

## **Digital Transformation and Social Business: A Practice-Based Pathway Framework for SMEs**

**Dr. Fefie Dotsika**

School of Applied Management

Westminster Business School

35 Marylebone Rd, London NW1 5LS, United Kingdom

**Keith Patrick**

School of Management and Marketing

Westminster Business School

35 Marylebone Rd, London NW1 5LS, United Kingdom

### **Abstract**

---

*This research focuses on the lessons learnt from case studies involving the digital transformation of three London SMEs. The companies adopted social technologies to renovate operations, develop new sets of skills and capabilities and remodel customer value propositions. The transformation processes had common elements that fed through to the companies' strategies. We conceptualised our research as a network, regarding roles and interventions as network effects, to analyse the adoption process and dynamically link the technology and social context with digital transformation strategy. The lessons learned were distilled into a framework whose two-fold aim is to (a) support organisations through digital transformation and (b) inform organisational strategy. The framework is modular with components that assist and guide the various phases of designing, deploying, implementing and sustaining this transition.*

---

**Keywords:** Digital transformation, digital business, business information management, social platforms

### **1. Introduction**

The changes associated with the adoption of digital technologies in an organisation are referred to as digital transformation. It is disputed whether it is the technologies themselves or the organisational strategy pertaining to their adoption that drives transformation (Kane et al. 2015). In either case, companies investing in new digital technologies are more profitable than their competitors (Levenburg et al., 2015). As digital transformation moves up in leadership agendas, the need of a framework to advise and inform the process is increasingly essential. Among the most recent digital technologies, social platforms have the capacity to transform business processes, manage organisational complexity and create market opportunities (Leonardi et al., 2013).

In this article we use the term *digital transformation* to denote the process of adopting and integrating digital technologies to transform organisational capabilities and business processes that deliver value to stakeholders and enable innovation (Lucas et al., 2013; Cui & Pan, 2015). We use the term *social technologies* to identify platforms and applications that enable and support communication, collaboration, content co-creation and knowledge sharing, facilitating social interactions in an organisational setting.

While a large number of organisations believe that digital transformation is critical, few can be classified as companies with digital maturity, partly because of insufficient capabilities and limited resources (Li et al., 2018) but also lack of experience to form a strategy that drives transformation and can get clear business benefits from new digital technologies (Bautista et al., 2019). Indeed digital transformation is not always well-understood, predominantly around the adoption of Internet-related technologies and the role of service providers of digital platforms during the transformation (Besson & Rowe, 2012). This is particularly relevant in the case of small and medium size enterprises (SMEs) whose adoption of new technologies is markedly slow (Cragg & Mills, 2011). Digital technologies have changed the business environment creating opportunity as well as threat to the growth of SMEs. There are significant critical factors leading to commercial success for SMEs that choose to adopt digital technologies (Nguyen et al., 2015). Despite the evident benefits, digital transformation is hindered by a shortage of resources that vary from labour and skills to infrastructure (Demirkan et al., 2016). SMEs' restricted resources mean that the adoption process differs to that in larger businesses (Ghezzi et al., 2013).

Regardless of the significance SMEs play in the global economy, the research into technology adoption remains relatively limited and has produced no framework to guide and inform the adoption process (Alshamaila et al., 2013). This is the gap that this paper addresses. Having been part of three digital transformation projects with London companies, we present our work and propose a framework that provides SMEs with guidance and support when undertaking their own digital transformation.

The rest of the paper is organised as follows: Section 2 looks into related research. Sections 3 and 4 present the research design, data analysis and interpretation. Section 5 discusses our findings and identifies the implications for research and practice.

## **2. Digital transformation in SMEs**

SMEs are identified as major economic players and a powerful source of national, regional and local economic growth (Nieto & Santamaria, 2010).

Digital transformation research for SMEs focuses on and is framed around efficiency achievement, operational improvement and the creation of new potential opportunities. Relevant work (some providing partial frameworks) addresses adoption issues of traditional information and communication technologies (Neirotti et al., 2018), system adoption for the support and development of organisational capabilities (Nguyen & Waring, 2013;), entrepreneurship (Li et al., 2018), e-commerce/m-commerce technologies adoption (Ghezzi et al., 2012) and digital business strategies (Taiminen, & Karjaluoto, 2015; Rana et al., 2019).

Social technologies' adoption research is disproportional. The process is fairly well understood in areas such as marketing communications, customer relationships and reputation management (Durkin et al., 2013; Olanrewaju et al., 2020) but underrepresented in the areas of knowledge management and internal communications (Von Krogh, 2012; Patrick & Dotsika, 2007; Wamba & Carter, 2014). This is the gap the research carried out addresses and the paper's contribution.

Being involved in digital transformation projects with London SMEs, we faced these challenges while investigating the process of adopting social technologies to support organisational change and growth, and the way this process informs and shapes organisational strategy. Between 2005 and 2018 we worked with three London SMEs in knowledge transfer projects, funded by Innovate UK. The companies' respective business areas were independent research, telecommunications and legal services. The research projects dealt with digital transformation focused on social technologies/media/platforms.

All three firms wanted to develop their social business capability to fully leverage the potential and opportunities of social technologies and apply them to advance competencies and optimise business processes. In particular they wanted to adopt social media technologies to generate new stakeholder experiences, both external (customers, partners) and internal (employees). Organisational interest in social networks is increasing as they acknowledge the value of facilitating cross functional collaboration (Karoui et al., 2015). Despite their varied capabilities due to their size differences, they all struggled to take their transformation initiatives to the next level. The field of Social Business was relatively new and there was no success guaranteeing blueprint. There were risks involved and, especially in the two earlier projects, it would take years to see the results of their efforts.

From the start of the first project (2005) to the end of the last (2020 review) there had been no digital transformation methodology and/or framework to guide the process. The project teams undertook research into change readiness and focused on encouraging adoption and working with teams and individuals to help them make the most of the companies' social capabilities. Revisiting the three projects, we conceptualised our research as a network, regarding roles and interventions as network effects, with the aim to identify, record and analyse decisions made and propose a framework to guide SMEs in their own digital transformations

The contribution of the research is a digital transformation framework for SMEs, focused on the adoption of social technologies. The framework aims to guide organisations through the lifecycle of digital transformation and inform organisational strategy at every stage. It is modular and scalable - within SME limits.

### **3. Research approach and design**

The research is based on three digital transformation projects in London companies over a period of years. Our collaborative and participatory engagement had interventionist nature, with main purpose to respond to organisational needs, relate theory to practice, and cycle reflection and action to help the SMEs reach their specific digital transformation. Action Research was adopted as it served well the projects' strong social and organisational context and multifaceted information management processes, whose inherent complexity was intensified by multiple different stakeholder views and value conflicts. These characteristics, along with the projects' collaborative and competencies-enhancing nature, focus on change processes and the involvement of practitioners as subjects as well as co-researchers further supported the suitability of the method (Baskerville, 1999). A combination of participant observation (Jepsen *et al.*, 1989) and process consultation (Schein, 1999) was employed. The collaborative aspect of both methods and their commitment to improve practice through an organic process involving systematic and iterative stages were relevant to all projects.

Participant observation was particularly helpful in resolving issues related to differing vocabularies, contradicting assumptions and requirements. The suitability of the method was notable for contributions relating to improved/critiqued practice and organisational transformation (Bradbury & Reason, 2006). The method facilitated the gaining of familiarity with the multivariate social setting of internal stakeholders, their views, practices and value conflicts.

Process consultation was employed on the basis of the relationship type between the researchers and clients which was high on both sides: we worked together with the companies, driven by their agenda to decipher the issues in question, identify the requirements and solve the problems. The method allowed for a more interventionist approach where the consultation aimed to influence and improve the organisational capabilities to anticipate and resolve similar future situations (Patrick & Dotsika 2007; Dotsika & Patrick, 2013).

The continuing lack of a digital transformation methodology by the end of the third project, led us to re-visit our work from all three projects collectively, with the aim to identify, record and analyse the choices and decisions made during the original research and propose a framework to guide SMEs in their own digital transformations. The extensive material collected during the lifetime of the three projects included interviews with primary stakeholders of all levels, notes from participant observations and surveys with practitioners, consultants and knowledge workers. Intermediate and/or final results of the three digital transformations have been well documented [anonymised] (XXX & XXX 2006; XXX & XXX 2007; XXX 2009; XXX & XXX, 2013; XXX *et al.*, 2014). Despite the common target, that of a digital transformation, and overlapping teams, there was no link between the projects and no common theoretical context. This set the basis for the quest for an analytical tool that would enable the conceptualisation of the research, analyse its stages and propose a framework for digital transformation.

The technology adoption in the three projects had led to a multiplicity of action research engagements, roles and interventions that were complex, and neither predefined nor static. Regarding roles and interventions as network effects, we conceptualised action research as a network. The notion of actor-network in Actor-Network Theory (ANT) (Latour 1999) was used as an analytic tool to capture the projects' complexities and interpret multiple roles and interventions of action-research engagements (Boulus-Rødje, 2012). The method contributes to organisational studies by recognising that social relations are dependent on the material world and introducing nonhuman actors into the frame (Latour 2005).

ANT’s critical stages of inscription, translation, framing and stabilisation were particularly relevant to the subject area (Chinedu et al., 2014). They provided both the analytical theoretical underpinning for the adoption process and suitably structured and described each project’s timeline.

- Inscription is the process of determining the functionalities and patterns of use to be imprinted on technical artefacts (Akrich, 1992). As such it is guided by organisational requirements, competencies and constraints and can be thought of as the vision behind the intended transformation (Callon, 1991).
- Translation is the design process of re-interpreting, presenting under different context and/or appropriating other actors’ interests by means of association, simplification and combination of entities (Callon 1986). The creation of convergence bridges existing sociotechnical gaps and shapes ideas, plans and requirements.
- Framing, originally defined as the process of identifying discrete agents (Callon, 1999), captures the evolution of technological artefacts whose functionality develops and adapts over time and describes the outcome. Project artefacts adaptation was captured during the testing and training periods for each project.
- Stabilisation is the final stage of consensus and closure and signifies that the problem is solved or needs to be redefined, looping back into inscription (Bijker et al., 1989).

Thematic analysis was applied to the collected data, which were organised by company, collection medium (interviews, surveys, participant observation material) and stakeholder (internal: manager, practitioner/knowledge worker/champion, support, consultant; external: customer, vendor, community). The process is depicted in Figure 1.

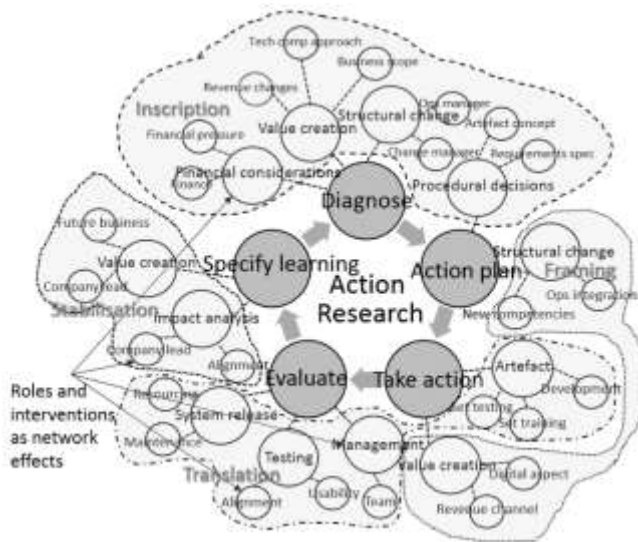


Figure 1. Network of roles and interventions

#### 4. Digital transformation focus: social technologies

Despite their different scopes, all projects focused on the adoption of social technologies. We follow the transformation changes in four subsections that present and analyse our findings, starting with project overviews and following the ANT stages of inscription, translation, framing and stabilisation.

#### 4.1. Setting the scene(s)

The digital transformation paths were dependent on the company objectives, sector, competitive priorities and customer expectations. They focused on reshaping the customer value proposition, the operating model, or a combination of both, and determined the transformation capabilities that needed developing in the organisations (Berman, 2012). An overview of the projects is presented in Table 1.

Company core business	Comp. size (at onset)	Project aim	Artefact/ Social technologies adoption focus	Transformation path focus (main)	Essential transformation capabilities	Duration	Review
<b>COMPANY A</b> Independent research company	Small	International market entry research in parallel with planning, product development, sales, marketing and new business acquisition.	Internal communications and organisational knowledge management system	Operating model transformation	Business model innovation Cross-channel integration	2005 to 2007	2014
<b>COMPANY B</b> Telecoms company specialising in digital signal processing technology	Small	Develop business strategy to transform the company from technology driven to marketing oriented with focus on their services for the Deaf and Hard of Hearing	Web portal and framework	Customer value proposition	Customer & community collaboration Cross-channel integration	2007 to 2009	2015
<b>COMPANY C</b> Legal services company specialising in insurance and corporate law	Large medium	Develop a social media-enabled intranet and a social media architecture to streamline business processes enabling faster response to market changes and improving productivity and profitability	Social media intranet platform	Combination of operating transformation and customer value proposition	Customer & community collaboration Cross-channel integration Networked workforce	2011 to 2013	2020

Table 1. Projects' overview

Each project had its own digital transformation drivers which determined the competitive advantages expected to result from the adoption of new information technologies and which were specific to the particular company. The drivers employed were divided into three groups addressing the inherent characteristics of the particular transformation, the interactions between company and customers and the interactions between the company and its partners and/or competitors (Andal-Ancion et al., 2003).

Inherent characteristics drivers include considerations on information intensity, electronic deliverability, customisation, and aggregation capabilities. Company/customer interaction drivers include find-ability, real-time dynamic interface capabilities and risk considerations. Company/partner and/or company/competitor interaction drivers considered are network effects, standardisation issues and missing competencies. To these we included drivers relating to social technologies’ capabilities. These were communication, collaboration, co-creation and crowdsourcing (Simula et al., 2015). Identifying the need to collect and connect activities of individuals and teams to support the creation of knowledge (Kaschig et al, 2016). The “social” drivers are examined separately as they apply to and influence both internal and external processes and communications. The drivers can be seen in Table 2.

Driver	Company A	Company B	Company C	
Inherent characteristics	Information intensity	<input type="checkbox"/>	-	<input type="checkbox"/>
	Electronic delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Customisation	-	<input type="checkbox"/>	<input type="checkbox"/>
	Aggregation	-	-	<input type="checkbox"/>
Company <-> Customers	Find-ability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Real time interface	-	-	-
	Risk issues	<input type="checkbox"/>	-	<input type="checkbox"/>
Company <-> Partners/Competitors	Network effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Standardisation	-	-	<input type="checkbox"/>
	Missing competencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social capabilities : company, company <-> Partners/Competitors	Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Co-creation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Crowdsourcing	-	-	<input type="checkbox"/>

Table 2. Digital transformation drivers

Three decision-making levels were considered for each ANT stage: strategic, tactical and operational/procedural (Moe et al., 2012). Key strategic aspects of digital transformation are divided into procedural elements, tactical decisions and strategic options. The procedural decisions are stage-related and divided into categories that emerged from the data analysis. Tactical decisions are divided into resource allocation considerations and challenges. The strategic options are associated with technology adoption, value creation changes, structural modifications and financial considerations, and adapted from the Digital Transformation Framework (Hess et al., 2016) to address the projects’ particular focus on social technologies, funded project status and company sizes.

#### 4.2. Method Application

##### Stage I: Inscription

The strategic options pertain to the company’s approach to new digital technologies (early adopter vs. follower), value creation changes (nature of digital interface to internal/external stakeholders, type of new revenue creation and scope for future business), organisational structural changes (lead, operational changes, new competences required) and financial aspects (funding and financial pressure on core business at the time). Tactical level decisions deal with the identification and use of resources. The procedural aspects relevant to the inscription stage are the (initial) problem evaluation, the artefact description and the requirements specification. Table 3 shows the aggregate results by company.

Inscription		Company A	Company B	Company C	
Strategic decisions	<b>New technologies</b>	Company approach	Early adopter	Follower	Early adopter
	<b>Value creation changes</b>	Digital interface	Internal: digital enrichment of existing product	External: digital enrichment of existing product	Internal/external: new content-based offerings
		Revenue changes [to be re-visited]	None	Unsure	None
		Future business scope	Content creation & aggregation	Content creation & distribution	Content platform management
	<b>Structural changes</b>	Company lead	Managing director	Managing director	Director of KM & Capability
		Ops changes	Business processes	Products and services	Business processes
		New competencies	Internally	Through partnership	Internally
	<b>Financial aspects</b>	Finance	40% company 60% government	40% company 60% government	60% company 40% government
		Financial pressure on current core business	Low to medium	Low	Low
	<b>Tactical decisions</b>	Resource allocation considerations	IT skills	IT skills	IT and Knowledge Management skills
		Challenges	Lack of expertise	Lack of expertise	Potential dependencies
	<b>Procedural decisions</b>	Initial problem evaluation	Pre-existing	Changed during project	Pre-existing
Artefact concept		Knowledge management system	Web portal and framework	Social intranet	
Requirements specification		Functional, performance	Functional, interface	Functional, performance, interface	

Table 3. Stage I: Inscription

Parts of the strategic decisions taken during the inscription process were typically carried out before the projects’ onset. These included the initial artefact concept, the clear identification of stakeholders, choice of technology for adoption and an overview of financial and value creation issues. The main challenges encountered during this phase were linked to resources, expertise and financial pressure in accordance with the findings of similar recent research into technology adoption by SMEs (Kyobe, 2011).

The structural changes were mostly resolved during this phase, apart from the need to acquire new competencies, which was challenging in the smaller companies, as they had to rely on existing, already strained resources.

These changes directly related to the tactical decisions on resource allocation and associated challenges. Lack of expertise and potential dependencies on a third party ensuing from outsourcing development processes were not effectively addressed and therefore not resolved during inscription, resulting in delays later on. The shaded cells correspond to incomplete actions and/or decisions which were carried out or finalised after the inscription stage. They proved to be problematic, disrupting the flow of operations and creating setbacks. Out-of-sync decisions were minimised during the third project as the adverse consequences were, by then, well understood.

During inscription, all companies had a low to medium financial pressure on their core business. In spite of its seemingly small role in triggering digital transformation, all companies agreed at the time that they expected the financial pressure to rise (as it did, especially in the smaller companies, see 3.4).

**Stage II: Translation**

The strategic options relevant to this phase were the technology choice for systems development and structural changes focused on the integration of new digital operations and competency issues. Tactical decisions were associated with employee allocation to the project development and challenges associated with the lack of shared understanding. Procedural decisions included use-case analysis, which was applied to finalise requirements and define processes for the development of the systems, and concept alignment, which refers to the correspondence between business objectives/processes and information technology requirements. This characteristic of the latter makes it an integral part of the translation process. Table 4 shows our findings.

Translation		Company A	Company B	Company C	
Strategic decisions	New technologies	Development	Media Wiki	Web portal	Confluence, Attensa, RubyOnRails
		Software tools	Open source	Open source	Proprietary
		Company IT	Supporter (partly outsourced)	Enabler	Enabler
	Structural changes	Integration of new operations into existing structures	Part of core business	Digital initiatives outside of core business	Digital initiatives outside of core business
		New competencies (digital capabilities)	Through partnership	Through partnership	External sourcing
Tactical decisions	Resource allocation considerations	Identify members for development team			
	Challenges	Lack of shared understanding			
Procedural decisions	Use-case analysis	Knowledge Management System requirements	Web portal requirements	Social intranet requirements	
	Alignment of concept: (short term: during project)	Structural		Structural, cultural	
	Software design	Pilot KMS	Website design	Intranet prototype	

Table 4. Stage II: Translation



The main challenge during the translation stage was related to the alignment of IT with business objectives. All projects shared frequent alignment discrepancies resulting from lack of shared understanding due to differences in objectives, company culture and communication issues. Our findings support research on the challenge to achieve business goals and IT alignment and maintain it over time (Shan & Kumar 2012; Ullah & Lai, 2013). Structural alignment indicates the fit between objectives and competencies. It varies with the size of the organisation and is overall easier to implement in smaller organisations, positively influencing the company’s performance (Tan & Gallupe, 2006). In bigger organisations we found the need for cultural, in addition to structural alignment, which examines organisational culture and the existence of a common understanding of business goals and new competences required.

Temporary or incomplete decisions on structural changes (shaded cells) were due to limited understanding of the importance of such decisions at that stage. It became obvious that they had to be addressed before framing as dealing with them later created conflicts and delays.

**Stage III: Framing**

The creation of convergence and in the previous stage prompted the re-examination of financial considerations. As a result, the strategic decisions at this stage involved re-visiting and re-evaluating the financial situation. Structural changes resulting from new operations had to be decided, as well as value creation changes focusing on the nature of digital transformation. The tactical decisions were similar to the previous stage and concentrated on challenges associated with resource allocation and task scheduling. Procedural aspects relevant to the framing stage were artefact development, testing and employee system training. The development followed iterative software implementation and, as it had started earlier on in all projects, the entry here signifies conclusion. Our findings are synopsised in Table 5.

Framing		Company A	Company B	Company C	
Strategic decisions	Value creation changes	Digital interface	Enriched media	Enriched media	Content platform, extended business
		Revenue changes	Potential of paid content	Freemium	None
	Structural changes	New operations	Integrated	Integrated	Separated
	Financial aspects	Financial pressure on current core business	Medium (change)	High (change)	Low
Tactical decisions	Resource allocation considerations	Staff allocation/ task scheduling	Staff allocation/ task scheduling	Dedicated team	
	Challenges	Task prioritisation	Task prioritisation	Dependencies on technology; engagement issues	
Procedural decisions	Artefact development	Knowledge Management System	Web portal	Social intranet	
	System testing	Alignment, usability, installation	Alignment, usability, accessibility, installation	Alignment, usability, installation, performance, integration	
	Training	Points of contact, needs and skills, culture change	Points of contact, needs & skills	Points of contact, formal material and sessions, culture change	

Table 5. Stage III: Framing

The financial pressure on the core business of the smaller firms had increased. This resulted in the decision to investigate potential new revenue streams, integrate new operations into the existing structures (strategic decisions-structural changes) and resolve resource allocation by staff allocation and task scheduling. The larger firm had no extra financial pressure and kept traditional operations separate from digital initiatives. Another consequence was re-visiting revenue changes in order to investigate alternative financial revenues for the artefact, with the first company identifying the potential of paid content using the knowledge management system for curating and re-packaging historical data. The second company decided on a freemium scheme, with the potential of a tiered subscription offering at a later stage.

The main challenge of the framing stage was employee training leading to full adoption of the developed system. In the case of the largest company, this included the development of training materials to address users of varied backgrounds and motivation, guide team leaders and manage expectations. Employee engagement findings support previous research on resistance to change (Rafferty & Griffin, 2006; Van Dam et al., 2007) .

Challenges relating to resource allocation were not well managed and remained problematic across projects (grey areas in table). In the case of the smaller companies they were eventually resolved with a more rigid task prioritisation which, with hindsight, needed to be factored in during the framing stage. The third project saw the onset of technology dependency issues , mirroring relevant research on platform decoupling and cloud solutions (Kumar et al., 2016; Hosseini et al., 2019).

#### **Stage IV: Stabilisation**

The strategic options are related to the role of the company's IT to achieving strategic goals (enabler:- IT as a core function; supporter:- IT as a means for efficient processes; innovator:- company at the forefront of innovative new technologies), future business scope, company lead for the project artefact during stabilisation and post-project, and, also post-project, financial resource planning. The tactical decisions handled resources as before and managed a set of challenges that were related to maintenance issues and/or particular to each project. The procedural aspects relevant to the stabilisation phase were the final system release/migration, impact analysis, maintenance planning and need for iterative alignment of concept during maintenance. Table 6 reviews the stabilisation stage for the three projects.

By this stage all companies had a good understanding of the opportunities to leverage their core competencies enabled by digital transformation and therefore were able to make decisions about value creation changes relevant to future business scope, which, in all projects centred on content creation. Decisions on post-project financing, leadership and resourcing (including system maintenance) needed to be made. The need for maintenance support planning, including category, resources and management proved problematic for the smaller companies, who considered it at first not a key but a theoretical concept impacting on resources without evident benefit. However, towards the end of the stabilisation stage, its merits and advantages become clearer, in line with similar research findings, especially in terms of safeguarding system availability, content quality, process efficiency and the flexibility of a system to enhance its functionalities and capabilities (Garg & Deshmukh, 2009). The smaller firms opted for corrective/adaptive maintenance (restore and/or implement changes) whereas the larger company followed a perfective/preventive path (re-visit and modify requirements and inhibit occurrence of errors/system downtime).

Stabilisation		Company A	Company B	Company C	
Strategic decisions	New Technologies	Company IT	Supporter	Enabler	Innovator
	Value creation changes	Future business scope (all as planned)	Content creation & aggregation	Content creation & distribution	Content creation & platform management
	Structural changes	Company lead	n/a system integrated into work flow	Managing director	Devolved down to KM team
	Financial aspect	Finance	Company (post-project)		
Tactical decisions	Resource allocation considerations	Company employee	Company employee	Company employee	KM team
	Challenges	Conveying benefits of system maintenance	Conveying benefits of system maintenance	Conveying benefits of system maintenance	Service-level-agreement considerations
Procedural decisions	System release	Platform migration	Platform migration	Web portal goes live	Platform migration
	Impact analysis	Knowledge assets; new markets	Knowledge assets; new markets	New markets	Organisational performance
	Alignment of concept (maintaining)	Structural, cultural, social			
	System maintenance planning	Corrective/adaptive	Corrective/adaptive	Corrective/adaptive	Perfective/preventive

Table 6. Stage IV: Stabilisation

The smaller firms did not perform a formal impact analysis of the digital transformation they underwent during this stage (shaded cells) but later, after the projects had concluded. The first company impact analysis highlighted emergence of knowledge assets and break through into adjacent markets (overseas). The second SME digital transformation led to their entrance into new markets shortly post-project. The larger organisation performed impact analysis including monitoring change management and innovation on processes. They found enhanced organisational performance across a wide scope of organisational processes and cost-effective support of varied value-chain activities.

Preserving alignment of concept was considered critical in maintaining stability between evolving business needs and business environment and keeping the balance between the multi-functional character of digital transformation with organisational strategy. Comparable results are well documented in relevant literature (Matt et al., 2015).

### 5. Discussion and implications for practice

This paper investigates the challenges and opportunities of digital transformation in three London SMEs who adopted social technologies to renovate operations and renew customer value propositions. Successful adoption of these technologies delivered digital enhancements to services, helped the companies to develop new business models and provided collaborative social platforms for innovation.

It was apparent that the companies lacked know-how and required a detailed framework to (a) manage the complexity and scale of the digital transformation, (b) separate the phases of the transition and (c) guide the strategic, tactical and operational decisions at every phase. The research led to the proposal of a conceptual framework that can assist with the transition and guide social technology adoption in similar sized organisations. It also reinforced analogous findings in similar studies.

Digital transformation is a strategic consideration and requires a clear digital strategy (Kane et al., 2015). Smaller companies set out focusing on the technology for adoption rather than the presence of digital strategy, whereas the largest firm had an initial digital strategy in place. This facilitated the transition considerably in that the organisation had a good understanding of the transformation impact, a culture that fostered change and proactively took care of missing competencies and capabilities.

Financial pressure on the primary business is a common factor and critical business driver for digital transformation (Berman, 2012; Matt et al., 2015). Assessed as low or medium at the start of the projects, its rise had been correctly anticipated (digital technologies increasingly affected business margins) and was instrumental in triggering digital transformation.

Alignment of business objectives with information technology and its maintenance are a crucial requirement and a fundamental challenge in digital transformation (Shan & Kumar 2012; Matt et al., 2015). Structural and cultural alignment leads to a common understanding of business goals and required competencies and facilitate the transition process. They were easier to realise in smaller companies. Alignment of concept was found equally vital post-project in preserving stability between changing organisational needs and business environment.

Digitalisation of business processes has a significant impact on structure and resources and requires detailed and careful planning that reflects the transition stage and degree of digital maturity. All SMEs depended on information technology for business functions to differing degrees but they were constrained by lack of resources and tight coupling between services and platforms (Kumar et al., 2016). Resource allocation challenges were particularly prevalent and frequent in the smaller organisations and slow to resolve. New systems' training, a prerequisite to full adoption, was challenged by resistance to change and low employee engagement which was remedied by tailor-made solutions. Technology dependency issues were the cause of more delays and eventually managed through architecture decoupling solutions.

The feedback loop at the end of transformation allows for the output of the stabilisation phase to be routed back as input for a new ANT cycle. This process facilitates maintenance, allows for reassessment of requirements and is identified as an essential method for change and growth (Dotsika & Patrick, 2013). Post-project conversions and adjustments in two out of the three companies implemented the feedback loop successfully, providing evidence of its suitability for supporting and assisting follow-up digital change.

The proposed framework (Figure 2) provides a guide to assist and inform all stages of the adoption of digital technologies. It delivers a common language that addresses strategy, goals, processes and progress evaluation. Post-project evaluation demonstrated unanimous agreement among companies that the ANT process was beneficial. The appraisal highlighted the following main aspects: effective decision taking, control of the project scope, high employee engagement and overall efficient communications.

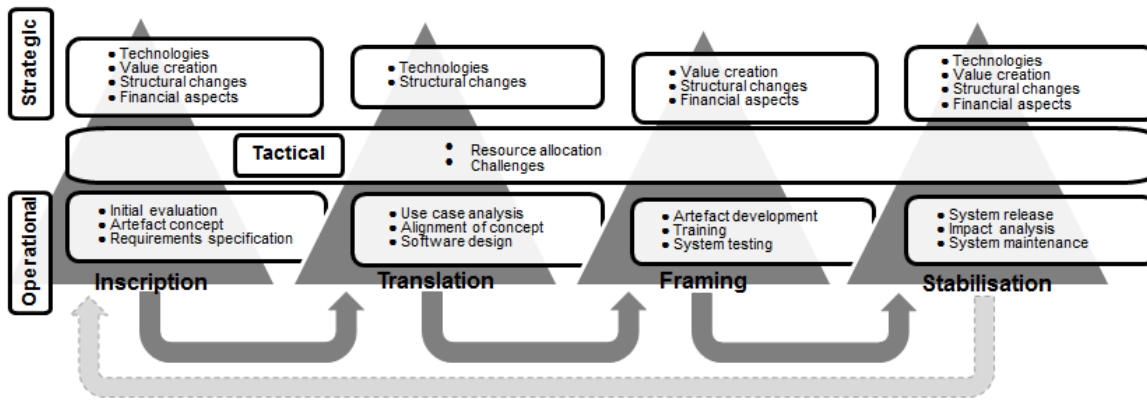


Figure 2. Digital Transformation Framework

## 6. Conclusions

This paper presents a dual proposition. Firstly, arising from the lessons learnt and wider reflection upon three digital transformation projects with SMEs, it proposes a framework that provides SMEs with guidance and support when undertaking their own digital transformation. Secondly, through its research methodology, it offers a perspective that addresses an evolving shortcoming related to the adoption of traditional methodologies and approaches when evaluating and undertaking digital transformations.

Whilst ICT adoption issues are relatively well known and supported by many models and frameworks, the challenges are different when addressing the adoption of technologies with a greater social element. This lies in the interaction, type and nature of the artefacts, physical or abstract, employed or created, particularly when addressing internal communications and knowledge management. A common trait of all SMEs is the dissimilarity, through their size, turnover, sector and objectives. Whilst they all share commonalities they can equally be characterised by their range of differences.

The development of the outlined framework offers a bridge that enables consideration of the key elements associated with digital transformation in a SME and addresses the identified gap in knowledge. The four stages provide a means and a step by step guide through the digital transformation, whilst addressing the relevant considerations at the strategic, tactical and operational/procedural levels. Each stage forms a set of intermediate reference points as goals and considerations, allowing for assessing impact and success. The framework provides an iterative guiding hand rather than a prescriptive linear process to follow. Essentially it provides a means to establish a common language alongside a common interpretation of the objectives while defining pathways to support their achievement. It leads to increased engagement and shared understanding for prioritising objectives and making decisions on how support and resources are provided. The process includes incorporating the SMEs own learning insights and new knowledge as iteration. This practice was found both possible and desirable, within the stages and elements therein.

All three SMEs reported increased profits post adoption, a result that supports and reflects similar prior research associating digital transformation with profit gains (Levenburg et al., 2015; Majchrzak et al., 2016; Delmond et al., 2016). The proposed framework presents an adaptable approach that is systematic, organised and rigorous whilst remaining adaptable to realising the benefits of digital transformation whilst managing the uncertainties within and without an SME.

The limitations of the research are related to the size of participant organisations (SMEs) and tight focus of transformation (social technologies). The framework works well for SMEs whose transformation is focused on the adoption of social technologies, but we do not know how well it can be generalised to address a wider range of digital transformation taking place in same size or larger organisations. This is the focus of future research and will include evaluating the framework against the practicalities of an end-to-end project, acknowledging the elements of the framework that were put in place retrospectively (grey areas in tables 4 to 7).

## References

- Akrich, M., (1992), The de-scription of technical objects, In Bijker, W.E. and Law, J. (editors) *Shaping technology/ building society: studies in sociotechnical change*, MIT Press, 205 – 224.
- Alshamaila, Y., Papagiannidis, S., & Li, F., (2013), Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(3), 250-275.
- Andal-Ancion, A., Cartwright, P., & Yip, G. S., (2003), The digital transformation of traditional business. *MIT Sloan Management Review*, 44(4), 34-41.
- Baskerville, R.L., (1999), Investigating Information Systems with Action Research, *Communications of the Association for Information Systems*, Vol. 2, Article 19.
- Berman, S. J, (2012), Digital transformation: opportunities to create new business models. *Strategy & Leadership*, 40(2), 16-24.
- Bautista, A., León, A., Rojas, J. and Raymundo, C., (2019), Strategic Planning Model to Increase the Profitability of an HR Outsourcing SME Through Digital Transformation. In *International Conference on Human Interaction and Emerging Technologies* (pp. 856-862). Springer, Cham.
- Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. *The Journal of Strategic Information Systems*, 21(2), 103–124.
- Bijker W. E. Hughes T. P. and Pinch T., Ed. (1989). *The Social Construction of Technology Systems*. New Direction in the Sociology and History of Technology. USA, Maple -Vail Inc.
- BIS, (2013), SMEs: The Key Enablers of Business Success and the Economic Rationale for Government Intervention BIS Analysis Paper No. 2, Department for Business, Innovation and Skills, London, URN BIS/13/1320.
- Boulus-Rødje, N., (2012), Action research as a network: Collective production of roles and interventions.
- Bradbury, H., & Reason, P., (2006), Conclusion: Broadening the bandwidth of validity: Issues and choice-points for improving the quality of action research. *Handbook of action research*, 343-351.
- Callon, M., (1986), Some elements of a sociology of translation: domestication of the scallops and the fishermen of the Briec Bay, in Law, J. (Ed.), *Power, Action and Belief: A New Sociology of Knowledge?*, Routledge, London.
- Callon, M., (1991), Techno-economic network and irreversibility, In J. Law, editor, *A sociology of monsters*. Essays on power, technology and domination, Routledge, 132 – 164.
- Callon, M., (1999), Actor-network theory—the market test. *The Sociological Review*, 47(S1), 181-195.
- Chinedu Eze, S., Duan, Y., & Chen, H., (2014), Examining emerging ICT's adoption in SMEs from a dynamic process approach. *Information Technology & People*, 27(1), 63-82.
- Cragg, P. and Mills, A., (2011), IT support for business processes in SMEs, *Business Process Management Journal*, Vol. 17, Iss. 5, 697- 710.
- Cui, M., & Pan, S. L. (2015). Developing focal capabilities for e-commerce adoption: A resource orchestration perspective. *Information Management*, 52(2), 200–209.
- Delmond, MH., Coelho, F., Keravel, A. and Mahl, R., (2016), How Information Systems Enable Digital Transformation: A focus on Business Models and Value Co-production.
- Demirkan, H. Spohrer, JC. and Welser, JJ., (2016). Digital Innovation and Strategic Transformation. *IT Professional*, 18(6), 14-18.
- Dotsika F., Patrick K., (2006), Towards the New Generation of Web Knowledge Search and Share, *VINE: The Journal of Information and Knowledge Management Systems* Vol. 36 No. 4, pp 406-422, ISSN: 0305-5728
- Dotsika F., (2009), *Uniting formal and informal descriptive power: Reconciling ontologies with folksonomies*, *International Journal of Information Management*, Volume 29, Issue 5, October 2009, pp 407-415, ISSN 0268-4012

- Dotsika F., Patrick K., (2013), Collaborative KM for SMEs: a framework evaluation study, *Information Technology and People*, Vol. 26, No. 4, 368-382
- Durkin, M., McGowan, P. and McKeown, N., (2013), Exploring social media adoption in small to medium-sized enterprises in Ireland. *Journal of Small Business and Enterprise Development*, 20(4), pp.716-734.
- Garg, A. and Deshmukh, SG., (2009), Flexibility in maintenance: a framework. *Global Journal of Flexible Systems Management*, 10(2), 21.
- Ghezzi A. Balocco R. and Rangone A., (2013), Technology diffusion theory revisited: a Regulation, Environment, Strategy, Technology model for technology activation analysis of Mobile ICT. *Technology Analysis & Strategic Management*, Vol. 25, Issue 10, 1223-1249.
- Ghezzi, A. Mangiaracina, R. and Perego, A., (2012), Shaping the E-Commerce Logistics Strategy: a Decision Framework, *International Journal of Engineering Business*
- Hess, T. Matt, C. Benlian, A. and Wiesböck, F., (2016), Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive*, 15(2).
- Hosseini, S., Fallon, G., Weerakkody, V. and Sivarajah, U., (2019), Cloud computing utilization and mitigation of informational and marketing barriers of the SMEs from the emerging markets: Evidence from Iran and Turkey. *International Journal of Information Management*, 46, pp.54-69.
- Janes S., Patrick K., Dotsika F., (2014), Implementing a social intranet in a professional services environment through Web 2.0 technologies, *The Learning Organisation*, Vol. 21 Iss: 1, pp.26 - 47
- Jepsen, L. Mathiassen, L. and Nielsen, P., (1989), Back to the Thinking Mode: Diaries for the Management of Information Systems Development Projects, *Behaviour and Information Technology*, Vol. 8, No. 3, 207-217.
- Kane, GC. Palmer, D. Phillips, AN. Kiron, D. and Buckley, N., (2015), Strategy, not technology, drives digital transformation. MIT Sloan Management Review and Deloitte University Press.
- Karoui, M. Duzdert, A. and Leidner, DE., (2015), Strategies and symbolism in the adoption of organisational social networking systems, *Journal of Strategic Information Systems*, Vol 24, Iss. 1, 15-32.
- Kaschig, A. Maier, R. and Sandow, A., (2016), The effects of collecting and connecting activities on knowledge creation in organizations, *The Journal of Strategic Information Systems*, Vol. 25, Iss. 4, 243-258
- Kumar, V. Loonam, J, Allen, J. and Sawyer, S., (2016), Exploring enterprise social systems & organisational change: Implementation in a digital age. *Journal of Information Technology*, 31 (2), 97-100.
- Kyobe, M., (2011), Investigating the key factors influencing ICT adoption in South Africa. *Journal of systems and information technology*, 13(3), 255-267.
- Latour, B., (1999), On Recalling ANT, in Law, J. and Hassard, J., (Eds.) *Actor Network Theory and After*, Oxford: The Sociological Review, pp. 15-25.
- Latour, B., (2005), *Reassembling the social: An introduction to actor-network-theory*. Oxford university press.
- Leonardi, P.M., Huysman, M. and Steinfield, C., (2013), Enterprise social media: Definition, history, and prospects for the study of social technologies in organizations. *Journal of Computer-Mediated Communication*, 19(1), pp.1-19.
- Levenburg, NM. Schwarz, TV. and Motwani, J., (2015), Understanding adoption of internet technologies among SMEs. *Journal of Small Business Strategy*, 16(1), 51-70.
- Li, L., Su, F., Zhang, W. and Mao, J.Y., (2018). Digital transformation by SME entrepreneurs: A capability perspective. *Information Systems Journal*, 28(6), pp.1129-1157
- Lucas, H. C. J., Agarwal, R., Clemons, E. K., El Sawy, O. A., & Weber, B. W. (2013). Impactful research on transformational information technology: An opportunity to inform new audiences. *MIS Quarterly*, 37(2), 371-382.
- Majchrzak, AM. Markus, L. and Wareham, J., (2016), Designing for digital transformation: Lessons for information systems research from the study of ICT and societal challenges. *MIS Q* 40, no. 2 (2016): 267-277.
- Matt, C. Hess, T. and Benlian, A., (2015), Digital transformation strategies. *Business & Information Systems Engineering*, 57(5), 339-343.

- Moe, NB. Aurum, A. and Dybå, T., (2012), Challenges of shared decision-making: A multiple case study of agile software development. *Information and Software Technology*, 54(8), 853-865.
- Nguyen, T. and S. Waring, T., (2013). The adoption of customer relationship management (CRM) technology in SMEs: An empirical study. *Journal of Small Business and Enterprise Development*, 20(4), pp.824-848.
- Nguyen, TH. Newby, M. and Macaulay, MJ., (2015), Information technology adoption in small business: Confirmation of a proposed framework. *Journal of Small Business Management*, 53(1), 207-227.
- Neirotti, P., Raguseo, E. and Paolucci, E., (2018). How SMEs develop ICT-based capabilities in response to their environment: Past evidence and implications for the uptake of the new ICT paradigm. *Journal of Enterprise Information Management*, 31(1), pp.10-37.
- Nieto, MJ. and Santamaría, L., (2010), Technological Collaboration: Bridging the Innovation Gap between Small and Large Firms, *Journal of Small Business Management*, vol. 48, pp. 44-69, 2010.
- Olanrewaju, A.S.T., Hossain, M.A., Whiteside, N. and Mercieca, P., (2020), Social media and entrepreneurship research: A literature review. *International Journal of Information Management*, 50, pp.90-110.
- Patrick, K. and Dotsika, F., (2007), Knowledge Sharing: Developing from Within, *The Learning Organization: The International Journal of Knowledge and Organizational Learning Management*, Vol 14, No 5, pp 395-406.
- Rafferty, AE. and Griffin, MA., (2006), Perceptions of organizational change: a stress and coping perspective. *Journal of applied psychology*, 91(5), 1154.
- Rana, N.P., Barnard, D.J., Baabduallah, A.M., Rees, D. and Roderick, S., (2019), Exploring barriers of m-commerce adoption in SMEs in the UK: Developing a framework using ISM. *International Journal of Information Management*, 44, pp.141-153.
- Schein, EH., (1999). *Process consultation revisited. Building the helping relationship*. Reading, MA: Addison-Wesley.
- Shan, Z. and Kumar, A., (2012), Optimal adapter creation for process composition in synchronous vs. asynchronous communication. *ACM Trans. Manage. Inf. Syst.* 3, 2.
- Simula, H. Töllmen, A. and Karjaluoto, H., (2015), Facilitating innovations and value co-creation in industrial B2B firms by combining digital marketing, social media and crowdsourcing. In *Marketing Dynamism & Sustainability: Things Change, Things Stay the Same...* (pp. 254-263). Springer International Publishing.
- Taiminen, H.M. and Karjaluoto, H., (2015), The usage of digital marketing channels in SMEs. *Journal of Small Business and Enterprise Development*, 22(4), pp.633-651.
- Tan, FB. and Gallupe, B., (2006), Aligning business and information systems thinking, a cognitive approach. *IEEE Trans. Eng. Manag.* 53, 2, 223-237
- Ullah, A. and Lai, R., (2013), A systematic review of business and information technology alignment. *ACM Transactions on Management Information Systems (TMIS)*, 4(1), 4.
- Von Krogh, G., (2012), How does social software change knowledge management? Toward a strategic research agenda. *The Journal of Strategic Information Systems*, 21(2), 154-164.
- Wamba, S.F. and Carter, L., (2014), Social media tools adoption and use by SMES: An empirical study. *Journal of Organizational and End User Computing (JOEUC)*, 26(2), 1-17.