CORE COMPONENTS OF DIGITAL TRANSFORMATIONS

Understanding the Principles Behind Successful Digital Transformations

By
[author's name]

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APPRECIATION

Core Components of Digital Transformations is an excellent book…..

Jane Doe

CIO, Sample Corp

***

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ACKNOWLEDGEMENT

I dedicate this book and the related research to my family for nursing me with affections and love and their dedicated partnership for success in my life. Also, to my relatives, mentor friends who shared their advice and encouragement to finish this book.

Special thanks also to everyone who participated in my surveys and in-depth interviews who willingly shared their precious time and knowledge.

In the hopes that this work may support your digital transformation to make it more successful and more sustainable and guide you through all the complexity of change management.

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FOREWORD 1

In today's context where organizations face tremendous digital opportunities that they must implement in order to maintain their competitiveness, let's welcome a book that aims to constitute a universal benchmarked framework on digital transformation.

The importance of a framework has long been proven in enterprise architecture; models like Zachman Enterprise architecture framework, The Defense and the Navy (DON) Enterprise Architecture Framework, Togaf, Cobit, to name a few, have been used as reference successfully for years. It is now time for a universally consistent and high-level framework defining the necessary components to drive an effective digital transformation journey.

This book perfectly targets digital transformation, and more specifically, the transformation brought about by disruptive technologies. What are the repercussions? Do the efforts made to implement these new technologies have a significant impact on competitive advantages? What are the effects on people? What are the essential elements to take into account to avoid pitfalls?

Rather than offering us a list of numbers, statistics and collated data, this book provides us with the information rigorously produced from the results of in-

depth research. The research methodology used was seriously followed, giving a status of reliability to the information deduced.

Throughout the book, the author presents the reflections found during his readings and puts them in relation with the results of the research to confront the essential elements defined by the existing frameworks, and more particularly with the first version of the author's framework; the Transformation Eco Systems (TESy). Highlighting research findings with the author's readings allows us to learn and understand these findings in their historical and contemporary context.

Ultimately, the initial TESy reference model is revised to develop a solid and complete digital transformation framework. Any organisation that embarks on a transformational process should equip itself with such a foundation to guide them.

I am honoured to have participated in this research and had the opportunity of sharing ideas directly with the author. I have learned much from the reading of this book, and I highly recommend the TESy framework to anyone engaging in a digital transformational journey.

Chantal Paquin, BRP Enterprise Architect, 2021

FOREWORD 2

I first met Helmut in early 2019 when we both worked in Accenture. Having struck an initial friendship and collaboration on many occasions, I have seen first-hand the values and benefits that Helmut brings with his approach to handling complex business problems and the benefit of having a holistic framework with constructs that drive transformative change.

Helmut's book has particularly resonated with me. I have worked as a programme and project manager for many years in some of the world's most influential and respected organisations. It is very clear to understand why large scale transformations do not succeed, and there is rarely just one reason.

While many publications out there discuss how to avoid pitfalls and recommendations that we use particular methodologies, and not to mention the plethora of cloud-based project management tools that seem to appear every few months, this is different. This book is not just a collection of quotations, ideologies and suggestions.

However, it presents a clear path with the necessary building blocks to craft your organisation's journey in an ever-changing environment successfully. In addition, a significant amount of research and inputs have been brought together to reinforce the TESy framework. I am confident that the reader will take this

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information and work with your organisation to understand the framework's benefits and apply them.

Marc Glen, Business Transformation Manager

FOREWORD 3

With my background as an IT manager and project manager in service management, I can only confirm that consistent questioning and implementation are generally required. The somewhat more than two decades "ITIL® Revolution" have more or less fizzled out; The technology-driven areas/departments are technically mature but have not gained much in terms of professionalism from the point of view of processes and organisational maturity.

With Service Brokerage, a product was created for the improved management of many individual services and their providers behind them. The breakthrough of this idea is delayed by a lack of acceptance, characterised by the disruptive questioning of guarantees of existence and the lack of suitable methods for implementation.

Along with this development, the digital transformation is also and above all changing technological areas. But what is a digital transformation? And above all - how can such processes be designed in terms of principles?

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After excitingly reading your work, I concluded that TESy is a framework that is guaranteed to be practical. Chapter 2 shows, among other things, the power of disruptive technologies such as blockchain, the Internet of Things and others. For me, the effects on the organisations are much more exciting. However, there is still a pinch in practice if it is about real and effective redesigns. An image rarely develops into organisational formats or a digital strategy with the necessary components such as knowledge, technologies or partners. Not to mention effective digital products, even if lighthouse projects suggest a different trend.

Suppose Europe wants to keep pace with its "old economy" developments, which is still widespread. In that case, TESy is ideally suited to consider all aspects of digital transformations in projects and processes. TESy extends the classic organisational triangle with strategy, partners and networks, risk management, regulatory requirements, and laws.

Mr Schindlwick's finding in Chapter 3, that currently, no known framework is suitable for disruptive changes, for digital transformations, does not cover all facets to be taken into account, corresponds with my experience. Whether it ITIL®, IT4IT, SIAM or others, TESy seems more comprehensive, well-thought-out, and groundbreaking to me. If I highlight the weaknesses of the approaches mentioned, your TESy model turns out to be a guide for transformation projects. My focus is on the areas of "Enterprise Architecture" and "Organisation". Without ignoring the other three focal points, those mentioned above open up the potential for successful projects.

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TESy must become the standard in the consulting industry. In particular, with the addition of the "Culture" area and the associated sub-components, the framework compensates for gaps in the existing methods. The inclusion of existing frameworks can, in turn, be an enriching method.

It takes a lot of attention and a significant breakthrough from TESy. But, used consistently, it can help overcome typical mental limits and accompany spectacularly disruptive transformations with a successful outcome, which corresponds to a digital perspective.

I wish you this breakthrough, TESy the recognition it needs, and users the necessary implementation success.

Peter Bergmann, CEO, ellata München Gmbh

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FOREWORD 4

In 2015 during my time in the United Kingdom, I started learning and building new concepts based on best-practice frameworks. Frameworks like Zachman, POLDAT and ITIL influenced me quite heavily. Whenever I am analysing complex structures or systems, I work with a framework. On the one hand, it provides me structure and guidelines, so I am not missing any potential blind spots. However, on the other hand, it makes the outcoming of the analysis more sustainable, and people better understand where I am coming from.

My consulting experience in digital transformation and my life-long learning focus led to the TESy-Framework described in this book. During my recent research with over 1.150 survey participants and 12 interview partners, I updated and enriched the Transformation Eco System (TESy) Framework. This book also provides guidance on how to better perform in transformational situations.

I am very grateful to publish my personal best practice approaches and hope you can benefit in the same way as I have done.

Helmut Schindlwick, Chief Information Officer, BBU GbmH

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PREFACE

In the last three decades, disruptive technology has shown enormous potential to improve the economics of various business processes. Examples of disrupted business process improvements include improved workflow, higher productivity, speeded up supply chain processes, and back-office transformation.

Technology disruption is defined as the advent of a new or existing technology that is created and/or used in a manner that renders the incumbent obsolete over the decades or years. Most value network disruptions or market disruptions are attributed to the business model rather than the technology itself, resulting in new markets.

An example of technology disruption relates to the invention of the personal computer. Chen and Bellavitis (2020) reported that by the time IBM joined the computing market in the 1970s, computer technology was not a new concept. However, IBM disrupted the computing market for main-frame computers and typewriters by developing high-quality in-breed designs enabling personal computer experience. Such a disruption also brought the computer to the masses. Subsequent ripples triggered by IBM created new markets and transformed

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communication. Today, the personal computer has primarily been disrupted by smartphones, tablets, and laptop markets.

Recent research has further elaborated technology disruptions in the light of low-end technology disruption. Low-end disruption occurs when a competitor enters a market at the low end through an improved business model, such as competing costs due to enhanced efficiencies. In the process of this disruption, there is an enhanced margin for an organisation. As a result, dominating businesses are influenced to leave the lower end of the market since it is the least profitable. A key example of such technological innovation was Toyota in the 1960s, which entered the market with basic, cheap, and low margin cars - a market segment neglected by General Motors. In the subsequent decade, Toyota moved up the market, taking over General Motors market share since they provided efficient products at lower costs. In the last decade, low-end disruption has affected Toyota with significant competition from companies such as Kia and Hyundai.

In addition to enhancing organizational productivity, Ritala et al. (2021) reported that disruptive technologies had triggered substantial differences in cost and quality. For example, a 2020 survey on the state of the Internet of Things (IoT) showed that 49% of the business leaders perceived technology to be a key driver of business productivity. Such enhanced productivity includes improved employee efficiency, meeting tight deadlines, and improved restructuring of supply-chain

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operations. In the future, technology disruption is projected to play a central part in shaping company operations, including flattening traditional hierarchical structures by increasing top management visibility, making them readily accessible.

Under the above considerations, it may be noted that the fast-paced development orientation of disrupted digital technologies has transformed the operational functionalities of businesses to a great extent. However, critics argue that digital technologies have exacerbated the survival and maintenance of competitive advantage to organisations. For example, Sibanda et al. (2020) reported that the ever-increasing focus on business efficiencies has led to the stagnation of most companies in America and Japan. Such stagnation may be attributed to the extended time horizon of developing disruptive technologies prompting businesses to reinvent in efficiency gains since they are considered to have the highest internal rate of return. Sibanda et al. (2020) added that continual re-investment in efficiency gains is to blame for stagnating company growth in Japan and the United States, rather than disruptive technologies.

Moreover, the prevalence of digital disruption is attributed to the new market entrants who prefer to opt for highly advanced digital solutions, which fosters product or service innovation, functional creativity, and efficient utilisation of resources. Brennan et al. (2019) also identified the transition of most businesses

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to digitally supported tools and interventions confirming the replacement of conventional business concepts and practices. Internationally, many globally recognised businesses like Uber, Airbnb and Facebook have revamped their business models through immersing artificially intelligent applications and embedded intelligence into their operations. In adherence with the market's modern trends, this has undoubtedly facilitated improved interaction, connectivity, and decision-making abilities.

In the last decade, policymakers and organisational strategists have been extensively inclined to enhance their organisations' capacity to adapt to the innovative disrupted technologies to keep pace with the current wave of technological emergence. This adoption is deemed necessary for the organisation's incremental progress, especially concerning humans' replacement with robots and artificially intelligent machines and software. From a literary perspective, several studies are highlighting the trials of disruptive technologies.

For instance, Christensen et al. (2018) identified that effective implementation of disruptive technologies requires the organisation to understand its context. It also requires ensuring a reliable development and comprehension of interconnections among the stakeholders, systems, related processes, and all the associated services.

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Gartner (2020) argued that adapting to disruptive technologies is the key to survival for businesses unleashing new opportunities in the next five to ten years. Shaw and Sui (2020) backed findings by Gartner (2019b) and further categorised Disrupted Technologies (DT) into two classes that included human-centric technologies and smart space. Human-centric technologies are further identified as a critical construct for lifestyle disruptions.

Moreover, human-centric approaches help organisations increase employees' capacity to take over different roles and hence be enabled to find solutions to organisational problems. On the contrary, smart space was conceptualised as a physical environment that facilitated coordination, connection, and openness while developing an intelligent eco-system urging seamless interaction that is immersive and automated.

Digitisation of disrupted technologies seems critical for organisations, hampering businesses' need to grasp an in-depth understanding of these technologies' application and utility and get an idea about the key influencers and determinants. Although Blockchain, Artificial Intelligence (AI), and Intelligent Things are penetrating the enterprise, organisations are still likely to face challenges in providing contributions solutions. According to Gartner, “A dozen other emerging technology trends are destined to improve trend sensing over the next five years”. However, it is ascertained that more technologies like 4D Printing, 5G,

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Autonomous vehicles, Cloud and Edge Computing will surface. Continuous adaptive risk and trust (CARTA), Conversational platforms, Dark data and Digital Twins will disrupt the industries and organisations.

According to Gartner (2019b), “Gartner Hype Cycle for Emerging Technologies and related technologies are more likely to provide “superhuman capabilities”, highlighting the importance of Artificial Intelligence (AI).

Insights by Gartner (2020) emphasize that the persistent progression of innovation and creativity based technological interventions encompass a potential to disrupt the status quo, reorganise the organisational values and identify their value pools, respectively. Furthermore, Kotarba (2018) argued that blockchain, artificial intelligence (AI) and the internet of things (IoT) could trigger changes in social patterns while influencing consumer behaviours, justifying the due importance and vitality of digital disruption. Despite these technological innovations, however, there is a lack of consensus in the extant body of literature among practitioners and scholars over designing a benchmarked digital transformation framework for businesses. As a result, there are challenges in streamlining businesses' digital transformation, further making it difficult to adhere to their envisioned organizational goals.

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Considering the lack of a uniform implementation framework, both commercial and government-based entities must commit resources to understand the scope of these technologies. In the process, advanced knowledge and understanding will enable them to prepare themselves to address the modern market needs and develop such skills and capacities, which are deemed vital digital transformation constructs.

This book aims to understand the mechanism of disruptive technologies' impact on organisations and industries in the European Union. Further, it elaborates the necessary components for designing an effective digital transformation strategy.

It also identifies the knowledge gap in the extant literature on digital transformation and disruptive technology. Based on an extensive search of past studies on the topic, this book has identified three key research gaps that inform the basis of this book.

First, the literary research lacks any consistent and high-level framework that can guide the organisations to implement disruptive technologies effectively to keep pace with the fast-changing technological paradigms.

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Second, the level of uncertainty for disruptive technologies' success is high. Consequently, no consistent framework has been developed to help the organisations kickstart their transformational journey.

Third, the impact of disruptive technologies on the operational and functional aspects of businesses and industries followed by the inter-dependent influencers has not been stated.

Specifically, the present study explores disruptive technologies and their implementation frameworks across organisations and industries, providing a comprehensive digital transformation framework that allows for successful organisational transformations.

Considering this rationale, this study aims to analyse multiple academic and consulting digital transformation frameworks to identify and collect relevant factors for a successful digital transformation. This research will explore various frameworks for digital transformation from different angles and rate them according to their field of expertise. Some frameworks have been focused on strategy, some on organisation and processes and others concentrate on people.

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This research will merge and further examine these frameworks and adopt the existing Framework called Transformation Eco System (TESy) to suit the broader digital transformation requirements. TESy guides every organisation when planning digital transformation or implementing disruptive technology. A more detailed description of the research, its philosophy, design and strategies can be found in Chapter 06, “About the Research”.

INVESTIGATING DISRUPTIVE TECHNOLOGIES AND THEIR IMPLEMENTATION FRAMEWORKS

This book investigates disruptive technologies and their implementation frameworks across organisations and industries. It provides a comprehensive digital transformation framework that could facilitate successful organisational transformation. It digs deep before extending the discussion to draw general conclusions. Next, the book recounts some details on digital transformation and its combination with emerging/disruptive technologies. Finally, it identifies transformational components that organisations need to consider when implementing and adopting emerging technology.

It discusses the limitations of existing implementation frameworks for digital transformation and introduces a new framework. Also, this book contributes to disruptive technologies, technological transformation, and digitisation by providing

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a base for future research to expand their research scope and enrich the contributions in this field.

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CHAPTER 1

DIGITAL TRANSFORMATION

The Transformation Eco System (TESy) Framework was first proposed by Helmut Schindlwick in 2017 and forms the conceptual model on which this book and his further research are based. To fully understand the TESy Framework, we must first look back upon the last two decades and see how researches have attempted to formulate a potential framework that may be used to help organisations achieve a seamless digital transformation process.

Today, there seems to be a rift between industry insiders and influencers regarding the crucial elements or processes companies should adopt to realise a successful digital transformation experience.

As we move deeper into the age of Artificial Intelligence, a key challenge among business leaders in the global tech industry will be implementing AI in their firm's operations. To effectively support business operations, Brock et al. (2019)

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recommended that companies should adopt a digital transformation framework anchored on seven major constructs. These include being grounded, agility, teamwork, intelligence, data-focus, and leadership.

Schallmo et al. (2019) also noted the lack of a clear digital transformation framework in organisations. He reported that successful digital transformation comes from implementing best practices such as problem identification, objective formulation, and solution creation. The process is then facilitated by enablers such as access to digital data, automation, customer access, and networking. In addition, companies in the implementation phase should consider partners, project scope, management, knowledge, and employees.

While their research on digital transformation has been invaluable, insights drawn from studies by Brock et al. and Schallmo et al. do not provide a standard integrated framework that any organisation can implement. As a result, it is challenging to create a single framework that managers may rely on to achieve their transformation agenda.

The works of other experts in the field are equally devoid of a framework that can be applied to any company in the industry. For example, Correani et al. (2020) recommended that successful digital transformation be anchored on technology,

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leadership, resource allocation, knowledge creation, and competence. By contrast, Del Rowe (2017) suggested an effective strategy to formulate networks, demand, competition, organisational goals, and continuous learning. In addition, Hausberg et al. (2018) cautioned that a successful digital transformation model focuses on multiple factors and components rather than a limited number of variables such as people, organisation, objective, resources, and knowledge. Therefore, these literary findings confirm the current challenge that organisations encounter with the lack of a universal digital transformation framework; this is where TESy comes in.

> **Research Result:** The Top 10 Frameworks with their strengths & weaknesses against the TESy-Framework can be seen in Appendix E of this book or more detailed at the website https://tesy-framework.com

To overcome the challenges of identifying an effective and unified digital transformation framework, Schindlwick (2017) constructed the Transformation Eco System (TESy) Framework. It has become a fundamental model through which organisations are achieving successful digital transformation.

Figure 1 presents the TESy Framework: to understand the digital transformation process in organisations from a holistic point of view.

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UNDERSTANDING THE TESY FRAMEWORK

The TESy Framework consists of five main components and 29 sub-components. The five main components include organisation, relationship, transition, enterprise architecture, and external factors.

THE FIVE MAIN COMPONENTS

Here is what each of the five main components encompasses:

1. The **organisation** component includes nine aspects: people, process, policy, knowledge, management system, technology, service/product, data, and information. The organisation represents a company where the process of digital transformation takes place. In this case, a group of people form a business or company to achieve a particular aim.

2. The **relationship** component entails three constructs, namely vendor, partner, and customer. The relationship aspect demonstrates the existing association between business and external parties or stakeholders who might be essential for the transformation.

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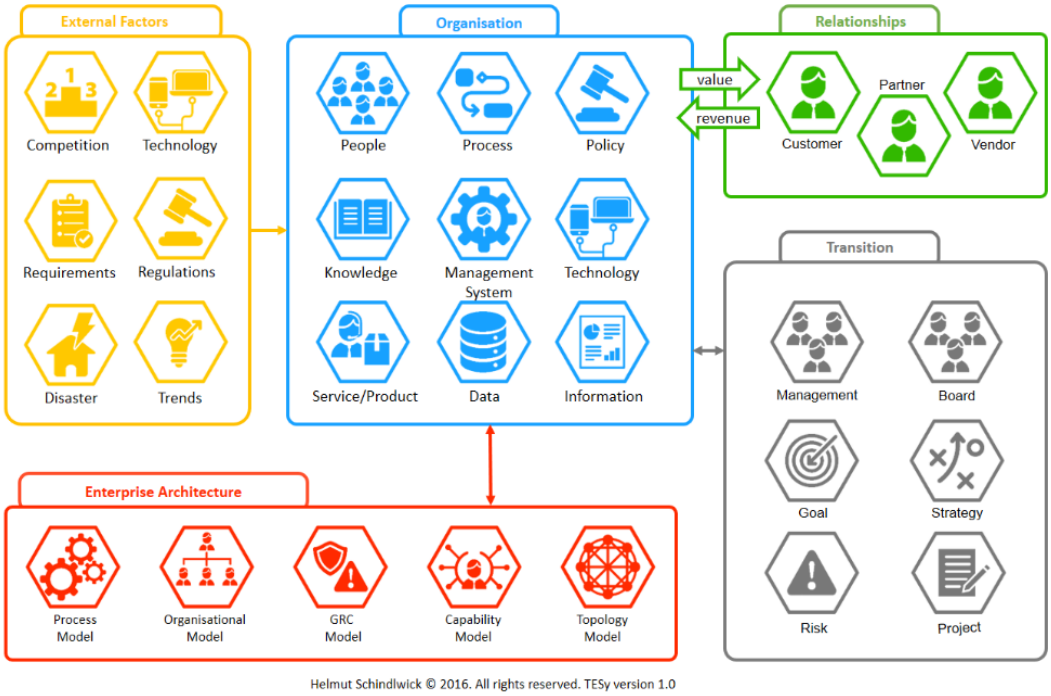


Figure 1: TESy Framework – Complete Overview (Schindlwick, 2017)

3. The **transition** component entails six factors: project, risk, strategy, board, and management. The transition is outside the organisation component since the same transformation parties work across different organisations. The digital transformation phase may be considered a project or an ongoing initiative.

4. The **enterprise architecture** consists of five constructs: the technology model, capability model, GRC model, Organisational model, and Process model. The architecture consists of different models needed to understand AS-IS and the TO-BE scenarios for a successful transition. The models are primarily considered as graphical representations in digital transformation.

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5. **External factors** constitute five issues: technology, competition, requirements, regulations, disasters, and trends. The external factors are outside an organisation, and they influence a company externally. Therefore, managers need to find ways of monitoring and minimising the negative impacts of external factors to find niches or potential areas to secure and expand their market position.

In this book, the 5-component TESy Framework and its 29 sub-components will form the basis for understanding the digital transformation process in organisations and companies. In short, the digital transformation framework consists of a blueprint for how organisations move through a period of significant change due to evolving technological processes. Therefore, an organisation's framework is a tool to guide its entire transformation and implementation journey effectively. Furthermore, a framework tool ensures that no areas of business operation are left unattended during the digital transformation phase.

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THE NEED FOR DIGITAL TRANSFORMATION

Disruptive innovation can be described as a force that sweeps aside existing technology and business models to make way for newer ideas. Prof. Christensen (Christensen, 2013) postulates that organisations often fail because leaders stand in the way of disruptive technologies that ultimately steal their market. Yet, as seen in the digital transformation timeline, technological change has continued to occur

over the decades.

On the one hand, technological changes happen faster. On the other hand, it is not only about technological changes anymore. It's crucial to note that digital transformation is not monolithic. There are four types of digital transformation: business process, business model, domain, and cultural/organisational. Within the "Framework for Transformation", Diana et al. (2012) make a similar observation that the transformation process steps are not holistic or strategic but scattershot and isolated.

Digitalisation and disrupted technologies foster a learning culture consisting of a community of workers instilled with a "growth mindset". As a result, people not only want to learn and apply what they have learned to help their organisation, but they also feel compelled to share their knowledge with others.

Unfortunately, 50% of all employees will need reskilling by 2025 as the adoption of technology increases, according to the World Economic Forum's Future of Jobs Report. The Digital Learning Transformation Framework (DLTF) provides a generic and flexible framework applicable to various traditional learning systems. It can help in seamless transformation decisions and execution. Other frameworks suggest incentivising and fostering capability building, cumulative learning, and

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seeing learning and experimenting as key to coping with change.

In the digitalisation of the organisation, the line between learning/training and working gets blurry as workers are always online, and physical learning gets less relevant. Development Training services for the transforming organisation have been suggested for developing employees and promoting data-supported learning and decision making. When starting a transformation, the organisation must ensure that people have the right skills and capabilities to handle future tasks.

Although it sounds logical, digital training needs to be delivered digitally through the COVID-19 crisis. Cooper (2021) explained that some organisations had experienced this move painfully as they had to switch to an online teaching methodology without being properly prepared for it. However, those companies that had already begun to offer online employee training found the early days of upheaval brought on by the pandemic easier to weather.

Digital transformation frameworks offer various ways of measuring competence, skill, and talent. For example, the DT success Framework builds a solid foundation of different ways to achieve success like value, skills, goal integration, and outcome. To take advantage of digital transformation, stakeholders will be interested in positioning the right people and assets in the proper positions to

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obtain optimal results.

Gap-Map also shows a considerable impact on employee competence with focused transformation training. For example, one survey demonstrated that over 85% of staff were initially unaware of the implications of digital transformation.

An organisation relies on smart, creative employees with a digital boundary spanning skillset for successful digital transformation. Partnering fresh digital talent with experience and stimulation from outside the organisation can boost its creativity and innovation. Having a looking-in view from the outside is also an integral part of competency fields (legacy-, shared- and emerging competencies) as most of the competencies remain relevant across the industries.

The digital bank competency framework describes competencies applicable to other sectors as well. Kreitstshtein (2017) suggested that organisations review their "digital readiness" to understand the current state and determine its learning and development programmes. There is a significant increase in new digital and IT positions in digitally maturing companies compared to less mature ones. This suggests that these firms have focused on building the skill set necessary to promote internal change and support cultural change.

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IS DIGITAL TRANSFORMATION (DT) A NEW INVENTION?

Digital transformation comprises three levels, including digital competence as general skills and attitudes. Digital usage is the application of digital competence within a specific context, and digital transformation is achieved when digital usage enables innovation and creativity, stimulating individuals or organisations. Although the TESy Framework is referencing COBIT and their process, "APO07.03 Maintain the skills and competencies of personnel and is making the point that a skilled workforce is costly, but how much would an unskilled workforce cost an organisation?

As part of the Digital Transformation Survey 2020 of this book research and the question of what the significant pitfalls were during their recent transformation project, they responded as follows:

- Insufficient knowledge and experience by the user
- Inadequate time to learn during the transformation

Therefore, training and education are needed upfront of the transformation to address the lack of specialised knowledge so that companies can digitally transform a legacy infrastructure.

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The complete survey results can be seen at https://tesy-framework.com

Also, Kreitstshtein (2017) analysed the workforce's digital transformation and referred to a trend amongst SMOs (Small Medium Organisations) in the technology sector where employees seek greater autonomy, flexibility, and challenging project expectations short-term contracts. By not recognising such a trend, an organisation will fail to attract young talents and therefore miss the required knowledge for their digital transformation.

Sahu et al. (2018) suggest in their study that trend analytics improve customer segmentation, empower organisations with improved insights and showcase customer engagement patterns. Therefore, watching and analysing trends is an essential task for an organisation. As Lindberg and Hemvik (2015) pointed out in their framework, business opportunities will be generated out of " intended business impact" and " innovation strategy".

The sub-component "Technology (Ex)" as an external factor in the TESy Framework is not meant to be the implementation model that the organisation uses. Instead, it is intended to be seen as a driver for transformation. Diana et al. (2012) identified four critical areas of technology that drive changes in ' 'today's enterprises and create a perfect storm of innovation; Big Data, social media,

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Mobility, and Cloud Computing. Technology as an external factor changes at an immense breakneck speed. Riccio (2016) and Levin (2018) pointed out that 'today's technology is not tomorrow's technology.' Constant transformation means that organisations must always focus on staying relevant in their ability to look outside themselves and assess new occurrences within the external environment.

When planning a digital transformation, an assessment of relevant technology should be the first driver to consider. Riccio (2016) reported the need for organisations to identify suitable technology as a priority approach. However, some researchers have expressed reservations that the best-practice frameworks will do little for other aspects of the business which are equally in need of innovation.

Nevertheless, change is indispensable, and many organisations, such as the insurance industry, find that their long-standing technology architectures create significant barriers. According to Trussel et al. (2016), 37% of the surveyed organisations reported that their legacy technology infrastructure and systems have largely slowed their change initiatives. Furthermore, Trussel elaborated that most organisations focus on the processes and technology while underestimating the people requirement in terms of skills development and knowledge acquisition for their employees.

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CHAPTER 2

To fully understand the history of digital transformation, we have to go back to its origin in the 1940s. Elwood Shannon conducted one of the earliest known pieces of research on digital communication and information in his 1928 article "A Mathematical Theory of Communication."

THE ORIGIN OF MICROSHIPS AND SEMICONDUCTORS

In the 1950s, the microchip and the semiconductor transistor were invented, transforming analogue computing into digital computing. These technologies are still used today. For example, John Bardeen (1908-1991), William Bradford Shockley (1910-1989), and Walter Houser Brattain (1902-1987) won the Nobel Prize in Physics in 1956 "for their researches on semiconductors and their discovery of the transistor effect." In the 1960s, Gorden Moore theorised that computing power doubles once about every year. Today, Moore's Law still acts as a guide to innovations that increase the scope and reach of digitisation.

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THE EMERGENCE OF DISRUPTIVE TECHNOLOGIES

The 1970s and 1980s focused largely on technological development; the first home computers merged during this time. For example, in 1978, the classic Space Invaders was invented, triggering the golden age of digital arcade video games. Further, data entry jobs helped convert analogue records into digital media. In the 1980s, the World Wide Web (www) was invented, and automation affected the labour market. By the end of the 20th century, the worldwide web was an integral part of global culture. Since 2010, digital transformation has dominated business strategy and is a critical source of growth for many organisations.

The Harvard Business Review has reported that half of the S&P 500 companies would be replaced by digital technologies in the next decade. Furthermore, Gartner predicts that in 2021, 20% of all activities an individual engages in will involve at least one of the top seven digital giants. Hence some of the researched frameworks have been replicated by looking at the leading digital giants in the industry.

The International Data Corporation (IDC) once predicted that worldwide spending on digital transformation would reach USD 2.3 Trillion in 2023. Digital transformation spending is expected to steadily expand throughout the 2019-2023 forecasted period, achieving a five-year compound annual growth rate of 17.1%. Throughout this timeline, an organisation that does not successfully adopt the

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transformation from analogue to digital will struggle to remain market competitive, as outlined in the S&P 500 sample before. It's important to understand that the disruption caused by digital transformation is an ongoing process. New technological innovations are breaching the forefront every year, and businesses must regularly adapt to compete in the industry.

Even the monetary FIAT system has been disrupted by cryptocurrencies and the blockchain technology that supports them. Although the market capitalisation of cryptocurrencies is a bit over 2.6 trillion USD, the opportunities of this new technology are promising – a decentralised financial system where everyone can get access without a middleman.

The best recent example of digital transformation in the cryptocurrency space is the Bitcoin adoption of El Salvador. It took them 40 years for 30% of El Salvadorians to get a bank account, but just ten days for about 20% to get a bitcoin account.

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DISRUPTIVE TECHNOLOGIES AND THEIR BUSINESS APPLICATIONS

Researchers have shown considerable interest in studying disruptive innovations in the last decade because they explain how firms achieve and sustain competitive advantage in markets. The study of disruptive innovations analyses different characteristics, such as the meaning of disruptive technology, technological

challenges of incumbent firms, the demand of technology, leadership effects on firms' innovative activity, and organisational networks.

Even now, the sources of disruptive innovations among different industries are uncharted territory.

Key questions that are yet to be answered include:

- What is a vital driver of disruptive innovations in firms?
- How does R&D management support the development of disruptive technologies in industries with high intensity of research investments?

Assessing disruptive technologies is vital to understanding potential contributing factors that support business competitiveness.

Types of recent Disruptive Technologies are:

- Blockchain
- The Internet of Things
- Cloud Computing
- Cybersecurity
- Artificial intelligence

Studying recent market disruptions can provide an integrative approach within the current theoretical framework of disruptive technologies that can advance existing

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understanding of the sources of disruptive innovation and related implications in creating competitive advantage.

THE FUTURE IS DECENTRALISED

Blockchain technology is one of the latest disruptive innovations that has attracted the attention of scholars and practitioners. According to Arora et al. (2018), blockchain use has grown over the last five years to become an underlying technology for cryptocurrencies such as Bitcoin and other digital financial transactions. As a result, technology enthusiasts, entrepreneurs, and developers strongly support blockchain usage considering its potential to revolutionise contemporary legal, economic, and financial transactions.

On the other hand, Sceptics argue that blockchain technology and its applications remain uncertain and ambiguous. Even so, past researches indicate a rapid growth and use of blockchain. Moreover, blockchain technology promises to improve transparency and traceability and has a massive impact on every sector relying on complex supply chains.

The Internet of things (IoT) is another potential new technology that has caused a massive disruption in organisations and companies, including telecommunications, cloud computing, and broadband or cable connections. The

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IoT constitutes intelligent connected devices at home, in the workplace, or companies with the ability to communicate over a multimodal network without human-to-computer or human-to-human involvement.

A growing body of research indicates that IoT will offer unprecedented opportunities in the future to penetrate automation and technology, with potential impact on developing new business models and capturing novel market concepts and organisational growth. Also, IoT may further improve the user experience by augmenting today's data collection techniques through sensors to collect, store, and analyse data automatically.

With advancements in hardware, wireless networking, and cloud computing, this data may be stored, analysed, and used to enhance the user experience and optimise internal systems in previously impossible ways. Furthermore, the number of sensors is projected to grow from 30 billion in 2019 to over 95 billion in 2025, with each person on the planet carrying an average of seven devices (Benzidia et al., 2021).

Thus, this explosion in the "internet things" and subsequently, the data being collected will impact significant service providers like device manufacturers, networking, and semiconductor developers and redefine organisational branding strategies and product offerings. As such, researchers and practitioners anticipate that through IoT, there will be a massive opportunity for organisations to provide a

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variety of customised services and products, with the prominent ones being home control systems, healthcare, automobiles, manufacturing, and environmental protection.

Besides blockchain and the Internet of Things, cloud computing has also emerged as a potentially disruptive technology in organisations and companies. For example, Borangiu et al. (2019) expressed that third-party suppliers could use virtualisation technologies to create and distribute computing resources to customers on-demand via the Internet browser in cloud computing. Thus, cloud computing steadily replaces more rigid software and services licensing models in small/medium businesses (SMB) and enterprises in most organisations.

For example, cloud computing has replaced existing software and service licensing business models in the last five years because of its scalability, flexibility, and utility-based pricing (Cooper, 2021). Therefore, cloud computing as innovation enables less-skilled and less-wealthy individuals to receive similar utility as more-skilled, and more-wealthy intermediaries could formerly attain.

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THE AI REVOLUTION

Artificial intelligence (AI) has also emerged as a powerfully disruptive technology in cloud computing, blockchain, and IoT. Researchers have defined AI as a symptom of the Fourth Industrial Revolution. Experts are already calling Artificial Intelligence the most important of several disruptive technologies, with crucial

artificial narrow intelligence, artificial general intelligence, and artificial superintelligence.

- Artificial narrow intelligence includes robots and comparable substitutes performing particular tasks.
- Artificial general intelligence focuses on applying AI to emulate human capabilities and intelligence.
- Finally, artificial superintelligence is considered a futuristic technology whereby AI mechanisms will be created and developed to be superior to human intelligence.

Several AI subfields have been identified, including machine learning and subdivisions such as deep mind and deep learning, facial recognition, robotics, natural learning progression, and artificial neural networks (Correani et al., 2020; Gartner, 2019b).

Over the years, the various disruptive technologies such as blockchain, artificial intelligence, the Internet of things, and cloud computing have offered fundamental improvements to traditional business models, mainly transforming entire industries and leading to growth drivers.

Web-based enterprises, Decentralised Autonomous Organisation (DAO) that leverage digital infrastructure can enter markets quickly and move with agility in

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the new digital economy. To stay on top of rapid and sometimes radical change, managers should know how to position their organisation to take advantage of these new technologies and track and combat new and sophisticated security threats. Growing insights from current literature shows that disruption may be driven by several factors, of which five specific dimensions can be identified:

- ***Cost*** – new technologies and processes make old ones uncompetitive in terms of production cost, as the new ones are so cheap that old ones become unprofitable,
- ***Quality*** – new technologies and processes raise the quality of products or services to a level that makes the old ones uncompetitive,
- ***Customers*** – significant changes in consumer or business customer preferences make previous products or services unattractive relative to new ones,
- ***Regulation*** – new laws or regulations no longer permit old ways of working, for example, environmental or labour protection regulations designed to improve social conditions, and
- ***Resources*** – previously significant resources are no longer readily available for various reasons ranging from the exhaustion of natural resources to trade blockades.

Blockchain, AI, IoT, and cloud computing give rise to new cybersecurity threats despite the positive impact of disrupting business operations. In the last decade, disruptive technology has caused a significant increase in the number of

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cybersecurity threats experienced globally. For example, according to the Wipro Information Technology and Security Company, a 53.6% increase in the number of records stolen globally from 2015 was due to cybersecurity domain disruptions.

A recent security threat was reported at the Colonial Pipeline, an American oil pipeline system, where ransomware hackers disrupted the pipeline's computerised equipment. Business leaders need to be aware of such disruptive technologies since most technology disruptions are susceptible to exploitation. For example, IoT devices have a low processing footprint and memories with minimal security capabilities, including security patching. As a result, such devices are easy targets for hackers, allowing them to create custom malware to take total control and use them as a base for cyber-attacks.

IMPACT ON ORGANIZATION/INDUSTRY

The impact of disruptive technology on an organisation is often multi-faceted and hard to pin down. Although disruption functions as a driver of change across many business disciplines, its effects are pervasive, requiring firms to invest differently, act bravely and adapt their corporate cultures.

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TRANSFORMATION PROJECT AND ORGANIZATIONAL DISRUPTION

Over the last two decades, multiple attempts have been made to understand the extent to which disruptive technology has impacted organisations and larger industries as a whole. Insights from research show conflicting findings on the possible association between the type of transformation project and their impact on disrupting organisations.

Benzidia et al. (2021) shared that some of the technologies such as cloud solutions, IoT, artificial intelligence, and blockchain technology have significantly ($p > 0.05$) disrupted traditional workplaces. Insights by Arora et al. (2019) also noted that blockchain technology would substantially disrupt enterprise services in the next five years. However, some researchers, such as Kumar et al. (2021) and Ritala et al. (2020), report that these technologies have not caused substantial disruption to organisations since they have not attained maturity and are still evolving.

Research Result: *Statistical analysis found that not all disruptive technologies or transformation projects are associated with organisational and/or industry impact. Instead, only the disruptive technology "Artificial Intelligence" and "Cloud Solutions" was confirmed to have an impact. By contrast, all the other disruptive technologies show no significant association in their effect on organisations and industry.*

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During the in-depth interviews (for more detail of all participants, see CHAPTER 06), Jürgen stated that "pressure from China started the innovation around service-led business model supported by new technology such as Smart Thing."

Thiagu says, "because of their digitisation approach (Cloud Computing), they can now do more work from home, especially in pandemic situations. The end-user is in different countries, but the digital transformation itself is only in India. Around ten products have been in the cloud exposing services to the customer. AI and ML are also used in the transformation of the publishing process."

Thomas sees the transformation more as an evolution rather than disruption; for example, he perceives Tesla Motors as disruptive. German car manufacturers have to integrate with 30-40 systems. Although cloud providers try to disrupt more prominent software players, replacing old market players with new ones is disruptive. Thomas added that "impact depends on company culture and the type of industry." For example, in 2019, Cloud exchange servers replaced old on-site infrastructure, a move considered a massive advantage during the pandemic a couple of months later.

Lars observed an increased focus on "using Cloud Solutions, e.g., ServiceNow, Office 365, and Hybrid data centre innovated with 5G in 2017-2019, prototypes with Edge Computing, also thinking about IoT."

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Martin emphasised using cloud solutions to make their customer more efficient and reliable in efforts to "replace analogue fax machines, GSM modems, and SMS services with a digital cloud solution."

According to Christoph, "due to COVID-19, we have been forced to switch to an online teaching methodology to pressure points; first on the security of some of the online tools (e.g., Zoom and second the switch to different technology, e.g., Discord."

These survey responses show that Artificial Intelligence and Cloud Solutions have the most significant impact on organisations and industries, but it seems that specific sectors are experiencing a different level of influence, and different generations of people experience the effects differently

COMPONENTS INFLUENCING TECHNOLOGY TRANSFORMATION

Researchers have attempted to examine the essential components likely to facilitate and influence digital technology transformation in organisations. Sibanda et al. (2020) elaborated that those diverse perceptions are related to how organisations prioritise important components for organisational changes. A total of 12 principal members for transformation has been discussed in this book. These 12 components include people, type of technology, knowledge, vendor, partner, management, strategy, project, risk, regularisation, requirement, and competition.

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Valkokari et al. (2018) shared that the success of each component depends on the type of organisation, its goals, and existing expectations. As such, all components may have a varied impact in their contribution to the transformation of an organisation.

Therefore, a study was done to determine whether there is any significant correlation between the 12 essential components (people, knowledge, vendor) and organisational transformation.

Research Result: *It has been found that 11 components significantly contribute towards organisational transformation. However, the only risk component was found not to impact the organisation and industry transformation.*

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EMPLOYEE BEHAVIOUR

A study was done to understand what business leaders and employees would do differently in their next transition when there is a technological transformation in their organisations and companies.

Research Result: *What people would do differently in their next transition significantly correlates with the transformation process. For example, if they would do differently in "Agility", "Vendor", "Competition" or "Risk", it is clear that their impact scores are significantly higher compared to other levels.*

By contrast, if they would do differently in "regularisation", "vision" or if they would "not change anything", it is clear that their impact scores are significantly lower compared to other factors.

PITFALLS FOR SUCCESSFUL DISRUPTIVE TECHNOLOGY

Some of the significant pitfalls likely to affect successful technology disruption in their respective organisations are regulation, vision, learning culture, knowledge, strategy, technology, process, management, competence, leadership, governance, and collaboration. Additional sources of pitfalls include project organisation, innovation, partnerships, requirements, agility, vendor, competition, and risks. The research was conducted to find out the mean impact ratings among individuals is different for at least one pitfall in impacting disruptive technology in organisations and industry.

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Research Result: *The results show that: if their major pitfall is "Risks", "Competition", or "Vendor", their impact scores would be significantly higher compared to other pitfalls. However, if their major pitfall is "regularisation", "strategy", or if they have not provided any feedback ("no feedback"), their impact scores are not statistically significant compared to other pitfalls.*

DEMOGRAPHIC FACTORS

The potential disruptive impact technologies have on organisations and industries has also been assessed in the light of different demographic variables. Ten possible demographic variables have been identified to understand the potential impact of disruptive technologies on organisations. These demographic variables include age, gender, industry, type of sector, project success, goals attainment, most critical issues, project management certification, role in the organisation, and country where the disruption is happening. Based on these findings, research shows that:

Research Result: *In terms of geographical location, results show that when comparing among European countries, if the primarily worked areas are "North America" or "Africa", the mean impact score seems lower than that of Europe. However, suppose the*

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primarily worked places are "Middle America", "South America", "Middle East", or "Australia". In that case, the mean impact score seems higher than that of Europe. Importantly, it should be noted that if the primarily worked location is "Asia", their mean impact score seems almost the same as that of Europe.

TYPE OF TRANSFORMATION AND PROCESS EXECUTION

The full extent of individuals' impact on an organisation's transformation remains unclear; understanding this will help identify the particular type of technology projects that lead to a higher effect on the organisation. Specifically, the focus is to examine whether organisations have different preferences for technologies such as blockchain, AI, IoT, and cloud connections. In this regard, research was conducted.

Research Result: *The type of transformation project artificial Intelligence and Smart Things is associated with how the emerging/disruptive technologies affect the current processes and how to execute operations. In contrast, all the other disruptive technologies are not associated with how the emerging/disruptive technologies affect the existing processes and how to implement strategies.*

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In this regard, Daniel stated that "when you are growing, you need digital transformation when business units are not performing well. Doing business transformation should be based on Customer Journey maps."

Jürgen advocated the need to start from strategy/vision and be business-oriented, not technology-led. Moreover, Thiagu elaborated on "focusing more on IT services in the cloud with a focus on accessibility and portability. The key focus should be on starting with As-is processes that have been in good shape."

Similar observations were shared by Almudena, who believes that if "changing one wheel of the car (IT) is not speeding you up, you need to change all four (Systemic) approaches, moving the focus from project to value streams."

Chantal believed that "for older people, it is not easy to change for older people as they have done their work in specific processes and are now changing". It is hard to pull people out of their daily work and put them into transformation projects. Very senior people are more afraid of staying in business than driving change/transformation. They started with the pre-defined business process, but it does not fit their eco-system. During Covid, they stopped and did a complete As-Is and To-Be analysis. Using the Customer and Consumer journey map to build is very complex global value chain to transform. Seven years ago, the planning of the transformation started, and for two years, the transformation project started."

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Peter shared that "it is a big change in the competence of the workforce". At the same time, Matthias indicated that "change is a question of attitude, behaviour and culture of a company. So important are smaller incremental changes and not one change every ten years."

In line with these views, Thomas observed that "with newly implemented digital solution new training is necessary new skills are needed. Self-service portals are fully digitalised but not helping the customer/consumer as they have to help themselves now."

Lars indicated that there is a need to "get into the mind of people to have innovative processes and have innovated minds, moving the analogue company to an open-minded to a learning company. In contrast, employees have smartphones tight integration with their processes."

Fernando elaborated that "in the past, there was a tendency of using process frameworks out of the books before finding out that processes getting in the way of business propositions". Thus, Fernando emphasised the need to consider a new support model for cloud infrastructure, including a new life cycle of services.

Christoph noted that "after government COVID decision we had to switch immediately to enhance the curriculum right away, but people have the perception

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that online training has lesser quality than physical training." Insights from these participants indicate that Artificial Intelligence and Smart Things seems to have the most significant impact on processes and how you execute them.

TECHNOLOGY LEADS TO COMPETITIVE ADVANTAGE

Over the last ten years, disruptive technology has become somewhat of a buzzword associated with tech giants like Netflix, Amazon, and Uber. In the previous five years, these companies have displaced traditional taxi services, brick-and-mortar shopping malls and stores, altered the entertainment industry, and changed how customers consume media.

In the process, there is a growing consensus that disruptive technology has contributed to competitive advantage for companies that have embraced the disruption rather than tried to hide from it.

INFLUENCE OF TRANSFORMATION PROJECT

Researchers have sought to explore whether the type of transformation technology influences the expected competitive advantage. For example, Ershova et al. (2018a) shared that some technologies like blockchain and IoT are still evolving. As a result, their competitive advantage is yet to be corroborated by industry and technology corporations.

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By contrast, cloud computing and artificial intelligence have received growing support in various fields due to their continuing uptake near maturity. Although, there are concerns that the type of disruptive technology may have varied impacts on the nature of competitive advantage depending on the use of such technologies as blockchain, IT, IoT, and cloud solutions, research was conducted that states:

Research Result: *Blockchain and Artificial Intelligence significantly impact how disruptive technology contributes to a competitive advantage. By contrast, Smart Things, Cloud Services, and "Other" technologies do not show significant impact in their contribution to a company's or an organisation's competitive advantage.*

In this regard, Daniel shared, the process is "mainly about customers and public area citizens where you have strict budget restrictions doing business transformation based on Customer Journey maps."

Also, Jürgen indicated that "Competition from China mitigate with product innovation and service-led business model."

Thiagu expressed that from his perspective that not too many challenges from IT due to cloud automation. Incremental change is essential, not a big bang

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approach, with two significant drivers being business continuity and cost reduction (Thiagu).

COMPONENTS FOR TRANSFORMATION

When implementing disruptive technologies, different factors stipulated under the TESy framework affect a company's competitive advantage. Key among these crucial components that inform a company's competitive advantage includes people, process, technology, and knowledge. In addition, vendors and partners who participate in the technological implementation process largely influence their effectiveness in establishing a competitive advantage for companies.

Additional components fundamental to implementing disruptive technology in an organisation's competitive advantage include partner, management strategy, organisation, risk, regulations, and competition. As such, there is a need to examine these various TESy components and examine their potential association with a company's competitive advantage. The findings show that:

Research Result: *The TESy components: people, process, technology, knowledge, vendor, partner, management, strategy, organisation, regulation, requirements, and competition significantly impacted competitive advantage. However, the test*

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component risk did not show any significant impact on influencing competitive advantage.

PEOPLE'S ACTIONS

During the digital transformation process, personnel behaviour and actions might substantially influence a company's competitive advantage when using these technologies. For example, Ershova and Hohlov (2018) have said that diversity in people, processes, technology and existing knowledge level define people's actions that influence an organisation's competitive advantage.

Fosty et al. (2015) added that management behaviour and employee influence actions, define partners, management strategy, organisation, risks, regulations, and competition. As such, organisational shareholders take measures taken into consideration during the transition phase of disruptive technology implementation are likely to influence a company's competitive advantage. Research shows that:

Research Result: *What people would do differently in their next transition significantly correlates with how disruptive technology has led to a competitive advantage. If they would do differently in "Competition", "Vendor", "Partner" or "Process", it is clear that their likelihood scores are significantly higher compared to other levels. However, if they would do differently in "knowledge",*

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"People", "Management" or "Agility", their likelihood scores are not significant to other levels.

PITFALLS IN DIGITAL TRANSFORMATION (DT)

A company's competitive advantage following the emergence of disruptive technologies might be affected by different factors. For example, Fosty et al. (2015) reported that while building a digital DNA, multiple factors include technology uptake and implementation success. Further, company shortcomings in terms of TESy factors such as regulations, partners, vendors, and competition might affect its competitive edge in the market.

Every company or organisation must be aware of its shortcomings as they apply different technologies. In the process, companies will be able to put in place measures to mitigate possible pitfalls that might negatively impact their competitive advantage. In the light of these considerations, there is a need to examine whether TESy components may be involved in significant pitfalls concerning the amount of competitive advantage. To this end, research was conducted which concluded that:

Research Result: *Peoples' major pitfalls had been correlated with a competitive advantage. That is, if people's major pitfall is "Competition", "Vendor", "Partner", or "Regulation", it is clear that*

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their mean likelihood scores are significantly higher compared to other pitfalls. However, if people's major pitfall is "Strategy", "Management" or if they have not provided any feedback ("no feedback"), it is clear that their impact scores are not significant compared to other pitfalls.

Martin indicated that "COVID is currently the biggest driver of industry change, as customers cannot access their fax machines and local infrastructure. Other drivers include improving costs, lowering general process costs and staying competitive.

Fernando shared that the IT environment (electricity, dimensions of servers) removes the guesswork out of success. You have to spend much money on estimated, anticipated hardware and capital expenditure to be competitive.

DEMOGRAPHIC VARIABLE PERCEPTIONS

What it means to gain a competitive advantage may be perceived differently by different demographic groups, for example, age, gender, industry type. Other variables include; sector, project success, goals attainment, most critical issues, project management certification, role in the organisation, and country where the disruption occurs. Therefore, it is necessary to examine whether such

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demographic factors are likely to be perceived differently based on their impact on its competitive advantage. The results are:

Research Result: *There is a significant association between the "success of the project", "achievement level", "most critical issue", "project management certification", "your role in the industry", "age" and the way that disruptive technology has led to a competitive advantage. In contrast, there is no significant association between "sector of the organisation", "industry you primarily worked in", "gender" and the way that disruptive technology has led to a competitive advantage.*

As far as primarily worked location is concerned, there is no significant association between the primarily worked location and how disruptive technology has led to a competitive advantage. If your primarily worked locations are "North America" or "Africa", the mean likelihood score seems lower than Europe's. However, if your primarily worked locations are "Middle America", "South America", "Middle East", "Australia", or "Asia", then the mean likelihood score seems higher than that of Europe.

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PROJECT MANAGEMENT CERTIFICATION METHOD

The project management certification method may also affect the competitive advantage of any disruptive technology. There are various certification methods, including Project Management Professional (PMP), Computing Technology Industry Association (CompTIA), Master Project Manager (MPM), Certified Associate in Project Management (CAPM), Prince 2 Foundation/Prince 2 Practitioner (Prince 2), and Professional in Project Management (PPM).

Other management certification includes Certified ScrumMaster (CSM), Certified Project Management Practitioner (CPMP), Project Management in IT Security (PMITS), and Certified Project Manager (CPM). In addition, there might be an association between project certification and competitive advantage.

Each certification method often has unique and different project implantation and management framework potential. This indicates that the success of each certification method and its influence on competitive advantage varies from one form to another.

In addition, the certification process determines the level of skills and knowledge employees possess in facilitating the successful implementation of disruptive technologies and their subsequent impact on a company's position in the market. To find out, research was conducted.

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Research Result: *Results shows that: the mean likelihood ratings differ depending on whether the project management certification method is "CompTIA", "PMP", "MPM", "CAPM", "Prince 2", "PPM", "CSM", "CPMP", "PMITS", "CPM" or not. Therefore, there is a significant association between the project management certification method "CompTIA", "PMP", "MPM", "CAPM", "Prince 2", "PPM", "CSM", "CPMP", "PMITS, "CPM" and how disruptive technology has led to a competitive advantage.*

PROJECT MANAGEMENT APPROACH

Project management methods may correlate with a competitive advantage. Therefore, the type of project management an organisation uses may potentially influence its subsequent competitiveness in the market.

Potential project management approaches include applying PM, assessing years of experience, and whether companies have used any PM method before. This section further helps in examining whether an organisation prefers any project management approach over others.

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Research Result: *There is a significant association between the preferred project management approach "Apply PM", "Years' Experience", "Use any PM Method" and how disruptive technology has led to a competitive advantage.*

EXTERNAL CONSULTANCY

Consultancy is integral to the initial success of new disruptive technologies in organisations with no exposure to emerging digital transformations. As a result, organisations often seek external consultation to implement and successfully use digital transformation technologies. In addition, consultancy contributes to internal learning and employee training on effective strategies of exploiting and executing tasks with new technology.

The type of consultancy acquired by the company would impact the success of the digital technology and subsequent competitive advantage. Potentially, external consultancy may determine the strategy type, project type, and operational type adopted by a company and its following competitive advantage.

Research Result: *The mean likelihood ratings are the same if an external consultant has supported them in their transformation*

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project or not. Therefore, there is no significant association between whether any of the three "External Consultancy" has supported them in their transformation project or not and how disruptive technology has led to a competitive advantage.

IMPACT ON PEOPLE AND SOCIETY

Technological advancements since 2015 have had a substantial impact on how people access services and how societies operate. For example, big data analytics through cloud computing, IoT, and blockchain has substantially influenced how people access services, such as banking, financial transactions, security, and customer experience. Therefore, there is a need to explore how different disruptive technologies impact people and the general society.

IMPACT OF TRANSFORMATION PROJECTS'

Over the years, organisations have attempted to adopt and implement different transformation projects such as blockchain, AI, IoT, cloud solutions, and Others to their business operations. The increased uptake of these disruptive technologies signifies their positive impact on human experiences, such as access to services, products, and overall consumer experience.

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Disruptive technologies have substantially impacted society by opening new job opportunities for people, influencing economic growth, tapping new industries and innovations, and widening economic benefits to broader populations.

Disruptive technologies such as blockchain, AI, IoT, cloud solutions, and others continue to be optimised and benefit both the business world and society. As a result, technology and business leaders may build new markets for products and technologies that focus on quality, efficiency, and reliability.

The research was conducted that helped us find the type of transformation project that influences the kind of impact emerging/disruptive technologies to have on people and society.

***Research Result**: The type of transformation projects "blockchain" and artificial intelligence influences the type of impact which emerging/ disruptive technologies have on people and society. In contrast, "smart thing" and cloud solutions are not associated with the impact of emerging/disruptive technologies on people and culture.*

Daniel shared that due to digitalisation in Canada, they found 250.000 people illegal in Canada because of COVID-19 and their sickness.

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Jürgen observed that they could not over-communicate to people ("over-news" but were under-informed.

Thiagu indicated that every manager should be a leader to drive successful transformation.

Matthias noted that people see their tasks differently, with the most essential being intrinsic motivation, from a sample of airline businesses where everyone is proud of doing work helping the airline take off. Transformation is about working with people, and I try to feel proud of what they are doing.

Thomas shared that:

Different people can deliver different types of work; the software user is sometimes overloaded with tasks he should perform. Self-service portals are not good enough if the user cannot access them due to a technical failure. Artificial Intelligence could be a solution, but the technology is not there yet. The user needs to formulate the ticket content, and no technology can help him with this task. The impact depends on company culture and the type of industry (Thomas).

Lars noted that their organisation is at the brink of becoming a learning organisation. Motivated employees have the freedom to make their own decisions and failures. Open-minded leadership should support employees, building an open culture allowing them to co-create, free minds to make fee decisions. In the

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process, "HPA is using much-sophisticated technology especially from being a public company."

Martin shared that "data entry type of jobs will be reduced and impacted depending on cultural differences. For example, the US and Asia have experienced more incremental/continuous improvements than Germany in recent years. In the US, they do not question the whole process; they just want to fix it. In contrast, in central Europe, the process will be revolutionised."

Christoph held the view that "COVID-19 restrictions demand responsible ways of conducting on-site training. We have a very self-directed team also before COVID, so they have worked from home beforehand from time to time, but of course, doing this 100% of the time has its dynamics." A key aspect is to ensure "workers are intrinsically motivated so there was no need to implement special structures to maintain productivity."

Fernando believed in the need to ensure business as part of your transformation journey. Otherwise, you have already lost considering the different cultures is essential, as the adoption might differ. Bringing people together when they are all working from home needs some creative ways to solve.

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IMPACT OF TRANSFORMATION ON TESY COMPONENTS'

Disruptions in TESy components such as people, processes, technology, and knowledge may significantly impact society. The innovative strategies and technological solutions determine the type of societal transformation associated with disruptive technologies. The test components that affect people and culture are personal knowledge or expertise in the digital transformation process.

Corporations with highly qualified personnel are likely to establish strong growth and competitive advantage over corporations with lesser skilled employees. Additionally, such companies' impact on people and society depends on networks created with vendors, partners, strategies, existing risks, and management frameworks when implementing disruptive technology. Thus, it becomes evident that the TESy components for transformation might influence how people and society experience technological disruptions.

The research was conducted to confirm the significant correlation between the essential TESy components (e.g., people, knowledge, vendor, partners) and their impact on society.

Research Result: *there is a significant correlation between "people", "process", "technology", "knowledge", "vendor", "partner", "management", "strategy", "organisation", "risk",*

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"requirements", "competition" and its impact on people and society. In contrast, there is no significant correlation between "regularisation" and its impact on people and society.

PEOPLE'S ACTIONS DURING TRANSITION

Human behaviour that individuals embrace during the transformation process might impact people and society. According to Ershova and Hohlov (2018b), competition, agility, vendor, vision, technology, and culture or learning culture might inform the societal impact. For example, strict regulation measures, lack of imagination or inefficient company processes and strategies might negatively affect positive technological experience by people and society. By contrast, continuous innovation, agility, vision, governance, and skills would positively influence how people experience technology.

What people would do differently in their next transition significantly correlates with the impact emerging/disruptive technologies have on people and society specifically, if they would make different choices when it comes to "Competition", "Agility", "Vendor", or "Requirements".

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COMPANY PITFALLS' IMPACT ON PEOPLE AND SOCIETY

Various company pitfalls may determine the level of experience that people and society would have. In this case, TESy components may help explore different company or corporate pitfalls that could negatively impact favourable experiences towards transformation projects. These pitfalls may result from the nature of existing competition, vendors, processes, risks, management, project organisation, partners, regulation, and technology. Moreover, pitfalls may include the type or level of knowledge, people, strategies, and requirements.

Therefore, failure to balance between these aspects might contribute to pitfalls that hinder company prospects. For example, unreliable partners and vendors would result in effective technology implementation and subsequent negative experience of related services or products among customers and society. In addition, poor company management and lack of strategy would also negatively impact how people and culture experience disruptive technology.

Peoples'major pitfalls related to the TESy components have had a significant correlation with impact on people and society. That is if their major pitfall is "Competition", "Vendor", "Process", or "Requirements".

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INFLUENCE OF DEMOGRAPHIC VARIABLES

Demographic factors might also influence how society and individuals experience disruptive technologies. For example, the extent of success of a project, ability to achieve set goals, and adoption of suitable project certification impacts how technology is perceived. Likewise, a company's ability to facilitate and address the most critical issues would affect the level of support or opposition towards disruptive technologies.

Also, other demographic variables such as geographical location, sector, industry, the role of organisation, gender, and age might influence technology uptake and how people experience them.

The research confirmed the significant association between demographic variables and emerging/disruptive technologies' impact on people and society. The result is as follows:

Research Result: *There is a significant association between "achieved your goals", "most critical issues", "countries", "industry", "age" and the type of impact that emerging/disruptive technologies have on people and society. In contrast, there is no significant association between "project management*

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certification", "sector", "gender", and the impact of emerging/disruptive technologies on people and society.

Daniel noted that it is "not limited but different perceptions, northern Europe are in love with EA, the US use as less standard as possible, and in Asia, it is non-existent." Jürgen noted that "Africa can start the transformation without having legacy systems in place." Thiagu noted that "the end-user is in different countries, but the digital transformation itself is only in India."

Almudena and Chantal shared contrary views noting that:

Different countries have different cultures and different hierarchical understandings. America is winning; Germany, Austria, and Switzerland can hardly deliver minimum viable products. Silicon Valley is exceptional and not the average of American companies (Almudena).

International transformation programmes (Mexico, Canada, Finland, Austria, Australia, and South Africa) show that different countries are very different in transformation in terms of laws and culture. Due to COVID-19, the project plan was changed it slowed down the process. Now there is a big-bang approach in North America (Chantal).

Peter reported that "it is not related to geographical borders rather a question of culture and management. In the case of India, US and Asia have a completely

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different mindset; they see the change as an opportunity, unlike Europe." He elaborated further by saying that Europe seems tired of all the various market disruptions in the past. Therefore, Europe often stands in the way of true digital transformation.

Matthias shared that "from a technological point of view there is no difference across countries, but from a cultural point of view in Germany they need to know that everyone is working in the home office. In Switzerland, they are more result-focused."

Thomas also indicated that "it is different even in small distances, e.g., England and Germany. Although there is no reaction on a support ticket during bank holidays in the UK, the service quality in India has improved over the recent years."

Although the technology, e.g., AWS, is global, the local customer is too small to have any rights or impact on the service industry, such as in Germany. These findings show that the transformation of disruptive technologies is limited to countries and influenced by societies, cultures, and industries.

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SUMMARY

It began with detailed essential constructs related to digital transformation in organisations. Then, it is focused on detailing the digital transformation framework

upon which other sections were anchored, concentrating on the TESy Framework by Schindlwick (2017). In addition, important insights related to the study topic, such as what constitutes digital transformation and why it is relevant, have been discussed, noting that digital transformation is not a new phenomenon.

The study has examined disruptive technologies such as blockchain, the Internet of things, and cloud computing concerning how they are disrupting business operations and company management.

Disruptive technologies such as blockchain, cloud services, and smart products have primarily affected the regular operation of markets, businesses, and industries. Artificial intelligence and cloud solutions significantly impact sectors and organisations. By contrast, artificial intelligence and smart things seem to impact processes and how individuals execute them mainly.

The research revealed that not all disruptive technologies or transformation projects are associated with organisational and/or industry impact. Instead, only artificial intelligence was confirmed to affect organisations. By contrast, blockchain, smart things, and cloud solutions did not significantly impact organisations and industries.

The disparity between survey findings echoes observations from past literature. There is a lack of consensus on how disruptive technologies impact companies.

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Sahu et al. (2018) reported that disruptive technologies might affect companies differently. For example, one technology substantially impacts business operations, such as blockchain. In contrast, other technology, such as smart things, lacks any impact.

Schallmo et al. (2019) also reported that disruptive technologies are still at their nascent phases. Therefore, their application or impact in organisations is not uniform or comparable as they have not reached maturity in their exploitation. For example, Schallmo et al. (2019) noted that artificial intelligence and cloud solutions had substantial application in security and information storage organisations. Other disruptive technologies such as smart things and blockchain are still evolving and primarily considered technologies of the future in the advent of 5G telecommunication networks which is still evolving. These observations may help explain the potential disparity in survey and interview responses regarding disruptive technologies and whether they disrupt modern business and life.

Individual considerations on future technology application and exploitation are inferred by creating a competitive advantage for companies. Further, a fundamental impact of emerging/disruptive technologies is aligned with individuals' motivation to perform better in organisations and companies.

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Survey findings showed that except for the TESy construct "risk", all other components influence what people would do better in the future to enhance digital transformation in their organisations.

There are essential transformational components that organisations or companies need to consider when implementing and adopting emerging technologies. Individuals future interest in adopting disruptive technology was attributed to the project's success, achieving goals, focusing on the most critical issues, having project management certification, and individual roles in an organisation.

However, constructs such as age sector, gender, industry, and country's location do not seem to impact organisations or modern life. In terms of geographical location, survey results show a significant impact of disruptive technology in Europe than in Africa and North America when comparing among countries. Furthermore, survey results indicated that artificial intelligence and smart things substantially impact business and life compared to other disruptive technologies. While individuals seek to achieve a competitive advantage in their organisations and improve future disruptive technology applications, the disruption is limited to countries, potentially due to varying societal norms, cultural practices, and industry types.

According to Schindlwick (2017), effective data management and technology use in an enterprise depend on set goals. For example, telecommunication companies

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are more likely to use blockchain and cloud solutions than manufacturing companies likely to use smart things. Therefore, the type of industry will influence disruptive technology adoption and its associated competitive advantage. Disruptive technology is not limited, but there are varying perceptions about it in different countries.

In summation, the results show mixed findings on the vital TESy components to consider when implementing technology. In most cases, results showed that blockchain and artificial intelligence appear to be widely applied. By contrast, smart things and cloud services do not show significant impact in their adoption, possibly due to limited contribution to a company's or an organisation's competitive advantage.

Further, the TESy components "people", "process", "technology", "knowledge", "vendor", "partner", "management", "strategy" and also, components such as "organisation", "regulation", "requirements", and "competition" significantly impacted competitive advantage. However, the TESy component risk did not show any significant impact on influencing competitive advantage.What people would do differently would be focused on constructs such as "competition", "vendor", "partner", and "process". However, individuals are less focused on TESy components such as "knowledge", "management", and "agility".

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Focusing on these constructs contributes to a competitive advantage when tailored on the success of the project, type of project management certification, and role in an organisation. Importantly, all project management certifications such as PMP, CompTIA, MPM, CAPM, and Prince 2, have a positive impact on how digital transformation disrupts business and life, leading to competitive advantage. Lastly, digital transformation appears to occur irrespective of whether an organisation has procured or not procured the services of an external consultant.

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CHAPTER 3

EMERGING TECHNOLOGY PROJECT AND IMPLEMENTATION OF DISRUPTIVE TECHNOLOGY

This section focuses on examining emerging technologies and how organisations can adapt to disruptive technology. Specifically, we must examine possible pitfalls and false assumptions about the current implementation process for disruptive technologies. Moreover, the chapter identifies a specific implementation framework needed to support the uptake and utilisation of these transformational technologies in organisations and industries.

MAJOR PITFALLS AND COMPETITIVE ADVANTAGE

Various hurdles can affect the success of digital transformation initiatives such as blockchain, cloud solutions, and IoT. As such, this chapter aims to determine if these factors have any correlation to other transformational factors

IMPACT OF TRANSFORMATION PROJECTS ON PITFALLS FOR COMPANY'S CHANGE AGENDA

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Today, organisations are actively involved in implementing and utilising different transformation projects in their business operations. Key among these transformation projects include blockchain, AI, IoT, cloud solutions, and others. However, limited information is available regarding the type of obstacles organisations can face during the transformation process. Therefore, research is being conducted to investigate whether the type of transformation project (i.e., blockchain, AI, IoT, cloud solutions, or others) is associated with the major pitfalls experienced during a company's transformation process. The results are as follow:

Research Result: *The type of transformation project "Smart Thing", "artificial intelligence", and "cloud solutions" is associated with the major pitfalls for your transformation project. In contrast, blockchain is not associated with the major pitfalls for organisational transformation projects.*

IMPACTS OF PROJECT MANAGEMENT CERTIFICATION

Project management certification essentially informs the process and approaches in the implementation phase. There are different types of project management certification, including PMP, CompTIA, MPM, CAPM, Prince 2, PPM, CSM, CPMP, PMITS, and CPM. Each of these certifications has a varied impact on project success. However, it is still unclear how these certification projects may be associated with potential pitfalls for its transformation plan.

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The possible pitfalls being explored in this relationship include the TESy components: people, process, technology, and knowledge. Other analysed factors include vendor, partner, management, strategy, project organisation, risks, regulations, requirements, and competition.

The research was conducted to find out, the result is:

> ***Research Result:*** *Having or not having project management certification is not associated with the major pitfalls for your transformation project.*

Interview responses showed that project management certification and years of experience significantly correlate to the major pitfalls experienced during digital transformation.

For example, Daniel noted that the “business stakeholders do not follow through with their initiatives”. At the same time, Jürgen shared that “underestimating the time the transformation will take, not having a fully executive sponsorship, and ensuring to put the budget in the right place.” Thiagu further narrated that “COVID-19 had an impact in project delivery, but the SAAS approach made the communication easier for the senior management and the execution to the customer the impact is much bigger.”

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According to Almudena, “differentiation between knowledge and certification is important.” Chantal maintained that “one thing is that the organisation does not understand what they are buying, where they want to go step back regarding funding because initial planning was not realistic.”

According to Peter, “large organisation building a new start-up externally to start/prepare their innovation and transformation. However, managers focus on their position and fail to take the risk of innovating slowing or preventing transformation project, e.g., GDPR discussion” (GDPR, 2018).

Fernando believed that “for digital transformation to become a success it means to improve processes with technology, they were not done efficiently. That is, organisations need to make the business part of their transformation journey. Otherwise, you have already lost.” In summation, the most crucial aspect is to ensure solid governance is in place and every leader is an endorser and promoter.

Further, Matthias also claimed that:

We need more leaders today; we have too many managers. Switzerland has the saying that Managers do things right and leaders do the right things. Nevertheless, in a company, you need both because of the management as they think they are losing some control, but you need to transport trust and give confidence to the people. In 3 transformation projects, all of them are the central pain point the

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management and the board level issue with too many tools in place without governance (Matthias).

Thomas shared a need to support the customer from a service level management point of view if he needs support, and prominent players like AWS or Microsoft cannot provide the necessary support. “This is a big issue for small and medium organisations to get proper support. Outsourcing contract with 1300 pages and still delivering poor support, with the risk appetite of a German CIO is rather small.”

Lars advocated that “it is important to start with a prototype and let the business decisions not push a solution into your business functions. Every new solution needs to provide value to the business.”

Christoph noted that “helping students and alumni find a job employment and developing a platform to automate 90% of the processes”. Such an approach eliminates the risk that business partners wanted to tailor the workflow of Code Factory, where we are looking for standardisation satisfying different needs of stakeholders (students/graduates, companies looking for new hires).

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IMPACT OF PROJECT MANAGEMENT METHOD

Methods used in project management vary from company to company. Subsequently, the type of project management method used during transformation may counter influence on pitfalls incurred during the transformation process.

In line with the TESy framework, these pitfalls include people, process, and technology. Other factors include knowledge, vendor, partner, management, strategy, project organisation, risks, regulations, requirements, and competition.

By contrast, the project management methods include applying PM, years of experience, and whether any PM method is being used. Thus, there is a need to examine which project management method has been used for projects with some pitfall categories/types. The research was to determine whether there is any correlation between project management methods (such as applying PM, Years of experience, and used PM method).

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Research Result: *It is concluded that the preferred project management method "Years of Experience" is associated with the major pitfalls for a transformation project. In contrast, the preferred project management method "used any PM" is not associated with the major surprises for a transformation project.*

IMPACTS OF EXTERNAL CONSULTANCY

The external consultancy also influences the success of the transformation process in organisations. Some of the major categories for external consultancy focus on strategy type projects, project type projects, and operational type projects. However, it is unclear whether external consultancy influences key pitfalls for the transformation project such as people, process, technology, knowledge, vendor, partner, management, strategy, and project organisation.

Even so, past work shows that consultancy is a key to the initial success of new disruptive technologies in organisations that have not yet had any exposure to emerging digital transformations. Therefore, research was conducted to determine whether there is an association between external consultancy and major pitfalls for a transformation project.

Research Result: *It is concluded that external consultants or consulting organisations' support are associated with your transformation project's major pitfalls. Therefore, the support from external consultancy in terms of strategy, project, and operational type projects may be vital to impacting an organisation or company's transformation process, necessitating the need to eliminate major pitfalls during project transformation.*

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IMPACT OF DEMOGRAPHIC VARIABLES

Many factors are integral in successful digital transformation. Therefore, there is a need to properly coordinate these factors to avoid potential pitfalls during the implementation and transformation process. Some of the significant issues impacting the success of projects include requirements, scope, planning, and nature of existing plans.

A well-planned project should be able to overcome existing issues related to demographic factors. However, the research is still in its nascent stages, and there is a lack of consensus on whether demographic variables are likely to influence major pitfalls of the transformation process.

On the one hand, the demographic variables include age, gender, industry, sector, role in the organisation, project success, achieving goals, most critical issues, project management certification, and geographical location by country or region.

On the other hand, the major pitfalls for transformation projects align with the TESy framework on people, process, technology, knowledge, vendor, partner, management, strategy, project organisation, risks, regulations, requirements, and competition. To confirm research was conducted, which concludes that:

Research Result: *"Success of the project", "achieved your goals", an individual's "role in the organisation", "industry" of your*

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organisation, "gender" of your organisation, "age" is associated with the major pitfalls for a transformation project in an organisation or a company. In contrast, the "most critical issue" facing a digital transformation project, having or not having "project management certification", primarily worked location by "country, "sector" of your organisation, is not associated with the major pitfalls for your transformation.

FRAMEWORK SUPPORTING THE IMPLEMENTATION OF A DISRUPTIVE TECHNOLOGY

This section focuses on how personal familiarity with the transformation process influences the successful implementation of disruptive technology. The primary assumption is that industries, corporates, and personnel familiar with any transformation frameworks would likely be more successful in the implementation process than those unfamiliar with the change models in digital transformation.

TRANSFORMATION PROJECT'S IMPACT ON FAMILIARITY WITH TRANSFORMATION FRAMEWORKS

Individuals and organisations have actively shown commitment in their implementation and implementation of different transformation processes. The

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specific transformation processes under consideration included blockchain, AI, IoT, cloud solutions, and others in this book.

However, there is a growing interest to examine whether these transformations have any significant correlation with each other. Therefore, research was done to determine whether people involved in specific technology transformation projects have a different familiarity with these disruptive innovations and their transformation frameworks. The results are:

Research Result: *The type of transformation project "blockchain", "artificial intelligence", and "smart technology" is associated with familiarity with any transformation frameworks in organisations and companies. In contrast, "cloud solutions" is not associated with familiarity with any transformation frameworks.*

Results showed that familiarity largely influences the choice of frameworks and what individuals would do differently in the next project. According to Daniel, "frameworks and standards helping in common understanding to create reference models for industries. Usually, frameworks are very detailed, so you do not drop anything, but Asian Framework is not focusing on IT transformation."

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Jürgen added that “different cultures need another way of dealing with the digital transformation, working more on the fly. Thiagu added that “currently there is no framework used, they gathered information from people’s knowledge.”

Almudena added that the key frameworks used are limited to the “Michael Küster Framework and Toyota Kata Framework.” Also, Chantal noted that additional fundamental frameworks used include the “TOGAF from Open Group and Impact from IBM.”

Peter and Matthias elaborated “several frameworks, but the most interesting is the simulation game ‘system team change’ (STC). Additional frameworks include applying the “Safe as an agile framework and DevOps” recommended by Thomas.

Moreover, Lars noted that “the IT department is using the ITIL Framework but only selected processes in addition to using project management frameworks.” These findings show a potential correlation between the familiarity of frameworks and what individuals would do differently in the next project.

IMPACT OF TESY COMPONENTS’

The TESy framework identifies essential components (such as people, process, technology, knowledge, and vendor). A key area of research interest is assessing whether the TESy features correlate with people’s familiarity with the transformation process.

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Levin (2018) reported that the transformation process is gradual and not constant, implying that individuals acquire different levels of knowledge as new technologies emerge. As such, it may be noted that familiarity with any given transformation framework might vary from one person to another.

Furthermore, what is unclear from the extant literature is whether there is any correlation between TESy components and familiarity with existing transformation frameworks. In line with these considerations, the main focus is to determine whether TESy components have been rated high to people regarding their familiarity with transformation frameworks. It has been found that:

Research Result: *There is a significant association between the "technology", "vendor," partner", "management", "risk", "regularisation", "competition" and familiarity with transformation frameworks. In contrast, there is no significant association between the "people", "process", "knowledge", "strategy", "organisation" and familiarity with transformation frameworks.*

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PEOPLE'S ACTIONS DURING TRANSITION AND FRAMEWORK FAMILIARITY

Individuals often share their expectations regarding measures they may be willing to embrace in subsequent technology transition processes. Therefore, this section focuses on examining whether there is any significant relationship between people's actions and framework familiarity.

Key constructs under consideration when examining people's actions include the TESy constructs such as competition, vendor, processes, risks, management, project organisation, partner, regulation, and technology. Moreover, pitfalls may include the type or level of knowledge, people, strategies, and requirements. It has been found out that:

Research Result: *What people would do differently in their next transition is associated with their familiarity with any transformation frameworks*

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PITFALLS OF TRANSFORMATION PROJECT AND FAMILIARITY

Pitfalls within an organisation such as inadequate management, unreliable partners, inferior technology, and inefficient processes may affect familiarity with transformation projects. Similarly, personnel pitfalls such as lack of knowledge,

strategy, level of organisation, and skills may influence project familiarity. In this case, key pitfalls are closely related to TESy constructs.

Therefore, the focus is to examine whether an association exists between TESy components on pitfalls and people's familiarity with the transformation process in organisations; this would indicate what TESy component is involved in major pitfalls concerning understanding a transformation framework. It has been found out that:

Research Result: *The major pitfalls for the transformation project are not associated with their familiarity with any transformation frameworks.*

DEMOGRAPHIC VARIABLES AND MAJOR PITFALLS FOR TRANSFORMATION PROJECT

Demographic variables may influence the common pitfalls of transition projects. The focus of this study was to examine whether demographic factors may influence the pitfalls commonly experienced in the organisational transformation process. Major demographic factors under consideration in this study included the project's success, achieving your goals, most critical issues, project management certification, geographical location in countries focusing on European nations, role in organisation, sector, industry, gender, and age.

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In addition, the critical TESy pitfalls included people, process, technology, knowledge, vendor, partner, management, strategy, project organisation, risks, regulations, requirements, and competition.

> ***Research Result:*** *It's been concluded that the major pitfalls for the transformation project are not associated with their familiarity with any transformation frameworks.*

EXTERNAL CONSULTANCY AND FAMILIARITY WITH TRANSFORMATION PROJECT FRAMEWORK

External consultancy might have a direct impact on the transformation process of disruptive technologies in organisations. Some of the major categories for external consultancy focus on strategy type projects, project type projects, and operational type projects.

However, there is a lack of understanding on whether external consultancy influences familiarity with transformation project framework when considering TESy constructs of people, process, technology, knowledge, vendor, partner, management, strategy, and project organisation. Furthermore, the literature has not established the association between these TESy constructs and external consultancy attributes such as strategy type, project type, and operational type projects.

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The research was conducted to find out, which state that:

> ***Research Result:*** *There is no significant association between external consultancy support and familiarity with transformation frameworks.*

SUMMARY

There is no single implementation framework in place that is used in implementing disruptive technologies. Instead, depending on its country of location and business operations, each organisation appears to have a unique implementation framework.

Project management certification, years of experience have a significant relationship to the major pitfalls. In most cases, organisations and companies lack a common framework to follow. By contrast, familiarity largely influences the choice of frameworks in organisations. Therefore, results showed that existing frameworks and standards fail to help attain a common understanding when creating industry reference models.

Usually, frameworks are varied in their details but differ, making the integration process or universal model difficult. For example, frameworks such as the Toyota Kata Framework, TOGAF from Open Group and Impact in IBM, Agile framework,

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and Waterfall lack complete integration in all their features with each other. These observations echo findings from past studies.

There is a lack of consensus among organisations and companies regarding the essential elements or processes that companies may adopt in their implementation framework to realise a successful digital transformation experience. Since 2004 when I first worked with the ITIL framework and visualised the process content in the process modelling suite of Casewise (now Erwin Inc.), we merged various normative systems, e.g., ISO, SOX, MiFID, and the ITIL process model. Integrating the systems allowed our clients to have a holistic view of their requirements and track why they are doing things in a certain way as the requirements are linked to the processes. We also completed the mapping by adding audit questions to make assessments easier.

Despite the lack of a uniform digital transformation framework, the existing models contain five key elements and 19 constructs that may be integrated to eliminate existing shortcomings. These five key components that impact the digital transformation process during the implementation phase include (1) external factors (i.e., competition, requirements, and regulations), (2) organisation (i.e., people, process, regulation, knowledge, management, information, and technology), (3) relationship (i.e., vendor, partner, process, and customer), (4) transition (i.e., management, goal, project, and strategy), and (5) enterprise architecture such as (process model, capability, and organisational model).

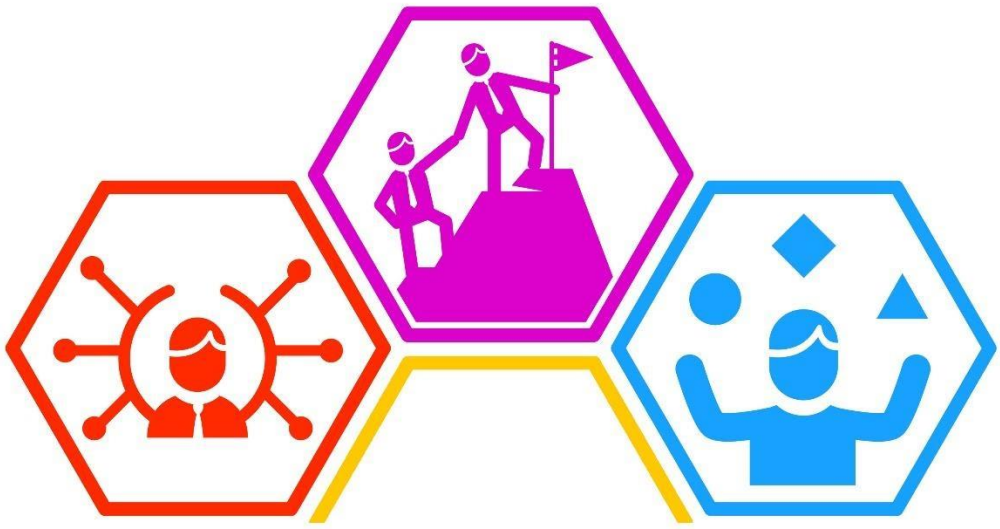
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These five components (i.e., external factors, organisation, relationship, transition, and enterprise) broadly align with the TESy framework (shown in Figure 1) and proposed by Schindlwick (2017).

Therefore, any future implementation of disruptive technology in organisations or businesses should be anchored on the five constructs of external factors, organisation, relationship, transition, and enterprise. According to Schindlwick (2017), these TESy constructs are a model by which organisations or companies may create a unified conceptual framework to achieve a successful digital transformation process. While the TESy model constitutes 5 (i.e., external factors, organisation, relationship, transition, and enterprise architecture) and 29 constructs as key to successful disruptive technology implementation, findings from this study confirmed 19 constructs in the five components to significantly influence the implementation process.

Later in this book and as part of the research outcome, CHAPTER 05 presents the updated TESy-Framework 2.0 with new components identified as relevant for a digital transformation.

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CHAPTER 4

MEASURE SUCCESSFUL IMPLEMENTATION OF A DISRUPTIVE TECHNOLOGY PROJECT

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This chapter focuses on whether agile or waterfall transformation methods are essential when implementing and measuring disruptive technology success in organisations. Moreover, it discusses how disruptive technologies impact existing systems and process metrics within companies and organisations.

AGILE OR WATERFALL TRANSFORMATION METHODS'

Development methods such as agile and waterfall are rarely followed during technology implementation and facilitation in companies and organisations. As a result, the measurement of their effectiveness in how well they facilitate the implementation process remains uncertain. The waterfall method entails a traditional and sequential approach to development, based on clear milestones amongs testing, development, design, meeting needs, and going live. Subsequent phases start only when the previous ones have been completed. By contrast, agile methodologies entail more iterative approaches.

Researchers have attempted to investigate the extent to which either agile method or waterfall methods may impact the technology implementation and measurements of various factors of success. Therefore, a lack of consensus or existing information on disruptive technology is limited to help understand the

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extent to which the given methods influence disruptive technology success.

This section aims to formulate potential hypotheses that may be used to understand how agile and waterfall methods affect the digital transformation process while evaluating the specific method that is more appropriate. The focus is on determining whether agile or waterfall transformation methods would be beneficial in helping with implementation and measurement processes.

TYPE OF TRANSFORMATION PROJECTS

Individuals and organisations treat methods used in project transformation as a feasible unit of analysis to analyse the impact of specific methods on actual executed and achieved design routines. However, there is lack of data available on how company preference for a specific implementation method (either agile or waterfall) would impact the transformation project success (for instance, blockchain, AI, IoT, cloud solutions, and others).

This section would be essential in examining and exploring the possible impact of the project management approach on a transformation project. Paterek (2017) formulated an implementation framework based on an agile method that identifies processes, situation fitness, random noise,agency and the leading software

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implementation design routines. Findings showed that the use of the agile method was effective in implementing new technology processes. However, other researchers have noted that alternative methods such as waterfall are more effective in implementing digital transformation initiatives.

Jouko et al. (2017) applied trace-implemented design methods in large organisations. The method focused on using the object-oriented waterfall technique with three software projects based on agile methods. The traces were analysed using mixed-methods methods entailing qualitative content assessment and Markov models.

The results showed that in both cases, the type of methods based either on agile or waterfall technique accounted for between 35 percent to 40 percent of the transformation process. However, the rest depended on the personal habits of the designer, the fitness condition of the projects, and environmental noise.

These findings show that digital transformation methods are smaller than assumed, while project conditions and designer habits broadly impact the transformation process. Therefore, there is a need to examine whether the type of transformation project is associated with the project management approach or not.

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The conclusion of the research was as follows:

> **Research Result:** The type of transformation project "blockchain", "artificial intelligence", "smart thing", or "cloud solutions" is associated with the project management approach you prefer for your project. In contrast, "other technologies" is not associated with the project management approach or favour in your project.

TESY 'COMPONENTS' IMPACT ON PREFERRED METHOD

Individuals have rated TESy components as key to the successful implementation of the digital transformation framework. The main TESy components include people, processes, technology, knowledge, and vendors. In this book, the primary focus is to evaluate whether TESy components impact the choice of the preferred method during digital technology transformation - i.e., agile or waterfall. A study was done to find out if TESy components affect a preferred project management approach. These results are as follows:

> **Research Result:** The results show a significant correlation between "technology", "vendor", "partner", "risk", “regularisation”, “competition” and the preferred project management approach. In contrast, results show no

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significant correlation between "people", "process", “knowledge”, “management”, “strategy”, “organisation”, “requirements” and the preferred project management approach.

PROJECT MANAGEMENT CERTIFICATION AND PROJECT MANAGEMENT METHOD

Ng and Lee (2020) shared that project management certifications, such as Associate in Project Management, Certified Project Manager (CPM), Project Management Professional (PMP), and Certified Project Management Practitioner (CPMP), may influence the choice of project management method.

In addition, Baryshnikova and Taratukhin (2017) found that potential choice of a project management certification may have varied impact on individual preference with companies preferencing Prince 2 Foundation/Prince 2 Practitioner over Professional in Project Management (PPM) or CompTIA Project+ over Project Management in IT Security (PMITS). Nonetheless, there is a paucity of knowledge regarding project management certification and choice of management method.

Research Result: The findings of the research show that having a project management certification is associated with

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the project management approach you prefer or favour in your project.

Findings from survey responses showed that having a project management certification impact achieving organisational goals. Martin shared that project management certification is essential with organisations such as Space X using agile transformation programs.

Moreover, Jürgen cautioned that “predicting years is not feasible, e.g., due to COVID-19, the environment is changing continuously very fast and focus should be on self-organised teams (using the agile framework).”

He adds, “Agile is not enough as it needs to be embraced and understood. Minimum Viable Products is vital to ensure to meet the customer/consumer need.”

On the other hand, Thiagu observed that following agile methodology is essential. However, Almudena also noted a need to make a clear “differentiation between certification and knowledge because during COVID-19 issue, many people completed tons of certifications without acquiring the complete knowledge and skills.” In this case, agility is impossible for some organisations, at least in their mindset. Chantal noted that there is a need to “use a mixed approach between

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waterfall and agile."

Further, Fernando pointed out that "individuals need to understand where they are and start from a clear starting point; agile principal form SCRUM. Thus, the focus is working with pieces of various frameworks, without just using one framework."

A vital issue with waterfall is that the business needs to see results early in the project. Continuous improvement is made by the project team, not by the operation. In most cases, they do not look at certification but instead consider experiences, according to Peter.

Matthias also indicated that individuals should "first start with a road map to define the goal. However, having the people on board is important, so you need the roadmap and visualisation to help with communication. Using the Kanban Board is important also because of the physical/haptical presence of the board."

Lars elaborated this, saying, "Within IT, we are using Prince 2, but also agile methodology." Martin suggested that using a hybrid approach between waterfall and agile would enhance results.

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Christoph gave an example that “CodeFactory uses an agile methodology for project management and is also teaching agile methods. Often waterfall is vulnerable to changing requirements.” These results show that project management certification influences achieving organisational goals.

EXTERNAL CONSULTANT AND PROJECT MANAGEMENT APPROACH

External consultants are central to the successful uptake and implementation of digital transformation projects such as blockchain, IoT, and cloud services. Nandico (2016) shared that these consultancy companies may contact organisations to evaluate or develop the evaluation design and implement it according to the reference lines. However, despite their potential impact in ensuring the success of a project, Naslund and Kale (2020) cautioned that external consultancies face numerous and practical conflicts as they seek to facilitate project implementation.

One of the main concerns is related to choosing one project management method over another. In the process, conflicts are bound to occur, which might derail a digital transformation project. Therefore, there is a need to examine how external consultancy might be associated with the project management approach.

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Over the years, organisations have acknowledged the role of external consultancies in their success. In this case,research was done to understand whether there is a significant correlation between consultancy and the chosen project management approach. Therefore, whether an external consultant has supported or not supported them in their transformation project is associated with the project management approach you prefer or favour in your project.

PROJECT TYPE AND PROJECT MANAGEMENT APPROACH

The type of external consultancy (i.e., strategy type, project type, and operational type) might have varied impacts and influences on the project management approach. According to Egorova et al. (2017), the type of project management would directly impact the choice and outcome of management processes in organisations and across industries. Therefore, individuals and companies should be cautious of the project type they select when facilitating project management during digital transformation initiatives. Some research was done to evaluate which consultants are likely to have higher relations with suitable management approaches to make informed decisions during project implementation.

Research Result: The finding shows that the familiarity with a transformation framework is associated with the project management approach you prefer or favour in your project.

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FAMILIARITY WITH A TRANSFORMATION FRAMEWORK AND PROJECT MANAGEMENT APPROACH

The section helps us understand whether being familiar with transformation frameworks determines the choice of project management approach. In this case, the TESy constructs such as people, process, technology, knowledge, vendor, partner, management, strategy, and project organisation broadly inform the transformation framework.

Therefore, the association between these TESy constructs and the project management approach needs to be assessed. In this case, the assumption is that familiarity or non-familiarity with transformation frameworks might impact on project management approach. In light of these considerations, some research was done to understand if there is any significant correlation between familiarity with the transformation framework and the choice for the project management approach.

Research Result: The familiarity with a transformation framework is associated with the project management approach you prefer or favour in your project.

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FAMILIARITY OF TRANSFORMATION FRAMEWORK'S IMPACT ON PROJECT MANAGEMENT

Yap et al. (2017) shared that individual or company familiarity with existing transformation processes directly impacts how a project may be managed. Highly knowledgeable and skilled personnel with different frameworks are likely to replicate a positive impact on project management. On the contrary, employees who lack familiarity with transformation frameworks would experience challenges attaining progressive project management.

Therefore, there is an increased likelihood that familiarity with transformation frameworks may be correlated with the project management impact.

INFLUENCE OF PROJECT SUCCESS ON DEMOGRAPHIC VARIABLES

The selected project management approach influences different demographic variables. For instance, project management selected in a company might directly impact the success of projects, influence set goals, and inform attainment of critical issues. Further, project success may be related to demographic factors such as industry, sector, gender, and geographical location. However, there are not enough studies to establish whether the kind of chosen project management approach is associated with other variables against age, gender, industry, the role of organisation, sector, and success of a project.

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Research Result: Results showed that most critical issues, including project management certification, location country, role in the organisation, sector, gender, industry, and age, are associated with the project management approach that is preferred or favoured in the project. However, project management approaches such as the project's success and achieved goals were not associated with the project management approach that is preferred or favoured in your project.

SUMMARY

This chapter compared agile and waterfall transformation methods and assesses how they may help implement and measure disruptive technology - having a project transformation process such as agile or waterfall impacts achieving organisational goals. However, each of the project management certification and transformation models has its limitations and advantages. Even so, most participants shared that agile technology is widely used in organisations than waterfall development process.

Sometimes the agile methodology is not enough as it needs to be embraced and understood. At the same time, in other instances, it is quite useful due to its flexibility. Alternatively, the waterfall is a structured software development methodology. A vital issue with waterfall is that the business needs to see results

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early in the project to measure the success or failure of the transformation process (Schuchmann & Seufert, 2015). According to Seufert and Meier (2016), both waterfall and agile impact the implementation of technology. However, the waterfall methodology is a traditional model for developing engineering systems and is meant mainly for manufacturing and construction industry projects.

As such, waterfall may be well suited for construction and manufacturing sectors seeking to implement disruptive technologies. When agile is applied to disruptive technology implementation, specialised tasks should be completed in one phase, be reviewed, and verified before moving to the next phase. Smart (2018) added that waterfall is a linear and sequential approach, where implementation phases flow downward (waterfalls) to the next. Survey responses indicated that familiarity with a transformation framework is associated with the project management approach that is preferred in the project. The process may also be influenced by whether an external consultant has supported or not supported them in selecting their transformation project.

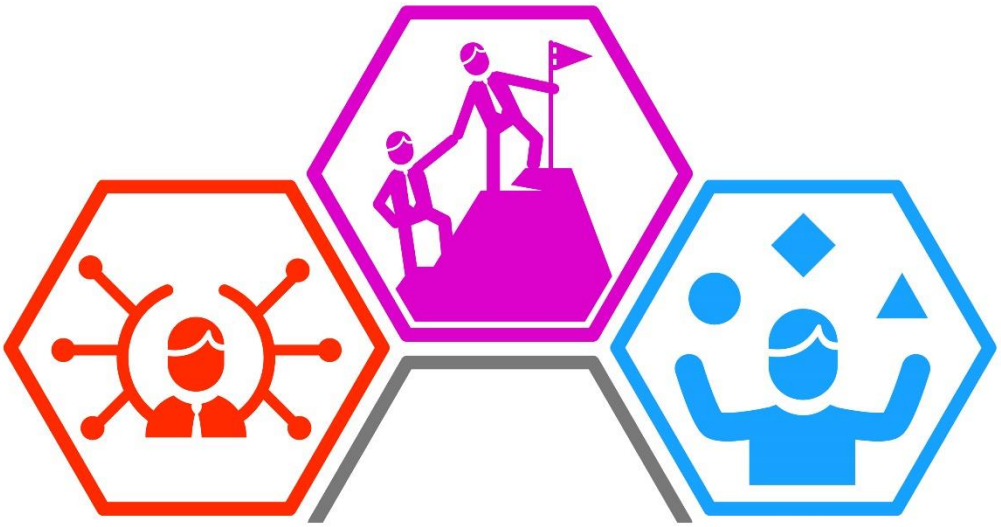
The choice of project management certification method in an organisation also influences the project management approach preferred in implementing disruptive technology. By contrast, agile methodology is a type of incremental technology development model and implementation based on principles that focus more on people, results, collaboration, and flexible responses to change.

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Instead of planning for the whole project, the model's success in disruptive transformation is measured by breaking down development work in small increments completed in iterations or short time frames. Therefore, short term successes are vital to the measurement and determination of agile effectiveness during the implementation of disruptive technology in organisations. Each iteration includes all SDLC phases such that a working product is delivered at the end. After several iterations, a new or updated product is released.

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CHAPTER 5
WHAT TO DO NEXT?

So far, we have discussed digital transformation and how TESy components are key to organisational transformations. First, we detailed the digital transformation framework used in the study to focus on the transformation ecosystem framework. After that, we discussed digital transformation in organisations and the factors that influence the adoption of disruptive technology. We also touched upon different disruptive technologies, including blockchain, IoT, cloud services, cybersecurity issues, and artificial intelligence. Finally, we discussed how these digital technologies potentially disrupt companies, businesses, and people's lives.

Further, the book has also discussed current disruptive technologies and their potential business applications along with the impact of disruptive technologies on

organisations and industries.

Moreover, we have also highlighted and elaborated on the definition of the emerging technology project and how to implement disruptive technology in companies and organisations, working through potential pitfalls and wrong assumptions on existing implementations based on the TESy framework.

NEW IMPROVED TESY FRAMEWORK V2.0

A new and improved TESy Framework 2.0 has emerged out. Figure 2 presents the new TESy Framework that organisations or companies in the EU may consider when implementing disruptive technologies. This concept is based on a holistic framework for effective organisational transformation and digital transformation. As discussed earlier, each TESy component and sub-component below is viable and essential to consider in every transformation process. The Framework has evolved with the new research findings.

Research has proved digital transformation framework's value and applicability for organisations. In line with Figure 2, organisations should focus on six key components and their sub-components when implementing disruptive technologies. These six constructs include external factors, organisation,

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relationships, enterprise, culture, and governance.

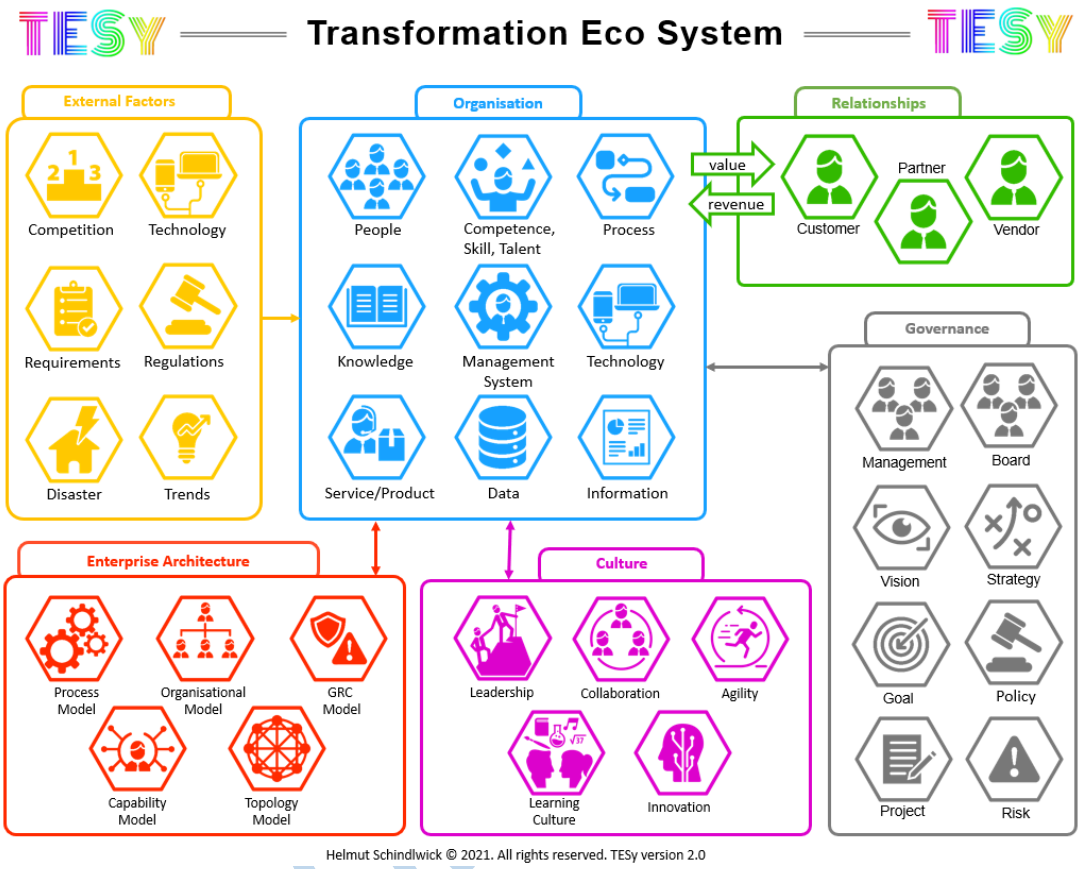


Figure 2: Transformation Ecosystem Framework v.2.0 (TESy)

The component “Culture” and its sub-components have been added to this framework due to this research. They will strengthen the holistic view of this digital transformation framework.

The public available website https://tesy-framework.com/ will collaborate with everyone who is interested in applying this framework.

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LIMITATIONS

The book has examined disruptive technologies and their implementation frameworks across organisations and industries. There is lack of a comprehensive digital transformation framework that could facilitate successful organisational transformation. However, the TESy model by Schindlwick (2017) contains essential constructs that may be taken into consideration in identifying a unified digital transformation framework with the advent of digital transformation.

Also, successful digital transformation may be impacted by transformation models, support from external consultants, and project management certification, necessitating further research to examine their impact on digital transformation processes. Despite these findings, however, there are potential limitations that may impact the results of this study.

For example, a limitation was that there is no universal theoretical framework to help interpret potential factors likely to influence the digital transformation process and help identify specific components that need to be considered when implementing disruptive technologies in organisations.

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CHAPTER 6
ABOUT THE RESEARCH

In this chapter, I will outline the source of this book, which is based on my doctoral dissertation. My research revolved aroundinvestigating disruptive technologies and their implementation frameworks across organisations and industries. It also aims to provide a comprehensive digital transformation framework that could facilitate successful organisational transformation.

This chapter focuses on the research methods and strategies that are used to collect data. The chapter commences with a discussion of the research philosophy.Further, it discusses research strategies, techniques and data collection procedures. The chapter concludes with a summary of the key methods that were used in this study. Research onion by Saunders et al. (2017) will be adopted to devise the research philosophy and related research aspects.

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The model guides how to formulate a valid methodology by starting from the outside and working through the core of the “onion” - the data collection and data analysis.

RESEARCH PHILOSOPHY

The current section discusses the research tradition upon which this study was anchored. According to Easterby-Smith et al. (2018), two primary philosophical frameworks are used mainly in social science research. These philosophical frameworks include ontology and epistemology. The following subsections detail these research traditions and discuss the rationale of a specific research philosophy used in this study (i.e., pragmatic philosophy).

CHOICE OF RESEARCH PHILOSOPHY

Pragmatic philosophy was used in this book to guide the direction of the research process. Jansen (2020) shared that as a research tradition, pragmatism philosophy postulates that researchers should apply a methodological approach or a philosophical concept that works best in investigating a problem under study. Therefore, pragmatic philosophy helps a researcher avoid being trapped in the philosophies of reality and truth and instead focus on applying a methodology that is best positioned to understand the problem under study. Through such an approach, pragmatic research srecognises that each research method has its advantages and potential limitations.

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According to Chun et al. (2019), pragmatic researchers use more than one source of information or data collection methods. Alternatively, pragmatic researchers may use different data collection methods concurrently or use one method followed by another.

In elaboration, pragmatic researchers may often use survey questionnaires to collect background knowledge about the topic. This is followed by in-depth interviews to explore and understand key trends identified from the initial surveys (Chun et al., 2019).

This study focuses on understanding digital transformation and components that are central to organisations and companies during the implementation processes. Initially, surveys (Digital Transformation Survey 2020) were conducted to identify critical trends and statistics on the topic, followed by in-depth interviews with experts to understand the tested hypotheses. Thus, surveys were used for fact-finding exercises about the topic, followed by further assessment through interviews to understand established quantitative data. Such an approach aligns with insights shared by Creswell et al. (2017), where pragmatic philosophy supports using multiple methods and strategies to collect data, thereby facilitating triangulation and ensuring the internal validity of the study findings.

Using pragmatic philosophy was informed by the need to employ a methodology that could best help investigate disruptive technologies and their implementation frameworks across organisations and industries while providing a comprehensive digital transformation framework that could facilitate successful organisational

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transformation.

This study's pragmatic philosophy was considered essential in understanding digital transformation in organisations and how different disruptive technologies facilitate this transition process. In addition, pragmatic philosophy was considered central to identifying transformational components that organisations need to consider when adopting and implementing emerging disruptive technologies.

Notably, using multiple methods in this study was key to critically discussing the limitations of existing implementation frameworks for digital transformation and identifying a potential framework for future implementation efforts. Finally, pragmatic philosophy enabled research to select methodologies central to creating new knowledge on a unified model for implementing disruptive technologies, facilitating technological transformation, and digitising transformation processes in organisations. Also, pragmatic philosophy enabled the identification of potential limitations. It further formulated new approaches for future research to expand their scope and fill knowledge gaps in the existing literature in this field.

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RESEARCH DESIGN

An explanatory mixed-method design was used in the current study to examine the formulated research process. The choice of pragmatic philosophy informed the

choice of the mixed research method. Pragmatic philosophy supports using a research design that examines and understands the topics. Using explanatory design was intended to collect data and mix findings from both surveys and interview responses and understand digital transformation in organisations while identifying primary constructs relevant to successful transformation processes.

A two-phase research approach was used under the explanatory mixed-method design. Phase one focused on collecting quantitative data using survey questionnaires. Phase two further advanced the study by collecting qualitative data using semi-structured interview questions. Such an approach enabled the identification of the key trends on the topic. Later, qualitative data was used to explain the significant trends on the topic based on expert responses from twelve participants. Explanatory research design is suitable when researchers use qualitative data to understand quantitative trends, especially when there are outlier results, surprising quantitative data, and non-significant or significant statistical correlations in a study topic.

In this book, the use of explanatory design was informed by its advantages. First, Creswell (2017) shared that being a two-phase study approach, a researcher efficiently implements it and collects relevant information, one step at a time. Therefore, there Is no need for recruiting external researchers to facilitate the data collection process.

Second, findings obtained from the study facilitate corroboration of findings by supporting or explaining data trends that might be unclear when a single method

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is used. Moreover, conducting a mixed research method ensures an in-depth collection of relevant information about the study to comprehend new outliers associated with past studies, thereby helping create a potential hypothesis to be investigated in future research.

Finally, data collection during the interview may create an enabling environment where a researcher may inquire more about the topic, resulting in participants sharing more insights about the topic. In the process, new themes might emerge that the researcher may have omitted, overlooked, or failed to take into consideration.

Figure 03: "Research Framework" illustrates the research problem, the taken measures and the planned outcome of the research.

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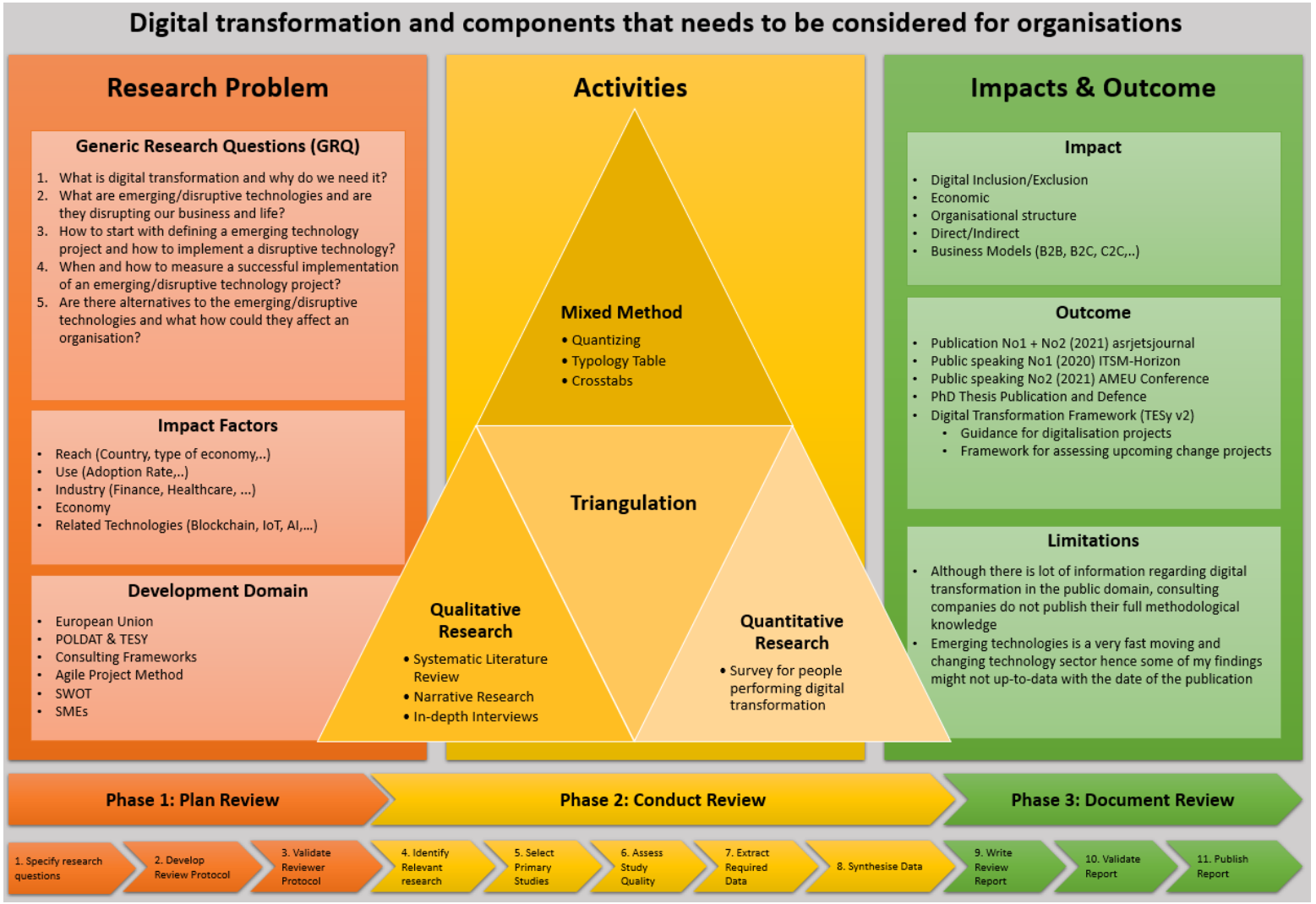


Figure 3: The Research Framework

RESEARCH STRATEGIES

In this book, narrative research is used, which is part of the qualitative analysis that is inductive and exploratory. The research will use the strategy case study (in-depth interview) and survey (quantitative research). For this book, it is crucial that each research step builds on the other.

TECHNIQUES AND PROCEDURES

Within the research "onion," Saunders et al. (2017) defined the core of their layers as "techniques and procedures" for a placeholder of the chosen data collection and data analytics techniques and procedures. The following section elaborates on the chosen research design aligned with the philosophical standpoints from the previous sections.

This research will be conducted in multiple phases within the 3-step research approach. It includes a survey in quantitative data collection as part of the survey analysis and qualitative analysis through coding and case study (in-depth interview). All three phases will use a mixed-method approach.

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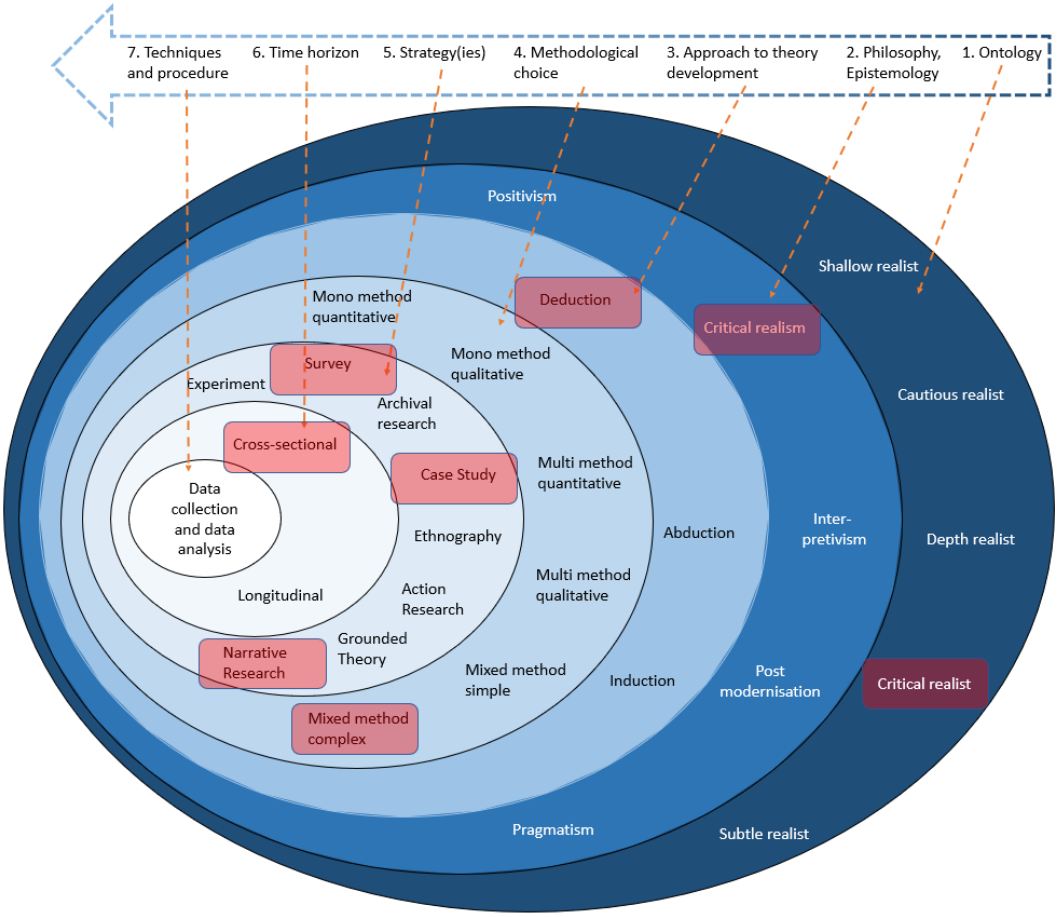


Figure 4: The applied research "onion". Source modified (Saunders et al. 2017, Blaikie 2007)

To summarise the selected components from the research "onion", this study will be performed under the following assumptions:

1. Ontology: Critical Realist
2. Philosophy/Epistemology: Critical Realism
3. Approach to theory development: Induction and Deduction
4. Methodological choice: Mixed Method Complex
5. Strategies: Narrative Research, Case Study, Survey

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6. Time Horizon: Cross-Sectional

7. Techniques and Procedures: Systematic Literature Review Process, Triangulation between Qualitative- and Quantitative Research; Mixed-Method Research with Coding

In summation, the red highlighted areas in Figure 4 show the chosen research components that will be followed in this study.

METHODS USED IN RESEARCH

The research design needs to support this research's objective to identify digital transformation strategies and frameworks to implement emerging and disruptive technologies. Methods gather and collect data; they are tools and techniques and consider ethical dimensions. The methodology is a theory or an analysis of how research should operate. Derivation from the chosen ontology and epistemology leads to methodological consideration, giving rise to the instrumentation and data collection.

The current book was based on mixed-method research.According to Creswell (2017), mixed research methods refer to “combining various elements of both quantitative and qualitative approaches with regards to perspectives, data collection and data analysis”. The chosen mixed method research is respectively

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what (Saunders et al., 2017) visualised as “mixed method complex" “ in their research “onion”.

LITERATURE REVIEW SYNTHESIS

To analyse the state of a specific literature topic, the systematic literature review process has been chosen as a comprehensive methodology that is most useful for software engineering related studies. Working with digital transformation and data software engineering concepts will prove quite helpful. The systematic review process applies a specific protocol that is outlined in the next section. A systematic literature review has more advantages over traditional literature research, as the findings are more transparent and scientific replicable as a predefined search strategy is in place.

Therefore, the study provides evidence that the phenomenon is robust and transferable. A systematic review is not a content analysis, e.g., Flick (2018), where the predictive and exploratory studies have been classified to their main content and themes. Instead, a systematic literature review process is “a means of evaluating and interpreting all available research relevant to a particular research question or topic area or phenomenon of interest”.

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This study followed the mixed-method research, which is defined as “combining various elements of both quantitative and qualitative approaches with regards to perspectives, data collection and data analysis”. The use of mixed research was intended to triangulate data sources and collect rich data on the topic. In the process, collected data could be more objective to reduce potential bias that might affect findings.

SURVEY

The survey is thoroughly planned and performed. Two different concepts have been merged to get the most out of the survey data. An introductory letter will guide the interviewees and offer them incentives to improve the response rate even further. Figure 5 shows the survey process used in the study.

The survey is a cross-sectional study to catch a frozen moment in time and reach different audiences compared to later. The survey has been sent to the author's significant number of LinkedIn contacts based on consulting clients, but it will also be promoted through the Accenture employee base. Some of them have been contacted using XING and were attracted through Facebook, add campaigns and direct mailshot campaigns.

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CASE STUDY (IN-DEPTH INTERVIEWS)

An interview is a personal exchange of information or, as the name interview suggests, an interchange of views between two or more people on a topic of mutual interest. Interviews can do what surveys cannot, which is to explore issues in depth.

There are four types of interviews that can be used for conducting the in-depth interview. Thisresearch will use the standardised open-ended interview type, which is the most suitable one, as the interview questions are determined in advance, and all interviewees are asked the same questions. Both will increase the comparability of responses. In addition, an open-ended question to open a discussion will be embedded in the interview to overcome this interview type's lack of flexibility.

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TARGET POPULATION AND SAMPLE SELECTION

The current section details the research setting, target population, and sample selection of participants who participated in this study, including the study settings based on the European Union. The target population is later discussed, focusing on industries and organisations. Further, the sampling process is discussed and

its application in selecting participants into the study. Finally, recruiting the participants into the study is detailed, focusing on social media campaigns.

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RESEARCH SETTING

This research was done in the European Union, focusing on the different industries and corporate organisations across Europe. There has been substantial digital transformation in different industries across the European Union in the last decade. However, despite this, there is still a lack of a single or universal implementation framework for disruptive technologies in industries and corporations in the European Union.. Therefore, there is a need to undertake this research and explore the current state of the digital transformation process in European industries and corporations while seeking to identify a single framework that may be considered for organisations in the future.

According to Branca et al. (2020), the lack of a unified transformation model in European industries slows progress in enhancing uptake of disruptive technologies and measuring their success. Bisio et al. (2018) shared similar concerns noting that the lack of a unified digital transformation framework hinders the practical application of the Internet of Things (IoT) for industry 4.0 applications due to cybersecurity threats. Möhring et al. (2020) also emphasised the need for an elaborate digital transformation framework in European corporations to achieve self-optimising machining systems.

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These findings show growing challenges and knowledge gaps across the European Union industries and corporations, necessitating the need for this study and the motivation to limit this research to Europe. As such, the research was limited to the European corporate and industrial sector, with a specific focus on the European Union member countries.

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TARGET POPULATION

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According to an employment specialisation report by Eurostat (2021), there were 253 million people employed in different industries across the European Union. Among these, 90% of the workforce was concentrated in six economic activities. These included fishing, forestry, and agriculture that accounted for 4.5% of the EU total employment. Further, the construction industry accounted for 6.3% (14.7 million) of the employment data, accounting for 35.6 million or 15.3% of the employments. Moreover, retail and wholesale trade, accommodation, transportation, food services, and information and technology accounted for 27.5% (64.4 million) of employment.

Furthermore, the real estate, insurance, finance, scientific, professional, and support services industries employed 38.1 million or 16.4% of the citizens across the EU. Public administration and support activities also accounted for 16.4% of the employment or 38.1 million citizens. At the same time, education, healthcare, social work, and defence industries employed 69.1 million or 29.7% of the EU citizens. In this study, the focus was to recruit participants from these industries and examine the digital transformation process in these sectors. Specifically, the study intended to recruit participants who had insight into disruptive technologies and the digital transformation process across these industries and organisations

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across the European Union.

PARTICIPANT SAMPLING

Since it's not possible to recruit all the estimated 253 million people employed in different industries across the European Union, the researcher conducted participant sampling to recruit a representative sample for the study. The sampling process was executed in two phases to recruit participants who participated in the surveys and those who participated in the interview sessions. The focus of the sampling process was to ensure the capture and collection of participants who could help the researcher capture relevant data to answer the formulated research objectives.

First, to recruit participants for the survey questionnaires, probability sampling was used. According to Creswell (2017), in the probability sampling technique, the researcher chooses samples from a larger population using a method based on probability theory. Davies (2020) added that probability sampling is based on the fact that every member of a population has a known and equal chance of being selected. As such, selecting participants for this study was based on random sampling drawn from different EU industries. Through random sampling, the participants had an equal chance of taking part in the study. Creswell (2017) detailed that random sampling offers a chance to perform data analysis with less

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risk of carrying an error. There is an equal chance of selection and presents a cost-effective and time-effective method for recruiting participants into a study.

Under the above considerations, it may be noted that probability sampling gives a researcher the best chance to create a representative sample. To determine the representative sample size that could participate in the study, G*Power analysis was performed. Considering a confidence level of 95%, a sample size of 253 million, and a margin of error of 5%, an ideal sample size for this study was initially considered to be 385 participants through probability sampling, selection, and recruitment of 385 participants across the European Union industries.

Second, to recruit participants for the interview sessions, purposive sampling and non-probability sampling techniques were used. Purposive sampling is also known as selective or judgemental sampling, and it focuses on selecting participants into the study based on their' qualifications concerning the topic under investigation. Specifically, the focus was to recruit C-level participants such as chief finance officer (CFO), chief executive officer (CEO), and chief information officer (CIO) into the study, considering their high-level information about the ' 'company's digital transformation processes. Moreover, the selection of interviewees focused on recruiting managers, application managers, and service managers from different industries in the EU to provide in-depth information about digital transformation and the key components in the successful implementation of disruptive

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technologies.

A sample size of 12 interviewees was recruited into the study based on a predetermined criterion. The inclusion and exclusion criteria focused on:

- People aged 20 years and above;
- Organisational leaders or managers working in EU industries or corporations;
- Employees who had worked in their current companies for more than two years;
- Organisations having experienced digital transformation or currently transforming.

The choice of 12 participants for the interview sessions was informed by attaining saturation and methodological rigour. According to Ghauri et al. (2020), a sample size of between 8 and 20 participants is enough for a qualitative study to attain rigour. Furthermore, 12 participants in this study were considered enough to collect enough information to the point that no new themes or ideas could emerge even with more participants in the study.

PARTICIPANT RECRUITMENT

The recruitment process was achieved through two phases: phase 1 focused on

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recruiting participants for survey questionnaires, and phase 2 focused on recruiting participants for interview sessions. First, to recruit participants who participated in this study, the researcher posted a media campaign or advertisement on social media sites such as Facebook. The media campaigns included details of the study, including the topic, research objectives, and research questions. Also, the media advert included an ethical consent form assuring participants of their privacy and data confidentiality. In addition, the 'researchers' numbers and email addresses were attached to the flyer used for the media.

Moreover, a link to an online survey was attached to the flyer. Thus, participants who expressed interest in the survey could visit the link and anonymously fill and return the completed survey questionnaires.

Participants who filled and returned their online surveys were assumed to have given online consent and voluntarily agreed to participate in the study. No personal information was collected during the survey process to ensure unauthorised persons did not identify respondents. Instead, all the survey responses were coded using synonyms to maintain participant privacy. Any participant who has additional questions about the study was encouraged to contact the researcher using the attached phone number or email address.

Second, to recruit participants for the interview sessions, the researcher posted a

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flyer with the aim and objectives of the study on LinkedIn, Facebook, and direct mail campaigns. The flyer advert included details about the study, including the study aims and objectives. An informed consent form was attached highlighting the approval from the university to conduct this study. Participants who expressed interest in participating in the study were encouraged to contact the researcher through email or using the provided phone number. A screening document for criteria compliance was emailed to interested participants for completion before returning it to the researcher.

The screening document detailed the participants who could participate in the study limited to the predetermined inclusion and exclusion criteria. The specific focus was limited to C-Level leaders (e.g., CFO, CEO, CIO) and the operational point of view of the operational staff (Manager, Service-/Application Manager). Participants who met the inclusion criteria were contacted via email or telephone to discuss the details of the study and the interview questions. The first 12 participants to fill in consent forms were considered for the study. Any additional participants were thanked for their interest and informed that the study had been closed.

However, a follow-up plan was taken into consideration when the initial participant recruitment did not contact 12 participants. Initially, only 8 participants had expressed their interest in the interview sessions. Therefore, under the follow-up

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plan, the research took different measures to recruit additional 4 participants. The measures included re-posting the recruitment flyers on LinkedIn, emails, and Facebook. Further, the recruitment flyers were posted to other platforms, including GroupMe/WhatsApp groups, Accenture contact base, LinkedIn/XING, and online groups (such as university alumni groups, dissertation groups, professional groups, and Facebook groups).

The follow-up plan resulted in the recruitment of 4 more participants who were later recruited into the interview sessions after providing their electronic consent to participate in the study voluntarily.

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Table 1 presents the demographic characteristics of participants who participated in the study. Participants consented to participate in the study, and their professional information is publicly accessible on LinkedIn.

No.	Participants	Title	Company	Country
1	Daniel Lambert	Vice President	Benchmark Consulting	Canada
2	Thiagarajan Venkatraman (Thiagu)	Senior Project Manager	Publishing Company	India
3	Almudena Rodriguez	Business Agility Consultant	Rodriguez Pardo & Assocs	Germany
4	Jürgen Horak	Senior Executive Consultant	Former GM at Dimension Data	Austria
5	Chantal Paquin	Architecte d'entreprise	Bombardier Recreational	Canada
6	Peter Bergmann	CEO, Senior IT-Expert	elleta München GmbH	Germany
7	Matthias Traugott	CEO	Punctdavista AG	Switzerland

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8	Thomas Pränger	CEO	VALpro Business Software AG	Germany
9	Lars Wentorp	CIO	Hamburg Port Authority	Germany
10	Martin Hager	CEO	Retarus GmbH	Germany
11	Fernando Scheps	Business Line Hub Lead	Accenture	Switzerland
12	Christoph Pirringer	CEO	CodeFactory GmbH	Austria

Table 1: Interviewees who Participated in the Interview Sessions Through Microsoft Teams

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DATA COLLECTION INSTRUMENTS

The current section details the data collection instruments used to collect relevant information from the participants from different organisations. Primary data collection tools included the use of survey questionnaires and semi-structured interview questions. These primary data collection tools are further detailed in the subsequent subsections focusing on the questions asked and the nature of data collected from the participants.

SURVEY QUESTIONNAIRES

The survey questionnaire was an open-ended document containing a mix of both open and closed questions self-designed based on the literature review. The survey questionnaire focused on collecting data to test the formulated hypotheses. The survey questions sought to collect data from participants, including information such as whether the participants have been in a transformation project with disruptive technology within the past two years. They were also asked which "technology domain they used during the transformation process. Multiple selections were possible if needed, and the participants were also asked to rate the success of their transformation projects.

Additionally, the surveys asked participants to rate the importance of different factors in their projects, strategies they could do differently if they had to redo the same transformation, and identifying potential pitfalls in their transformation

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project. Participants were also asked to share whether they have any project management certification, the kind of project management approach they prefer or favour in their transformation process and whether their organisations have used any project management method to manage their projects. The potential role and influence of an external consultant or consulting organisation in supporting their transformation was also examined. The consulting organisation that had supported participants in their transformation was also identified, along with the areas of action.

Further, through the survey, the researchers asked participants to name any transformation Framework and/or provide a URL for the transformation process and the extent to which the disruptive technology impacted their organisation and/or industry. The level to which a specific disruptive technology had changed their current processes and how they execute and measure them was also examined, taking into account the effect of such disruptive technologies on their competitive advantage. In addition, the impact of the same technologies on people and our society was assessed.

Their views regarding how the transformation of disruptive technologies is limited to any boundaries like countries, societies, or industries have been assessed as well. Information collected through the interview questions was key to examining and exploring possible correlations between independent variables (disruptive

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technologies) and independent variables (i.e., digital transformation in organisations and/or companies).

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DATA COLLECTION PROCEDURE

The current section discusses and elaborates on the data collection procedures. As discussed in the previous section, data for this study was collected using survey questionnaires and interview questions. In this section, the process of data collection using these two instruments is discussed. In addition, the duration of the data collection process and the potential ethical issues that emerged during the data collection process is further discussed. The following subsection first details the data collection process using surveys before discussing the interview data collection process.

SURVEY DATA COLLECTION

Google Forms platform was used to collect the survey responses from participants from across the EU and different industry sectors. Qualitrics.com is an online platform that enables researchers to capture and collect detailed insights on customer, product, brand, and employee experience insights in one place. Molnar (2019) pointed out that Google Forms is a reliable online survey tool that enables individual researchers to create, distribute, amend, and analyse survey responses from a single point that is convenient for their study.

Also, Google Forms are available to all staff, students, and faculty to collect survey data through online settings. In this study, the advantage of using Google Forms related to collecting a large amount of quantitative information from multiple

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participants from across the EU. In the process, it became possible to cut down on costs and time needed to collect data compared to conducting face-to-face or paper-and-pencil surveys.

In addition, considering the online global COVID-19 pandemic that contributed to lockdown in most EU countries, the use of the Google Forms platform provided a secure online channel for data collection. Data collection is still possible during lockdown through safe and secure methods that reduce physical contact with participants.

Reduction of physical contact between the researcher and participants reduces the risk of COVID-19 viral spread. Furthermore, it ensures the objectivity of the responses since the researcher did not influence the participants' opinions. The use of online surveys through Google Forms further ensured a high response rate, thereby reducing potential bias and ensuring generalizability of the findings. In the light of these considerations, it may be noted that the use of the Google Forms platform provided a reliable and convenient avenue for the data collection process in this study.

Before initiating the data collection process through the Google Forms platform, the first page of the online survey contained an informed consent form.

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Participants who clicked on the link provided during the online campaigns or through flayers during the recruitment exercise landed on the first page that contained the informed consent form. Specifically, participants' informed consent about the aim and objectives of the study was sought, and the participants were assured of their privacy. Through easy language, participants were also informed that taking part in the surveys was voluntary and that they could leave the survey at any time without any negative impacts. The first page of the online survey at Google Forms platform has an option for "Continue" and "Exit" with participants who consented to take part in the study clicking "Continue" to fill the survey questions and submit the completed responses.

Each survey session lasted between 8 to 15 minutes. Upon completing the survey questionnaire, the participants were encouraged to submit the completed responses by clicking on the "submit" option. Two weeks after distributing the surveys, a follow-up email was sent to potential participants reminding them about the survey. In addition, the email kindly reminded the participants who had not yet filled the surveys to engage in the exercise at their convenience. As a result of the follow-up reminder, more responses were received. A third and final email reminder was sent after a month and two weeks, with different responses received before closing the survey.

The obtained raw survey responses were subsequently compiled using Google

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Forms (2020). Raw data was downloaded and exported to SPSS statistical analysis software version 24 for further descriptive and inferential statics analyses. The raw data was stored in a password-protected computer. Additional backups were made to a Google Drive using a password-protected email to prevent unwarranted access or ensure data recovery if the ' 'researcher's personal computer is stolen or the stored raw data becomes corrupted. Backup data to Google Drive ensured raw survey responses would be available for future reference for a period of up to 5 years before they were deleted or destroyed (Ghauri, et al., 2020). The following subsection further discusses the data collection method used to collect the interview responses from the 12 participants.

> **Research Result:** The outcome of the survey where 1.152 people participated is published as infographic at: https://tesy-framework.com/
>
> Detailed statistical analysis is published at: https://tesy-framework.com/

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INTERVIEW DATA COLLECTION

Interview responses were collected after receiving electronic consent from participants related to the study objectives. A total of 12 participants took part in the interview sessions. Specifically, the researcher conducted an online interview using Microsoft Teams (Video and Voice) to obtain first-hand data consistent with the generic approach to qualitative research methodology. Bryman (2017)

asserted that online interview sessions allow participants to share their lived experiences. Also, online interviews ensure participants freely express their views, opinions, and perceptions about the topic, enabling a researcher to record their body language and in-depth expression about the feelings of meaning they attach to a given topic.

As the primary research method, semi-structured interviews in this study enabled the research to build rapport with every participant. Also, the interview approach ensured the researcher created flexibility during the interview sessions, thereby seeking richer responses to complex and personal issues related to digital transformation and their impact on organisations and/or companies. Participants were encouraged to detail their responses and clarify their statements through probes, leading to richer responses. All the interview sessions were scheduled at a convenient time for every participant. The duration of each interview session varied and lasted between 50 minutes and 90 minutes.

Notably, the interviews were conducted in a safe and secure private room to ensure privacy and reduce potential disruptions. Private rooms such as a private library allowed for the recording of the interviewee responses. The recording was done via the Microsoft Teams in-built recording options, and participants were asked for consent and agreed to their responses to be recorded throughout the interview sessions. The researcher followed the created interview guide, asking

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the same questions in the same manner for each participant. Using open-ended questions, the researcher used probes and clarifications to encourage additional, richer answers to questions whenever such a need arose during the sessions.

After completing each interview session, the researcher respectively thanked every participant for finding time to participate in the study. In a follow-up exercise, the participants were informed that a copy of the transcribed interviews would be sent to their emails for any additions or changes to ensure that none of their responses had been left out, misstated, or misunderstood. Upon leaving the interview room, the researcher immediately completed an observation guide and field notes to ensure optimal accuracy and recall in filling the collected interview responses.

Accuracy was maintained by reviewing the interview data that had been collected in addition to the observation records and field notes. Upon completing all interviews and data collection, the raw interview responses were coded and anonymously secured in a password-protected computer to ensure participant privacy and data confidentiality. The transcribed data were used for further data analysis to identify the main themes emerging from the interviews.

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SUMMARY

The current chapter has detailed methods and strategies to collect relevant data from participants to answer the research questions. The chapter commenced by discussing the concept of research philosophy focusing on ontology and epistemology. Then, considering the debates evident in various research traditions, the researcher used pragmatic research philosophy and discussed the rationale for its selection.

In addition, the chapter has discussed issues of research approach, strategies, techniques and procedures, and research methods. The study also elaborated about the target population and sample selection, including research setting, target sample, sampling techniques, and recruitment of the participants. Data collection instruments focusing on interviews and surveys have also been detailed.

As part of the research, more academic publications can be found at the links below:

- How COVID-19 has Impacted Digital Transformation - From the Perspective of C-Suite Professionals

  https://asrjetsjournal.org/index.php/American_Scientific_Journal/article/view/6619

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- Alma Mater European Conference: ALL ABOUT PEOPLE 2021: Digital Transformation in Science, Education and Arts https://en.almamater.si/project-management-stream-at-9th-ameu-international-scientific-conference-s444

CHAPTER 7

ABOUT THE AUTHOR

For 20 years, published author Helmut Schindlwick has specialised in digital transformation initiatives for international organisations. This enthusiastic lifelong learner is BBU GmbH Austria's current CIO, successfully spearheading innovative infrastructure transformations from scratch. His endeavours have earned his organisation a spot as one of eAward 2021's nominees for their "Cooperation and Organisation" category.

Schindlwick holds a PhD in Management and two Masters Degrees, including a Master's in Business Administration and a Master's in Science. Using insights, he

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has gleaned from his extensive education and experience. Schindlwick wrote "Core Components of Digital Transformations: Understanding the Principles Behind Successful Digital Transformations," which is a no-nonsense guide for business leaders to successfully drive transformational change in their organisations as they — and the world — embrace disruptive technologies that change lives for the better.

Believing that lifelong learning is key to his success, Schindlwick has become an expert in modelling techniques, supporting frameworks, and staff leadership through years of education and experience. He consistently raises the bar by earning certifications for ServiceNow, ITIL, COBIT, Prince2, ISO 27002, and more.

When ' 'he's not writing, he works as a consultant on transformational projects around the world. Schindlwick has spent two years in Moscow, six years in the United Kingdom, and four years in Frankfurt, guiding and supporting international organisations in improving their IT, application, data, and process architectures. He is a keen proponent of visualisation as a valuable tool in analysing and solving organisational challenges.

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APPENDICES

APPENDIX A: REFERENCES

Abbosh, O., Nunes, P., and Downes, L. 2019. Pivot to the Future - Discovering Value and Creating Growth in a Disrupted World. Public Affairs.

Afandi, W., 2017. The role of strategic leadership in digital transformation process. *Int.J. Recent Res.Appl.Stud*, vol. 33, pp. 19-22.

Agar, M. 1993. Speaking of ethnography. Cited in D. Silverman. 377–392.

Amado, A., Cortez, P., Rita, P., and Moro, S. 2018. *Research trends on Big Data in Marketing: A text mining and topic modeling-based literature analysis*. *24*(1), 1–7. https://doi.org/doi:10.1016/j.iedeen.2017.06.002

Analía, M. 2017. A Framework to Assess Organizational Readiness for the Digital Transformation. 15(2), 27–40. https://doi.org/doi:10.15665/rde.v15i2.976

Annacone, A., 2019. The 4 Types of Digital Transformation. June, Available from: https://www.linkedin.com/pulse/4-types-digital-transformation-andrew-annacone/.

Arksey, H., & Knight, P. T. 1999. Interviewing for social scientists: An introductory resource with examples. Sage.

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. 2018. *Introduction to research in education* (10th ed.). Cengage Learning.

Arora, J., Doshi, R., Jain, A., Goswami, P., Nandi, S., & Islam, R.-N. 2018. *Blockchain Services PEAK Matrix Assessment 2019: Race to Make Enterprise Blockchain Real*. Everest Group. https://www2.everestgrp.com/reportaction/EGR-2018-31-R-2836/Marketing

Association, B. E. R. (2018). *BERA Ethical Guidelines: British Educational Research Association Ethical Guidelines* (8th ed.). British Educational Research Association. https://www.bera.ac.uk/wp-

Book Preview

content/uploads/2018/06/BERA-Ethical-Guidelines-for-Educational-Research_4thEdn_2018.pdf?noredirect=1

Baryshnikova, A., & Taratukhin, V. (2017). Digital Transformation Framework for Smart Factory.

Benzidia, S., Luca, R. and Boiko, S., 2021. Disruptive innovation, business models, and encroachment strategies: Buyer's perspective on electric and hybrid vehicle technology. *Technological Forecasting and Social Change*, 165, p.120520.

Beiske, B. 2017. Research Methods: Uses and limitations of questionnaires, interviews and case studies, Munich: GRIN Verlag.

Bhaskar, R. 2013. *A Realist Theory of Science*. Taylor \& Francis. https://uberty.org/wp-content/uploads/2015/09/Roy_Bhaskar_A_Realist_Theory_of_Science.pdf

Bhushan, N. 2018. Digital Learning Transformation--A Strategic Framework Using the Analytic Hierarchy Process. 15–17.

Bianchini, A., Pellegrini, M., Rossi, J., and Saccani, C. 2018. A new productive model of circular economy enhanced by digital transformation in the Fourth Industrial Revolution-An integrated framework and real case studies.

Bisio, C., Garibotto, A. Grattarola, F. Lavagetto, A. 2018. Sciarrone, Exploiting context-aware capabilities over the internet of things for industry 4.0 applications, *IEEE Netw. 32*(3), 108–114.

Blaikie, N. 2007. *Approaches to social enquiry: Advancing knowledge*. Polity. https://books.google.at/books?hl=en&lr=lang_en&id=a8LAIqk0-nIC&oi=fnd&pg=PR4&dq=+(Blaikie,+2007)+&ots=TCOl0qBRHv&sig=JCjlpA2mzGjrQCSAQUtcdGvuVBc#v=onepage&q=realist&f=false

Boban, M., and Weber, M. 2018. Internet of Things, legal and regulatory framework in digital transformation from smart to intelligent cities. 1359–1364.

Book Preview

Bocayuva, M. 2021. Cybersecurity in the European Union port sector in light of the digital transformation and the COVID-19 pandemic. *WMU J Marit Affairs*. https://doi.org/10.1007/s13437-021-00240-4

Bogdan, R., & Biklen, S. K. (1997). *Qualitative research for education*. Allyn & Bacon Boston, MA. https://s3.amazonaws.com/academia.edu.documents/31190365/EDU7900_Qualitative_Research_for_Education.pdf?

Bondar, S., Hsu, J. C., Pfouga, A., and Stjepandic, J. 2017. *Agile digital transformation of System-of-Systems architecture models using Zachman framework*. *7*, 33–43. https://doi.org/doi:10.1016/j.jii.2017.03.001

Bonnet, D., and Nandan, P. 2011. *Transform to the Power of Digital - Digital Transformation as a Driver of Corporate Performance*. Capgemini. https://www.capgemini.com/wp-content/uploads/2017/07/Transform_to_the_Power_of_Digital.pdf

Borangiu, T., Trentesaux, D., Thomas, A., Leitão, P., and Barata, J. 2019. Digital transformation of manufacturing through cloud services and resource virtualization. *Computers In Industry*, *108*, 150-162. https://doi.org/10.1016/j.compind.2019.01.006

Branca, T., Fornai, B., Colla, V., Murri, M., Streppa, E., & Schröder, A. 2020. Current and future aspects of the digital transformation in the European Steel Industry. *Matériaux & Techniques*, *108*(5-6), 508. https://doi.org/10.1051/mattech/2021010

Braun, V., & Clarke, V. 2019. Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589-597. doi: 10.1080/2159676x.2019.1628806.

Brennan, N., Subramaniam, N., & van Staden, C. 2019. Corporate governance implications of disruptive technology: An overview. *The British Accounting Review*, *51*(6), 100860. https://doi.org/10.1016/j.bar.2019.100860

Brereton, P., Kitchenham, B. A., Budgen, D., Turner, M., & Khalil, M. 2007. *Lessons from applying the systematic literature review process within the software engineering domain*. *80*, 571–583. https://doi.org/doi:10.1016/j.jss.2006.07.009

Book Preview

Brooks, R., Te Riele, K., & Maguire, M. 2014. *Ethics and education research*. Sage. https://books.google.at/books?hl=en&lr=lang_en&id=Kx6JCwAAQBAJ&oi=fnd&pg=PP1&dq=brooks

Bryman, A. (2017). *Social Research Methods (4th Ed)*. Oxford: Oxford University Press.

Budman, M., Hurley, B., Khan, A., & Bhat, R. 2018. *Manifesting legacy: Looking beyond the digital era - 2018 global CIO survey*. Delloite Insights. https://www2.deloitte.com/content/dam/insights/us/articles/4774_CIO-survey/DI_CIO-survey-2018.pdf

Brock, J., and von Wangenheim, F. 2019. Demystifying AI: what digital transformation leaders can teach you about realistic artificial intelligence. *California Management Review, 61*(4), 110-134. https://doi.org/10.1177/1536504219865226

Cannell, C., and Kahn, R. 1968. Interviewing. The Handbook of Social Psychology.

Chen, Y. and Bellavitis, C., 2020. Blockchain disruption and decentralized finance: The rise of decentralized business models. Journal of Business Venturing Insights, 13, p.e00151.

Christensen, C.M., 2013. The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press.

Christensen, C.M., McDonald, R., Altman, E.J. and Palme, J.E., 2018. Disruptive innovation: An intellectual history and directions for future research. *Journal of Management Studies*, vol. 55, no. 7, pp. 1043-1078.

Chun Tie, Y., Birks, M., and Francis, K. 2019. Grounded theory research: A design framework for novice researchers. SAGE open medicine, 7, 2050312118822927. doi: 10.1177/2050312118822927

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education*. routledge. https://www.amazon.com/Research-Methods-Education-Louis-

Book Preview

Cohen/dp/1138209880/ref=sr_1_1?keywords=cohen+research+methods+in&qid=1559379397&s=gateway&sr=8-1

Collins, H. 2018. *Creative research: The theory and practice of research for the creative industries*. Bloomsbury Publishing. https://www.amazon.com/Creative-Research-Practice-Industries-Required/dp/2940411085

Cook, T. D., Campbell, D. T., & Shadish, W. 2002. *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin Boston, MA. https://www.alnap.org/system/files/content/resource/files/main/147.pdf

Cooper, K. 2021. Introduction to Software Engineering Perspectives in Computer Game Development. Taylor & Francis, London: Chapman and Hall/CRC

Creswell, J. W. 2011. *Controversies in mixed methods research*. (N. K. Denzin & Y. S. Lincoln (eds.); pp. 296–284). Thousend Oaks. https://books.google.at/books?id=qEiC-_ELYgIC

Creswell, J. W. 2014. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications, Inc.

Creswell, J. 2017. Research design: Qualitative, quantitative, and mixed methods approach (5th Ed.). Thousand Oaks, CA: Sage Publications.

Creswell, John W., and Tashakkori, A. 2007. *Editorial: Differing Perspectives on Mixed Methods Research*. *1*(4), 303–308. https://doi.org/doi:10.1177/1558689807306132

Crocker, L., & Algina, J. (1986). Introduction to classical and modern test theory. ERIC.

Crowther, D., & Lancaster, G. (2012). *Research methods*. Routledge. https://www.taylorfrancis.com/books/9780080943442

Cohen, L., Manion, L., & Morrison, K. 2018. Research methods in education Routledge. (New York & London).

Book Preview

Correani, A., De Massis, A., Frattini, F., Petruzzelli, A., and Natalicchio, A. 2020. Implementing a Digital Strategy: Learning from the Experience of Three Digital Transformation Projects. California Management Review, 62(4), 37-56. https://doi.org/10.1177/0008125620934864

Cozzolino, A., Verona, G. and Rothaermel, F., 2018. Unpacking the Disruption Process: New Technology, Business Models, and Incumbent Adaptation. *Journal of Management Studies*, 55(7), pp.1166-1202.

da Costa, L.' is S., Pereira, L., & Akkari, A. 2018. A Proposed Framework to Identify Digital Transformation Maturity in Small Industries. 156, 30–33.

Davies, P. 2020. A Quick Guide to Quantitative Research in the Social Sciences. Oxford: Oxford University Press.

Davison, M. L. 2009. The challenges we face managing those external (and internal) consultants! Paper presented at PMI® Global Congress 2009—North America, Orlando, FL. Newtown Square, PA: Project Management Institute.

Del Rowe, S. (2017). Digital transformation needs to happen: the clock is ticking for companies that have been unwilling to embrace change. *CRM Magazine, 21*(10). Retrieved from https://www.destinationcrm.com/Articles/Editorial/MagazineFeatures/Digital-Transformation-Needs-to-Happen-Now-120789.aspx

Designit, W. 2016. *The strategic Design Process to change organisations and generate innovation*. Designit (Wipro). http://www.designit-tokyo.com/en/blog/the-strategic-design-process-to-change-organizations-and-generate-innovation/

Diana, F., McKinney, T., and Mulcahy, K. 2012. *The digital Enterprise: A Framework for Transformation*. Tata Consulting Services. https://sites.tcs.com/insights/perspectives/digital-enterprise-framework-for-transformation/

DiGiacinto, D. (2019). The Importance of the Internal Review Board for Approving Proposed Research. *Journal of Diagnostic Medical Sonography*, *35*(2), 85-86. doi: 10.1177/8756479318817220

Book Preview

Easterby-Smith, M., Thorpe, R., Jackson, P. and Jaspersen, L., 2018. *Management and Business Research*. 5th ed. New York: SAGE.

Egorova, M., Bulgakova, B., and Selyutina, L. 2017. Modelling of investment processes in the sphere of social house building, in: Innovations in science and education, International Conference Proceedings, Central Bohemia University, Prague, pp.67-72.

Ershova, T. V., and Hohlov, Y. E. 2018a. *Digital Transformation Framework Monitoring of Large-Scale Socio-Economic Processes*. 1. https://doi.org/doi:10.1109/MLSD.2018.8551765

Ershova, T. V., and Hohlov, Y. E. 2018b. Internet of Things, legal and regulatory framework in digital transformation from smart to intelligent cities. 1359. https://doi.org/doi:10.23919/MIPRO.2018.8400245

Eurostat. 2008. *RAMON - Reference and Management of Nomenclatures (Rev. 2)*. eurostat. https://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC

Eurostat. 2021. Employment specialisation of EU regions. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190917-1#:~:text=In%202016%2C%20there%20were%20232,construction%20(14.7%20million%3B%206.3%25)%ees7

Flick, U. 2018. The Concepts of Qualitative Data: Challenges in Neoliberal Times for Qualitative Inquiry. *Qualitative Inquiry*, *25*(8), 713-720.

Fosty, V., VanDurme, Y., and Vezbergiené, A. 2015. *Building your digital DNA - Digital transformation in progress*. Deloitte Digital, Belgium. https://www2.deloitte.com/content/dam/Deloitte/be/Documents/technology/deloittedigital/Deloitte-Digital-BE_Building-your-digital-DNA_download_HR.pdf

Fowler Jr, F. J. (2013). *Survey research methods*. Sage publications. https://books.google.at/books?hl=en&lr=lang_en&id=CR-MAQAAQBAJ&oi=fnd&pg=PP1&dq=fowler+survey+research+methods&ots=KOvaMRUVDT&sig

Book Preview

=04cYavJHCtgbENQ3CvV6-t8jER4#v=onepage&q=fowler%20survey%20research%20methods&f=false

Frank, A., Dalenogare, L., & Ayala, N. (2019). Industry 4.0 technologies: Implementation patterns in manufacturing companies. *International Journal Of Production Economics*, *210*, 15-26. https://doi.org/10.1016/j.ijpe.2019.01.004

Gadd, D. 2004. Making sense of interviewee–interviewer dynamics in narratives about violence in intimate relationships. 7(5), 383–401.

Gartner., 2017. Market Insight: Gartner Global Top 100 IT Vendors in 2016. June, Available from: https://www.gartner.com/document/code/333112.

Gartner, I. 2019a. *Most Hyped Trends for 2019*. Gartner Inc; https://www.gartner.com/en/innovation-strategy/trends/most-hyped-technology-trends

Gartner, I. 2019b. *The Gartner Hype Cycle highlights the 29 emerging technologies CIOs should experiment with over the next year.* Gartner Inc. https://www.gartner.com/smarterwithgartner/5-trends-appear-on-the-gartner-hype-cycle-for-emerging-technologies-2019/;

Gartner, I., 2020. Hype Cycle for Emerging Technologies, 2020. 18.August, Available from: https://www.gartner.com/en/newsroom/press-releases/2020-08-18-gartner-identifies-five-emerging-trends-that-will-drive-technology-innovation-for-the-next-decade.

Garud, R., Kumaraswamy, A., Roberts, A., and Xu, L. 2020. Liminal movement by digital platform-based sharing economy ventures: The case of Uber Technologies. *Strategic Management Journal*. https://doi.org/10.1002/smj.3148

GDPR. (2018). *EU General Data Protection Regulation*. eugdpr.org. https://eugdpr.org/

Gimpel, H., Hosseini, S. olla, Huber, R., Probst, L., R oglinger, M., and Faisst, U. 2018. *Structuring digital transformation: a framework of action fields and its application at ZEISS*. *19*(1), 31–54.

Ghauri, P., Grønhaug, K., and Strange, R. 2020. Research methods in business studies. Cambridge: Cambridge University Press.

Book Preview

Gläser, J., & Laudel, G. (2013). *Life With and Without Coding: Two Methods for Early-Stage Data Analysis in Qualitative Research Aiming at Causal Explanations*. *2*. http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=edsdoj&AN=edsdoj.2129f8216088454ba22cf4ee3d630463&site=eds-live&custid=s1098328

Golafshani, N. 2003. *Understanding reliability and validity in qualitative research*. *8*(4), 597–606. https://nsuworks.nova.edu/tqr/vol8/iss4/6/?&sa=U&ei=ysMjVIynMZHd7Qay44H4DQ&ved=0CEEQFjAI&usg=AFQjCNFpuZ6PjJRw2DDeLP5vBVIRU5O79A/

Google Forms, S. (2020). *Google Forms, 2020* (2020th ed.). Google, Alphabet.

Grossman, R., 2015. How to Create a Learning Culture. 1.May, Available from: https://www.shrm.org/hr-today/news/hr-magazine/pages/0515-learning-culture.aspx#:~:text=worth%20the%20effort.-,What%20Is%20a%20Learning%20Culture%3F,share%20their%20knowledge%20with%20others.

Gruber, T. R. (1993). *A translation approach to portable ontology specifications*. *5*(2), 199–220. https://www.sciencedirect.com/science/article/pii/S1042814383710083

Guba, E. G., & Lincoln, Y. S. 1994. *Competing paradigms in qualitative research*. *2*(163–194), 105. file:///D:/Users/Helmut/Downloads/10-guba_lincoln_94.pdf

Gulati, P. M. (2009). Research Management: Fundamental & Applied Research. Busca Inc.

Haigh, E., Richards, B. J., & Hamer, J. (2017). *Mega Trend #1: Digital Transformation*. Source Information Services Ltd. https://reports.sourceglobalresearch.com/report/download/3053/extract/Digital-transformation

Haigh, F., Kemp, L., and Bazeley, P. 2019. Developing a critical realist informed framework to explain how the human rights and social determinants of health relationship works. *BMC Public Health* 19, 1571. https://doi.org/10.1186/s12889-019-7760-7

Book Preview

Hammersley, M. 2017. *Deconstructing the qualitative-quantitative divide 1* (pp. 39–55). Routledge. https://www.taylorfrancis.com/books/e/9781315248813/chapters/10.4324/9781315248813-2

Handwerker, W. P. (2005). *Sample design*. *3*, 429–436.

Harvard Business Review., 2017. Digital Transformation Is Racing Ahead and No Industry Is Immune. 19.6., Available from: https://hbr.org/sponsored/2017/07/digital-transformation-is-racing-ahead-and-no-industry-is-immune-2.

Hausberg, J., Liere-Netheler, K., Packmohr, S., Pakura, S., and Vogelsang, K. 2018. Digital transformation in business research: a systematic literature review and analysis. In DRUID18. Copenhagen Business School, Copenhagen, Denmark. Retrieved from https://ssrn.com/abstract=3169203

Heilig, L., Lalla-Ruiz, E., and Voß, S. 2017. *Digital transformation in maritime ports: analysis and a game theoretic framework*. *18*(2), 227. http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=edb&AN=126875397&site=eds-live&custid=s1098328

Henningsson, S., & Hedman, J. (2014). Technology-based Transformation of Digital Ecosystems: The DETT Framework. 15.

Hitchcock, G., and Hughes, D. 2002. *Research and the Teacher: A Qualitative Introduction to School-based Research*. Routledge. https://books.google.fr/books?hl=en&lr=&id=WhmIAgAAQBAJ&oi=fnd&pg=PP1&ots=MboUCqBOGK&sig=KHdpe4M2jWPmKSP95jkCleuwvtE#v=onepage&q&f=false

Ho, J., 2021. Disruptive innovation from the perspective of innovation diffusion theory. Technology Analysis & Strategic Management, pp.1-14.

Hochschild, J. L. 2009. *Conducting Intensive Interviews and Elite Interviews*. https://scholar.harvard.edu/jlhochschild/publications/conducting-intensive-interviews-and-elite-interviews

Book Preview

Hudson, P., & Miller, C. 1997. *The treasure hunt: strategies for obtaining maximum response to a postal survey*. *11*(2), 102–112. https://www.tandfonline.com/doi/abs/10.1080/09500799708666920

IBM, C. 2013. *Digital Reinvention - Preparing for a very different tomorrow*. IBM Corporation. https://www.ibm.com/downloads/cas/20NX8NYB

IBM, C. 2020. *Digital Reinvention in action (Infographic)*. IBM Corporation. https://www.ibm.com/downloads/cas/GAY3DKZZ

Ismail, M. H., Khater, M., and Zaki, M. 2017. Digital business transformation and strategy: What do we know so far? Retrieved from https://cambridgeservicealliance.eng.cam.ac.uk/resources/Downloads/Monthly%20Papers/2017NovPaper_Mariam.pdf

Issa, A., Hatiboglu, B., Bildstein, A., and Bauernhansl, T. 2018. Industrie 4.0 roadmap: Framework for digital transformation based on the concepts of capability maturity and alignment. *Procedia CIRP*, *72*, 973-978. https://doi.org/10.1016/j.procir.2018.03.151

Ivancic, L., Vesna, B. V., and Spremic, M. 2019. *Mastering the Digital Transformation Process: Business Practices and Lessons Learned*. *2*, 36. https://doi.org/doi:10.22215/timreview/1217

Jansen, F. 2020. Explaining Society: Critical Realism in the Social Sciences. *European Journal of Communication*, *35*(3), 308-310. doi: 10.1177/0267323120922091

Jarvis, C., Arnell, S., and Ching, T. M. 2019. *Rethink risk and enterprise security in a digital world*. DXC Technology. https://assets1.dxc.technology/digital_transformation/downloads/DXCDigitalDirections_Security.pdf

Jouko, N., Aaltonen, K. and Kujala, J. 2016. Challenges of adopting agile methods in a public organization. *International Journal of Information Systems and Project Management*, 4(3); 65-85. https://www. doi/abs/10.1080/0950079970.8392h

Book Preview

Kanaracus, C., Sato, C., and Wang, R. R. 2017. Constellation research 2017: digital transformation study. Retrieved from https://www.constellationr.com/research/constellation-research-2017-digital-transformation-study

Kaushik, V., & Walsh, C. 2019. Pragmatism as a Research Paradigm and Its Implications for Social Work Research. *Social Sciences*, *8*(9), 255. doi: 10.3390/socsci8090255

Kavadias, S., Ladas, K. and Loch, C., 2016. The Transformative Business Model. *Harvard Business Review*, vol. 94, no. 10, pp. 90-98. Available from: http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=bsu&AN=118307931&site=eds-live&custid=s1098328 ISSN 0017-8012.

Khan, S. and Bohnsack, R., 2020. Influencing the disruptive potential of sustainable technologies through value proposition design: The case of vehicle-to-grid technology. Journal of Cleaner Production, 254, p.120018.

Kitchenham, B. (2004). *Procedures for performing systematic reviews*. *33*(2004), 1–26. http://www.it.hiof.no/~haraldh/misc/2016-08-22-smat/Kitchenham-Systematic-Review-2004.pdf

Koleva, M. 2021. New Approach to Deep Miniaturization: A Way to Overcoming Moore's Law. *Journal of Modern Physics*, *12*, 167-178. doi: 10.4236/jmp.2021.123015.

Kolodynskyi, S., Drakokhrust, T., and Bashynska, M. 2018. *The Innovative Infrastructure of Economic Development in the Framework of International Digital Transformation*. *4*, 166. https://doi.org/doi:10.30525/2256-0742/2018-4-4-166-172

Kouroubali, A., and Katehakis, D. 2019. The new European interoperability framework as a facilitator of digital transformation for citizen empowerment. *Journal Of Biomedical Informatics*, *94*, 103166. https://doi.org/10.1016/j.jbi.2019.103166

Kvale, S. (1996). *InterViews: An Introduction to Qualitative Research Interviewing*. SAGE Publications, Inc. https://www.amazon.com/InterViews-Introduction-Qualitative-Research-Interviewing/dp/080395820X/ref=sr_1_1?keywords=9780803958203&linkCode=qs&qid=1572675654&s=books&sr=1-1

Book Preview

Kramer A., Tachilzik T., and Bongaerts R. 2017. Technology and Disruption: How the New Customer Relationship Influences the Corporate Strategy. In: Khare A., Stewart B., Schatz R. (eds) Phantom Ex Machina. Springer, Cham.

Kreitstshtein, A. and others. 2017. Digital transformation and its effects on the competency framework: a case study of digital banking.

Kumar, D., Fenn, J., and Normala C., 2020. Technology disruption and business performance in SMEs. *Journal of Product Innovation Management*, 14(2), pp. 429-58.

Kvale, S. and Brinkmann, S., 2009. *InterViews*. Thousand Oaks: Sage Publications.

Lehmann, C. (2018). *Infosys debuts its digital navigation framework*. 451 Research, LLC. https://www.infosys.com/navigate-your-next/framework/Documents/digital-navigation-framework-debut.pdf

Lee, R. 1993. *Doing research on sensitive topics*. Sage. https://books.google.at/books?hl=en&lr=lang_en&id=AVW_MGH5ZsIC&oi=fnd&pg=PP10&dq=lee+1993+doing+research+on+sensitve&ots=f4YpI9apkG&sig=diFJY-LT-IjaxpyROcSVs5PGSoE#v=onepage&q=lee%201993%20doing%20research%20on%20sensitve&f=false

Lehmann, C. (2018). *Infosys debuts its digital navigation framework*. 451 Research, LLC. https://www.infosys.com/navigate-your-next/framework/Documents/digital-navigation-framework-debut.pdf

Levin, A. 2018. *Transformation is constant, not digital*. Designit (Wipro). https://medium.designit.com/transformation-is-constant-not-digital-c4f691fac5b7

Li, F. (2017). The digital transformation of business models in the creative industries: A holistic framework and emerging trends. https://doi.org/doi:10.1016/j.technovation.2017.12.004

Book Preview

Liere-Netheler, K., Vogelsang, K., Packmohr, S., and Hoppe, U. 2018. *Towards a Framework for Digital Transformation Success in Manufacturing*. European Conference on Information Systems (ECIS).

Lindberg, A., and Hemvik, K. 2015. How to Recognize Opportunities for Digital Transformation: a framework for Large \& Established Firms.

Losch, A. (2009). *On the origins of critical realism*. *7*(1), 85–106. https://www.tandfonline.com/doi/abs/10.1080/14746700802617105

Loonam, J., Eaves, S., Kumar, V., and Parry, G. 2018. Towards digital transformation: Lessons learned from traditional organizations. Strategic Change, 27(2), 101-109. https://doi.org/10.1002/jsc.2185

Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research*. Sage publications.

Mat, S., Merga, M., and Morris, J. 2020. *Conducting quantitative research in education*. London: Springer Nature.

Mathur, M.B., Reichling, D. 2019. Open-source software for mouse-tracking in Qualtrics to measure category competition. *Behav Res 51, 1987*–1997. https://doi.org/10.3758/s13428-019-01258-6

Michael, S. and Smith, E., 2019. *Worldwide Spending on Digital Transformation*. Oct, Available from: https://www.idc.com/getdoc.jsp?containerId=prUS45612419.

Mihardjo, L., Sasmoko, S., Alamsjah, F. and Elidjen, E., 2019. Digital leadership role in developing business model innovation and customer experience orientation in industry 4.0. *Management Science Letters*, vol. 9, no. 11, pp. 1749-1762.

Mikl, J., Herold, D., Pilch, K., Ćwiklicki, M., and Kummer, S. 2020. Understanding disruptive technology transitions in the global logistics industry: the role of ecosystems. *Review Of International Business and Strategy*, *31*(1), 62-79. https://doi.org/10.1108/ribs-07-2020-0078

Mitchell, S. (2000). *Tao Te Ching: A New English Version*. HarperCollins. https://books.google.at/books?id=OIVQOlx0ZVsC

Book Preview

Mohajan, H. K. 2018. Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, *7*(1), 23-48.

Möhring, H., Wiederkehr, P., Erkorkmaz, K., & Kakinuma, Y. 2020. Self-optimizing machining systems. *CIRP Annals*, *69*(2), 740-763. https://doi.org/10.1016/j.cirp.2020.05.007

Molnar, A. (2019). SMARTRIQS: A Simple Method Allowing Real-Time Respondent Interaction in Qualtrics Surveys. *Journal Of Behavioral And Experimental Finance*, *22*, 161-169. https://doi.org/10.1016/j.jbef.2019.03.005

Myers, M. D. 2013. *Qualitative research in business and management*. Sage. https://books.google.fr/books?hl=en&lr=&id=XZARAgAAQBAJ&oi=fnd&pg=PP2&dq=Myers,+M.D.+(2008)+%E2%80%9CQualitative+Research+in+Business

Nandico O.F. 2016. A Framework to Support Digital Transformation. In: El-Sheikh E., Zimmermann A., Jain L. (eds) Emerging Trends in the Evolution of Service-Oriented and Enterprise Architectures. Intelligent Systems Reference Library, vol 111. Springer, Cham. https://doi.org/10.1007/978-3-319-40564-3_7

Naslund, D., and Kale, R. 2020. Is agile the latest management fad? A review of success factors of agile transformations. *International Journal Of Quality And Service Sciences*, *12*(4), 489-504. https://doi.org/10.1108/ijqss-12-2019-0142

Newman, L. 2018. Basics of Social Research: Qualitative and Quantitative Approaches. 3rd Ed., Upper Saddle River, NJ, Pearson Publishing.

Ng, J., and Lee, J. 2020. Project Management Certifications—Are They Worthwhile to Seek? *IEEE Engineering Management Review*, *48*(4), 20-27. https://doi.org/10.1109/emr.2020.3033579

NTT, D. (2018). *Digital Transformation: A Roadmap for Success (5-R Method)*. NTT Data. https://us.nttdata.com/en/-/media/assets/white-paper/digital-transformation-roadmap-whitepaper.pdf

Book Preview

Nwaiwu, F. 2018. Review and Comparison of Conceptual Frameworks on Digital Business Transformation. 3, 86. https://doi.org/doi:10.7441/joc.2018.03.06

Oja, J., Roth, S., & Westerlund, L. 2017. Futures of robotics. Human work in digital transformation. *International Journal Of Technology Management*, *73*(4), 176. https://doi.org/10.1504/ijtm.2017.083074

Onwuegbuzie, A. J., & Johnson, R. B. 2006. *The validity issue in mixed research*. *13*(1), 48–63. http://www.msera.org/docs/rits-v13n1-complete.pdf#page=55

Onwuegbuzie, A. J., & Leech, N. L. 2007. *Sampling designs in qualitative research: Making the sampling process more public*. *12*(2), 238–254. https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1636&context=tqr/

Orji, C.I., 2019. Digital business transformation: towards an integrated capability framework for digitization and business value generation. *Journal of Global Business and Technology*, vol. 15, no. 1, pp. 47-57.

Oxford Analytica. 2021a. Critical infrastructure sees rising cybersecurity risk. *Expert Briefings*. https://doi.org/10.1108/OXAN-DB261563

Oxford Analytica. 2021b. US pipeline hack signals critical infrastructure risks. *Expert Briefings*. https://doi.org/10.1108/OXAN-ES261393

Palos-Sanchez, P.R., Arenas-Marquez, F.J. and Aguayo-Camacho, M., 2017. Cloud computing (SaaS) adoption as a strategic technology: Results of an empirical study. *Mobile Information Systems*, vol. 2017.

Paterek, P. 2017. Agile transformation in project organization: knowledge management aspects and challenges. Proceedings of the 18th European Conference on Knowledge Management ECKM 2017, Vol. 1, pp. 1170-1179.

Patton, M. Q. (1980). *Qualitative evaluation methods*. Cambridge: Cambridge University Press.

Book Preview

Paulus, R., Xiong, C., and Socher, R. 2017. *A Deep Reinforced Model for Abstractive Summarization*. http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=edsarx&AN=edsarx.1705.04304&site=eds-live&custid=s1098328

Payne, G., & Payne, J. (2004). *Key concepts in social research*. Sage. https://books.google.fr/books?hl=en&lr=&id=CeE2uW3B1_QC&oi=fnd&pg=PT1&dq=Longitudinal+and+Cross-sectional+Studies+Geoff+Payne+%26+Judy+Payne&ots=1xqITxtulm&sig=3SXoPE3lxJgy6g7MvvX3hDZR-qg#v=onepage&q=Longitudinal&f=false

Peter, M., and Gatziu, S. 2016. *The Need of a Framework for the Digital Transformation of Industry Ecosystems*. COLLA16--The Sixth International Conference on Advanced Collaborative Networks, Systems and Applications, November 13-17, 2016, Barcelona, Spain.

Pihir, I., Tomičić-Pupek, K., & Tomičić Furjan, M. 2019. Digital transformation playground. Journal Of Information and Organizational Sciences, 43(1), 33-48. https://doi.org/10.31341/jios.43.1.3

Rath, T. (2007). *StrengthsFinder 2.0*. Simon and Schuster. https://books.google.at/books?hl=en&lr=lang_en&id=gttDCwAAQBAJ&oi=fnd&pg=PA81&dq=clifton+strengthsfinder&ots=KH-Zht84ua&sig=nTu5DaON91r9-0XG2nQmub08we0#v=onepage&q=clifton%20strengthsfinder&f=false

Redmer, A., Dannath, J. (2020). Changes in employment since the 1990s: numeracy practices at work in IALS and PIAAC. *ZDM Mathematics Education 52*, 447–459. https://doi.org/10.1007/s11858-019-01112-1

Reis, J., Amorim, N., and Matos, P. 2018. Digital transformation: a literature review and guidelines for future research Anonymous *World conference on information systems and technologies*, 2018.

Riccio, J. (2016). *The BXT approach: Widening perspectives on digital transformation*. PWC. https://www.digitalpulse.pwc.com.au/digital-transformation-bxt

Book Preview

Ring, K. 2018. *EY wavespace combines the art of the possible with the realities of coporate life*. 451 Research, LLC. https://wavespace.ey.com/wp-content/uploads/sites/7/2018/06/wavespace-Research.pdf

Ritala, P., Huotari, P. and Kryzhanivska, K., 2021. Disruption talk: an analysis of disruption-related communication, strategies, and outcomes in S&P 500 firms. Technology Analysis & Strategic Management, pp.1-12.

Robson, C., and McCartan, K. (2016). *Real world research*. John Wiley & Sons. https://books.google.at/books?hl=en&lr=lang_en&id=AdGOCQAAQBAJ&oi=fnd&pg=PA17&dq=Real+world+research&ots=pY8gVwbDdO&sig=u13k4541hIEA3QdhTWyetfxgpak#v=onepage&q=introductory&f=false

Rotolo, D., Hicks, D., and Martin, B.R., 2015. What is an emerging technology?. *Research Policy*, vol. 44, no. 10, pp. 1827-1843.

Rudman, H., Benyon, D., and Hall, H. 2015. *A framework for the transformation of the incumbent creative industries in a digital age*. International Forum on Knowledge Asset Dynamics.

Russell, K. D., O'Raghallaigh, P., O'Reilly, P., and Hayes, J. 2018a. *Business to digital transformation: a proposed framework for achieving business intelligence alignment*. Irish Academy of Management Annual Conference 2018.

Russell, K. D., O'Raghallaigh, P., O'Reilly, P., and Hayes, J. 2018b. *Digital privacy GDPR: a proposed digital transformation framework*. AMCIS 2018-24th Americas Conference on Information Systems.

Ryan, J. and Tipu, S., 2013. Leadership effects on innovation propensity: A two-factor full range leadership model. *Journal of Business Research*, 66(10), pp.2116-2129.

Sahu, N., Deng, H., and Molla, A. 2018. A capability-based framework for customer experience focused digital transformation. 1–10.

Book Preview

Sapsford, R. 2006. *Survey research*. Sage. https://books.google.at/books?hl=en&lr=lang_en&id=NOAGd7Hx9F4C&oi=fnd&pg=PP2&dq=sapsford+survey+research&ots=G_CpiWhaK5&sig=ojE14pHCJWf05uuLQ4FGmjLsyDw#v=onepage&q=sapsford%20survey%20research&f=false

Saunders, M. Lewis, P. and Thornhill, A. (2017). *Research Methods for Business Students (7thed.)*. Harlow: Financial Times Prentice Hall.

Schallmo D., and Williams, C.A., 2018. History of digital transformation. In: *Digital Transformation Now!*Springer, pp. 3-8.

Schallmo, D., Williams, C., and Boardman, L. (2019). Digital Transformation of Business Models — Best Practice, Enablers, and Roadmap. *Digital Disruptive Innovation*, 119-138. https://doi.org/10.1142/9781786347602_0005

Schindlwick, H., 2017. Reduce costs and improve data quality through the implementation of master data management and data governance in an international enterprise. Fachhochschule Technikum Vienna.

Schuh, G., Rebentisch, E., Riesener, M., Diels, F., Dolle, C., and Eich, S. 2017. Agile-waterfall hybrid product development in the manufacturing industry — Introducing guidelines for implementation of parallel use of the two models. *2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*. https://doi.org/10.1109/ieem.2017.8289986

Schuchmann, D., and Seufert, S. 2015. Corporate Learning in Times of Digital Transformation: A Conceptual Framework and Service Portfolio for the Learning Function in Banking Organisations. 8(1), 31–39. https://doi.org/doi:10.3991/ijac.v8i1.4440

Schwertner, K. 2020. Digital transformation of business in Europe. *Trakia Journal of Sciences, 15(*1); 388-393.

Scott, D. 2005. *Critical realism and empirical research methods in education*. *39*(4), 633–646. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-9752.2005.00460.x

Book Preview

Seufert, S., and Meier, C. 2016. *From eLearning to Digital Transformation: A Framework and Implications for L&D*. *9*(2), 27–33. https://doi.org/doi:10.3991/ijac.v9i2.6003

Shannon, C. 1948. A Mathematical Theory of Communication. *Bell System Technical Journal, 27* (3): 379–423. doi:10.1002/j.1538-7305.

Schwab, K., 2020. T*hese are the top 10 job skills of tomorrow – and how long it takes to learn them*. 21.October, Available from: https://www.weforum.org/agenda/2020/10/top-10-work-skills-of-tomorrow-how-long-it-takes-to-learn-them?utm_source=twitter&utm_medium=social_scheduler&utm_term=Education+and+Skills&utm_content=01/01/2021+00:00.

Sibanda, W., Ndiweni, E., Boulkeroua, M., Echchabi, A. and Ndlovu, T., 2020. Digital technology disruption on bank business models. *International Journal of Business Performance Management*, 21(1/2), p.184.

Silverman, D. 2015. *Interpreting qualitative data* (5th ed.). Sage. https://books.google.at/books?hl=en&lr=lang_en&id=BvmICwAAQBAJ&oi=fnd&pg=PP1&dq=silverman+interpreting+qualitative+data&ots=sLK_1yMO9X&sig=yPLZBAF1laEnkdaXlPIXVo9vyw4#v=onepage&q=silverman%20interpreting%20qualitative%20data&f=false

Smart, J. 2018. To transform to have agility, don’t do a capital A, capital T agile transformation. IEEE Software, 35(6); 56-60. https://doi.org/10.1109/ms.2018.738j

Spelman, M., Weinelt, B., Gul, M., Lacy, P., Shah, A., Popp, W., Falk, S., Cooper, T., and Rathi, V. 2017. *Unlocking Digital Value to Society: A new framework for growth*. World Ecconomic Forum & Accenture. https://www.accenture.com/_acnmedia/Accenture/Conversion-Assets/WEF/PDF/Accenture-Unlocking-Digital-Value-To-Society.pdf

Stankovski, S., Ostojic, G., Baranovski, I., Babic, M., and Stanojevic, M. 2020. The Impact of Edge Computing on Industrial Automation. *19Th International Symposium INFOTEH-JAHORINA (INFOTEH)*. https://doi.org/10.1109/infoteh48170.2020.9066341

Book Preview

Stewart, B., Schatz, R. and Khare, A., 2017. Making Sense of Digital Disruption Using a Conceptual Two-Order Model. In: *Phantom Ex Machina*Springer, pp. 3-21.

Snyder, B., and Curtis, B. 2018. Using Analytics to Guide Improvement during an Agile–DevOps Transformation. *IEEE Software*, *35*(1), 78-83. https://doi.org/10.1109/ms.2017.4541032

Thummadi, B., and Lyytinen, K. 2020. How Much Method-in-Use Matters? A Case Study of Agile and Waterfall Software Projects. *Journal Of The Association For Information Systems*, *21*, 864-900. https://doi.org/10.17705/1jais.00623

Trussel, M., Nodine, T., Regimbal, L., Courlas, S., McNeill, A., Merrey, P., Portelli, L., Pritchett, W., Phipps, S., and Quirk, S. 2016. *Empowerd for the future*. KPMG International. http://bpcc.org.pl/uploads/ckeditor/attachments/10306/Raport_KPMG_Empower_for_the_future_Insurance_reinvented.pdf

Valkokari K., Rantala T., Alamäki A., Palomäki K., 2018. Business Impacts of Technology Disruption - A Design Science Approach to Cognitive Systems' Adoption Within Collaborative Networks. In: Camarinha-Matos L., Afsarmanesh H., Rezgui Y. (eds) Collaborative Networks of Cognitive Systems. PRO-VE 2018. IFIP Advances in Information and Communication Technology, vol 534. Springer, Cham.

Verhoef, P., and Bijmolt, T. (2019). Marketing perspectives on digital business models: A framework and overview of the special issue. *International Journal Of Research In Marketing*, *36*(3), 341-349. https://doi.org/10.1016/j.ijresmar.2019.08.001

Verina, N., and Titko, J. (2019). Digital transformation: conceptual framework. Proceedings Of 6Th International Scientific Conference Contemporary Issues in Business, Management And Economics Engineering '2019. https://doi.org/10.3846/cibmee.2019.073

Verbi, S. (1989). *MAXQDA Analytics Pro 2018* (2018th ed.). VERBI GmbH.

Veselovsky, M., Gnezdova, J, Glebova, A., Nikolskaya, V., and Lebedev, A. 2018. *Innovative transformation of the russian industry in the framework of digital technologies*. *39*(41), 6p.

Book Preview

http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=edselc&AN=edselc.2-52.0-85055952878&site=eds-live&custid=s1098328

Vial, G. (2019). Understanding digital transformation: a review and a research agenda. J Strateg Inf Syst 28:118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Waldo, J. 2019. *A Hitchhiker's Guide to the Blockchain Universe*. *62*(3), 38–42. https://doi.org/doi:10.1145/3303868

Wilson, J., Arshed, N., Shaw, E., and Pret, T. 2017. *Expanding the Domain of Festival Research: A Review and Research Agenda*. *19*(2), 195–213. https://doi.org/doi:10.1111/ijmr.12093

Winter, G. 2000. *A comparative discussion of the notion of'validity'in qualitative and quantitative research*. *4*(3), 1–14. https://nsuworks.nova.edu/cgi/viewcontent.cgi?referer=https://scholar.google.at/&httpsredir=1&article=2078&context=tqr/

Wipro, L. (2018). *Wipro's Digital Transformation Model*. Wipro Limited. https://www.wipro.com/content/dam/nexus/en/industries/communication-service-providers/solutions/wipro-digital-transformation-model.pdf

Yap, J., Abdul-Rahman, H., and Chen, W. 2017. Collaborative model: Managing design changes with reusable project experiences through project learning and effective communication. *International Journal of Project Management*, *35*(7), 1253-1271. https://doi.org/10.1016/j.ijproman.2017.04.010

Zachariadis, M., Scott, S., and Barrett, M. 2010. Exploring critical realism as the theoretical foundation of mixed-method research: evidence from the economics of IS innovations. Cambridge Judge Business School. https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/workingpapers/wp1003.pd

Zomer, T., Neely, A., and Martinez, V. 2018. Enabling Digital Transformation: An Analysis Framework.

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APPENDIX C: CROSSTAB TOP 10 FRAMEWORK COMPARISON

	TESy Framework	(Lindberg, Hemvik 2015)	(Kreitstshtein 2017)	(Gimpel, Hosseini et al. 2018)	KPMG	Accenture	Deloitte	(Schuchmann, Seufert 2015)	(Li 2017)	(Ivancic, Vesna et al. 2019)	Total
Dictionary											
TESy Framework Components	20.8%	15.7%	17.6%	13.1%	1.4%	11.6%	3.5%	6.8%	7.8%	1.7%	100.0%
External Factors	28.9%	27.2%	10.5%	1.8%	4.4%	7.0%		11.4%	1.8%	7.0%	100.0%
Competition	2.9%	44.9%	8.7%	13.0%	7.2%	1.4%	5.8%	5.8%	2.9%	7.2%	100.0%
Technology (Ex)	11.6%	10.4%	18.8%	12.2%	13.1%	17.6%	2.4%	0.6%	2.4%	10.7%	100.0%
Requirements	48.1%	3.8%	7.7%	7.7%	5.8%	5.8%	7.7%	7.7%	3.8%	1.9%	100.0%
Regulation	40.9%	1.1%	26.9%	6.5%	5.4%	18.3%	1.1%				100.0%
Disaster											
Trends	18.0%	20.0%	50.0%	2.0%		4.0%			6.0%		100.0%
Organisation	17.7%	22.4%	13.9%	13.8%	6.1%	3.1%	8.3%	7.8%	0.7%	6.2%	100.0%
People	13.2%	12.8%	22.3%	8.3%	7.3%	3.6%	15.6%	7.5%	0.4%	9.1%	100.0%
Process	25.2%	16.2%	12.1%	17.2%	3.8%	1.9%	2.8%	7.1%	2.5%	11.2%	100.0%
Policy	49.1%	0.6%	3.6%	3.6%	1.2%	32.9%	0.6%	1.8%	4.2%	2.4%	100.0%
Knowledge	11.6%	39.0%	13.0%	2.5%	2.2%	2.2%	5.1%	16.2%	1.1%	7.2%	100.0%
Management System	32.2%	13.3%	13.6%	10.4%	4.6%	1.9%	2.4%	6.9%	5.0%	9.8%	100.0%
Technology (Org)	8.8%	12.2%	14.2%	13.0%	9.2%	15.8%	4.4%	0.2%	13.4%	8.8%	100.0%
Service, Product	6.8%	10.6%	30.6%	13.1%	4.3%	10.0%	4.4%	6.2%	9.8%	4.2%	100.0%
Data	64.5%	6.6%	12.0%	8.6%	1.1%	2.7%	0.9%	0.6%	0.7%	2.3%	100.0%
Information	46.3%	8.9%	3.6%	19.9%	2.8%	2.1%	1.1%	1.1%	3.6%	10.7%	100.0%
Relationships	39.3%	17.9%	12.5%	16.1%	3.6%	1.8%		5.4%	3.6%		100.0%
Customer	9.1%	13.5%	23.5%	14.8%	11.0%	9.9%	4.4%	1.7%	7.3%	4.7%	100.0%
Partner	6.2%	16.6%	8.3%	13.5%	24.4%	14.5%	4.1%	4.1%	2.1%	6.2%	100.0%
Vendor	41.7%			16.7%		12.5%			29.2%		100.0%
Transition	6.3%	24.7%	13.6%	11.0%	15.5%	5.0%	6.1%	3.1%	4.9%	9.8%	100.0%
Management	28.6%	14.7%	8.1%	12.5%	8.1%	1.6%	2.6%	8.7%	4.3%	10.7%	100.0%
Board	21.6%	2.0%		15.7%	9.8%	13.7%	17.6%	13.7%		5.9%	100.0%
Goal	13.3%	29.6%	11.9%	8.1%	10.4%	7.4%	5.2%	5.9%	5.2%	3.0%	100.0%
Strategy	6.3%	24.5%	23.4%	8.6%	10.7%	4.7%	7.4%	3.5%	5.2%	5.7%	100.0%
Risk	50.6%	20.8%	2.6%	3.2%	10.4%	5.2%	3.2%	0.6%	2.6%	0.6%	100.0%
Project	32.8%	11.4%	4.6%	8.7%	9.2%	19.3%	3.6%	3.8%	1.8%	4.9%	100.0%
Enterprise Architecture	18.8%	12.2%	7.9%	4.5%	6.7%	4.2%	4.2%	0.8%	39.4%	1.3%	100.0%
Process Model	28.6%	35.7%	17.9%						3.6%	14.3%	100.0%
Organisational Model	47.1%	0.2%	8.0%			0.2%	21.2%	21.8%	1.6%		100.0%
GRC Model	77.0%	7.8%	1.8%	2.3%	5.0%	2.5%	1.5%		1.0%	1.3%	100.0%
Capability Model	7.9%	23.2%	1.3%	12.6%	21.2%	1.3%	13.2%	15.2%	1.3%	2.6%	100.0%
Topology Model	100.0%										100.0%
Missing components?											
(?) Culture	8.2%	13.3%	6.1%	3.1%	16.3%	1.0%	17.3%	11.2%	16.3%	7.1%	100.0%
(?) Learning Culture	1.1%	2.5%	14.5%	1.5%	1.1%	1.5%	4.7%	70.2%	2.2%	0.7%	100.0%
(?) Leadership	3.6%	7.6%	5.3%	6.6%	15.5%	10.9%	36.6%	5.9%	5.3%	2.6%	100.0%
(?) Competence, Skill, Talent	6.4%	2.5%	48.7%	2.5%	4.8%	3.4%	24.8%	4.1%	0.5%	2.1%	100.0%
(?) Vision		4.9%	19.7%	11.5%	29.5%	3.3%	14.8%	4.9%	3.3%	8.2%	100.0%
(?) Innovation	0.4%	41.1%	4.5%	6.5%	5.1%	9.6%	2.9%	9.2%	12.8%	7.9%	100.0%
(?) Collaboration		23.5%	27.2%	7.4%	1.2%	14.8%	8.6%	13.6%	1.2%	2.5%	100.0%
(?) Governance	93.8%		0.4%	1.3%	1.8%	0.4%	0.4%			1.8%	100.0%
(?) Agile	1.1%	1.1%	47.7%	21.6%	14.8%	2.3%	4.5%	1.1%		5.7%	100.0%
SUM	22.4%	15.4%	14.6%	9.9%	7.2%	6.4%	6.3%	6.3%	5.9%	5.6%	100.0%
N = Documents	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	1 (10.0%)	10 (100.0%)

APPENDIX D: TESY-FRAMEWORK 2.0 POSTER

