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DIGITAL INNOVATION: EXPLORING INTEGRATION AND TRANSITION MODES IN SCALING SUCCESS

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Aiming at fostering digital innovation for value creation, incumbent firms have largely adopted dedicated and separated structures for innovation and new business creation. While these structures have been successful in enabling exploration, bringing digital innovations to scale remains a challenge. By employing a qualitative case study of an incumbent bank, with individual projects as the unit of analysis, this study investigates

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the practices and challenges of transitioning digital innovations developed in separate structures to operationalisation or commercialisation in the core of the organisation, a shift essential for enabling innovations to reach scale. Our key contribution is in presenting a dual business-technology transition-to-scale model defined by the intensity of integration and explaining how innovation managers deviate from this model by adopting coping actions aimed at overcoming innovation and organisational transition challenges. With this, we further highlight the challenges of managing an aligned dual business-technology transition in the context of an incumbent firm undergoing digital transformation.

Keywords: Digital innovation; digital transformation; structural ambidexterity; corporate venturing; case study; transition to scale; integration; transfer.

Introduction

Leveraging digital innovation (DI) is central to new value creation in the digital age (Drechsler *et al.*, 2020; Nambisan *et al.*, 2017) and is thus essential for the long-term success of incumbent firms. To this end, incumbents must effectively enable and manage DI while pursuing the multifaceted challenges of digital transformation (DT) (Wiesböck and Hess, 2020; Smith and Beretta, 2021; Trischler and Li-Ying, 2022). Nevertheless, researchers and practitioners' communities agree that succeeding in capturing value from DI and implementing DT is complex and challenging (Nambisan *et al.*, 2017; Dąbrowska *et al.*, 2022).

As discussed by Raisch and Tushman (2019), in the struggle for organisational renewal and long-term sustainability, incumbents often explore new and exploit existing opportunities simultaneously. Because of the size of their established core businesses, these firms tend to be primarily interested in the exploration of DIs or new digital businesses with sufficient market potential to grow into large-scale operations (Raisch and Tushman, 2016). Despite significant efforts and resources invested, however, according to recent industry estimates, around 75% of DIs still stall before reaching the desired scale (Martin, 2018). Similarly, 66% to 84% of DT initiatives fail to deliver the expected results (Correani *et al.*, 2020).

Such a scaling challenge represents a core managerial concern. As argued by Raisch and Tushman (2016, p. 1238), "If new businesses remain locked in their initial exploratory efforts, organisations risk squandering the returns on their exploratory investments, contributing to a downward cycle of search and failure". To date however, there are few concrete approaches in solving this issue. Ultimately, textbook cases, such as Kodak, Blockbuster, and Sears, continue to serve as a reminder that operating customer-centred digital businesses at scale is imperative in today's world.

Aiming at addressing this issue, recent studies (e.g., Burgers *et al.*, 2009; Jansen *et al.*, 2009; Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015;

Raisch and Tushman, 2016; Hansen *et al.*, 2019) have sought to investigate the internal transition of innovations from exploration to exploitation and the process through which these become independent and self-sustaining market offerings, business processes and models inside the firm. This also includes investigating the role of integration and transfer at the unit level.

Over the past decades, incumbent firms have largely adopted ambidexterity, and pursued corporate entrepreneurship (CE), through the creation of separated and dedicated structures for innovation and new business creation (e.g., innovation labs, digital venture hubs, etc.) As such, these structures are an essential locus of exploration action (O'Connor and DeMartino, 2006; Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015; Hoessler and Carbon, 2022). In addition, these units are increasingly expected to build synergetic links with core business and technology (O'Connor and DeMartino, 2006; Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015) hence, becoming central to the transition of DIs towards operationalisation or commercialisation at scale.

Bringing together the literatures on DI and DT implementation, ambidextrous organisations, and CE, this study aims to expand previous research by investigating the dynamics of integration and transfer in the transition to scale of DIs in incumbent firms, with a focus on understanding (i) the practices and challenges when transitioning DIs developed in separated structures, (ii) the impact of digital technologies and (iii) the role of the innovation manager and unit.

By analysing a diverse set of innovation projects, we present a business-technology transition model, including considerations of integration and transfer, and the role of integration intensity along the transition process. We then discuss how innovation managers adapt their approaches to cope with innovation and organisational challenges, deviating from the presented model. Along these lines, we highlight the orchestrating role of the innovation manager in the transition to scale. We conclude by stressing that the coping actions of innovation managers enable DIs to graduate towards maturity and independency in the context of an incumbent firm undergoing DT but can also lead to a business-technology misalignment with important consequences for the transition to scale of DIs.

Theoretical Background

DI and transformation: Adoption of dedicated separated structures, processes, and approaches

The scaling issue of DIs is associated with the challenges of managing DI and transformation in incumbent firms (Correani *et al.*, 2020). DI refers to “the creation

of (and consequent change in) market offerings, business processes or models that result from the use of digital technology” (Nambisan *et al.*, 2017, p. 224). Alongside this, DI management refers to the practices, processes and principles that underlie the effective planning and coordination of DI in organisations (Nambisan *et al.*, 2017). The pursuit of DT, in turn, refers to the implementation of interconnected changes in structures, resources, routines, roles, culture, competencies, etc. aimed at enabling organisations to utilise digital technologies (Drechsler *et al.*, 2020).

In order to continuously leverage digital technologies and bring new digital offerings, processes and models to markets, incumbent firms must manage DI in a way that embeds these in the organisation (Wiesböck and Hess, 2020) alongside the changes of DT (Drechsler *et al.*, 2020). Towards this goal, incumbent firms must carefully consider the impact of technical, organisational, and cultural aspects (Sebastian *et al.*, 2017; Wiesböck and Hess, 2020).

In this direction, scholars have highlighted: (i) the importance of integrated foundational operational backbones and digital service platforms (Sebastian *et al.*, 2017; Wiesböck and Hess, 2020); (ii) the role of ambidextrous, dedicated and separated structures in enabling DI (Smith and Beretta, 2021; Hoessler and Carbon, 2022; Trischler and Li-Ying, 2022), and; (iii) the adoption of practices from the broader entrepreneurship ecosystem, such as user-centric approaches, agile principles, and lean methodologies (Nambisan *et al.*, 2017; Smith and Beretta, 2021). Furthermore, studies (e.g., Bosler *et al.*, 2021; Hinings *et al.*, 2018; Nambisan *et al.*, 2017; Wiesböck and Hess, 2020) have largely stressed that DI in the context of a firm pursuing DT involves carefully balancing new and legacy business and technology elements (Wiesböck and Hess, 2020).

The need to pursue DI, while navigating the changes intrinsic to DI, makes the transition to scale of DIs particularly challenging as, in addition to market-related issues (customer preferences, market maturity, technological shifts), innovations need to navigate significant internal hurdles (Bosler *et al.*, 2021; Hinings *et al.*, 2018; Nambisan *et al.*, 2017; Wiesböck and Hess, 2020).

While scholars have highlighted the need to consider technical, organisational, and cultural aspects and balance new and legacy elements, including stressing the role of dedicated structures, processes, and approaches, investigation of the on-the-ground implementation of DI and transformation is limited (Appio *et al.*, 2021; Nadkarni and Prügl, 2021).

This is particularly true when separated units are created to facilitate and house DIs (Bråthen *et al.*, n.d.). Indeed, scholars have increasingly highlighted the need to expand research on the day-to-day of DI and transformation and adopt new lenses to understand the phenomenon (Nambisan *et al.*, 2017).

Structural separation in corporate entrepreneurship and ambidextrous organisations; towards the investigation of integration and transfer in the transition to scale

The adoption of dedicated structures, processes and approaches bring the management of DI close to the practices (and challenges) of pursuing innovation and new business creation through ambidextrous organisational designs and CE.

The creation of dedicated and separated structures, and its related managerial challenges, is a prolific area of research in the literature on ambidextrous organisations. In simple terms, ambidextrous organisations effectively manage exploration (searching for and experimenting with new knowledge associated with innovation and new business creation) and exploitation (improving and applying existing knowledge to produce goods and services associated with profit maximisation) (Gupta *et al.*, 2006) simultaneously (O'Reilly and Tushman, 2004).

While this capability is considered essential for the long-term survival of firms, the often-opposing logics of exploration and exploitation mean that the pursuit of ambidexterity is plagued by paradoxical situations and tensions (Andriopoulos and Lewis, 2009; Hansen *et al.*, 2019; Rojas-Córdova *et al.*, 2022). Adaptive processes and structures, such as the allocation of exploration activities to a separated and dedicated structure (Raisch, 2008), play an essential role in balancing the pursuit of such contradictory goals (March, 1991).

Structural ambidexterity, however, does not entail only separation, but managing integration of exploration and exploitation activities ensuring synergetic benefits (O'Reilly and Tushman, 2004; Raisch, 2008; Andriopoulos and Lewis, 2009) and successfully managing the process through which exploration initiatives transition to become exploitative businesses (Raisch and Tushman, 2016), including its transfer from exploration to exploitative structures.

The research on CE brings additional insights into this challenge by investigating the transition to scale of new ventures created in separated structures. Within the CE literature, scholars have discussed corporate venturing (CV) as a means of addressing organisational ambiguity in entrepreneurial action (von Hippel, 1977; Popowska, 2020) by separating a group of intrapreneurs from the core organisational structure (Zajac *et al.*, 1991; Garrett and Covin, 2015; Popowska, 2020). In this direction, firms have adopted separated and dedicated structures (Burgers *et al.*, 2009), such as formally established units and other formats e.g. internal incubators, accelerators, etc. (O'Connor and DeMartino, 2006; Gassmann *et al.*, 2012; Bhan Ahuja, 2019).

While these structures foster innovation and new business creation (Hill and Birkinshaw, 2008; Garrett and Covin, 2015; Covin *et al.*, 2021), their subsequent

scaling remains a challenge. These structures often emphasise the discovery, incubation, and acceleration of ideas as unique projects (Raisch and Tushman, 2016; Leiting *et al.*, 2020; Handrich *et al.*, 2021). However, challenges arise when these move closer to the core business, seeking resources or a foundational structure for operationalisation or commercialisation (Santos *et al.*, 2009; Sutcliff *et al.*, 2019; Leiting *et al.*, 2020). Ideally, these ventures would seamlessly integrate with the core business, garnering the necessary support to thrive independently (Raisch and Tushman, 2016) or mature to be assimilated by a pre-existing unit (Leiting *et al.*, 2020). Yet, this is a complex process (Raisch and Tushman, 2016; Leiting *et al.*, 2020; Smith and Beretta, 2021), with ventures often left unsupported post-acceleration and struggling to secure a structure for scaling (Corbett *et al.*, 2013; Leiting *et al.*, 2020).

This persistency of the scaling issue has led the literature on CV to stress the need to further investigate the internal transition process of corporate venture projects (Campbell and Park, 2005; Raisch and Tushman, 2016; Leiting *et al.*, 2020), in addition to the long known challenges faced by corporate ventures (e.g., lack of strategic fit, imperfect market validation, lack of internal sponsors, among many others) (Block, 1982; Macmillan *et al.*, 1986).

Given the common interest of the CV and the ambidextrous organisations' literatures in the adoption of separated structures for the management of innovation and new business activities, it is important to clearly define the commonly used terms, in particular transition, graduation, integration, and transfer.

The concept of *transition* illustrates the journey of explorative initiatives, such as innovations and new business ideas, maturing into processes or offerings operationalised or commercialised at scale as exploitative activities (Hansen *et al.*, 2019). This journey entails a *graduation* process (Raisch and Tushman, 2016), during which initiatives alternate integration and separation moments vis-à-vis the core business towards securing support and gaining independence. Delving deeper, *integration* (Jansen *et al.*, 2009; Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015) pertains to the flow of assets between innovation and new business units and the core business. Integration is essential because it enables access to complementary knowledge and resources essential for turning early-stage ideas into feasible and viable solutions (Raisch and Tushman, 2016; Handrich *et al.*, 2021). Finally, as these innovations mature, there comes a pivotal point of *transfer*, when innovations migrate from innovation and new business (exploration) structures to core (exploitative) structures (Hansen *et al.*, 2019), propelling their journey towards scalability.

Recent studies have started to shine a light on the practices and challenges of balancing integration and transfer in the transition to scale of projects developed in

separated and dedicated units (Burgers *et al.*, 2009; Jansen *et al.*, 2009; Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015; Raisch and Tushman, 2016; Hansen *et al.*, 2019). Along these lines, who initiates the innovation and when integration is sought at the unit level emerge as key defining factors in the transition journey (Chen and Kannan-Narasimhan, 2015). Studies of exploration–exploitation transition, integration and transfer at the unit or team level, however, are still few and fragmented.

The role of the innovation manager in separated and dedicated structures for DI

Numerous studies analysed the role of senior management in enabling exploration–exploitation (Andriopoulos and Lewis, 2009; Knight and Cuganesan, 2020) by, for instance, instating synergetic values across exploration and exploitation units and mediating between conflicting goals. Recent studies, however, stressed that leadership involvement alone is not sufficient (Zimmermann *et al.*, 2018), calling for an increased focus on the role of other essential actors.

In this direction, recent studies sought to shine a light on the role of innovation managers at the project level (Raisch and Tushman, 2016; Leiting *et al.*, 2020; Smith and Beretta, 2021). In their findings, studies have reflected a reliance on influencing capabilities to navigate the exploration–exploitation divide and enable innovations to transition to scale.

Smith and Beretta (2021) focussed on how the actions that exploration managers adopted to cope with the challenges of DI in an ambidextrous organisation led to changes in the ambidextrous configuration adopted by the firm. Along these lines, the authors stress that coping actions are needed at the level of the innovation manager because exploration–exploitation often contains novel features that clash with existing routines and practices, necessitating on the ground answers. Furthermore, the complexity of digital transformation, with its interconnected aspects such as digital platforms, software and physical components, autonomous agile teams, big data analytics, and project and holistic focus, inevitably leads to a greater number of paradoxical tensions and greater complexity and ambiguity. This complexity requires innovation managers to simultaneously attend to and cope with all these aspects, consider their reciprocal effects on each other, and continuously adjust their organising efforts.

In-depth investigations, however, are needed to better understand the role innovation managers play in the integration and transfer of exploration activities vis-à-vis business and technology peers at the project level.

Methodology

This study applied the exploratory lens to better understand the practices and challenges when transitioning DIs developed in separate structures to the core business structures, at the final stages of the innovation process. Due to its exploratory nature, a qualitative approach was adopted as it enables deeper understanding of real-life phenomenon (Saunders *et al.*, 2015), while a case study design was chosen for our focus on empirical and theoretical contributions (Dubois and Gadde, 2014). Furthermore, this study applied an abductive research strategy, extending prior theory based on the empirical insights generated (Dubois and Gadde, 2014).

An abductive logic involves pursuing knowledge generation by combining theory- and data-driven approaches, requiring the researchers to undertake backs-and-forths between frameworks and data, continuously testing observed phenomena against existing theory (Peirce, 1992; Dubois and Gadde, 2014). In this process, it aims at extending the theory by developing new concepts or ideas to account for puzzling empirical materials that do not fit existing theoretical frameworks (Timmermans and Tavory, 2012; Tavory and Timmermans, 2014).

Our setting is a large Asian bank, herein referred to as Bank Ltd., with several mature banking businesses (commercial banking, asset management, insurance, etc.). The focus on a large incumbent firm is explained by the focus on DI and transformation, the on-the-ground implementation of ambidexterity, including the usual adoption of separated structures, the availability of resources for DI activities, and the likelihood of observing the transition to scale of projects. Furthermore, the banking sector offers a rich environment for the study of digital innovation given the need to quickly answer to a fast changing, and increasingly digital, banking landscape (Sund *et al.*, 2021) while typically facing significant legacy systems that affect the innovation process (Sund *et al.*, 2021), large and often rigid structures and the need to comply with complex processes and procedures to ensure compliance with regulatory frameworks (Riikkinen and Pihlajamaa, 2022).

Given the complexity of investigating a large firm, we limited our research to one subsidiary and the parent company, in which the pursuit of DI through separated structures is the most mature (refer to Figure 1).

This paper examined eight DI projects (refer to Table 1) based on three selection criteria: (i) they directly address DT objectives, (ii) they were developed in separated innovation structures, and (iii) they represent diverse transition to scale processes.

The research methodology involved semi-structured interviews conducted in two phases. In the first phase, senior management and innovation managers were

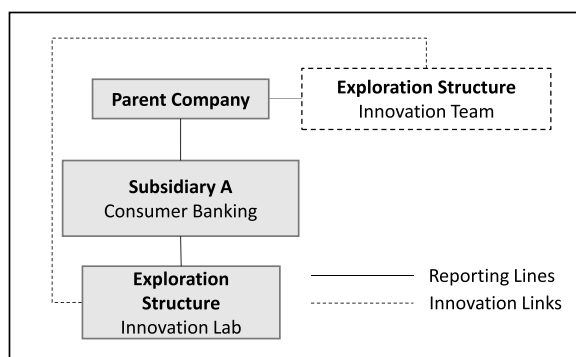


Figure 1. Empirical setting.

interviewed to gain an initial understanding. Based on suggestions from initial informants, in the second phase, interviews were conducted with project teams, including peers from core units, and representatives of a partnering consulting company to gain insights from different angles. A total of approximately 705 min of interviews were recorded, transcribed, and analysed. Secondary data were also used to provide a contextual understanding and allow for multiple facets of the phenomenon to be understood (refer to Table 2).

Initially, interviews were scheduled with 10 elite informants (Aguinis and Solarino, 2019). Subsequently, additional interviews were conducted to ensure that key insights were not missed. In selected cases, the informants were interviewed twice or asked follow-up questions and clarifications in written format. This uncovered details within already identified themes, indicating saturation (Saunders et al., 2018).

Findings

The orchestrating role of the innovation manager

At Bank Ltd., each innovation and new business project was overseen by an innovation manager, who had the essential responsibility of ensuring that these became independent and self-sufficient in the core structures of the organisation, enabling them to successfully transition to operationalisation and/or commercialisation at scale.

Innovation managers could, in this direction, orchestrate the integration of each project; they could seek integration with one or more core business and technology peers, define when integration was sought and determine what mechanisms to leverage for integration. They could also orchestrate the transfer of projects to core

Table 1. Summary of selected projects: Transition, integration, and transfer.

	<i>Project A</i>	<i>Project B</i>	<i>Project C</i>	<i>Project D</i>
<i>Description</i>	Data-driven loan underwriting	AI assistant for customer service	Platform-based advertising	Automated debt restructuring
<i>Transition Process</i>	Aligned business-technology	Early business-late technology	Early technology-late business	Aligned business-technology
<i>Stage</i>	Operating at scale	Operating at scale	Acceleration phase	Operating at scale
<i>Innovation Objective</i>	Revenue growth through new customer group	Cost saving and customer experience	New digital business model	Cost saving and customer experience
<i>Innovation-Exploration Structure</i>	Innovation lab at Subsidiary A	Innovation lab at Subsidiary A	Innovation lab at Subsidiary A	Innovation lab at Subsidiary A
	<i>Project E</i>	<i>Project F</i>	<i>Project G</i>	<i>Project H</i>
<i>Description</i>	Consumer mobile application	Payment methods through biometrics	Digital twins	Digital accounts
<i>Transition Process</i>	Early business-late technology	Early technology-late business	Early technology-late business	Aligned business-technology
<i>Stage</i>	Operating at scale	Acceleration phase	Incubation phase	Operating at scale
<i>Innovation Objective</i>	Cost saving and customer experience	Cost saving and customer experience	New digital business model	Revenue growth through a new business line
<i>Innovation-Exploration Structure</i>	Innovation lab at Subsidiary A	Innovation team at mother company	Innovation team at mother company	Innovation team at mother company

Source: Authors.

Table 2. Overview of data collection.

Data types	Sources		
	Internal: Senior management Innovation managers	External: Innovation partners	Total
Interviews	12 interviews	2 interviews	14
Documents	3 internal presentations	23 press releases and news articles 6 company performance reports	32

Source: Authors.

structures by engaging with core business and technology peers as transfer homes or by working with senior management to create new structures (new business units, new subsidiaries, etc.) to continue the operationalisation and/or commercialisation of solutions.

Business-technology duality of DIs

In their orchestrating role, innovation managers considered and managed a double transition to scale: (1) that of the business and (2) that of the technology involved in each new digital market offering, process, or model.

This duality emerged given the need to (i) balance business and technology objectives; (ii) integrate different actors, building synergetic links with business and technology peers; and (iii) transfer the business-related aspects of the innovation to a core business unit or support function while needing to transfer the technological aspect of the solution to a digital or IT function. This consideration of business-technology integration and transfer appeared in all the analysed projects (refer to Table 2).

In this duality, the innovation unit often acted as an intermediary, serving as an integration channel between core business units and the digital/IT functions, which would eventually need to coordinate the operationalisation and/or commercialisation of the business-technology components of the new DI without the involvement of the innovation team.

Business-technology transition model

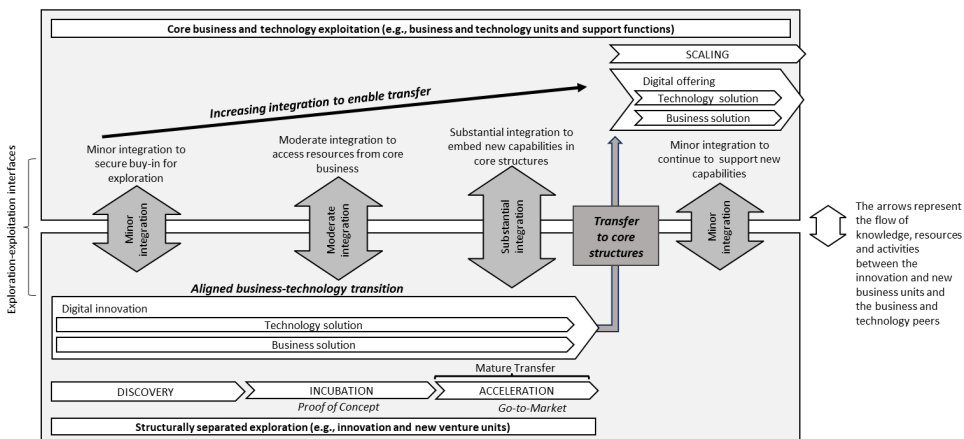
Innovation managers, and senior management, described a typical business-technology transition journey through which DIs were expected to progress towards scale, passing through the process of becoming self-sufficient in core business structures.

This model started with a standard discovery, incubation, and acceleration innovation journey. This innovation stage was followed by a scaling phase characterised by production for operationalisation and/or commercialisation. In addition to the usual innovation journey, the model described included integration requirements. Considerations of a transfer home for the DI started at the early stages of the innovation process and continued throughout the shift to production.

In the model described, the intensity of integration was key. The innovation manager would seek minor integration with core business and technology peers in the early stages of the project to gain buy-in and identify potential transfer homes. Following the development of a concept, the innovation unit would seek a moderate integration to access core assets (resources, knowledge, activities, customers, etc.) and, in suitable cases, to start embedding new knowledge, resources and activities in expected transfer homes.

The multifaceted aspects of proof of concept (PoC) and go-to-market activities offered a valuable opportunity for the innovation manager to connect with peers around the DI, serving as key business-technology integration platforms. The PoC is a critical stage in innovation management, where a prototype or model is developed to validate the feasibility of a concept in a real-world environment. The go-to-market, in turn, encompasses all the activities and tactics required to bring innovations to the target audience and generate revenue. It includes the marketing and operational plan, pricing strategy, distribution channels, etc.

Finally, around the time the innovation was mature enough to be transferred, moderate to quite substantial integration would be developed to embed the new



Note: Building on Hansen et al. (2019) and Chen and Kannan-Narasimhan (2015).

Figure 2. Aligned business-technology transition of DI with integration and transfer.

market offer, process, or model in the core business and technology structures of the organisation. At this stage, the innovation unit would progressively remove itself from the initiative, transferring any remaining business and technology capabilities related to the digital process, product, service, or model to core peers.

In this expected transition model, the business and technological components of DIs are managed and transitioned concomitantly, ensuring that the business and technology aspects of the DI or new business are aligned, and that core peers can continue to link the technology solution to the business problem during the operationalisation and/or commercialisation process without the engagement of the innovation unit as the intermediary. Figure 2 illustrates the described transition model of DIs.

Project scaling journeys: Towards independence and self-sufficiency

Despite innovation managers and senior management describing a similar expected transition journey, the reality of the projects analysed demonstrates that the model represented a guiding framework rather than a strictly implemented model. At the project level, the transition journey of projects, including integration and transfer activities, deviated from the described expected model. Of the eight projects analysed, only three followed the expected model. The other five projects reflected important deviations.

These deviations emerged as puzzling or surprising factors. To illustrate the divergencies, we selected three distinct project journeys (refer to Appendix for illustrations of the transition journey of the selected projects). The first described project follows the general lines of the described model, with very minor deviations. This project is an example of an aligned business-technology transition. The following two projects reflect major deviations and misaligned business-technology transitions. These are presented with the objective of shining a light on the decisions or actions of innovation managers that led to such divergencies.

Aligned business-technology transition: Project A — Data-driven loan underwriting)

The data-driven loan underwriting project represents a transition, in general, aligned with the expected described model, with minor deviations. The project was initiated by the innovation unit after hearing from the risk assessment team about their challenges in approving loans for individuals without traditional credit scores. Following an initial discussion, the innovation team developed the concept of an alternative loan underwriting model using consumer behaviour data collected from mobile applications.

As described by the innovation manager of the project, the development of the data model and the testing of the concept were the most complex parts of the solution. The innovation unit opted to partner with an external knowledge provider to develop the alternative credit score concept. Integration with the core business peer was relatively minor and focused on understanding needs and gaining the buy-in of the risk assessment team for the alternative underwriting model.

From a technology point of view, the solution required the development of a software development kit (SDK), which would enable data to be collected and transferred to the team responsible for the underwriting. Integration was also initiated with the mobile application team, as the solution would require taping into the functionalities of their platforms and the core IT and digital functions responsible for maintaining the mobile application backbone.

The incubation of the solution required the further involvement of other support functions in the organisation, such as the legal, marketing and sales teams, to ensure that the solution fit core business requirements and to enable access to core resources for the activities around the validation of the concept.

Following the PoC, the project team, at this point involving core business and technology peers, opted to transfer the alternative credit score model to the risk assessment team. This was possible because the increasing intensity of integration developed during the discovery and incubation of the solution enabled the risk assessment team to develop the capabilities needed to independently manage the model without the involvement of the innovation unit or external provider, as well as to put in place the technical processes needed to operationalise the solution at scale.

The integration with the mobile application, sales and marketing teams developed during the proof-of-concept allowed the innovation unit to gain buy-in and start embedding the solution in their processes, which led to the alternative credit score technology and model being launched as a digital lending product offered in the core consumer mobile application.

Finally, by maintaining IT peers informed since inception and more strongly engaging the core IT team in the PoC, supported by the digital capabilities of the mobile application team, the innovation unit was able to embed the SDK in the core IT structures and transfer its management to IT peers.

With the SDK managed by the core IT and digital functions responsible for maintaining the mobile applications backbone, the digital lending product offered by the mobile application, and the alternative scoring model carried out by the risk-assessment team, the DI could be operationalised and commercialised at scale by core peers in the core structures of the organisation. The integration of multiple actors during the process also meant that business and support functions were able to continue the solution without the involvement of the innovation unit.

Early business and late technology transition: Project B — AI customer service assistant

The AI customer service assistant project represents a transition journey that significantly deviated from the typical expected journey, with an early business and late technology transition. Incentivised by senior management, the project was co-incubated by the innovation unit and operations team to find alternative, cost-saving solutions to expand customer services.

While AI bots for customer services are now an industry standard, at the time of the project, in 2016, they were still a novelty in the banking sector. In fact, Bank Ltd. was one the first to develop such a tool in its region. Given the novelty, the innovation manager responsible for the project assessed that successfully developing and scaling this solution would require Bank Ltd. to develop significant new capabilities along with the implementation of multiple changes in core business and technology structures.

To enhance the chances of success, the innovation manager, together with core business leadership, opted for leveraging the strong ownership of the customer services team and initiated the project with a substantial business integration to start building new AI operations capabilities early on. This represented a first important deviation from the typical model described. By opting for an early significant integration with a core business peer, the innovation manager attached the concept development to the core business.

Following the joint development of the initial solution concept during the discovery phase, a new team within the customer services unit was created, and former customer service employees began to be reskilled to become the new AI operations team. Operating an AI bot, however, is not a typical capability of a traditional customer service team. The new AI operations team could not operate all aspects of the solution. The technology-heavy aspects of the solution would need to find another home in the organisation.

Given that the AI bot needed to connect with the usual customer service systems to ensure a seamless customer experience, the AI technology would need to integrate with the IT backbone of the organisation. Therefore, the integration of the core IT function as a core asset provider and probable transfer home for the technology was a logical need.

Bank Ltd., however, faced significant IT resource constraints, which meant that any substantial engagement of IT peers would require going through a lengthy resource allocation process. IT peers also utilised cumbersome processes and procedures for task identification and allocation. Thus, the innovation unit opted to develop a minor, informal integration with core IT peers during the discovery and incubation process while working with an external AI partner for the development

of the AI bot and training the employees to operate the AI in the customer service team. This represented a second major deviation from the typical, expected, transition model. The minor and later integration of the technology team meant that the transition towards self-sufficiency of the business and of the technology aspects of the solution were disassociated.

Ultimately, these choices enabled the project to progress and reach scale despite the IT resource constraints. However, it also meant that when time came to operationalise the solution at scale, the core IT peers had not yet developed AI capabilities needed for implementation and could not take over the solution. To stop the project from stalling in the scaling phase, the innovation unit team had to expand its role to maintain the more technology-heavy aspects of the bot while transferring the more business aspects to the new AI bot team under Customer Services.

Early technology and late business transition: Project C — Platform-based advertisement

The platform-based advertisement project also represents a transition journey that significantly deviated from the expected journey, with early technology and late business transitions. The project was initiated by the innovation unit, answering a request from senior management to explore new sources of revenue for the organisation.

Data monetisation through data-driven advertisement placement in the Bank's key digital platforms emerged as an opportunity to tap into the large volumes of consumer behaviour data collected because of the increased deployment of digital technology tools.

As the project represented a new business model for the organisation, it would have the potential to cannibalise current business, leading to greater internal resistance. The innovation unit thus opted to seek only minor integration with business peers, namely, the mobile application team, with the objective of accessing core assets for concept development and PoC. In turn, it decided to explore the possibility of spinning-off the solution as a new venture.

The innovation governance mechanisms of Bank Ltd. incentivised, however, the innovation unit to seek internal ownership of the project. This, combined with the fact that the technology involved in the solution did not require major new capabilities, led to close integration with the core data function of the organisation and the IT peers involved in the operationalisation of the core data systems. The innovation unit also sought minor integration with the digital hub in charge of the company's core mobile application as it aimed to launch the new product on this platform.

Around the end of the PoC stage, while the technology could be transferred to be operationalised at scale by the core digital/IT functions, the innovation unit had not been able to secure a business structure to which to transfer the project. The initial idea of spinning-off the solution as a new venture was placed on hold given the need to, at least initially, embed the solution in existing core digital platforms to enable the solution to grow into a self-sustaining business.

The core data function of the organisation, while positioned as a project owner, is not a business unit and, thus, could not commercialise the solution. To enable the project to continue to progress towards scale, the innovation unit envisioned engaging an external commercialisation partner while expanding its role to continue holding the business side of the solution during the transition-to-scale period.

In this case, the initial decision to maintain the business aspects of the project separated from core business to protect it from business-as-usual concerns enabled the solution to continue to be developed, but also created a disassociation of the business-technology transition. This disassociation resulted in the project stalling before the scaling phase until a solution could be found.

Discussion

Our investigation reveals that innovation managers and senior management alike have in mind an expected transition model for DIs developed in separated structures, which includes an expected aligned business-technology integration and transfer towards independence and self-sufficiency. This typical transition model is greatly aligned to the innovation management theory dictating the management of innovations and new ventures by separated and dedicated units (Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015; Raisch and Tushman, 2016; Hansen *et al.*, 2019). Separation is used to protect innovations and new ventures from the rigidities of the core business, while integration is used to create synergetic benefits, enabling access to core assets or the embedding of new knowledge, resources, and activities of the DI in a core business structure.

As such, in the expected model described, the initial careful integration enables the manager to secure buy-in while protecting projects from business-as-usual concerns. When initiatives are mature enough to stand on their own and maintain their integrity as innovations and new ventures, usually around the acceleration period, they are transferred to existing or new core business and/or technology structures.

However, we observed three important factors that expand existing theory. First, the model described and, indeed, the journeys observed, were not centred around alternating integration and separation, as described by theory (Raisch and

Tushman, 2016). In practice, some degree of integration always existed. In fact, the model and real journeys were defined and shaped by changes in the level or intensity of integration developed; altering the level or intensity of business or technology integration throughout the project created greater or lesser flows of knowledge and resources.

This interesting factor can be explained by the internal orientation of the innovation and new venture structure. As their expected role is to spur innovations and new ventures building on the strengths of core-business, continuous integration was essential to ensure continuous flow of knowledge and resources.

This observation is important because it better explains the challenges of managing innovation-integration trade-offs in these contexts. Integration always existing, it becomes clear that previously observed trade-offs (Hansen *et al.*, 2019), such as enabling exploratory-complementarity linking versus contamination and better access to resources versus resource starvation, are a constant throughout the innovation to scale process.

Furthermore, previous research described how integration is defined, who initiated it and when integration is initiated (Chen and Kannan-Narasimhan, 2015). Based on the above, we extend previous literature by developing a model of aligned business-technology transition to scale, that captures and argues that the integration journey is defined by whom, when and to what extent to integrate.

Second, the puzzling deviations observed, represent, in essence, deviations from what theory (Gassmann *et al.*, 2012; Chen and Kannan-Narasimhan, 2015; Raisch and Tushman, 2016; Hansen *et al.*, 2019) dictates. Based on empirical observations, we argue that these deviations are a consequence of the decisions made or actions taken by innovation managers to cope with the challenges of the business-technology transition in the context of an incumbent firm undergoing DT, which result in altering decisions of with whom, when and to what extent to integrate. In the cases described, the integration decisions made, or actions taken, by the innovation managers aimed at coping with technical, operational, or cultural challenges involved in enabling the organisations to utilise digital technologies for value creation.

In short, the combination of internal orientation of the innovation unit and the need to cope with technical, organisational, and cultural changes related to DTs led innovation managers to alter expected with whom, when and to what extent to integrate decisions, deviating from the expected model.

This observation is important because while deviations served the purpose of enabling projects to continue to mature despite internal challenges, they came with important managerial trade-offs. First, it led to a *disassociation of the business-technology transition*, creating avenues for projects to stall in the scaling phase.

Second, it led to *mutations in the scope of action of the innovation unit*, deviating exploration resources to support projects already in the exploitation stage.

Finally, previous studies have stressed the orchestrating role of senior management in ensuring the integration of exploration–exploitation activities (O'Reilly and Tushman, 2004). We further expand on previous research by highlighting the essential orchestrating role of innovation managers in the integration and transfer of innovations and new business towards scale and describing how it unfolds in practice.

Orchestration plays a crucial role in innovation management, involving the identification and alignment of actors and resources, the management of interdependencies and the facilitation of communication and collaboration (Carnes *et al.*, 2017; Andersén and Ljungkvist, 2021). As our findings show, innovation managers not only drove innovation and exploration activities but were closely involved in the implementation of the changes needed in core business structures to ensure that innovations could be independent and self-sustaining (*vis-à-vis* the innovation unit) during operationalisation and/or commercialisation at scale.

This orchestrating role of the innovation manager also helps in explaining the deviations observed. Expanding on previous theory (Andriopoulos and Lewis, 2009; Knight and Cuganesan, 2020), we thus argue that in addition to the strategic decision-making of senior managers, the day-to-day decisions of innovation managers are key in enabling synergetic links between innovation units and core business to be developed and managed and, as such, play a key role in the management of ambidextrous organisations.

Intensity of integration

As discussed, innovation managers' coping actions revolved around altering who they sought integration with, when they sought integration, and the extent of integration sought. Thus, this finding describes an additional dimension of the temporal aspect of integration, *i.e.*, the intensity of the integration (please refer to Figure 3).

Building on existing theory (Chen and Kannan-Narasimhan, 2015; Raisch and Tushman, 2016), we argue that integration along the transition process can be described as varying from loose to tight, or minor to substantial, depending on how innovation units and core business peers interact. The looser the integration, the lower the interdependency, coordination and flow of knowledge, resources and activities among innovation units and core business and technology peers. A tight integration, logically, would entail the opposite.

In the standard model described, innovation managers transitioned from looser to tighter, or minor to moderate to substantial, integration. Initially, a looser integration was described as enough to gain buy-in. A moderate integration was

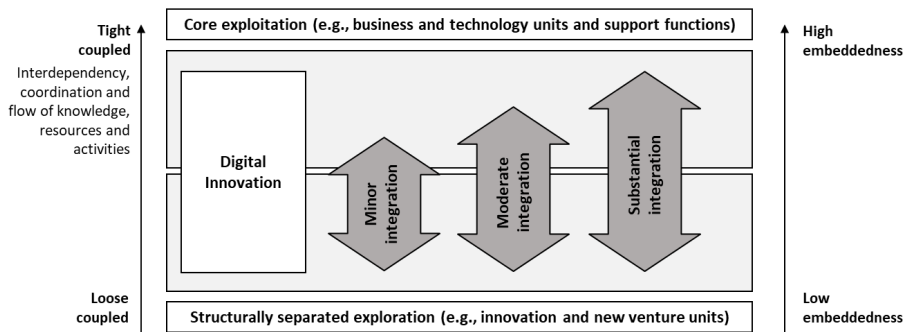


Figure 3. Degree of integration drives embeddedness.

described as enough to enable access core corporate assets. Embedding new knowledge, resources, and activities in turn required creating tighter coupling between the innovation unit and the core business and technology structures.

This logically dictates that innovations or new businesses that involve significant new capabilities require greater integration to ensure embeddedness. Significant changes brought by DIs to either business or technology knowledge, processes and activities would mean substantial adaptation for core business actors involved in the operationalisation and/or commercialisation of developed new digital solutions or new digital businesses.

Indeed, we see this in the case of project deviations. Instead of following the expected model, innovation managers altered the expected extent of integration along the transition process, based on the hurdles afforded by legacy technical, organisational, and cultural factors and on the need to support the implementation of change to enable the transition of projects. For example, in case of Project A (data-driven loan underwriting), working with core business and technology peers to restructure some core processes was sufficient. In case of Project B (AI customer assistant), enabling transition meant being involved in building a new team and reskilling employees. In Project C (platform-based advertisement), it meant supporting the creation of a completely new business team.

Coping actions of innovation managers and the challenges of DI

Looking at the management of hybrid models of ambidexterity, [Smith and Beretta \(2021\)](#) stressed that the actions taken by organisational members to cope with organisational paradoxes indirectly affected the organising model by altering its original design. In short, to cope with the paradoxical challenges of implementing an ambidextrous model, organisational actors made decisions that ultimately altered the model. Our findings, support [Smith and Beretta \(2021\)](#) as we

observed a similar project-level dynamic. The actions that innovation managers took, or the decisions that they made, to cope with the challenges of transitioning DIs in the context of incumbent firm operating an ambidextrous organisational model and undergoing DT led to project-level alterations in the transition of DIs vis-à-vis the pre-defined model.

For instance, transitioning solutions required overcoming core business and technology around resource allocation, such as in the case of an AI customer assistant. Innovation managers described how working with core business and technology peers delayed DI projects given the cumbersome processes and procedures used to define and allocate tasks. Innovation managers also described how governance mechanisms required gaining buy-in from internal project owners, often entailing multiple rounds of convincing. In addition, they described how transitioning DIs often required implementation changes to support the operationalisation or commercialisation of solutions. To face these challenges, innovation managers had to alter the with whom, when, and to what extent to integrate of their initiatives, creating new, unexpected, integration and transfer.

Contributions, Limitations and Future Research

Contributions

We extend the existing CE research (Raisch and Tushman, 2016; Hansen *et al.*, 2019) by presenting an expected transition to scale model described by the innovation actors of a large incumbent firm. We expand the previous structural ambidexterity research (Burgers *et al.*, 2009; Chen and Kannan-Narasimhan, 2015; Jansen *et al.*, 2009) by identifying an additional dimension of exploration–exploitation transition, the intensity of the integration sought, and by discussing its role in enabling the transition to scale.

Furthermore, we also contribute to the literature in DI and DT implementation (Smith and Beretta, 2021) by describing how innovation managers adapted their approach to integration and transfer to cope with the challenges of DI in the context of an incumbent firm undergoing DT, deviating from the described transition model. Along these lines, we also contribute to research by shedding light on the role of innovation managers in orchestrating integration and transfer, enabling the internal transition to scale of innovations (Raisch and Tushman, 2016; Leiting *et al.*, 2020; Smith and Beretta, 2021).

Finally, theory has greatly reflected on the need to orchestrate the scaling of both business and technology in digital innovations (Nambisan *et al.*, 2017; Drechsler *et al.*, 2020; Wiesböck and Hess, 2020; Bosler *et al.*, 2021). However, empirical evidence of how this, de-facto, happens in incumbent firms is limited.

Insights from the CV and structural ambidexterity literatures are most concerned with integration of innovations and new ventures with core *business*, not directly approaching the business-technology duality (Burgers *et al.*, 2009; Chen and Kannan-Narasimhan, 2015; Jansen *et al.*, 2009; Raisch and Tushman, 2016).

In this direction, we present a model of how innovation managers expect to enable an aligned business-technology transition to scale and further contribute to the literature on DI and DT (Nambisan *et al.*, 2017; Drechsler *et al.*, 2020; Wiesböck and Hess, 2020; Bosler *et al.*, 2021) by showing that integration and transfer decisions significantly impact the business-technology transition of DIs and, thus, need to be carefully managed to avoid misalignment.

Practical implications

The duality of managing DI means double attention for exploration units and senior management. They should be attentive to innovation myopia (Durisin and Todorova, 2012). If the needs and challenges in terms of both business and technical capabilities are not carefully considered, managers might later face challenges in transferring and transitioning part of the solution, which could lead to delays and wasted resources. Furthermore, managers should be aware that managing this duality might lead to tricky situations in which efforts to facilitate one side (business or technical) lead to challenges on the other. In addition, innovation units should be aware of the essential orchestration and intermediation roles they play in the transition to the scale of DIs through their ability to shape integration and transfer, creating the foundations for a successful transition of solutions.

Finally, while we observe cases in which transitioning solutions to scale require expanding the role of the exploration units, senior management and heads of innovation units must carefully consider their implications for overall innovation and exploitation in the organisation. With innovation resources being diverted towards operationalisation and/or commercialisation activities, less attention is dedicated to continuously spurring new projects.

Limitations and future research

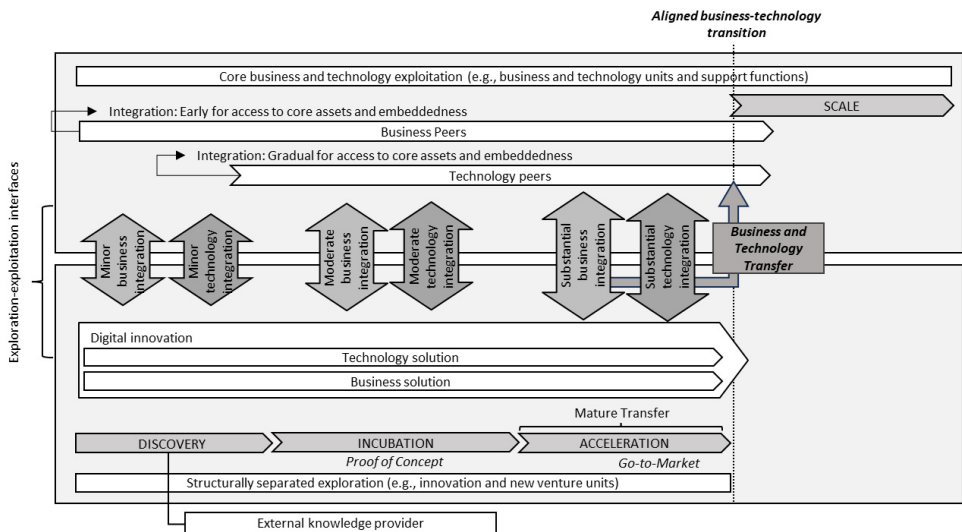
Different organisations might apply different exploration-exploitation configurations, which might bring additional integration and transition needs. Thus, future research could provide additional insights by exploring other contexts. That said, the adoption of a separated structure (e.g., innovation unit) and of innovation practices coming from the broader entrepreneurship ecosystem (discovery, incubation, acceleration, and scaling) of Bank Ltd. are representative of a configuration often adopted by incumbent firms, which might indicate the similar findings could be found in other contexts.

While we observe, in the journeys of DI projects, deviations from the transition model initially described by innovation managers, we do not systematically map all the potential innovation and organisational factors that might play a role in shaping the approach to integration and transfer. Additional efforts could attempt to map factors and their intrinsic dynamics. Finally, multiple avenues for investigation have emerged for the study of DI in the context of DT. In particular, understanding how the pace of DT in an organisation might affect the integration and transfer of DIs, and vice versa, is key.

Acknowledgments

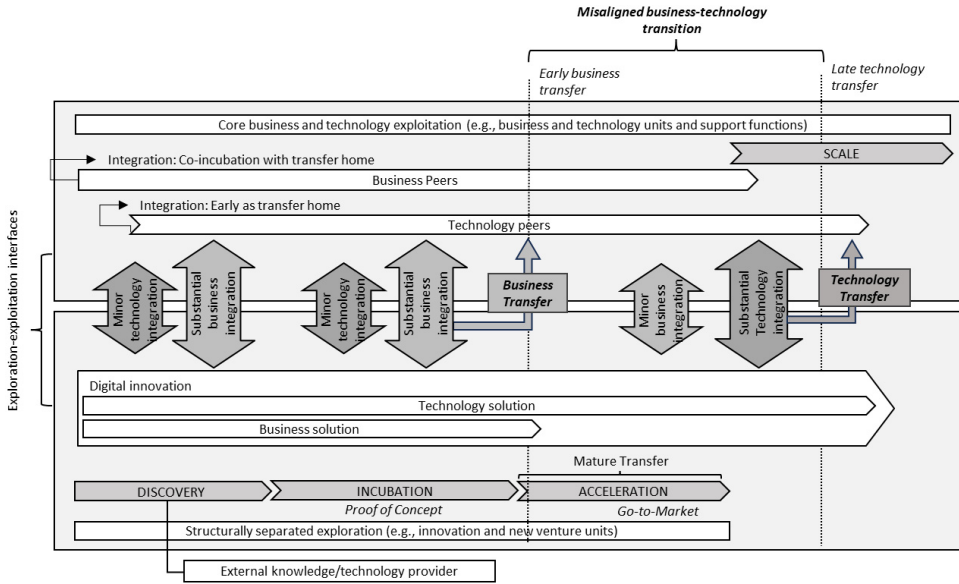
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Appendix A. Illustration of Selected Project Transition Journeys



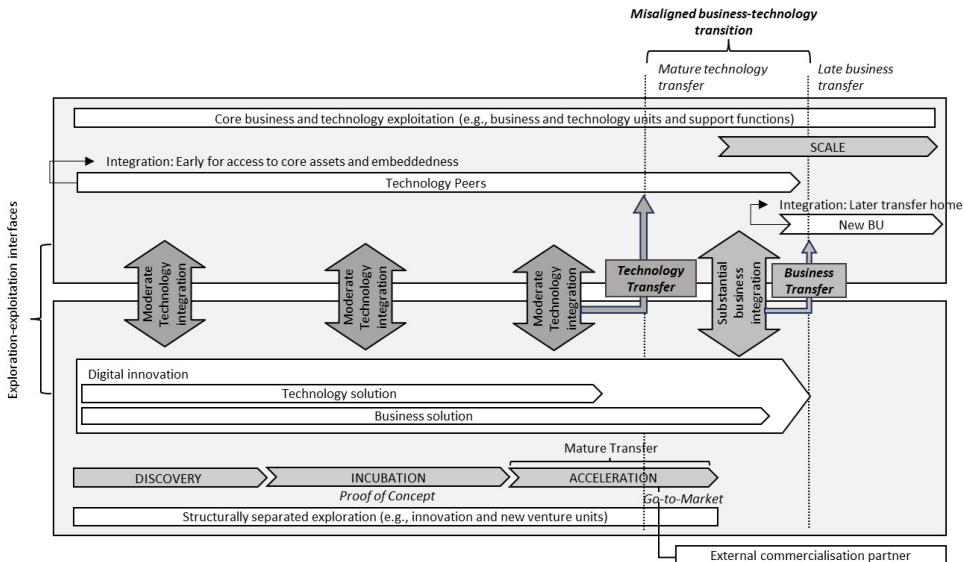
Source: Authors’ own illustration based on study findings.

Figure A.1. Aligned business-technology transition: Project A — Data-driven loan underwriting).



Source: Authors' own illustration based on study findings.

Figure A.2. Early business and late technology transition: Project B — AI customer service assistant.





Source: Authors' own illustration based on study findings.

Figure A.3. Early technology and late business transition: Project C — Platform-based advertisement.

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