Digital Transformation in the Making: Lessons from a Large Energy Company

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Summary

The objective of this chapter is to describe the journey of Centrica Plc from a traditional energy retailer toward a digital service company. The shift follows the threat of commoditization of the core business but is also driven by the huge innovation opportunities afforded by digital technologies, big data and analytics that are part of the assets available to the organization. The journey is characterized by both successes and failures. Far from having been fully realized, this transformation is still in the making. The insights reported in this chapter are backed by a longitudinal case study of the company's digital transformation, which includes empirical evidence from participant observation, project reviews, and other sources of primary data from the company[1]. The overarching question discussed in this chapter is: *How does a large incumbent organization transform itself through a digital transformation?* In describing the key phases of Centrica's digital transformation journey over the last 10 years, we focus on a specific innovation team (the *Accelerator Hub*) and describe how they have successfully promoted new product/service development approaches such as Design Thinking, agile, and other techniques to support the organizational transition from a traditional to a digital innovation environment. The chapter will also discuss challenges, problems and limitations met by the team and the organization, thus offering a realistic account that resonates with the experience of practitioners tasked with managing digital transformation in other companies.

[1] The case study is based on the Knowledge Transfer Partnership (KTP) grant n. 11248 between Centrica Plc and Cardiff University Business School, funded by Innovate UK. The project lasted between November 2018 and November 2021. The first three authors were Academic Lead, Research Associate, and Company Supervisor in the project. Additional information on the KTP project is available from the Authors.

Digital Transformation in the Energy Industry

Over the last ten years, the traditional services, business models and organizational systems in the energy sector have been increasingly impacted by digitalization and the big data revolution (De Luca et al. 2021). The advent of smart meters and domestic IoT (i.e., Google Nest) gave energy companies a leading role within an ecosystem of digital technologies revolving around energy, which generate huge volumes of customer data in real time. Such an increased rate of digital innovation in the industry has spurred market entry by a new generation of pure digital players targeting tech-savvy and price-sensitive customers with innovations such as smart offers and flexible tariffs (Zhou and Yang, 2016). In addition, growing sales of private hybrid and fully electric vehicles, and the increasing electrification of commercial fleet and public transport networks are driving a seamless integration between energy and mobility, adding a new source of big data from geo-localization for energy companies. Finally, enduring concerns and mounting awareness of the dangers related to climate change have been driving a shift to private and public investments in renewable technologies as well as innovations in energy production that push toward household self-sufficiency and peer-to-peer energy trading powered by blockchain. All these factors have converged on incumbent players in the energy industry, creating a perfect storm for the disruption of traditional services, business models and organizational structures (McKinsey 2020).

Centrica is part of the so-called "big six" energy players in the United Kingdom. The company's strategy is heavily focused on excellent customer service as well as driving for higher returns on investment through greater efficiency. As of March 2018, *British Gas* (Centrica's main brand in the UK) served 5.5 million electricity customers and 6.9 million gas customers in the UK. As far back as the early 2000s, Centrica had started investing in

their internet-based customer services, introducing electronic processing of meter readings, bills and payments. More recently, Centrica responded proactively to the UK Government mandate[2] to install smart meters and was one of the first big industry players to embrace digital transformation and launch new digital services in the energy market.

Methodology

The insights presented in this chapter emerge from a longitudinal and multi-method data collection process that spanned at least five years. In 2017, the research team conducted four semi-structured interviews with Centrica's management and data science team as part of a project on data-driven service innovation. These interviews were fully transcribed and manually coded. As a follow-up to that first interaction, Centrica entered into an industry–academia knowledge transfer partnership (KTP) with the UK-based research team, funded by a government grant, between 2018 and 2021. A requirement of receiving the grant was that the team should use rigorous methodological approaches to create new knowledge to be embedded in the organization. To this end, the KTP research associate conducted semi-structured interviews, participant and non-participant observations over three years, while working on a daily basis as part of the company. Interviews were fully transcribed and coded to identify success factors for (and barriers to) innovation within the data science team. Participant and non-participant observation generated a large quantity of fieldnotes and memos. Finally, the project database included different types of company documents (i.e., archival data, reports, organizational charts, emails and other written communication), which were triangulated with primary data. All the evidence collected was presented quarterly to the project committee, which included the academic team, Centrica's management, an

[2] The smart meter adoption in the UK energy sector, otherwise known as "the Smart Metering Implementation Programme", is led by the Department for Business, Energy, and Industrial Strategy (BEIS), regulated by the Office of Gas and Electricity Markets (Ofgem), and delivered by energy suppliers.

independent project adviser to represent the funder, and a project secretary who took full minutes of each discussion. Together, the eleven project committee meetings (from October 2018 to December 2021) provide a full trail of evidence, which includes project reviews, reports of emerging evidence, benefit/risk analyses and action plans. Thus, the insights presented in this chapter are supported by a longitudinal and multi-method action research process. Our protracted engagement with the case study offered the chance to move beyond short-term observation toward a more in-depth investigation of the digital transformation process (Marion and Fixson 2021). The next section outlines how Centrica's digital transformation began.

Early Innovation Successes

At the start of 2013, Centrica created a team of young and talented data scientists. This team was very entrepreneurial and started experimenting with a small-scale Hadoop cluster running on Raspberry Pis, championed by the Director of Strategic Systems and the CIO. This system initially ran in parallel with the traditional data warehouses, but quickly ended up replacing the old technology stack. This successful experiment resonated within the organization, and soon the nascent data science team became involved with several innovation projects centered around digital technologies and data (see Table 1).

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Digital innovation in this phase focused on few but highly relevant projects that propelled the company toward a future as a data company. In fact, despite being an incumbent, Centrica found itself at the forefront of digital innovation in the energy industry, where only a few players were active at the time. As stated above, the engine behind these early successes was a strong *IT-enabled entrepreneurial spirit* among the data science team. Interestingly, to mark

their entrepreneurial identity as different from the prevailing culture within the organization (which tended to be slow-moving and risk adverse), the data science team operated as a profit center within their department: they did not have a fixed budget, but instead they went out to the business lines hunting for projects and 'billed' the internal customers for their time. In addition, the data science team also started to pursue external consulting opportunities, with the idea of commercializing their expertise outside Centrica. Later, the data science director reflected that while this 'transactional' approach was meant to stimulate the entrepreneurial mindset within the team, it also limited internal collaboration and the emergence of a coherent and long-term oriented innovation strategy within the team.

Despite their significance for Centrica, the innovations that emerged during this stage resulted from an ad-hoc, slow, and expensive innovation process, characterized by difficulties and mistakes, and not supported by systematic innovation capabilities within the firm. In hindsight, delivering innovation was not a pleasant experience for those involved. Eventually, several new businesses had to be spun off or sold, after costly attempts to grow and develop them internally. Through this experience, Centrica started to realize that its culture, structures, and processes were not enabling innovation, and this realization marked the next stage of the company's innovation journey, which is described in the following section.

The Attention Turns to Organizational Change

The struggles experienced with the first generation of digital innovation projects triggered a wider effort toward a series of organizational changes, both structural and cultural, seen as necessary to fully unlock Centrica's innovation potential in future projects. This phase was characterized by a slower pace of innovation, during which no significant new product was

introduced, and a shift of emphasis from the external environment (entrepreneurial opportunities) to the internal environment (organizational barriers).

Business and innovation literature has widely documented the importance of the people and other organizational enablers of digital innovation in established organizations (Colarelli, Corbett and Peters 2018). These include various dimensions of organizational design, such as: leadership and top-management support (Lanzolla, Pesce and Tucci 2020), cross-functional collaboration between IT and other departments (Troilo, De Luca and Guenzi 2017), data-oriented culture (Davenport and Bean 2018), agile working methods (Augustin 2005), and data science talent management (Davenport and Patil 2012). In particular, a recent stream described and highlighted the advantages of integrating traditional stage-gate methodologies with agile, to form a new generation of hybrid agile stage-gate approaches to new product development that can effectively serve the digital transformation of incumbent companies (Cooper and Sommer 2016). Within Centrica, the main organizational barriers that were experienced during the initial innovation projects were related to:

- *Siloed organizational structures and lack of cross-functional collaboration*: the coordination between the data science team and the other departments involved in the launch of the new services was complex and often characterized by politics and internal resistance. There was a lack of shared goals, and information was not disseminated effectively across projects and between organizational units.
- *Predominance of a waterfall approach*: the prevalence of a linear and sequential approach to innovation projects slowed down the pace of prototyping, testing and commercialization, reduced experimentation, and increased product costs.
- *Risk aversion*: Small and incremental innovations (or 'low-hanging fruits') were prioritized over more radical and risky ones; there was a strong emphasis on avoiding

failure and short-term losses (i.e., prevention focus), and a very tight scrutiny of the supporting business case for every new idea.

To address the above problems, Centrica resorted to creating new teams, units, initiatives, and schemes to support its innovation ability. These included an internal venture capital unit, a bottom-up process to collect innovative ideas and suggestions from employees, a consumer lab and a team tasked to promote the generation of new IP within the firm, among others (see Table 2).

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These organizational interventions were both instigated and backed by the data science team. Interestingly, members of the data science team increasingly perceived their role as 'evangelists' of a new way of working, primarily based on scrum and agile approaches. In particular, the data science team promoted the adoption of agile squads, guilds, and tribes to resemble the agile organization structure popularized by Spotify (Kniberg and Ivarsson 2012) and others. An 'Innovation Tribe' was set up in 2018 as 'collaborative space' where diverse teams could share their progress and identify opportunities for cross-collaboration (see Table 2). The Innovation Tribe had monthly meetings, but these were often characterized by loose agendas and no clear leadership, and over time became just a routine for checking-in with others, but not to promote any significant collaboration[3]. About one year after its launch, the Innovation Tribe was discontinued, as the employee who started it left the company.

As these new structures and processes were created, the innovative sparks and big ideas that characterized the early innovation successes started fading away, and organizational attention turned to many, often unrelated, projects with a limited degree of coherence and a high rate of

[3] This evidence was gathered from participant observation and meeting documentation.

failure. In the meantime, the newly created initiatives were increasingly perceived by employees as 'empty boxes' as they lacked a solid pipeline of projects to work with. Lacking coordination, the new teams and organizational units which should have supported innovation started to step on each other's toes, which ultimately reduced collaboration. Meanwhile, the number of competitors embracing digital innovation in the industry had grown, and as a result Centrica had lost the leadership gained earlier on in terms of innovative services and business models. By the end of 2019, Centrica abandoned all these organizational initiatives, and closed the data science team. The only exception was represented by the Accelerator Hub, which survived a series of significant internal reorganizations, and emerged with a new role and a new vision, as we describe in the following section.

Evolution of the Accelerator Hub: From Filing Patents to Empowering People

The Accelerator Hub (from here on 'the Hub') is a 4-people team embedded in Centrica's Digital Technology Services (DTS) group function. Despite the name, the Hub is not a traditional corporate accelerator, designed for the incubation and growth of external ventures (Kohler 2016). Instead, the Hub's aim is to accelerate Centrica's path to better products, services, and teamwork, by allowing innovative ideas and solutions to be explored, structured, and quickly tested while always keeping *people* at the forefront of every activity. Despite the Hub being now recognized inside the organization as the 'go-to place' for exploring and testing new ideas, it went on a 5-year journey through diverse ways of working before a clear vision and direction of travel for the team was established.

The Hub was launched in 2017 as a 'squad' of the data science team, with the objective of becoming the 'IP machine' of Centrica's digital innovation. IP was relatively unfamiliar territory for Centrica, so the Hub's initial goal was to systematically generate patents from

data science and blockchain applications developed by the data science team; the initial ambition was to generate as many as 100 such patents per year. The data science leadership team assumed that creating new IP would generate a hard metric for the innovative ability of their team, hence driving more strategic investments in data-enabled innovation. However, this iteration of the Hub was not successful for various reasons[4]: first, the company did not have a coherent IP strategy or the need for such a high rate of patent submissions; second, team members were assigned to projects in a top-down fashion, and experienced low levels of fun and intrinsic motivation on the job, both factors data scientists considered very important; finally, the Hub's work was very technical and obscure for the rest of the organization, which led to the team becoming marginalized, despite their name.

In early 2018 the role and function of the Hub changed dramatically, as the data science team increasingly realized that they did not have an effective process in place to manage the front end of their innovation process. At the same time, the data science team started to perceive a lack of integration with the rest of the company, due to the highly technical nature of their work. As a result, the data science team innovation pipeline started to run out of new projects. Then, the Hub was 'repurposed' to become the 'front door' to the data science team and moved to a new physical space in the headquarters, where it played host to surgeries and ideation sessions focused on data-driven innovation with other teams from across the organization.

Concurrently, the Hub and data science team also entered a knowledge transfer partnership with academia to 'identify, implement, and embed an accelerated innovation process' (i.e.,

[4] Source: Interviews with the data science team.

from idea to market) for the data science team. This marked a shift from a technical to a more *relational* focus, both within the organization and with external partners.

By engaging with distinct parts of the organization and external stakeholders, the Hub team started to understand the need to create a more inclusive innovation environment and culture within Centrica that was not narrowly focused on data-led innovations. This factor, coupled with a major reorganization that 'killed' the other initiatives described in Table 2, created a gap in the organizational innovation structure, culture, and competences that the Hub team was ready to fill by adopting a completely novel approach. While retaining their link to data-driven solutions, the Hub broadened their scope to cover a much more diverse range of innovation opportunities, engaging with a wider audience of actors within the company.
In 2019, the Hub team created their own framework for innovation based on five stages: Feel, Learn, Identify, Test, Evangelize (FLITE Framework, Figure 1), which incorporated and adapted tools and frameworks from Design Thinking.

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Alongside the FLITE framework, the Hub developed a tool to operationalize the approach: the FLITE Plan (Figure 2). The FLITE Plan can be applied to any new idea or solution at any stage of delivery. When used at the start of a project, it provides structure around the concept and a template for exploring ideas and de-risking their execution; in more advanced stages of a project, the FLITE Plan acts as a point of reference to make sure the team delivers on the intended objectives, keeps seeking answers to the right questions, and ultimately achieves the intended outcomes. Both the FLITE framework and FLITE Plan build on a Design Thinking approach and established project management techniques, so they are not 'new to the world'. However, they are significant as they are 'new to the firm' and represented the first structured

attempt by the company to adopt a shared process to support the generation and development of new ideas. Another novel aspect of FLITE was that this resource was developed internally by the Accelerator Hub, and hence was more contextually relevant than previous frameworks Centrica had adopted from consultancy firms.

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In 2020, the Hub started to raise awareness of their role of 'Design Thinking consultancy' within Centrica, collaborating with various parts of the organization to test ideas quickly and to accelerate the development process of new products and services. The Hub team built their reputation as *innovation facilitators*, working alongside internal business lines and connecting them with external partners to identify and shape opportunities for new products and services.

As they became more popular internally, in 2021 the Hub team started to receive a sustained high level of requests from various parts of the organization to share and transfer their knowledge of innovation tools and methodologies. These requests were often driven by positive word-of-mouth among employees and were boosted even more after the Hub was featured as a best practice example in the CEO's monthly newsletter. The requests received by the Hub tended to be of three types: i) to consult with other teams on how to improve and optimize their creativity and innovation; ii) to help and guide innovation collaborations with other departments or external partners; iii) to upskill and train individuals and teams on new product and service development methods and tools. By listening and reflecting on these signals, the Hub structured their activities in three primary areas: Consulting, Collaborating and Coaching (Figure 3).

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Consult

When consulting, the Hub maintains a high-level, holistic view of the ideas and problems under consideration, rather than entering into any specific technical or operational aspect. In this type of engagement, one or more members of the Hub work in partnership with internal stakeholders to help them structure their challenges, and reach a shared understanding of pain points, opportunities, priorities, and actions. Consulting projects are typically short-term (2-12 weeks) and lead to well-defined outcomes and outputs. Once a consulting project is completed, the Hub hands it over to the stakeholder and exits the project. One example of the Hub's consulting activity is a workshop run in 2021 to help Board Gáis Energy (Centrica's brand in Ireland) to reassess the alignment between their business and technology strategies. First, the Hub helped to identify and recruit the relevant participants for the workshop, to make sure the right people were 'in the room.' Then, the Hub consulted on different exercises through which the workshop participants could achieve their objectives, and finally facilitated the session on the day. After the workshop, the Hub team created a report summarizing the main findings and actions agreed, allowing the Bord Gáis Energy team to track progress and results. The feedback was particularly positive. One of the Bord Gáis Energy executives in charge of the workshop commented: "*…sincere thanks to you for facilitating our IT/Business workshop … and for all the helpful prep and advice pre-workshop. Your assistance and guidance were invaluable. What took [major consulting company] 6 weeks to deliver, the Accelerator Hub was able to achieve in 90 minutes!*"[5].

Collaborate

Collaborations typically follow on from consultations whereby one or more members of the Hub actively participate in the identification and testing of a solution for a specific

[5] Source: Post-project feedback form.

customer/business problem. These pieces of work are more granular, usually looking at a specific challenge rather than the high-level approach described earlier. Collaborations are particularly suited to new products/services development where the Hub embeds itself among the stakeholder and their teams on an ongoing basis. These projects tend to be open-ended and typically last between 12 and 24 weeks. One example of such work is a Design Sprint run with British Gas Energy, aimed at improving their current customer onboarding journey. More specifically, the goal was to 'remove moments of doubts from the customer experience while keeping them informed proactively.' By engaging in a series of collaborative activities, a cross-functional team explored and tested different solutions in the space of five days, which resulted in tangible changes to the current journey within British Gas and a significant increase in the Net Promoter Score. A key stakeholder of this project (Head of Customer Complaints) commented "*This is the best thing I've seen at Centrica*."[6]

Coach

With a vision to "*empower colleagues to deliver for our customers*," the Hub set up the FLITE School, a means to coach people about product development techniques, facilitation, team building and leadership. The Hub is currently offering three different pathways as part of FLITE School:

- *Facilitation*: A series of sessions and classes that help employees to design, facilitate and lead innovation workshops in their team.
- *Design Thinking*: A course covering the fundamentals of Design Thinking, its impact in real-world case studies, and practical applications and key learnings gained through the team's experience within Centrica.

[6] Source: Post-project feedback form.

- *Effective Team Leadership*: A course looking at what makes a truly effective team and some of the building blocks needed to sustain it, and what it takes to be an effective leader of any team, big or small.

Very simply, the idea behind this activity is to *empower individuals* and teams to function autonomously and independently as effective innovators.

The FLITE School started in 2021 as an experiment, with a limited range of content and an initial goal of running one session per month. The Hub is now offering six different courses (two for each pathway) and running six sessions every month. Within a year of its launch, the FLITE School delivered training to over 250 employees and received an average rating of 4.8/5. In line with the 'evangelize' element of the FLITE framework, the Hub team publish all their projects (including successes, failures and lessons learned), reports and stakeholder feedback in an internal repository which can be accessed by every employee in Centrica. A key feature of the FLITE School is the aspiration to bring the stakeholders fully onboard with the analysis, solutions, and decisions, regardless of their technical competencies or innovation expertise; if there are knowledge gaps, these are addressed via the FLITE School. The Hub team tries to avoid technical jargon and terminology that may create communication and engagement barriers. Finally, the Hub team made an effort to make FLITE School sessions open and informal, providing psychological safety for both the trainers and participants. Despite this, the team faced several challenges, which required frequent adaptations in terms of the content, number of participants, duration and activities of the FLITE School before they could achieve the desired level of engagement and impact for the participants. Since FLITE School sessions started during the pandemic, the biggest challenge was to help participants actively engage and work together during and after the workshops, with no

chance of interacting face to face. These initiatives included the creation of development pathways (linking individual sessions and giving the participants a sense of direction) and a FLITE community (connecting participants and the Hub team). As evidence of these efforts, in 2021, the Hub won Centrica's Digital Transformation Services Award for 'Diversity and Inclusion'.

Implications

This chapter described the digital transformation journey of Centrica Plc, a global energy company, over the last ten years. We focused on the contribution made by an innovative organizational unit (the Accelerator Hub), to the development of a more dynamic and innovative culture and way of working within the firm. Although the chapter builds on a single case company, there are several implications and take-aways that are relevant for a wider audience of new product/service development managers, as they can be applied to other large organizations facing a similar process of transformation. Also, as the work of the Accelerator Hub is live and constantly evolving, our implications are meant to provide new product/service developers with a range of opportunities rather than set-in-stone conclusions or decisions.

First, the experience of the Accelerator Hub highlights the power of creating 'in-house' frameworks and tools that work well in the context of the focal organization, to foster collaboration and enhance innovation culture. This approach may complement or be a substitute for the use of external consultancies or expertise, which may be more expensive and not always able to fully capture the soft dimensions of the context in which they operate. Our case highlights how the main strength of the Hub is to build *trust* by focusing on people (rather than technologies) and acting as a catalyst for collaborative innovation by 'walking

the talk' daily (Bstieler 2006). In contrast, previous attempts by data scientists to revolutionize the company by 'pushing' scrum and agile working methods were perceived as overly technical by the business functions and did not take off. While an entrepreneurial approach that mimics a start-up mentality was appealing for the data science team, other departments did not identify with it (or even perceived it as a threat), and this situation eventually emerged as a bigger barrier. In sum, our first implication for incumbent firms is that *putting people at the center of digital transformation – instead of technologies – will generate a stronger momentum for innovation which will benefit the organization beyond the specific domain of digital innovation*. This insight resonates with growing evidence from research and practice supporting the idea that focusing on people, re-skilling and upskilling the workforce, and providing an incentive to experiment, fail fast or succeed slowly (Frankiewicz and Chamorro-Premuzic 2020) stimulates employees and teams to develop new ways to co-exist and co-evolve with the new digital technologies that transform their working environment.

Second, the evidence provided by Centrica's digital transformation caution other companies against the risk linked to the attempts by leaders to reorganize, reframe, recast, reform, and restructure the organizational structures and innovation processes without an overall innovation strategy. Blank (2019) describes these as organizational, innovation or process '*theaters'*. These efforts, though supported by good intentions, are often ineffective and short-lived; in fact, the results of these reorganizations are quickly reset when the next reorganization starts, like sandcastles on a beach. Many large and incumbent organizations may fall into the same situation experienced by Centrica, whereby an overabundance of initiatives created to support digital transformation resulted in costly but ineffective experiments, which were mostly abandoned. According to our observations, the Accelerator

Hub survived several reorganizations (unlike other units, including the data science team) because they were able to keep a clear focus on product, solutions, and deliverables, albeit on a small scale. So, our second implication for incumbent firms is to *avoid organizational and innovation theaters whereby process takes precedence over product, and to ensure that all organizational interventions aimed at transforming the culture and systems are subordinate to a clear innovation strategy*. In this respect, the Accelerator Hub is still a 'work in progress' as they are still mostly active in small-scale projects; to address this issue, the Hub is currently changing its strategy to grow its role and contribution within big and strategic innovation partnerships, for example in the electric vehicles' ecosystem.

Finally, the learnings from Centrica's case study inform the general understanding of the process of digital transformation in incumbent companies. Leveraging existing definitions, and the evidence presented in this chapter, we suggest that *digital transformation in established organizations is akin to a process of corporate entrepreneurship afforded by and realized through digital innovation.* Understanding the components of digital transformations, and their dynamics, provides a series of insights on the success of such initiatives. First, digital innovation can be an input, a process and/or an output of digital transformation in incumbent firms (Nambisan et al. 2017). In addition, the prevailing corporate entrepreneurship frameworks pinpoint four forms of corporate entrepreneurship that are reflected in Centrica's experience: i) a stream of new product/service innovations; ii) the rejuvenation of organizational structures, culture, and processes; iii) a striving for strategic renewal; and iv) the redefinition of the competitive domain that shifts the sources of competitive advantage away from the traditional territories (e.g., Covin and Miles 1999). These forms may be interpreted as a linear sequence, or as multiple routes which can be pursued in parallel, but there are very few normative guidelines for firms. Centrica's

experience indeed points to a non-linear pattern that started earlier on with an attempt to redefine the competitive arena with disruptive digital innovations aimed at cannibalizing energy retailing. In doing so, Centrica has leapfrogged the opportunity to connect the existing core business with the new digital opportunities. The implication is that *incumbent organizations may be blinded by the illusion of disrupting their industries, which if unrealized can backfire on their ability to leverage and exploit new digital technologies in their current markets*. In short, digital transformation may lead to overplaying disruption and over-exploration. Companies may realize this mistake when it is already too late to fix it, as both existing and new competitors might have capitalized on digital innovation within traditional domains. A counterexample of this approach is offered by Bosch, which has been able to create a very strong synergy between its traditional product–market combinations and the new opportunities offered by digital technologies (particularly IoT), before venturing into new domains. For example, by embedding sensors and smart capabilities in appliances, mechanical components and systems, Bosch built over time the knowledge base to support a new ecosystem of digital business models, thereby transforming and renewing the firm's competitive advantage in the digital era (e.g., Bosch IoT Lab). This points once again to the importance of a strong and coordinated effort of strategic renewal that binds the different forms of digital transformation together.

The Accelerator Hub over the last few years has supported Centrica's efforts to re-establish a clear innovation strategy for the organization centered around the customer. For example, the Hub is currently supporting the company's strategy to re-integrate the new businesses of smart-home technologies, digital services, and electric mobility with the mainstream energy retailing market, to create customer value where the company's competitive advantage and sources of profitability are still strongly rooted. Hence, our final implication is that

maintaining a strong customer-centricity is a necessary condition for the success of digital transformation initiatives in incumbent organizations: customer-centricity is a core organizational enabler that connects technologies, innovation, and strategy.

Conclusions and Key Learnings

To conclude, many companies know the destination of their digital transformation journey, but struggle with the route and get lost along the way. This chapter provides the experience lived by Centrica through their digital transformation and focuses on the role of the Accelerator Hub. Far from being perfect or complete, this account aims to stimulate reflection and offer actionable implications for practitioners that may help when contextualized in other organizations facing similar scenarios.

While caution is needed alongside any effort to generalize our insights beyond the focal organization, some of the implications from Centrica's case study may resonate with other large and established service organizations competing in industries with medium-to-high degrees of digitalization (i.e. insurance and financial services, retail, transportation and travel). Our insights may also be valuable for organizations with different characteristics, in particular smaller companies. In fact, small and medium companies may not have the same issues related to siloed organizational structures and lack of interaction/cooperation between IT/data experts and other departments. Also, in small companies, any attempts to replicate the FLITE School activities may be redundant. However, the example of the Accelerator Hub may inspire the leaders of small companies to identify, promote and support a 'go-to place' to accelerate the development of innovative ideas within the organization. In this respect, the key features of the Accelerator Hub approach are very applicable to small companies for several reasons. First, the Hub team is very small, so their activities and capabilities are

applicable to a small-scale context; second, the Hub operates very efficiently, without big financial investments; finally, the Hub's people-centric approach could work even better in a small working environment with flatter structures and tighter interpersonal networks.
Our insights may also be adapted to other types of contexts, for example to companies offering tangible products (or a mix of products and services). These companies may have a more structured new product development process and are also probably in a better position to integrate the physical elements of digital transformation (i.e. IoT and sensors) into their product/service innovation. The challenge in this context could be to establish and maintain a continuous and efficient connection between customers and technology, which could be led/facilitated by the tools and approaches promoted by the Hub team. In this context, the benefits related to collaboration and skill development could be extended to customers, suppliers and partners in the supply chain.

Finally, we believe our results may provide some insights also to organizations competing in service industries with lower degrees of digitalization (e.g. hospitality, education, culture). An Accelerator Hub-like team tasked with roles of internal consulting, promotion of inter-unit collaboration and coaching may support the initial transition of such organizations to a higher degree of digitalization. In fact, the establishment of a team like the Accelerator Hub may demonstrate to organizations still unfamiliar with digital innovation that this does not necessarily require strong consultancy support, huge technological investments and a large dedicated team. On the contrary, with a focus on product innovation, backed by a people-centered and customer-oriented approach, a small but competent and passionate team may ignite internal organizational energies and help direct them to digital innovation projects with the aim of increasing operational efficiency and enhancing customer experience (De Luca et al 2021).

Beyond the managerial implications highlighted above, the chapter presents new research-led insights that chime with the emerging research interest around the evolution of NPD/NSD capabilities in data-rich environments (Bharadwaj and Noble 2017).

Table 1 – Early-stage Digital Innovation Successes for Centrica

New Service	Description	Concept
Hive	Ecosystem of Smart Devices that can be controlled through a single app.	Hive's mission is to make customer life easier when it comes to home management. They offer a range of IoT devices, including heating (smart thermostats), security (smart cameras), lighting (smart lights), sensors (doors and windows), leak monitoring and, more recently, smart electric vehicle charging solutions. Hive was spun off from Centrica in 2012 and is now a strong player in the IoT/Smart-home spaces. All the devices can be connected to each other and remotely controlled through a single app, and can seamlessly integrate and interact with Amazon Alexa, Google Assistant and Siri. More recently, Hive has been brought back into the core business, under the British Gas Services & Solution Space.
Local Heroes	Digital platform to connect local tradespeople and customers in need for a service & repair job.	Local Heroes is a local tradespeople platform backed by British Gas. The initial idea was to build an 'Uber experience' for heating maintenance, and gas/electrical repair. Instead of providing these services via their own engineers' fleet, British Gas created a platform to connect customers and local tradespeople. By vetting the traders, underwriting the work, and managing secured payment, Local Heroes enables a fully digital experience to its customers. By entering the type of job needed (e.g., 'boiler service,' 'blocked sink') and the postcode, the platform returns a series of options for local traders (plumbers, electrician, boiler engineers) available to do the job and allows customers to book them online in the space of minutes. Since it was spun off from Centrica in 2016, Local heroes has developed a network of 7,000 local companies across the UK and helped almost 150,000 customers in their homes. Local Heroes has now been brought back into the core business, under the British Gas Services & Solution Space.
Centrica Business Solutions	Distributed energy trial to empower local communities to sell & buy energy through a range of advanced technologies.	Local Energy Market (LEM) was a 3-year trial to pilot future energy solutions using blockchain and AI technologies. Centrica installed a range of advanced technologies such as combined heat and power (CHP) systems, smart batteries, solar panels, and monitoring equipment in 100 homes and 81 businesses across Cornwall, England. Powered by solar panels, the energy in the batteries was aggregated and controlled remotely to provide a single block of power and flexibility to the local grid and national system, making it one of the most advanced examples of Local Power Plants in the UK. Customers could log onto the LEM platform, interact directly with the network operators to vary their power use in a way that would help them to manage the grid and receive monetary compensation. This resulted in about 900 tons of CO_2/year saved by residential customers and about 8,500 tons of CO_2/year for business participants. This venture is now part of the 'Distributed Energy & Power' business unit, under the Centrica Business Solutions umbrella.
Io-Tahoe	Automated Data Lake solution to discover insights and connections from unstructured data.	Io-Tahoe is an automated Data Lake solution enabling unstructured data discovery, categorization, and mapping. This solution enables commercial customers (particularly large organizations) to automate their data management and realize strategic and operational benefits. The platform was initially developed by Centrica to respond to the increasing demand for data storage, data analytics and data governance within the company. Once the solution was developed and rolled out internally by the data science team, they realized the potential market value of selling the service to external organizations (including competitors) facing similar challenges. Unlike Hive and Local Heroes, Io-Tahoe was sold externally in 2016 and is no longer part of the Centrica ecosystem.

Table 2 - Organizational Changes to support Innovation

Name (Business Unit)	Initial Expectations	History
Centrica Innovations (Group Function)	Venture Capital to invest in emerging start-ups and transfer knowledge internally.	Centrica Innovations was a group function set up in 2016 as an internal venture capital unit to monitor the external environment and invest in start-ups. By 2018, the VC units started funding internal projects as well, incubating internal ideas for new products and services across the organization (although the main focus remained external start-ups investments).
Accelerator Hub (Digital Technology Services)	Accelerate internal innovation through the generation of IP from data science initiatives.	The Accelerator Hub was set up in 2017 as a spin-off of the data science team. With the initial goal to accelerate the innovation process internally and get more ideas to market, the Hub was initially conceived as an 'IP machine' for the data science team. However, the team went through a series of iterations, and is now the only team left of the four discussed in this table.
MAGIC (British Gas – Energy)	Collect innovative ideas and suggestion for improvement from employees.	MAGIC was an initiative set up in 2016 to collect ideas within Centrica, mainly from Front Line employees (Customer Service Advisors and Engineers) to improve customer journeys and satisfaction. This team was using an internal social network (Yammer) to collect ideas and thoughts on how to potentially improve customer journeys. This team disappeared as part of the 2019 reorganization, while as of today, idea-gathering challenges are conducted by individual business units.
Consumer Lab (British Gas – Services)	Ideate, prototype and test new service and solution concepts.	Organization unit set up in 2016 within the British Gas Services & Solutions space to promote customer journey innovations for both new and existing markets. The main goal for this team was to evaluate new service concepts for British Gas through smoke tests and innovation sprints, adopting a 'Test & Learn' approach. The Consumer Lab was discontinued as part of the 2019 reorganization.

Figure 1 – FLITE Framework

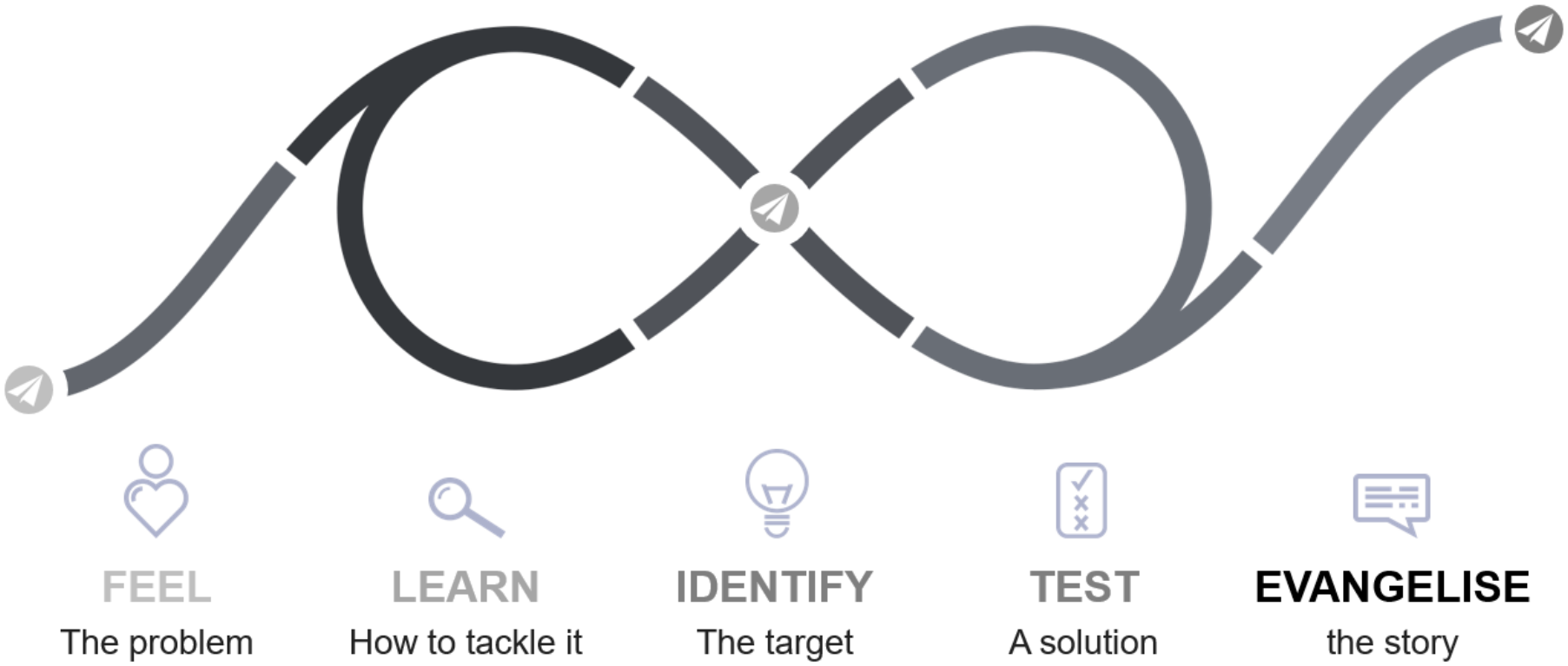


Figure 2 – The FLITE Plan Tool

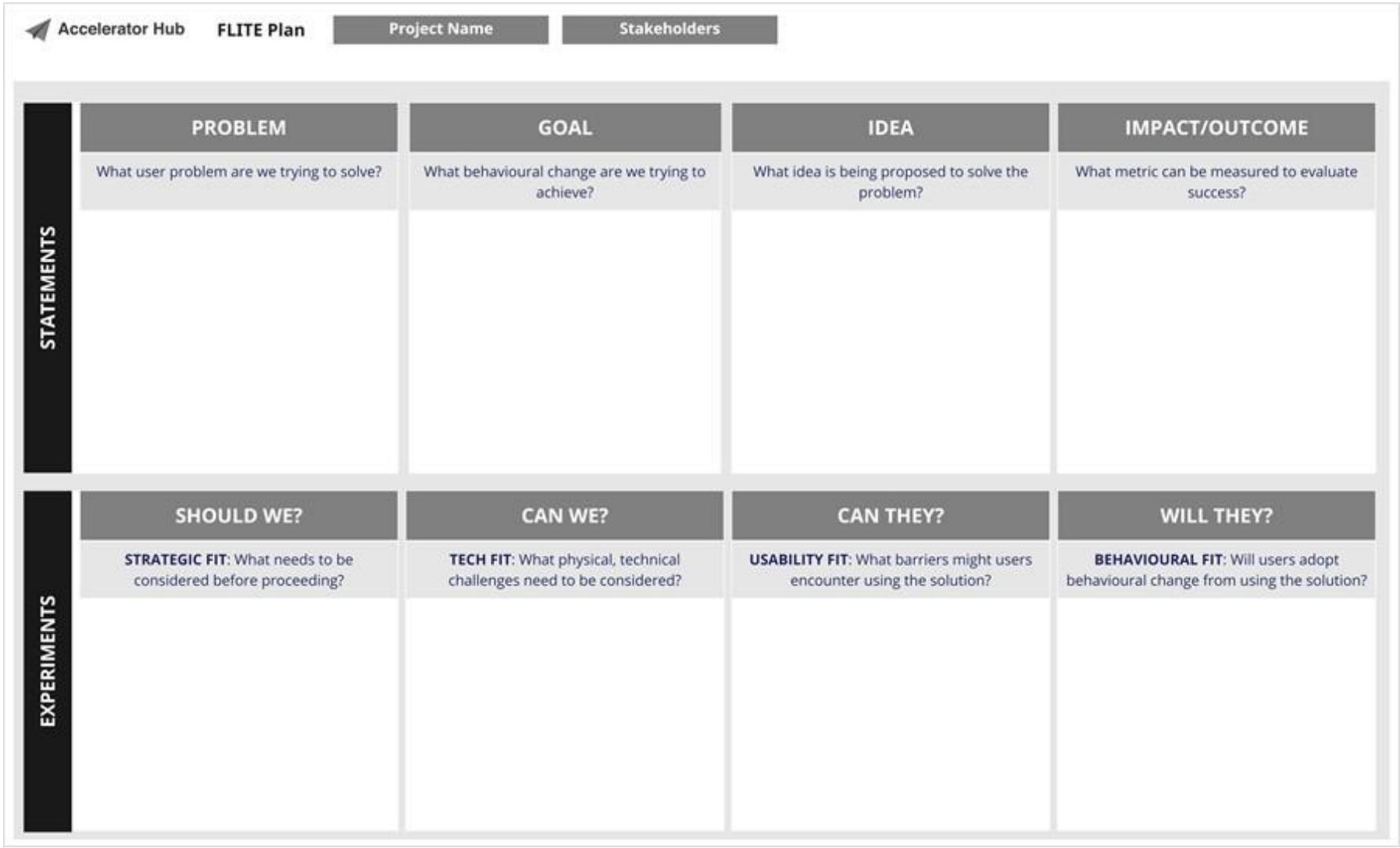
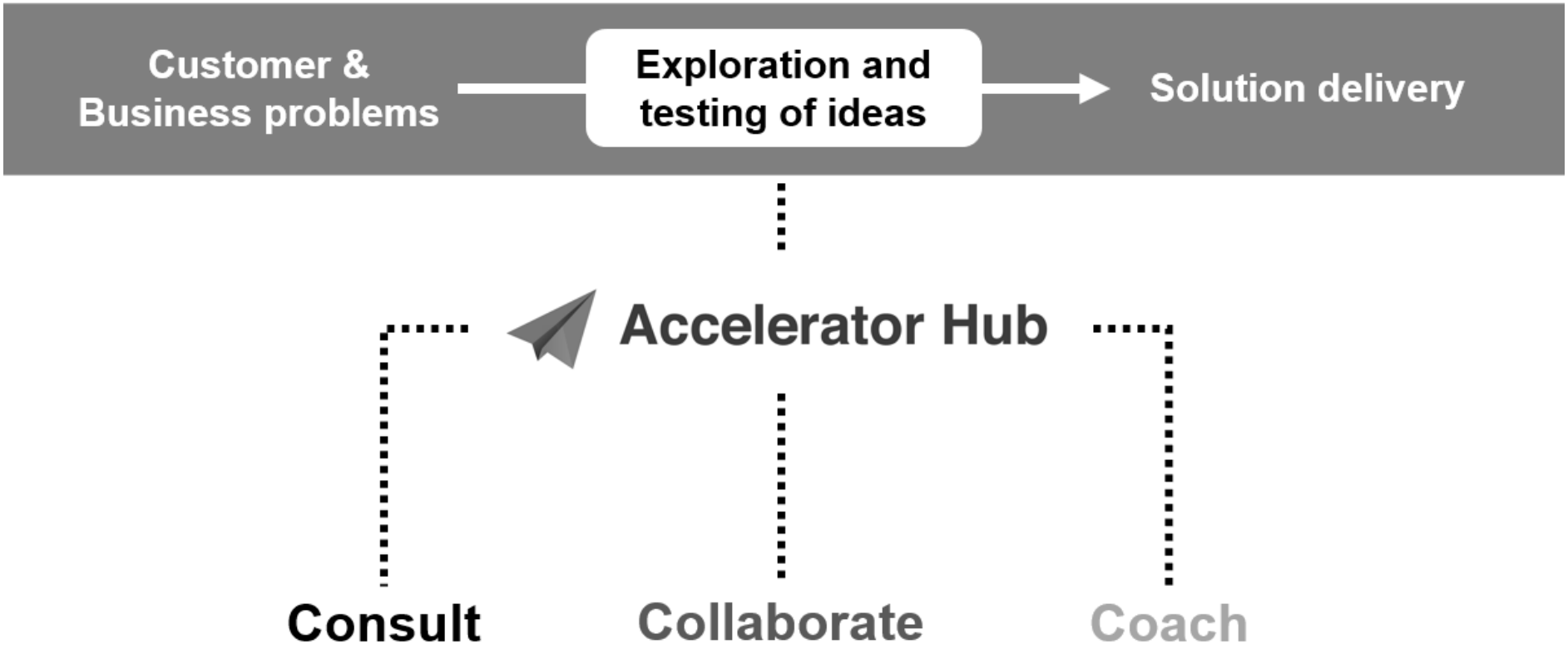


Figure 3 – The Accelerator Hub Activities (Consult, Collaborate, Coach) and Main Stakeholders



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