact on ROI and competition. Soft skills as a driver are positively related to decision making, communication skills, strategic planning and integrity and honesty.

Communication, strategic planning, organizational skills, adaptability positively related to willingness to learn. Survey also shows People are more open to feedback , willing to learn and adopt to new culture. Both drivers and barriers that are found to be related to each other are found to be people and process centric characteristics.

4.2 Conclusion

In order to transform and digitize successfully SME ICT service providers can adopt strategic planning, willingness to learn , adaptability, build organizational skills ,communication skills , clear vison and leadership . In other words, build positive relationships, collaborate ,communicate and succeed in the competition and get desired ROI. The key is concentrate and improve on the positive co-related variants of drivers and barriers and reduce or minimize the negative impact of the obstacles.

CHAPTER V:

DISCUSSION

5.1 Discussion of Results

Major barrier identified by the survey participants is insufficient skills (54%) , lack of vision (44%) , leadership and cultural issues (44%) , ROI (42%) followed by unsupportive staff (38%), security & governance(36%),lack of strategy(32%), collaboration challenges(32%) and competition (20%).

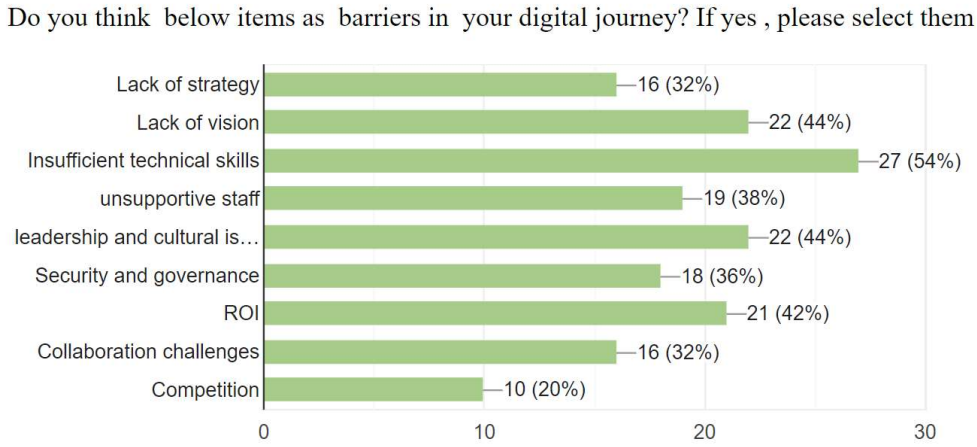


Figure 65- Barriers of Digital transformation

Literature review also emphasizes non-technical people and process related skills as challenges faced by SME ICT service providers in digitization.

Author	challenges
Nieminen, J. (2014) , Westerman et al.(2011)	coordination and leadership issues lack of collaboration

	Resistance to change Cultural issues lack of vision
Köffer (2015)	collaboration, compliance, mobility and technostress
Amankwah-Amoah et.al. (2021)	Technology infrastructure, institutional constraints(policy, regulation and law), security and privacy concerns, organizational level constraints(people, resistance to change, lack of technical expertise).
Nieminen, J. (2014)	Communication (60%), lack of collaboration (47%), technology enabler (40%), change resistance and risk-averse culture (33%), decisions regarding digital business (33%), insufficient budget(20%) ,legal issues (13%) and inefficiency(27%).
Ida Jessie Sagina ,2019	transformation strategy(26%) , organizational culture (21%) , lack of skilled employees (26%), meeting changing customer demands(47%), data driven (24%)
Safadi (2021)	75% of obstacles mainly non-technical (culture)

Schwertner (2017)	human factor, culture and employee resistance to change, lack of knowledge and good practices
PWC global industry survey (2016)	lack of digital culture and skills
Hubschmid-Vierheilig et al., 2019	insufficient resources and gaps in bringing digitalization into practise

Figure 66- Consolidated list of challenges from literature review.

According to the research article published by Altimeter, a research and strategy consulting firm based on the survey data from executives, states Low digital literacy or expertise among employees and leadership (31.4%) as the top most challenge in digital transformation followed by digital transformation viewed as a cost center (30.9%) ,Company Culture (30.5%) ,Lack of budget (30.5%),Lack of staff resources (30.1%) ,Legal and risk management or compliance concerns (24.6%) ,Human barriers (e.g. politics, egos, sabotaging, fear) (23.7%) , No sense of urgency (19.7%) ,ROI to justify value of digital transformation(10.6%), No leadership driving efforts (6.1%), Respondents have not experienced any of these challenges (4.2%).Shafiee Nahrkhalaji et al. (2019) has cited availability of resources(27%), development of new capabilities and skills(37%), corporate culture(33%), finding the exemplary leadership(33%), engagement of employees(24%), market uncertainties(15%), complexities of strategic and organizational challenges(34%), new competition and collaboration patterns(28%), changing current customer behavior (10%)and creating a vision (20%)as the main challenges in Digital transformation journey.

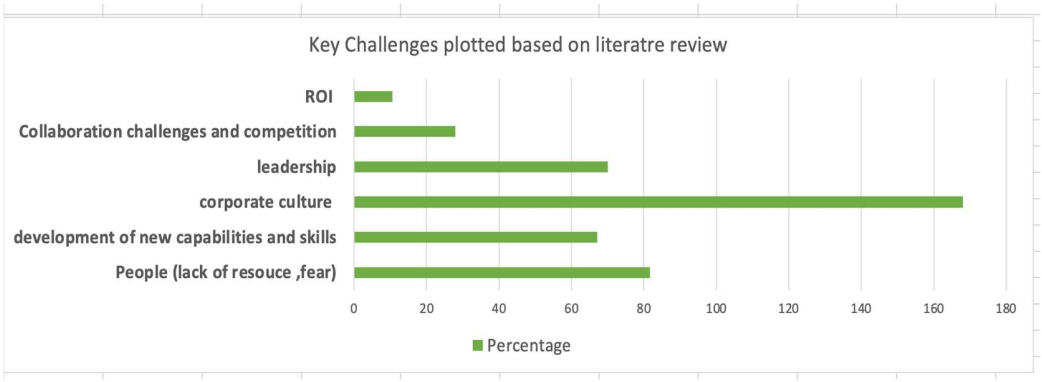


Figure 67 -Consolidated graphical representation of the challenges -own illustration.

Internal Factors affecting Digital transformation are identified as Capabilities fit, resource fit and change in business models while the external factors are external capabilities and resource fit, regulation, and maturity, needs and expectations of the customers (Tarute et al., 2018). SMEs are forced to look for new business models, new opportunities and improve existing products and services using the latest technologies like cloud, big data, IoT and AI. COVID-19 pandemic has been speeding up the digital transformation in SME ICT Service providers.

Typical SME barriers and pain points of digital transformation are skills shortage, need to learn new capabilities, knowledge gaps and resource constraints are slowing down the DT process. According to Heilala et al., (2020) the main challenges and barriers are limited understanding of digitalization and digital transformation benefits, dependency on manager /owners' passion for technology, shortage of skilled workers, difficulty in finding cost effective solution and tools to implement digital transformation into reality.

According to Nieminen, J. (2014) based on case study conducted on organizations identified the following challenges. Internal communication of business requirement

(60%), lack of collaboration (47%), not understanding the possibilities that digital technology enables (40%), legacy systems not supporting new business requirements (40%), change resistance and risk-averse culture (33%),Not understanding the dependencies of decisions regarding digital business (33%),insufficient budget(20%) ,legal issues (13%) and inefficiency(27%). According to the article published in Freshdesk based on surveys from leading consulting firms (Ida Jessie Sagina ,2019) - Charting a detailed transformation strategy(26%) ,organizational culture (21%) ,lack of skilled employees (26%), meeting changing customer demands(47%), data driven (24%), can use data in better way(86%), too much dependency on legacy systems and operational models, cyber security. Hubschmid-Vierheilig et al. (2019) cite Goerzig and Bauernhansl (2018), highlighting customer involvement, iterative development, and increasing business orientation as challenges arising from digitized products and services, all of which require new approaches and methods. Introduction of new IT infrastructure alone is not sufficient for digitalization. Process automation reduces pressure on head count and creates a lean process and may not return a positive ROI. SME's still need to bear the high cost in maintaining the quality and professional standards.

Three major dilemmas of digital transformation are customer proximity, technological simplification, and organizational capabilities. Non-Technical barriers are internal resources, customers and information, capabilities, value proposition and adaptability. Typical barriers identified by Peillon & Dubruc (2019) include lack of technical skills, insufficient IT structures, inadequate business processes, and high implementation risks and costs. From a global perspective, digital transformation invariably demands a significant shift in the organizational culture of a company, as it entails the adoption of new technologies and the acquisition of new skills. Technology barriers are core to

digitalization. They include varied technologies (cloud, AI , analytics, big data) and sound technical infrastructure to support offering ICT services in the form of process and product to their customers by re-designing their technical infrastructure and business model.

Strategy drives digital transformation not technology. Offering new products, value and services requires new resources, collaboration, and capabilities. They often require radical change at the organization level. People's unwillingness to accept change is underestimated by organizations. It required cultural transformation as well. Human resource related matters like lack of skillful employees, digital competencies are added barriers of digital transformation (Peillon & Dubruc 2019). Ambiguous customer needs, customer data security and privacy are identified customer related barriers.

Köffer (2015) identifies four core aspects as challenges: collaboration, compliance, mobility and technostress. Small and medium-sized enterprises (SMEs) must rapidly understand, adapt to, and predict customer needs (Lindner et al., 2017). Depending solely on past knowledge and procedures is no longer feasible, as existing concepts cannot address entirely new challenges and situations. Skilled employees with technological expertise, analytical skills, creativity, and out-of-the-box thinking are essential for addressing the challenges posed by digital transformation. Capabilities such as creativity and out-of-the-box thinking are vital in this regard (Pavlou and El Sawy 2010 as cited in Hubschmid-Vierheilig et al. (2019)).Amankwah-Amoah et.al.(2021) has cited four main barriers :Technology infrastructure, institutional constraints(policy, regulation and law),security and privacy concerns, organizational level constraints(people, resistance to change, lack of technical expertise).

Organizational transformation is equally a critical challenge of DT. Organizations are being transformed, in bits and pieces rather than systematically and strategically. SMEs need cultural change (pro digital culture), agility and insert technology, data, and digital deep into organization DNA by re-organizing and building cross functional diversified agile teams to push forward for a sustainable growth(Küng, L. 2017). Nieminen, J. (2014) identified 6 challenges from Westerman et al.(2011) :

lack of perceived urgency to begin the transformation.

coordination and leadership issues

lack of collaboration

Resistance to change.

Cultural issues

lack of vision

Long-standing obstacles for ICT SMEs to go digital include digital skills gaps, lack of information and awareness, and insufficient capital to finance the transformation for a large portion of the SME population. In addition, they encounter increased challenges in navigating the evolving business landscape, including rapidly changing regulatory frameworks, managing digital security and privacy concerns, and accessing high-quality, affordable digital infrastructure. Many firms are unaware of government subsidies that could help their digital transformation at low or no cost.

The lack of digital skills is a challenge that is transversal to most SMEs and is emerging as a critical hurdle to SME digitalization. Benefits of digitalization and digital transformation are not fully understood both by management and the employees. Nachit

et al. (2021) has categorized DT barriers as structural and cultural. Managerial support, lack of skills, regulatory and compliance as structural while employee habits and lack of technology know-how as cultural barrier to DT. While there are common challenges for SMEs to go digital, a one size-fits-all approach to SME digitalization is not adequate. Speed is crucial for providing necessary support during a crisis. Therefore, the use of digital technologies is proving critical in helping SMEs in these unprecedented times.

Cannon Business Process Services Article (2022) has cited the workforce as a critical challenge. Countless organizations are challenged by "people problem" when it comes to digital transformation. It is crucial to have the right individuals with the appropriate skills performing the correct tasks as a well-coordinated team to achieve success in any transformation. Companies must address two workforce challenges: acquiring and retaining key talent and dealing with the shifting demographics of today's workers in order to succeed in digital transformation.

Based on the data analysis , critical drivers identified for positive digital transformation are process /organizational and people centric skills.

The key organizational related skills - adaptability, strategic planning, communication
People centric skills -soft skills ,mentoring, teamwork ,empathy.

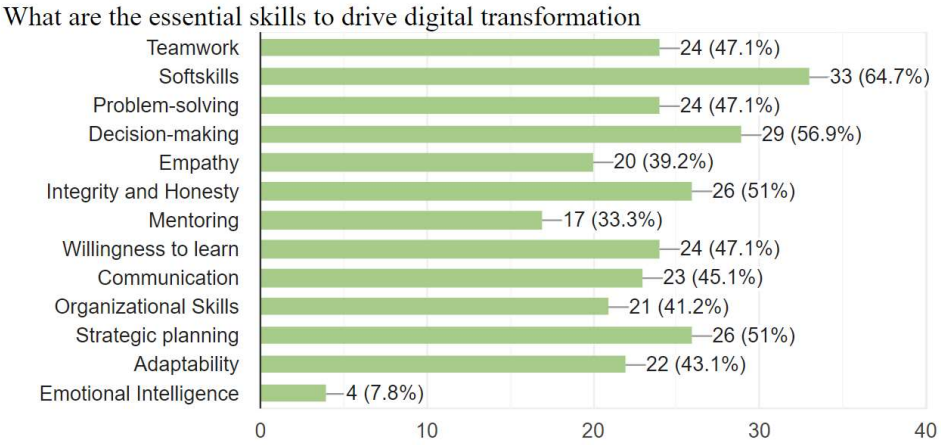


Figure 68 -Essential skills to drive digital transformation.

Literature review emphasis on customer, operations process, people, culture, and strategy as the key challenges faced by organization in digital transformation. Based on reviewed articles, the drivers are COVID-19, technology, customer expectation and innovation and the key challenges are the process, people and the culture. The most important is the people mindset and the process.

Authour	drivers
Osmundsen et al. (2018)	customer behaviour and expectations, changing business landscape and digital shifts
Gulati et al., 2020	Softskills
Heilala et al.,(2020)	technology trends ,customer demands, industry pressure, policy and regulatory factor
Nachi et al.,(2021)	technological infrastructure and skilled work force,management support, financial readiness,customer readiness, governance ,policies
Safadi (2021)	data analytics technology maturity, the customer-centricity, the business capabilities, and the organization's culture
Boston Consulting (2022)	leadership, technology , agile governance, talented people and integrated strategy
LaBerge et.al.(2020) and Amankwah-Amoah et.al.(2021)	Covid-19

Figure 69 -Consolidated list of drivers from literature review.

Build on positive people and organizational skills to reduce the impact of the negative barriers of competition, ROI, lack of strategy, unsupportive staff, collaboration challenges, security and governance.

Based on the survey response more than 70 % of the people are willing to learn new skills, get feedback and improve and adopt new culture in order to transform and implement digital transformation. They are eager to experiment and then scale production . This is inline with the literature review where organizations are using different models to experiment then scale up to production using various models like digital factory ,OKR, Agile change management etc.

Frameworks, models, and roadmaps reviewed through this literature review provided varied options for the SMEs for their digital transformation. Simple framework and models like Two Prong approach, Digital factory, Agile change management, OKR for digital journey are effective models. It requires good leadership capabilities to achieve the small goals in incremental journey. Each framework, model and roadmap reviewed in this article are unique and does not fit into one-size fits all concept. Although not all activities identified are relevant for every organization's digital transformation, different organizations create a path to digital transformation through different variants and combinations of these activities.

Identifying digital transformation implementation gaps can be achieved by building a roadmap to envision the company's vision and begin the transformation journey using any of the models and framework. Embracing digital transformation doesn't have to be a struggle—nor does it have to end in disaster. Incorporating new technologies as part of

your company's continued success is possible with a well-developed digital strategy that engages your entire organization and prioritizes communication, clarity, and steady, measurable, and achievable progress. Before embarking on the journey SME ICT provider need to assess current digital readiness state, goals, vision, required capabilities and then decide on their own framework or adopt any of the existing framework that suits their organization. For some organizations, the transformation gap is a conflict, but for others, it's an opportunity. It all depends on an openness to change. For accomplishing digital transformation, organizations must provide a supportive work environment and agile digital culture and ensure the quality of life at work is maintained at the workplace. All these challenges can be transformed into steppingstones under the guidance of a good leader using a roadmap and strategic approach by building dynamic capabilities and talented pool of communities to build new business models and strive in the market. This study also contributes to practice, and managers would benefit from this review. The analysis and discussions of different findings shed light on the challenges, gaps, framework, implementation factors and implications of digital transformation, which many organizations face today or are likely to face in the near future.

5.2 Discussion of Research Question

The analysis outcomes presented in the previous chapter provide an overall perspective of the SME ICT service provider's challenges in digital transformation. It also provides a generational comparison between the outcomes from the survey questionnaires and literature review. This chapter provides an in-depth discussion of the results along with the limitations of this study and suggested future research.

The findings show people are willing to learn, adopt , share knowledge , and experiment and scale . The trend that arose from the findings was providing leadership support and considering workers' needs and challenges to increase work satisfaction and improve business performance by providing better work culture. Communicate organization vision to each and every employee and build a supportive and co-operative teamwork with shared responsibility and knowledge. Organizations are also willing to experiment and scale as per business needs. One of the key components to drive digital transformation is found to be People centric skills(soft skills ,mentoring, teamwork ,empathy) and organizational related skills (adaptability, strategic planning, communication).

The main objective of this study is to attempt to contribute to the literature and the experience on digital transformation challenges of SME ICT service provider. Though various models and frameworks are used by organizations in the industry , there is no fixed format, or one size fit all framework or model for successful digital transformation. The contribution to this study is to attempt to analyze and find the positive and negative barriers and drivers of digital transformation. Findings from previous chapter show that people centric skills and organizational skills are essential for successful digital transformation. This study has future scope that can be fine grained to find how much or how identified barriers and drivers (people centric and organization related) can reduce the negative or positive relationship coefficient with one another for successful digital transformation for SME ICT service providers. It has future scope to derive the formula for successful digital transformation , to model a new framework based on the identified drivers and barriers.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

This study was to find the barriers faced by SME ICT service providers in their digital transformation journey. The study was conducted in 2 phases . First phase through literature review. Summary of the findings on the literature review on various frameworks , models , barriers and drivers of digital transformation for SME ICT service providers shared in chapter 2 . Summary of the literature review findings are shared in chapter 5. The second phase is survey SME ICT service providers to get feel the original heartbeat. The third phase is comparing the survey results with the literature review data. The comparison is done in chapter 5 under discussion of results. Literature review also emphasizes non-technical people and process related skills as challenges faced by SME ICT service providers in digitization (refer to Fig 66).

Chapter 4 (Results) highlighted the importance of people centric skills and organization related skills for SME ICT service providers digital transformation journey. Positive correlation occurs when two variables move in the same direction; as one increases, so do the other. The results show that positive correlation exists between ROI, leadership & cultural issues ,security, governance, supportive staff and collaboration challenges. This iterates that when there is better collaboration , with support work culture and leadership, it will have better results on ROI and governance. It has a positive impact on digital

transformation journey. Insufficient skills have mild positive impact on all identified barriers . It proves that unskilled staff may delay the transformation.

Vision and strategy and competition have positive correlation . It shows that clear vision and strategy are required to compete and succeed in digital transformation.

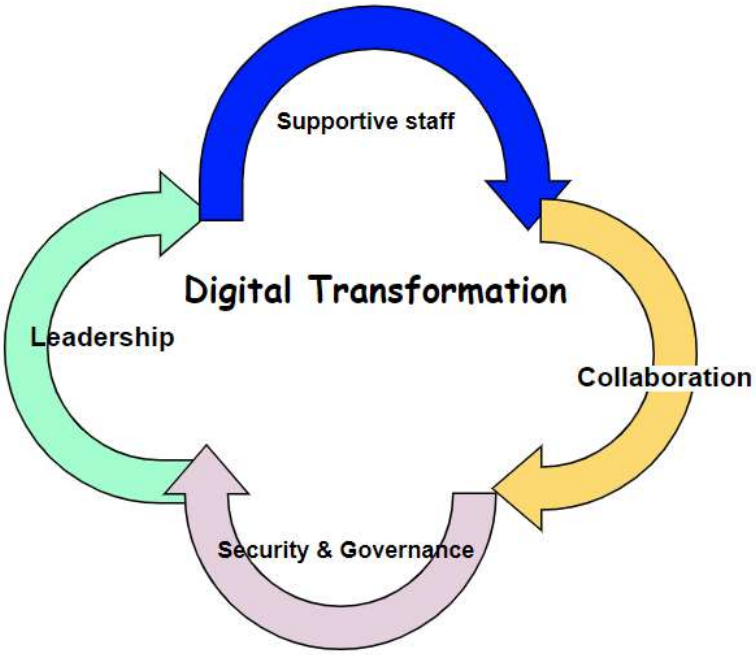


Figure 70 -Summary of Findings (Positive co-relationship of Digital transformation barriers)

Based on reviewed articles, the drivers are COVID-19, technology, customer expectation and innovation and the key challenges are the process, people and the culture (refer to Figure 69). Survey results show positive Correlation exiting between the various skillsets considered as drivers , that are required for digital transformation (refer to Figure

59). Positive co-relation between mentoring, teamwork, skillsets, decision making, empathy, willingness to learn, communication, strategic planning and adaptability.
A positive relationship exists between strategic planning, organizational skills, adaptability, honesty and integrity.

6.2 Implications

The research findings, discussions and their implications, which are particularly. important to the managers and SME ICT service providers who take the lead in the digital transformation of their organizations. The study shows positive co-relationships exist between people-centric skills and organizational-related skills. Though technology is important, it is the people, mindset and organizational skills that pave the way for successful digital transformation. The barriers related to people are identified as supportive staff, collaboration, leadership, adaptability, willingness to learn, teamwork, decision making . Barriers related to organization skills like communication, strategic planning, adaptability, integrity and honesty have positive co-relationship. Both the people's centric skills and organizational skills are important for any type of organization. When they apply the right amount in a positive way, it will lead to a successful transformation journey. SME ICT service providers may adopt any framework for their transformation journey based on their business needs, as there is no one size fits all. Whatever may be the model for the journey, the people involved must have the right amount of skill, with clear vision and clear communication, collaboration with the right leadership and strategy in place for the digital transformation success. This study emphasizes the people and process rather than the technology.

The results can encourage SME ICT service providers to be diligent in recognizing the value of their workers and the processes , who are the business drivers. Business leaders must communicate the company's vision with the working staff to align the business direction and prioritize the business areas. The study's implication is to identify positive variants of the digital transformation for the business leaders .When the identified variants are applied diligently in the right amount, it will help SME to transform smoothly for the success of the business.

6.3 Recommendations for Future Research

The research was conducted only to study the possible challenges faced by SME ICT service providers in their digital transformation journey. The study was able to identify barriers and drivers and their covariant relationship. The analysis was both qualitative and quantitative method. The quantitative method was used to test the hypothesis. The results showed several factors identified as barriers and drivers in the digital transformation journey. The results identified positive and negative relationships between identified barriers and drivers. The relationships identified were found to be people-centric and organizational skills. Further study can examine and analyze how many variations or levels of these factors can form a formula for success.

6.4 Conclusion

While further work needs to be done to identify methods for successful digital transformation, the study represents a step closer towards understanding the challenges faced by SME ICT service providers in their digital transformation journeys. The results of the author's research show the perception of SME ICT service providers' Digital Transformation challenges and their shortcomings. In reality, DT needs greater efforts to

improve business processes. The great benefits that DT brings to businesses are to help businesses gain new knowledge about customers, increase customer satisfaction, expand market opportunities, improve the process of developing new products, etc. (Mai Phuoc, D. D., & Thi Ha, D. V. , 2023).

It can be argued that it is easier for large enterprises to implement DT than SMEs because they have more resources for Digital Transformation. They face challenges in their transformation because digital transformation is not just the implementation of new technologies and tools. It is the process of adopting new technologies to modify or create new business processes, culture, and customer experience to meet the changing needs of the business. The intrinsic challenges of digital transformation can be overcome through the perspectives of business models, technology and knowledge. From a business model point of view, the challenge can be related to people, security and governance, skillsets, adaptability, mindset, leadership and strategy. The people and process are the main pillars of any form of organization apart from technology. The research also showed that people-centric and organization related skills are positive related coefficients. They are the main variants of the digital transformation journey, when applied or input into the any business model or framework in right quantity , it can transform the business into success.

Clear leadership, governance, talented people and integrated strategy with clear transformation goals are the success factors of digital transformation according to the literature review . The study hypothesizes that people-centric skills are positively related to digital transformation followed by process-centric skills. Research also identified unsupportive staff, leadership and cultural issues, insufficient skills as key people related challenges. It also identified teamwork, skillsets, decision making, empathy, willingness

to learn, communication, strategic planning and adaptability as key drivers of Digital transformation. SME ICT service providers need to communicate organization vision to the employees. They need to train the staff to learn about new technologies and provide leadership to achieve business transformation. They can adopt any business model as per their needs . But they must have a strong strategic plan, leadership, communication with supportive staff who can collaborate and willing to learn and adapt in order to sustain in market. To increase return on investment (profits), small business leaders must continuously provide formal training to their employees They should seek the necessary measures to increase factors that better toxic work culture, which is directly related to enhancing the business's performance through employee collaboration and teamwork. It iterates that for any successful digital transformation SME ICT service providers need better combination of both people and processes in place to achieve the transformation using any kind of technology.

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