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B2B Digital Transformation in Action - An empirical study from a Scottish SME

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Abstract

Purpose - Digital Transformation (DT) has emerged as a constant theme in academic and practitioner conversations. Many studies were carried out globally relating to large well-known companies. However, research that spotlights small and medium-sized enterprises remains extremely limited. The aim of this study is to address the research gap.

Design/Methodology/Approach - This study uses case study and action research methods demonstrating the implementation of real change in a Scottish B2B SME.

Findings – Integrating the issues and relevant literature, drawing on lessons learned from a real-life project, this study identifies areas that should be considered in implementing DT, and proposes a model for DT.

Originality - Case study and action research on DT are valuable in understanding practice and in identifying research opportunities by discovering the gap between theory and practice. The empirical findings and the proposed model will add to theoretical knowledge about practice and provide future research directions.

Track: 1. Organisational Transformation Change and Development; &
2. e-Business and e-Government.

1. Introduction &

Digital Transformation (DT) has emerged as a constant theme in academic and practitioner conversations. Companies in most industries have conducted initiatives to explore various methods to apply digital technology including social, mobile, Internet of Things (IoT), big data analytics, cloud and artificial intelligence. The challenges around the COVID-19 pandemic have further driven organisations to take actions by increasing their awareness of the need to accelerate DT (McKinsey, 2020; strategy&, 2020). Digital infrastructures are providing new tools for rapid upscaling in commercial practice (Huang et al, 2017). DT helps businesses gain

notable advantages (Correani et al., 2020), such as helping create products and services that are more efficient and consistent with customer needs (Tresp et al., 2016), shortening the innovation process and time to market (Urbinati et al., 2020), creating related digital ecosystems (Nambisan, 2017), and providing new opportunities for creating and appropriating value through digitisation and connectivity (Nambisan, 2017).

Given the increased interest in DT, many studies were carried out in global well-known companies, such as BMW, Uber, Airbnb, Facebook, and Alibaba (Vey et al., 2017), ThyssenKrupp (Schallmo, Williams and Boardman, 2017), Inditex, IMB, Walmart, Apple, Twitter (Pinzaru, Zbucnea and Vitelar, 2019), ABB, CNH Industrial, and Vodafone (Correani et al., 2020) using them as case studies to research business model innovation, balance digital & human touch, and customer journey improvement (Pinzaru et al., 2019). Despite widespread application in practice, research remains sparse in literature relating to small and medium-sized enterprises (SMEs) (Cenamor, Parida and Wincent, 2019; Matarazzo et al., 2021) understanding of approaches SMEs should take and what elements would increase their chance of success in DT. Due to the lack of necessary resources, insufficient capabilities, and other restrictions, SMEs face more challenges and barriers to DT than large companies, thus successful implementation of DT becomes more difficult (Zhang, Xu and Ma, 2022). There are also gaps in understanding the practice of suitable approaches for SMEs (Li et al., 2017). Surveys show that senior executives found that DT risk is their No.1 concern in 2019, yet 70% of all DT initiatives do not reach their goals and over \$1.3 trillion was spent on DT in 2018, it was estimated that \$900 billion went to waste (Tabrizi et al., 2019). Any kind of transformation requires serious commitment and at the same time bold, sometimes risky, decision making (Meffert and Swaminathan, 2017). Therefore, systematically DT requires not only all forms of resistance but also a great amount of investment in finance and resources. SMEs naturally have inadequate capability and limited resources that drive DT, exposing SMEs to increased risk. Vital to SMEs success is the need for in-depth practical research relating to DT modelling.

Past studies (e.g., Bertola and Teunissen, 2018; Kaidalova, Sandkuhl and Seigerroth, 2018; Correani et al., 2020) mainly used case study as an approach to analyse how companies digitally transformed their business (Kutnjak, Pihiri and Furjan, 2019). For the purpose of this research, to analyse a typical traditional paperwork-oriented and field worker intensive industry (a lift service company), and to understand DT in the context of practice in B2B SMEs, a case study and action research approach have been adopted. Case study is a research strategy frequently used in social sciences to analyse complex situations and phenomena. Action research has been regarded as valid in many businesses management studies, such as in marketing (Bonoma, 1985), operations management (McCutcheon and Meredith, 1993; Balthu and Clegg, 2021), management information systems (Benbasat, Goldstein and Mead, 1987), strategy (Mintzberg, 1979; Eisenhardt, 1989; Larsson, 1993), corporate communications (Zehrer and Leiß, 2020; Apostol et al., 2021). Action research usually implies a real problem in an organisation, with the search for a solution, in a collaborative manner, by teams formed of practitioners and academics (Stringer, 2014, p. 6). Being a “practice-based” approach action research generates knowledge from academic, theoretical and practitioner perspectives (Kemmis, 2009; Coghlan and Brannick, 2007). Action research is concerned with change in organisations (Shani and Pasmore, 1985). This method allowed us to immerse ourselves in the phenomenon explored, i.e., the conceptualisation of digital transformation strategy.

Examples of DT, in the lift industry include large corporations like Otis (1988) introduced Remote Elevator Monitoring (REM), which is a diagnostic system for checking and monitoring elevator performance from distant locations. Also, ThyssenKrupp implemented an Elevator Monitoring System called Max, which was one of the few digital transformations in the industry (Schallmo et al, 2017). The system aimed to improve technical diagnostic and engineering via delivery of real-time information flow for key components such as drive motors, lift doors and shaft via sensors. However, the DT at the operational level within the organisations are limited. This study will be one of the few focusing on lift industry DT, especially in the context of B2B SMEs.

Our objective is to address the above research gaps through empirical understanding of practice which can, in turn, lead to the improvement of existing theory and new theory development (Ketokivi and Choi, 2014). Leading the DT in practice within the business, the researchers are informed with a solid data foundation through intensive participation and involvement in implementing a cloud-based operating/CRM system that achieves automation and digitalisation in finance management, inventory control, field workforce management, fleet control, information management, etc. With close observation of business and people, drawing on lessons learned from the first cycle of the project, we developed a model that proposes DT success elements and provides practical outlines for SMEs to reduce the risks of DT failure and maximize the DT outcomes in business. Due to the foundations of the research project being derived from academic literature the research will make theoretical implications, connecting practice and theory. This study provides a real story from a live project.

2. Literature Review

2.1 Digital transformation

The term 'digital transformation' (DT) has become a hype and buzzword in both academic and practitioner literatures. However, there is no collective agreement on what DT is (Warner and Wäger, 2019), and what it encompassed (Wessel et al., 2020). Some scholars associated it with specific technologies to explain 'organizational shift to big data analytics' (Nwankpa and Roumani 2016, p. 4), while others focus on technology in general as the driver of change (Westerman, Bonnet and McAfee, 2014). The research emphasises that DT does not only mean technological changes, but also affects business process change (Hinings, Gegenhuber and Greenwood, 2018; Hausberg et al., 2019). DT involves reviewing an organisations business models, current processes, and technologies to create efficiencies and gain value (Erl & Stoffers, 2022). As such DT can be viewed as a method for developing the business, the importance of which has led to organisations combining both traditional and digital strategic business methods to develop a digital business strategy (Bharadwaj et al, 2013; Magnusson, Elliot and Hagberg, 2021). Hinings et al (2018) further suggest that DT requires a level of innovation that will influence internal business practices and the business ecosystem the organisation operates within, therefor affecting a range of business dimensions including changing business processes and challenging the business culture. Many studies have proven that organisations can benefit from growth derived from successful DT (Hauer and Naumann, 2020; Hottges, 2017). However, it is also recognised that businesses have distinct levels of

capability and commitment to DT, often being influenced by the ‘buy in’ from top management (Pingali, Prakash and Korem, 2021) and the associated willingness to adopt a transformational strategy. SMEs can be categorised into four levels of DT: being digitally aware, having digital acquirement, being digitally collaborative and seeking DT. The categorisation indicates the level of change and capability the SME is willing to endure (Garzoni et al., 2020; Agostino and Costantini, 2021; Pingali et al, 2021).

2.2 Digital Transformation Strategy

According to Matt, Hess and Benlian (2015), to achieve DT a digital transformation strategy (DTS) approach can coordinate, prioritise, and implement an organisation’s digital transformation efforts with the objective of governing an organisation’s journey. A clear strategy for deploying and exploiting digital technologies is crucial for an organisation’s future success. Hess et al, (2016) further suggest that to gain value from digital transformation the company must use due diligence in formulating the digital transformation strategy ensuring all ‘threads’ of the DT are coordinated having their own digital targets.

Considering the requirement for innovation, company willingness and level of digital experience coupled with associated driving factors, embarking on DT is challenging. More organisations are actively embarking on developing DTS that is combined with traditional practices (Bharadwaj et al, 2013). Pingali et al (2021) suggest five aspects to DTS development stating innovative thought should be given to process, product, business model, organisational variables, and technology. Whilst research by Agostino et al (2021) focuses on the need to have proper measurements in place so success of DTS can be measured.

2.3 Factors and Drivers of Digital Transformation Strategy

DT is driven via an array of both internal and external business considerations including industry & competition, customer expectations, financial stakeholders and partners, Government support, leadership, business growth objectives, globalisation, customer relationships, a need to increase process efficiencies, and the ability to attract the right people (Pingali et al, 2021; Ko et al., 2021; North and Lorenzo, 2020).

Often organisations consider the technology required to enable the DT rather than the wider array of influences and motivational factors within the business. Erl & Stoffers (2022) suggest when approaching DT organisations should consider the four primary factors that drive the transformation including the business, technology, data, and people, also agreeing that digital innovation is needed for DT to be present.

From a practical perspective business consideration may include delivering a detailed market audit, resource and capability assessment and an extensive business process mapping exercise. Fan and Ouppara’s (2022) case study on SMEs found that digital capability and leadership capability are perceived as the most important aspects affecting the overall success of DT with organisational structure and culture also being significant factors of DT.

Data considerations include mapping of information flow internally and externally and an assessment of the current and future potential that the creation of efficiencies in data management and analysis hold (see Figure 3).

People includes a full understanding of all key personnel job roles and daily activities being analysed to identify tasks that could be optimised, and where efficiencies could be created. It is essential that the individuals responsible for the DT strategy have adequate experience, with transformation projects, and as such are competent in aligning activities and processes to meet the expected strategy outcomes (Matt et al, 2015). Top management support is essential along the whole transformation process, since DT strategies affect the entire company, and their execution may, therefore, result in resistance from different areas of the organisation (Matt et al, 2015). It has been acknowledged that the human experience that surrounds digital technology is vital to raising an organisation's success of DT (Puthiyamadam, 2017). Therefore, it is essential for organisations to enable their employees to immerse themselves at every stage of DT (Fan and Ouppara, 2022).

Technology has been identified as one of the key drivers of DT (Morakanyane, Grace and O'reilly, 2017). Fehér, Szabó and Varga's (2017) research results further supported that technology is a key enabler of DT. Technology enables organisational transformation to take place, and technology-based systems are at the core of all DT efforts (Besson and Rowe 2012; Cha and Lee 2013). The use of technologies addresses an organisation's attitude towards recent technologies and its ability to utilise these technologies (Matt et al 2015). Digital technologies create opportunities which have the potential to transform certain areas of the organisation, such as business models, operational processes, and customer experiences (Morakanyane, Grace and O'reilly, 2017). Eventually, the impact of the transformation is beneficial to the organisation. After which a review of where technology can assist in creating efficiencies and add value can be carried out. Kane et al. (2015) state the priority should not be on the technology but on the organisation's DTS.

Past academic research has focused on providing guidance on certain aspects of DT but lacks specific guidelines for firms on how to formulate, implement, and evaluate DTS (Matt et al 2015). It is anticipated that following theoretical guidance to develop a DTS, a relevant model can be proposed.

3. Methods

The main goal of this project is to gain deeper insights into a SME's current digital activities and at the same time, to develop DTS and supporting actions for positive change, resulting in a proposed DT model. As a result, the work has been carried out by integrating both a single unit real-life case study and action research.

3.1 The case company

The empirical study is based on a sole case of a small medium-sized B2B company with over 40 employees located in the West of Scotland. The case company is a profitable one stop shop for all lift services including supply, installation, maintenance, and bespoke manufacturing. Established in 1999 the family-owned business is highly regarded throughout Scotland and parts of England. Through partnership with an Innovate UK (United Kingdom) knowledge transfer project (KTP) and the University of the West of Scotland (UWS) the company intends

to grow the business by adopting a DTS framework. This research seeks to understand an SME's current digital situation and develop relevant DTS and supporting actions.

Our involvement with the case company started in September 2020, when the KTP project was started with the financial support of a public organisation. The scope of the project framed jointly by corporate representatives, academic staff, and the funding body, broadly involved three academic teams: Marketing, finance and accounting, and operation.

3.2 Action research

In 1946 Kurt Lewin formulated action research in a bid to acknowledge social science in society (Bradbury et al., 2008). Action research has been defined as an approach that aims for: action towards solving a specific problem, and the development of knowledge or theory regarding the action taken (Coughlan and Coughlan, 2002). The researcher is no longer an external observer but is characterised by being a participant directly involved in problem solving (Greenwood and Levin, 1998).

As suggested by Coughlan and Coughlan (2009), one of the researchers was presented to the daily routine of the case company and learned the context in which it operated. From these observations and conversations with top management (company directors and managers), the objectives of the action research project were established. As the KTP project evolved, different data collection methods were used including the researcher keeping a research journal, company documentation collection and analysis, field notes, observation, semi-structured interviews with managers, staff, and clients (see figure 2).

The “story” of this study is narrated by a methodological account of how this action research project developed, and data were analysed, following Coughlan's (2019) five-phase model of the action research cycle (see figure 1) further developed for this research (see figure 2).

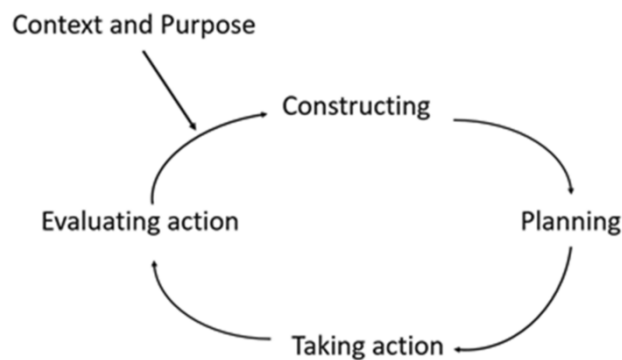


Figure 1. Cycle of action research Source: Coughlan, 2019, P.14

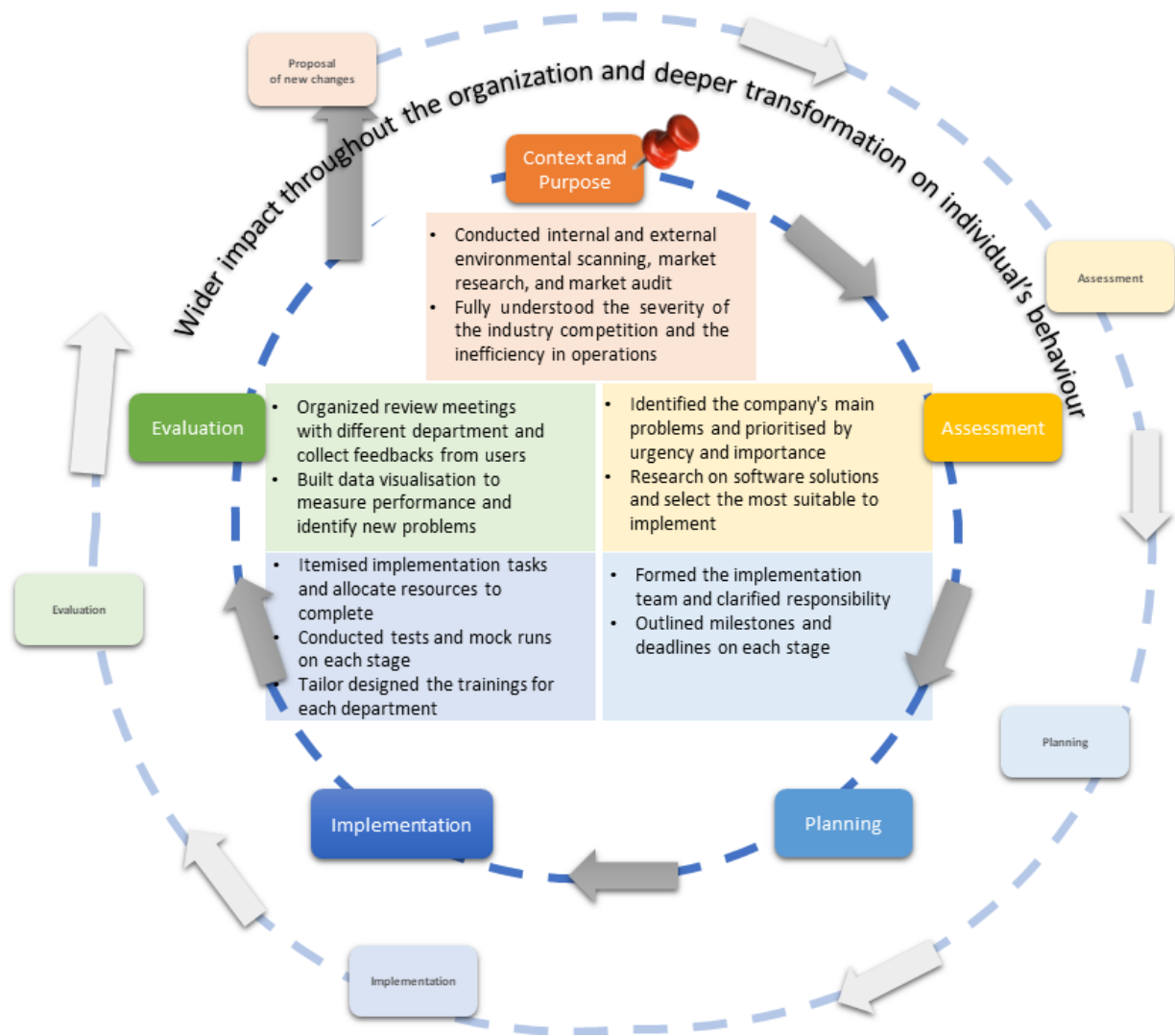


Figure 2. Adapted cycle of action research

3.3 Approach and early findings

The case company has been operating in a relative conservative industry, lift industry, for nearly 25 years, naturally adapting the most traditional managerial methods throughout the company for a long time. From the initial research and internal interviews, the following features have been exposed:

- Paper-oriented information flow between internal departments and with external stakeholders,
- Business processes are mainly operated manually,
- Decision-making based on memories, estimation, personal industry knowledge and experience; and
- Data in fleet, field worker, finance, sales, and operations were stored separately in different platforms that were not synchronized or shared across the organisation.

The manual and paper-oriented operations were severely undermining the company's efficiency and information flow, and, in turn, company competitiveness. From the initial market audit, in 2016 there are over 350 companies registered in lift industry nationwide (Plimsoll analysis, 2016)). From the industry analysis using Porter's Five Force model (Porter, 2008), the competition is severe, the case company is not only facing extraordinarily strong industry rivalry, but also the challenges of high bargain power from both buyers and suppliers (see figure 3).

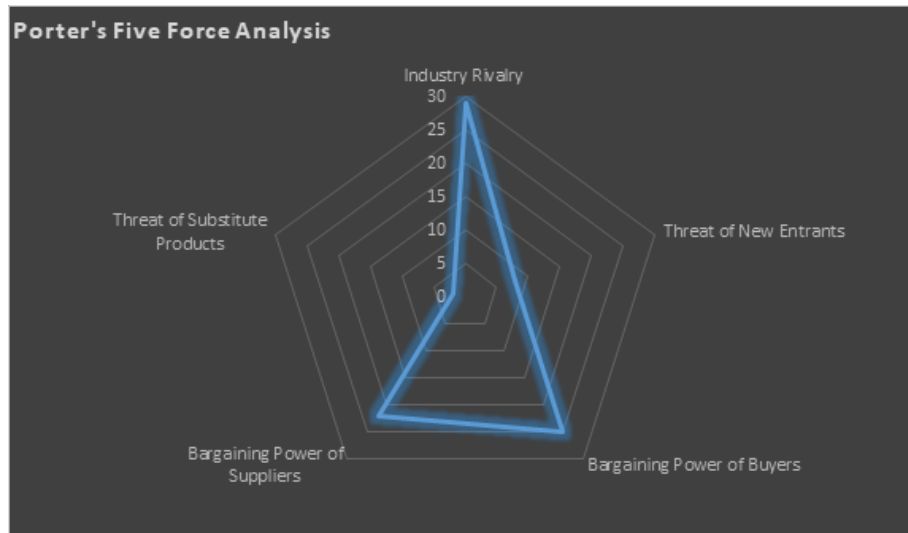


Figure 3. Porter's Five Forces applied

To be able to stand out amongst competitors, there was a need to make changes and achieve operation efficiency. Therefore, conducting the DT becomes the suitable solution.

Early findings suggest the DT within the company have been successful. The DT priorities proposed were based on solid market research, internal semi-structured interviews, and multiple demonstrations with vendors. The implementation procedures have been logically and clearly structured. After the implementation, there was continuous monitoring of data flow with an improvement cycle developed through observation (see figure 2).

It is believed that forming research to understand the routes that lead to successful DT in SMEs will be beneficial to influence other business when in comparable situation.

In this case, researchers with academic knowledge and background are highly integrated with the team within the case company which helps the improvement cycle.

As previously mentioned, inefficiencies in operations need to be changed across all levels of the organisation. However, each aspect of the operations required different changes in functions. For example, the field worker is focusing on improvement via a digital timesheet, worksheet and remote communication with the office team; while the finance team's transformation is centralised in paperless approaches, financial documentation automation and automatic synchronization with accounting system.

To summarise the transformational change, the general purpose is to:

- Implement automations to reduce manual processing,

- Digitalise job reports, financial reports, holiday requests, expenses, timesheets, and other paperwork,
- Implement synchronisation between various platforms,
- Develop open and shared databases and operational record etc., and
- Shift management decision-making from experience and knowledge led to data led.

In the case company, DT is strategic across all levels in the organisation. Hence, it has been conducted with a top-down manner. Senior management lead the business process design and establish the requirements on major KPIs. Senior management also set up milestones and guidelines during the implementation stages.

Individual team members take responsibility for specified tasks (see table 1)

Responsibility per member	Task
Service Director and Operational Business Development Manager	Collected data for previous system for basic setup like CRM (Customer Relationship Management) data and equipment list.
Financial Officer and Operational Business Development Manager	Financial codes.
Admin Staff and Operational Business Development Manager	Engineer details, rates, web user details and fleet information.
Service Director, Service Manager and Operational Business Development Manager	Specify job types, job settings, engineer workflow and worksheets.
Operational Business Development Manager	Map out automations in jobs and office actions.
Operational Business Development Manager	List alerts required in scenarios when internal or external team need to be notified.
Operational Business Development Manager & Admin Staff	Design document template like invoices, purchase order, emails job report to client etc.

Table 1 DT task orientated responsibility examples

The implementation was conducted in a busy working environment, changes were planned and made while the daily responsive work was still on-going. The case company has a specific individual acted as the change manager to plan and action the implementation. Senior management were also involved in weekly monitoring of the progression and distributed the resource to support the implementation.

After the implementation, feedback was collected for each function which drove the next cycle of changes.

For example, it has been discovered from the data analysis the field workforce had a lack of awareness in relation to route planning when attending maintenance jobs. This was reflected in engineers travel data. The case company could save more than one-hour productive working hours per engineer, per day if the engineer's route is pre-planned and optimised. Route optimisation has now become the next change to be implemented.

4. Proposed model

We have completed one cycle of the action research. Based on the first cycle, we proposed the following model. The model provides evidence for the presence of knowledge for SMEs digital transformation. The project is still ongoing. Future cycles will be needed to detect the extent of the change.

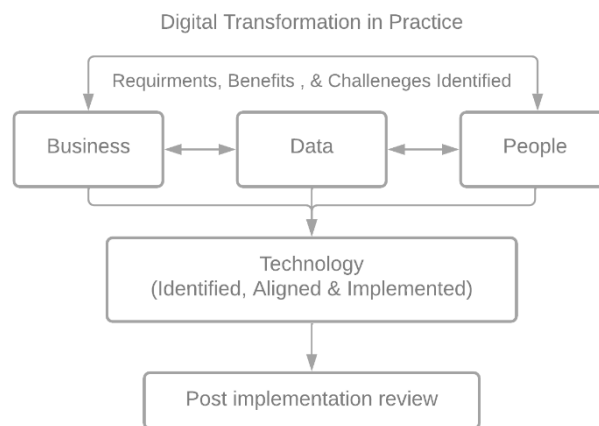


Diagram 1 Digital Transformation in Practice

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