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Managing digital transformation during re-internationalization: Trajectories and implications for performance

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ABSTRACT

This paper contributes to our theoretical understanding of how SMEs digitally transform during re-internationalization. We conducted qualitative, multiple-case studies into re-internationalization processes across 11 Chinese international SMEs. Using inductive data analysis, we identify two types of digital transformation, operational and strategic, and trajectories during re-internationalization. The complexity of digital transformation in re-internationalization is delineated by the intricate tensions between strategic digital transformation and new product development. Firm re-internationalization performance can plausibly be differentiated by how these tensions are managed.

1. Introduction

Understanding the re-internationalization phenomenon has been increasingly investigated in the International Business (IB) literature (Surdu and Narula, 2020; Vissak et al., 2020; Welch and Welch, 2009), but how firms digitally transform during the re-internationalization process has remained unknown. Our research presents evidence from Chinese international SMEs that experienced unintended and complete withdrawals from their exporting markets and achieved "complete" or "partial" re-internationalization upon re-entering foreign markets previously lost (Javalgi et al., 2011; Vissak and Francioni, 2013; Vissak and Masso, 2015). This research draws on the internationalization process (Vahlne and Johanson, 2017; Vahlne, 2020) and digital transformation (Fitzgerald et al., 2013; Sebastian et al., 2017) literatures to address this research gap.

The former has gradually evolved from the Uppsala Model (e.g. Johanson and Vahlne, 2009; Vahlne and Johanson, 2020) and accelerated internationalization (Oviatt and McDougall, 1994, 2005) to post-entry internationalization process studies (Prashantham and Young, 2011). New internationalization patterns discovered include born-again globals (Bell et al., 2001), de-internationalization (Mudambi and Zahra, 2007; Vissak and Masso, 2015), re-internationalization (Surdu et al., 2018; Surdu et al., 2019; Welch and Welch, 2009), serial and nonlinear internationalization (Vissak and Francioni, 2013) and intermittent exporting (Bernini et al., 2016). Among these, re-internationalization research has increasingly emerged as a topic of academic and managerial interest (Javalgi et al., 2011; Swoboda et al., 2011; Vissak and Francioni, 2013; Welch and Welch, 2009) since internationalization is more likely to be a process that involves cycles of de-internationalization and re-internationalization (Kafouros et al., 2021; Sousa et al., 2021).

Extant re-internationalization studies have focused on the duration of exit (Surdu and Narula, 2020), the role of knowledge, network and decision-making logic upon re-entry (Vissak et al., 2020) and the role of previous experience in re-entry (Aguzzoli et al.,

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2020). Firms may need to make changes, and hence perform differently, during re-internationalization (Surdu and Narula, 2020; Vissak and Masso, 2015). However, change processes during re-internationalization have not been examined. Considering the prevalence of engaging with digital technologies (Coviello et al., 2017; Monaghan et al., 2020), our research specifically investigates the question *how do SMEs digitally transform during re-internationalization*?

Addressing this research question is important because the digital transformation of established manufacturing SMEs has rarely been researched, and the extant internationalization process literature relating to digital technologies has mainly focused on born-digital firms that build and leverage from inception a digital infrastructure as part of a digital business model (Brouthers et al., 2016; Chen et al., 2019; Monaghan et al., 2020; Stallkamp and Schotter, 2021). Compared with born-digital firms, digitally transforming re-internationalizers may experience more challenges, such as the unlearning of previous international experiences (Surdu and Narula, 2020) and multiple resource tensions (Welch and Welch, 2009). Exploring SMEs' digital transformation processes during re-internationalization can add unique theoretical insights by elaborating new challenges faced by SMEs and the processes of how they are addressed.

At the same time, digital applications can increase the information availability and connectivity to the international world by reducing relevant costs, developing responsiveness to local markets, informing comprehensive decisions, and, more importantly, promoting product innovations (Brynjolfsson and McAfee, 2017). However, these positive effects are also associated with challenges and costs (Lanzolla et al., 2021, p.90). For example, Kriz and Welch (2018) found inherent uncertainties associated with technology construction within firms, and managers may need to deal with cognitive and emotional costs (Huber, 1991; Lanzolla et al., 2021). Furthermore, digital transformation is likely to blur firm and industry frontiers and stimulate more changes (Appio et al., 2021; Hanelt et al., 2021; Luo, 2021; Luo, 2022; Nambisan and Luo, 2021), which increases uncertainty because managers need to commit and adapt faster (Afuah, 2003; Nambisan, 2017; Roetzel, 2019). Exploring digital transformation processes during re-internationalization is important to demystify the obscure impact of digital transformation on internationalization processes.

How, then, do SMEs digitally transform during re-internationalization? We employed a multiple case study of 11 international Chinese SMEs to examine firms' digital transformation processes during re-internationalization in order to claim theoretical contributions. Our study is mainly inductive, and conceptualizes two types of digital transformation based on whether digital technologies are applied as an operational or strategic change, which elaborates how firms design or implement digital transformation.

Based on operational or strategic change, our findings identify digital transformation trajectories and their possible outcomes across our cases, where six achieved "complete" and five "partial" re-internationalization. The complete re-internationalizers followed a punctuated equilibrium approach of balancing the tensions between strategic digital transformation and new product development in early re-internationalization. They temporally prioritized their complete focus on either strategic digital transformation or new product development during re-internationalization. However, the partial re-internationalizes attempted to pursue both of these strategies simultaneously, apparently ignoring any potential tension between them. The findings also address whether and how digital transformation trajectories leading to complete re-internationalization differ across industries, which is absent from extant research.

This research also elaborates how strategic tensions emerged and evolved during firms' re-internationalization on different digital transformation trajectories. It establishes that digital transformation brought more learning challenges related to digital IB and extended learning beyond the existing knowledge concepts in IB: technological, market and internationalization knowledge in digital context (Fletcher and Harris, 2012; Pellegrino and McNaughton, 2017). Our sample of international firms engaged with digital transformation but suffered information overload and strategic tensions due to more learning tasks. In addition, we found that the geographical scope of re-internationalization played a crucial role in influencing re-internationalization success among our cases. The tensions between strategic digital transformation and new product development tend to be more prominent and severe when firms are extending their foreign market scope.

2. Theoretical background

Re-internationalization is defined as the re-entering process that escalates a firm's involvement with, or exposure to, foreign markets following a period of de-internationalization (Choquett, 2019; Javalgi et al., 2011; Kafouros et al., 2021; Vissak and Francioni, 2013; Vissak and Masso, 2015; Welch and Welch, 2009). The present study focuses on the re-internationalization process after one type of de-internationalization events: unintended and complete withdrawals from exporting markets. Recent studies have investigated different patterns of re-internationalization, such as complete and partial re-internationalization (Vissak and Masso, 2015), how market experience and the quality of host institutions affect the speed of re-entry (Surdu et al., 2018) and re-entry commitment (Surdu et al., 2019), how the duration of de-internationalization affects re-entry probability and performance after re-entry (Chen et al., 2019) and how knowledge, networks and decision-making logics affect firms' foreign market re-entries (Vissak et al., 2020). These studies largely focus on antecedents of the re-entry process; however, questions regarding how and why firms behave differently during re-internationalization have not been addressed in the literature. Since strategic changes underlie most re-internationalization studies (Chen et al., 2019; Surdu and Narula, 2020; Welch and Welch, 2009), how firms change during re-internationalization has remained a research gap. Responding to the call (Monaghan et al., 2020) for more understanding about the impacts of digital technologies on IB, this research addresses how re-internationalizing SMEs digitally transform during re-internationalization.

2.1. The digital transformation of international firms

Digital transformation is defined as a change process involved in employing digital technologies or developing new digital business models that create and appropriate more value for a firm (Fitzgerald et al., 2013; Kane et al., 2015; Verhoef et al., 2021). Recent studies

have found that digital transformation actions include applying digital technologies to promote internal and external collaborations (Singh and Hess, 2017), renewing business models (Hess et al., 2016; Westerman et al., 2011) and changing organizational culture for improved performance (Li et al., 2017; Vial, 2019; Warner and Wäger, 2019). These technologies mainly, but not exclusively, include information communication technology (ICT) based on big data, artificial intelligence (AI), cloud, blockchain and the Internet of Things (IoT) (Jean et al., 2020). Existing digital-related research in IB focuses on born-digital firms (Monaghan et al., 2020), such as i-businesses that use digital technologies to provide services or digital platforms for users (Brouthers et al., 2016; Chen et al., 2019; Nambisan et al., 2019a, 2019b). Although digital transformation becomes a strategic imperative for many traditional firms (Hess et al., 2016; Sebastian et al., 2017), how these firms digitally transform during re-internationalization remains largely unexamined.

The role of digital transformation has been introduced to existing internationalization process research (Monaghan et al., 2020). Digital technologies have demonstrated to have made profound impacts on international learning and networking due to lower communication and transaction costs (Alcácer et al., 2016; Oviatt and McDougall, 2005). They can increase information availability, and transparency may offer the instant identification of any threat or opportunity to emerge in international markets. Big data may also inform decisions and improve the efficiency of exploiting known opportunities (Brynjolfsson and McAfee, 2017). In addition, digital transformation may offer firms specific advantages to compete internationally, such as technological modularity that allows seamless connects to deliver value (Banalieva and Dhanaraj, 2019).

The late digital transformation of mature international SMEs could be more demanding due to their resource constraints compared with the flexibility of born-digital firms. Digitally transforming re-internationalizers may have more challenges, such as dealing with the confusion between new knowledge and previous international experience (Welch and Welch, 2009), unlearning (Surdu and Narula, 2020) and dealing with the uncertainty of product technologies (Kriz and Welch, 2018). Digital transformation demands clear goals and sufficient commitment and awareness to deal with its potential side effects as well as cognitive and emotional costs (Lanzolla et al., 2021; Matarazzo et al., 2021). For instance, re-internationalizers may face and have to cope with unexpected breakdowns and interruptions, cyber-attacks, data breaches, and digital-related regulatory multiplicity and variance across countries during their digital transformation (Luo, 2022). Fraccastoro et al. (2021) found that the understanding of potential boundary conditions of multichannel communications and experimenting how to manage digital communications is also necessary. Ko et al. (2022) highlighted the complexities of managing multiple stakeholders and building digital trust for international digital platform providers and participants. Digital platform providers may face technical bottlenecks which may limit internationalization expansion (Ojala et al., 2018). Scuotto et al. (2021) argued the importance of developing individual digital capabilities to cope with increasingly complex and interactive tasks, as well as employee's digital mindsets (Frankiewicz and Chamorro-Premuzic, 2020; Solberg et al., 2020). More importantly, digital transformation may bring large amounts of quickened internal and external data flows (Luo, 2021; Nambisan and Luo, 2021; George and Schillebeeckx, 2022) and "information overload" (Huber, 1991, p.103). Since digital transformation process is continuous with no foreseeable end (Chanias et al., 2019), it erodes resources and increase uncertainty because managers may need to redesign their products, operations and business models especially when their industry boundary is blurred (Afuah, 2003; Kretschmer and Khashabi, 2020; Roetzel, 2019). Without the integration of market knowledge and technical capacity for digital business capabilities (Cahen and Borini, 2020; Chanias et al., 2019; Tolstoy et al., 2021), such costs and side effects may undermine internationalization performance (Kohtamäki et al., 2020).

In brief, international SMEs' digital transformation processes during re-internationalization are a unique theoretical context but the impacts of digital transformation seem to be obscure among existing studies. Elaborating on how re-internationalizing SMEs address the challenges can add new theoretical insights and demystify the impacts of digital transformation, such as how, why and when digital transformation can or cannot bring value to a firm.

2.2. Operational and strategic digital transformation

We review the concept of digital transformation action which provides the foundation for theory development in this article. Digital transformation is applied differently (Appio et al., 2021; Cennamo et al., 2020; Correani et al., 2020; Gong and Ribiere, 2021; Hanelt et al., 2021). Digital transformation can be classified by its application as operational and strategic digital transformation. Operational digital transformation actions tend to emphasize the application of digital technologies in processes and systems to achieve operational excellence (Kane et al., 2015; Sebastian et al., 2017; Warner and Wäger, 2019). Firms may apply various digital technologies to build the infrastructure for a quick adaptation of product offerings, and/or constant cost reduction, as well as improvement and reinforcement of operational efficiency (Lanzolla et al., 2021; Mabey and Zhao, 2017). Strategic digital transformation actions with "an eye on transforming the business" (Kane et al., 2015, p.1) make wider changes within an organization to create value, including changes in processes and systems, collaborative approaches, business models and organizational cultures (Cennamo et al., 2020; Gurbaxani and Dunkle, 2019; Loonam et al., 2018; Singh and Hess, 2017; Verhoef et al., 2021; Westerman et al., 2011). Prior research suggests that most firms prefer operational to strategic digital transformation. For instance, Kane et al. (2015) found that only 15% of 4800 business managers digitally transformed processes and business models. In their survey of 1793 managerial participants, Boutetière et al. (2018) indicated that 68% of their respondents aimed at operational actions, whereas less than half attempted strategic digital transformation. For example, a firm initiating strategic digital transformation may change its business models to include new digital prototypes (Nambisan, 2017; Obal and Lancioni, 2013; Warner and Wäger, 2019) and new digital artefacts (Monaghan et al., 2020) besides initiating digital servitization (Paschou et al., 2020; Tronvoll et al., 2020) and new digital platforms (Correani et al., 2020; Simmons et al., 2013). Digital technologies can enable firms to investigate new possibilities for product offerings, discover new opportunities and stimulate a wide range of changes within firms.

These contributions to the extant digital transformation literature recognize that firms may initiate and implement digital

transformation for different purposes and in different ways. However, these understandings offer fragmented insights into specific digital transformation actions. More understanding of digital transformation actions is required to better address what actions are initiated during re-internationalization, and how these actions change over time.

2.3. The digital transformation process

How a new technology in general can be constructed in a firm is uncertain and resource-consuming (Kriz and Welch, 2018), whether it involves new products or processes, and new product development is reportedly an uncertain process over a long period (Krishnan and Bhattacharya, 2002; Stockstrom and Herstatt, 2008). Digital transformation, which involves organizational change and social construction of digital technologies to renew firm processes, may also be uncertain for a firm (Appio et al., 2021; Verhoef et al., 2021). This is because of the tension between established and new technology usage in terms of employee belonging, learning, performing and organizing (Wimelius et al., 2021; Yeow et al., 2018). Rather than assuming that digital transformation and new product development can automatically reinforce each other, we argue that these two technological construction processes may create mutual tensions rather than complements. Each process may compete for managerial attention and resources to address its own technological uncertainty, especially in a resource-constrained context (Bhoovaraghavan et al., 1996).

There are different approaches to managing tensioned changes (Pagani and Pardo, 2017; Hanelt et al., 2021). Two dominant approaches are the ambidexterity and punctuated equilibrium models. These two models differ in terms of whether tensioned adaptations should be managed sequentially or simultaneously (Simsek et al., 2009). Thus, the central distinction is a temporal separation. The ambidexterity model involves simultaneously managing multiple objectives which are tensioned (Benner and Tushman, 2003; Gibson and Birkinshaw, 2004; Gupta et al., 2006; Tushman and O'Reilly, 1996). The extant literature has conceptualized different ambidexterity approaches: organizational separation, domain separation and contextual ambidexterity (Mathias et al., 2018). Alternatively, advocates of the punctuated equilibrium model emphasize the temporal separation and cycling of conflicting demands due to their incompatible nature, under the assumption that long periods of stable and incremental change are interrupted by brief periods of radical change (Gersick, 1994; Mudambi and Swift, 2011; Tushman and Anderson, 1986; Uotila, 2018). Similarly, Gupta et al. (2006, p.698) defined punctuated equilibrium as "…temporal cycling between long periods of exploitation and short bursts of exploration". However, there is a little empirical evidence regarding how SMEs' digital transformation during re-internationalization is carried out, which of the two approaches of managing changes are used by them and what their implications are for re-internationalization. We need more insight into how digital transformation and new product development interplay and evolve for re-internationalization.

3. Method

We investigated how SMEs digitally transform during re-internationalization by following a mainly inductive theory building approach combined with deductive pattern-identification where concepts from prior literature are acknowledged rather than purely deduced (Fletcher et al., 2018). This approach allows researchers to make explicit theoretical assumptions and avoid undeclared bias (Vaughan, 1992). We used a qualitative, multiple case study design for tracking historical process and developing theory (von Krogh et al., 2012; Yin, 2018). This design facilitates early theorizing of a nascent phenomenon (Edmondson and McManus, 2007; Fletcher et al., 2018) and improves dependability from empirical observations to theory (Gibbert and Ruigrok, 2010; Lincoln and Guba, 1985).

3.1. Research context and case selection

Chinese internationalized SMEs were chosen as a research context. China has become the largest exporting nation and the most important manufacturing location globally, where SMEs comprise the majority of Chinese exporters (He et al., 2013). As China has the world's largest and fastest-growing *E*-commerce market, most Chinese exporters view constant engagement with digital technologies as one of their major strategic options in foreign markets (Jean et al., 2020; Wang et al., 2016). For instance, they embrace the emergence of the IoT, big data analysis and ICTs, which can support their internationalization (Chen et al., 2015). Thus, Chinese international SMEs are a rich empirical setting to address the study's research question.

We used two datasets to identify potentially suitable firms. The *Directory of China's Foreign Trade* is published by the China Council for the Promotion of International Trade and includes names and contact details for about 100,000 internationalizing firms and their industrial classification (Ji and Dimitratos, 2013). A listed Chinese SMEs dataset discloses the information needed for case selection and data triangulation and has been extensively used by IB researchers (e.g. Ren et al., 2015).

Firms were initially identified by applying theoretical case selection criteria (Cuervo-Cazurra et al., 2016; Patton, 2015). First, SMEs (based on the Chinese definition, the firms with fewer than 1000 employees) were extracted, leaving 1535 cases. Next, 507 firms with consistently less than 25% of the exporting intensity throughout their history were eliminated. Then, we applied the criterion of at least a 25% decrease in both export volume and export sales ratios in at least one year to identify firms that experienced de-internationalization. Subsequently, we viewed re-internationalization as a process of revival after involuntary de-internationalization (defined above) rather than a process involving a voluntary strategic change in a firm's foreign market portfolio (Vissak and Francioni, 2013; Welch and Welch, 2009). Therefore, we selected firms which retained some international involvement during the period of de-internationalization to rule out firms which intentionally exited for strategic reasons (Knight and Cavusgil, 2004). All historical exporting data were collected and collated using the selection criteria, resulting in 124 cases of re-internationalization.

Table 1
Case profile and data collection.

	Re-internationalization pattern	Firm age	No. of staff[a]	Products	Industry environment[b]	Internal reasons for de-internationalization	External reasons for de-internationalization	Primary data[c]	Additional data
Case A	Complete	15	420	3D printing machines	Heterogenous	• The management ignored the changing environment • Management inability to understand the market and respond quickly • Erroneous prospects about new products	• Increase in intensive competition • Problems with local partners • Market pressure on low price • Dynamic customer and market demand	CEO A (1) MKT A (1) R&D A (1) FIN A (1) GROUP (1)	609 pages
Case B	Complete	16	472	Pharmaceutical	Homogeneous	• The management ignored the changing environment • Unable to commercialize new products	• Increase in intensive competition • Reduction in customer interest and demand	CEO B (1) MKT B (1) R&D B (1) FIN B (1) B&D B (1) INT B (1) GROUP (1)	525 pages
Case C	Complete	12	380	Industrial robots	Homogeneous	• Obsolete existing products • Management inability to launch successful products on time • Erroneous prospects about new products	• Increase in intensive competition • Market pressure on new products • Reduction in customer interest and demand	CEO C (2) MKT C (1) FIN C (2) GROUP (1)	383 pages
Case D	Complete	12	365	Bio-medical electronics	Heterogenous	• The management ignored the changing environment • Unnecessary failed diversifications	• Unfavorable local business environment • Increase in intensive competition • Problems with local partners • Market pressure on low price	CEO D (2) MKT D (2) FIN D (1) GROUP (1)	458 pages
Case E	Complete	16	359	Agricultural chemicals	Heterogenous	• Obsolete existing products • Management inability to manage servitization and manufacturing in different foreign markets	• Market pressure on better quality and low price • Dynamic customer and market demand	CEO E (2) MKT E (2) R&D E (1) GROUP (1)	636 pages
Case F	Complete	13	260	Fine chemicals	Homogeneous	• Management inability to launch new products with acceptable costs • Unnecessary failed product diversifications	• Increase in intensive competition • Reduction in customer interest and demands	CEO F (2) FIN F (2) GROUP (1)	502 pages
Case G	Partial	11	282	Pharmaceutical	Homogeneous	• Management inability to understand the market and respond quickly • Erroneous prospects about new products	• Increase in intensive competition • Reduction in customer interest and demand • Low customer interest in new products	CEO G (1) MKT G (2) FIN G (1) GROUP (1)	391 pages
Case H	Partial	12	325	Pharmaceutical	Homogeneous				429 pages

(*continued on next page*)

Table 1 (*continued*)

	Re-internationalization pattern	Firm age	No. of staff[a]	Products	Industry environment[b]	Internal reasons for de-internationalization	External reasons for de-internationalization	Primary data[c]	Additional data
						• Management inability to understand the market and respond quickly • Obsolete existing products	• Increase in intensive competition • Reduction in customer interest • Unfavorable local business environment	CEO H (2) FIN H (1) INT H (1) GROUP (1)	
Case I	Partial	12	370	Meteorological devices	Heterogenous	• Management inability to understand the market and respond quickly • Management ignored the changing environment • Obsolete existing products	• Increase in intensive competition • Pressure for development of new products • Dynamic customer and market demand	CEO I (1) MKT I (1) FIN I (1) INT I (1) GROUP (1)	581 pages
Case J	Partial	16	420	Telecommunication devices	Heterogenous	• Management inability to understand the market and respond quickly • Reliance on existing partners	• Dynamic customer and market demand	CEO J (1) MKT J (2) GROUP (1)	429 pages
Case K	Partial	16	370	Telecommunication devices	Heterogenous	• The management ignored the changing environment • Erroneous prospects about new products	• Increase in g intensive competitions • Dynamic customer and market demand	CEO K (1) R&D K (1) INT K (1) GROUP (1)	339 pages

[a] We applied the Chinese official definition of SMEs in this research, i.e. firms with less than 1,000 employees.
[b] Characteristics of the industrial environment were self-reported by all interviewees from each case.
[c] Formal interviews are shown as: The interviewee (Number of interviews with the interviewee). CEO = Chief Executive Officer; MKT = Marketing Director, B&D = Business Development Director, FIN = Financial Director, R&D = Research and Development Director; INT = Internationalization Director; GROUP = Group interview.

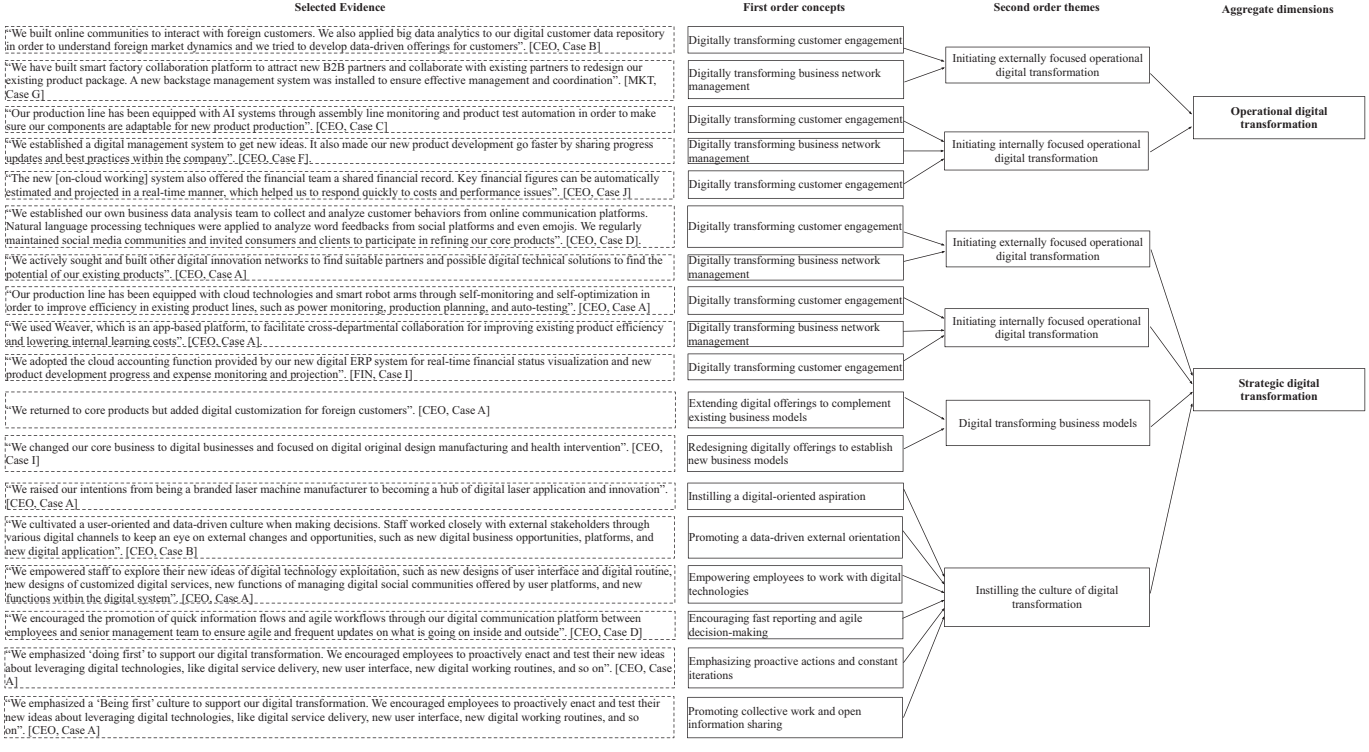


Fig. 1. Theme building and illustrative quotes.

By applying these definitions used by Vissak and Masso (2015), 80 complete and 44 partial re-internationalizers emerged. Complete re-internationalizers were those that reached 100% or more of their previous export volume after de-internationalization; partial re-internationalizers increased their subsequent exporting but failed to achieve 100% of the level before de-internationalization (Vissak and Masso, 2015). We then screened company profiles, official websites and relevant news items to establish whether the identified companies met our digital transformation definition (Fitzgerald et al., 2013) and ensured that our cases reflected digital transformation processes and SME re-internationalization processes and provided analytical generalization (Eisenhardt and Graebner, 2007). All the cases were contacted through email or personal contact. Finally, 11 of these theoretically selected cases agreed to participate in the research (see Table 1); six of them were complete and five partial re-internationalization cases (as shown in the Appendix). Multiple cases were selected to facilitate cross-case comparisons. We anonymized the firms as Cases A to K to secure confidentiality.

3.2. Data collection

Data were collected from the eleven firms over two years (2017–18) through semi-structured interviews and archival records covering firms' internationalization patterns, 2001–2017. Interviews were conducted with key informants involved in their re-internationalization processes, (i.e. firms' CEOs, founders, senior managers and external bank managers) who could reflect on the thoughts, activities, decisions and tensions or challenges that the firms experienced (Kumar et al., 1993; Zou and Ghauri, 2008). Interviews were retrospective over the period of firms' re-internationalization. During interviews, respondents were asked to recount (1) the history of their firms' re-internationalization, (2) their firms' digital transformation activities, including the reasons why they initiated them and (3) their experience and views about digital transformation activities during the re-internationalization process. In addition, multiple informants within each case participated in a group interview. In total, 47 face-to-face interviews of one to 1.5-h duration and 11 one-hour group interviews were carried out (see Table 1). In addition to real-time interviews, data were collected from retrospective accounts help to understand the intertwined processes and mechanisms of how things evolved (Yaylacı, 2020). The passage of time could improve interviewees' openness and objectivity while recalling the process of decline (Kriz and Welch, 2018). However, possibly mistaken recollections tend to be the main concern of retrospective interviews, since accounts may be tainted by time and other personal factors (Huber and Power, 1985; Kipping et al., 2014). To overcome this challenge, we adopted both individual and group interviews to triangulate data reliability (Yaylacı, 2020) and provide insights which mitigated any information biases and retrospective errors (Miller et al., 1997). A two-year engagement with interviewees through formal interviews and informal online chat established credibility (Sinkovics et al., 2008). In addition to interviews with CEOs, we asked similar questions through regular informal contacts with key informants and external bank credit managers to ensure credible retrospective accounts of re-internationalization and digital transformation events (Huber and Power, 1985; Lincoln and Guba, 1985).

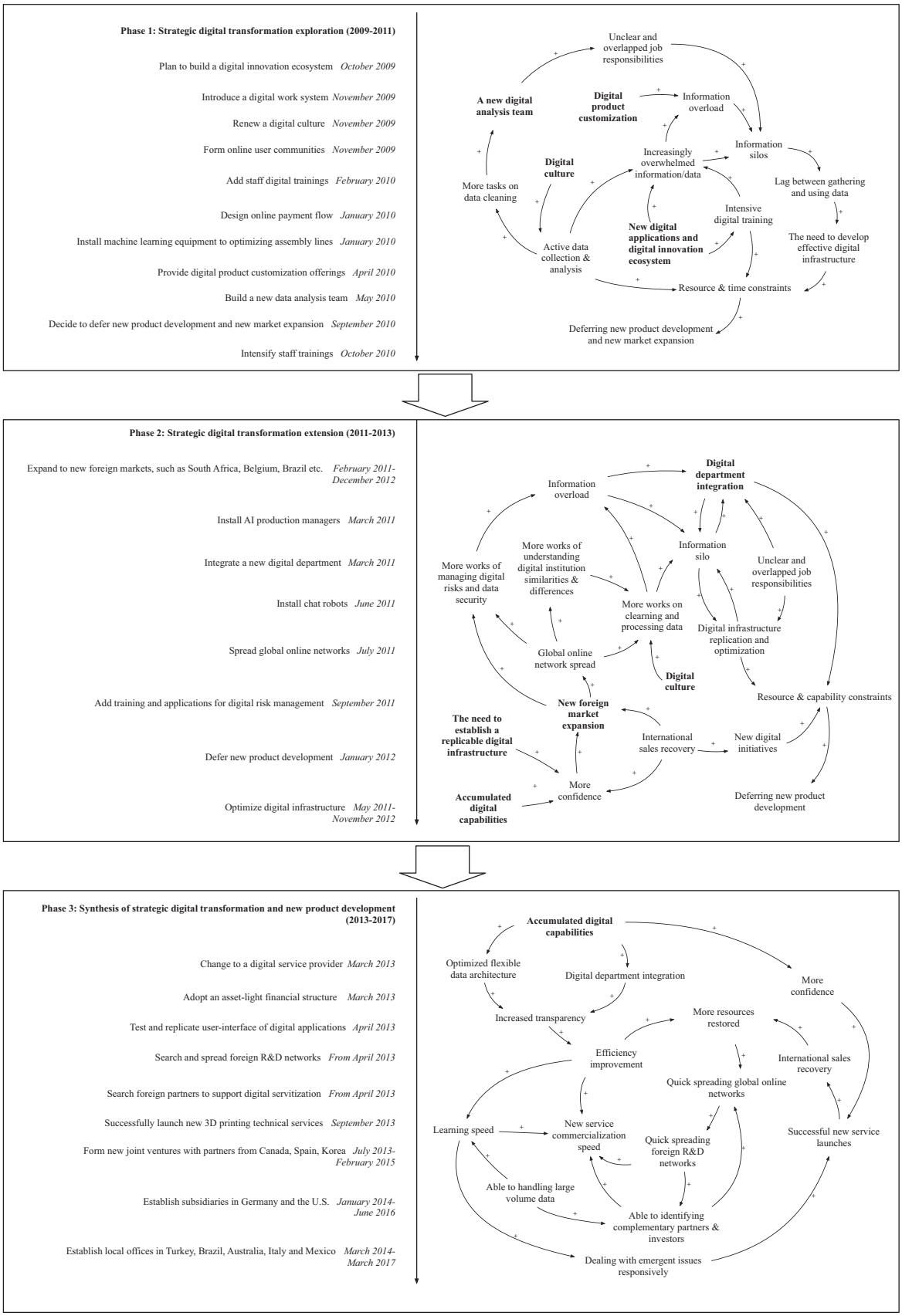
Archival data, including annual reports, minutes, email contents, brochures, media press, contents from official websites and secondary reports, were used and analyzed throughout the research process. Before data collection, these data provided an initial understanding of each firm and were used to inform interview questions ease participants' understanding and responses. During data collection, we collated interview transcripts with the archival data to triangulate and substantiate the theoretical constructs (Eisenhardt, 1989; Yin, 2018).

3.3. Data analysis

The focus of the qualitative analysis was to build (mainly inductively) a theory to explain how SMEs digitally transform during re-internationalization. We used three steps to examine, analyze and link digital transformation processes in the case firms' re-internationalization, which included (1) re-internationalization phases, (2) digital transformation activities and patterns over phases and (3) digital transformation during re-internationalization. We constructed a comprehensive understanding of each case through iterations between primary data, secondary data and the extant literature to triangulate data and to reduce single-source bias (Nielsen et al., 2020).

First, to examine the re-internationalization phases, our analysis centered on conceptualizing events and temporal patterns by constructing analytical bases for tracking changes (Langley, 1999). By following a visual mapping strategy, we integrated transcripts, annual reports, news, firm history and other relevant information from firms' official websites into a retrospective history. After the compilation of each case's re-internationalization history, the critical events and their temporal sequences were mapped in a re-internationalization timeline (Langley, 2009). We then compared and sorted common re-internationalization sequences across cases into four distinct patterns: Trajectory I (Cases A, D, E), Trajectory II (Cases B, C, F), Trajectory III (Cases H, I) and Trajectory IV (Cases G, J, K).

Second, to analyze digital transformation activities and patterns, we conducted a content analysis for each case, capturing the activities that each case firm implemented, rather than intended. We identified 249 digital transformation activities, inductively coded into first-order categories and then aggregated repeated codes into second-order themes using the data structure method (Gioia et al., 2012). Aggregated themes and dimensions were abstracted to establish research transparency (see Fig. 1). We further combined exploratory open coding (for each case) and cross-case, cross-phase explanatory pattern-matching (Corbin and Strauss, 2015; Miles et al., 2019) to identity digital transformation patterns. During the process of building data structure, digital transformation events and activities, themes and aggregate dimensions were inductively abstracted in iterative comparisons with the prior definitions and meanings of operational and strategic digital transformation (Boutetière et al., 2018; Kane et al., 2015; Loonam et al., 2018; Lanzolla et al., 2021; Verhoef et al., 2021).



(caption on next page)

Fig. 2. Digital transformation actions and consequences during re-internationalization – Case A.
Arrows indicate the direction of causal relationship. A "+" on arrow denotes a positive relationship between variables.
Multiple triggers underpinning the start of the process in the figure are in bold.

Third, to investigate digital transformation changes during re-internationalization, we combined conceptualized themes and aggregate dimensions with re-internationalization temporal trajectories as a first step toward building a holistic view of cases. Throughout the data analysis process, we constantly compared findings with the existing literature to improve the analytical generalizability of our research (Yin, 2018) and to ensure the confirmability of our findings (Sinkovics et al., 2008). Based on interviewees' narratives and reflections, we analyzed how and why patterns changed over phases, and how and why the changes were related to re-internationalization performance (Miles et al., 2019). The digital transformation trajectory during the re-internationalization of each firm was sent to its key informants for agreeing to ensure correct representation. A comprehensive illustration of digital transformation processes, events and our data structure are detailed in our findings to ensure dependability (Ghauri et al., 2020; Lincoln and Guba, 1985; Sinkovics et al., 2008). Quotations and visual maps are presented to substantiate the chain of evidence (Yin, 2018).

4. Findings

The aim of this paper is to explore how SMEs digitally transformed during re-internationalization. Our data reveal that digital transformation actions can be implemented as an operational or strategic change. Fig. 1 presents the additional data for each theme and dimension that underlies the distinction between the operational and strategic digital transformation.

Before the start of digital transformation, all the cases realized the importance of changes after experiencing involuntary de-internationalization caused by either internal incompetence, external disturbance or both (see Table 1). Due to their observations of the persistent trends in digital business in their environment, the case firms recognized the importance of strategic digital transformation and could implement it. For instance, the CEO of Case A commented: "*It [initiating strategic digital transformation] was something that has to be done. Everyone may need to play in the digital business arena, it's just a matter of time…. An early initiation would generate more own advantages for competing*". The CEO of Case B stated: "*Digital transformation would be the key theme for all kinds of firm*". According to the CEO of Case I, the rationale behind digital transformation was similar; however, he also remarked that "*We were pushed by key partners and clients to initiate digital transformation and services*".

Meanwhile, all the cases equally agreed on the necessity of synergizing new product development and strategic digital transformation to re-internationalize, but they also emphasized the potential difficulties with managing them both. "*No matter how digital you are, you still need to rely on new products to create value*" (CEO, Case C). Although both options were available, all the cases adopted different approaches to managing difficulties and embarked on distinct digital transformation trajectories. Our findings suggest four digital transformation trajectories during re-internationalization. In each subsection below, we present an analysis of each trajectory, the re-internationalization and digital transformation activities, how activities changed and the rationale behind why the firms conducted certain digital transformation activities over different phases.

4.1. Trajectory I

Complete re-internationalizers—Cases A, D, E—prioritized strategic digital transformation throughout their re-internationalization process and initiated new products later. These three firms commonly experienced three distinct phases: strategic digital transformation exploration, strategic digital transformation extension and synthesis with new product development. We select Case A as an example to detail the process because it showed the most tensions that occurred within this trajectory.

4.1.1. Phase 1: strategic digital transformation exploration

Case A started with strategic digital transformation in 2009 to support its existing product improvement. In this phase, the firm was lack of know-what and know-how relevant to its digital transformation at the time. Addressing these digital transformation knowledge gaps occupied the firm's existing capacity and pushed the firm to postpone new product initiatives.

Prior to the formal initiation of re-internationalization, the top management team (TMT) members in Case A agreed on the importance of digital transformation and decided to initiate a wide range of digital transformation actions. They expressed the belief that "*the core advantages for competing in the next decade should be digital-related capabilities*" (CEO, Case A). For example, the firm introduced a smart work system (*Weaver e-office*) in an attempt to reduce daily communication and collaboration costs across countries and improve efficiencies in production and financial management. The plan for building an international digital innovation ecosystem was projected in 2009. Assembly lines were equipped with machine-learning technology for constant monitoring to reduce operational costs and undertake automated product testing.

Integration after initiating digital transformation was not straightforward. The workload on employees increased rapidly for the digital skill gap to be closed and adequate preparations to be made, such as turning physical documents into digital files saved in the new digital system. Due to the need to develop digital management capabilities to ensure efficiency and connectivity across teams, departments and countries, more staff training was scheduled, but this resulted in employees becoming overloaded with information. In Case A, the finance director described the dilemma he faced: "*Employees complained that their work doubled, and they had no time to learn the digital things well, but if we didn't do any training, the staff would have no idea how to use these digital tools*" (FIN, Case A). Existing human as well as financial resources became strained due to the software subscription fees and increased staff digital training expenses.

Moreover, the efforts designed to increase connectivity and transparency within the firm appeared to create barriers in achieving this goal. An inadequate data processing procedure was introduced, but this complicated information management. Staff did not know what to share and when or how to clean data for confidentiality. Shared files and information were often missing or were difficult to find. Some employees were reluctant to make the data they collected accessible to everyone, which resulted in information silos and delays. This became more prominent during re-internationalization because of the increased information processing that was needed to regain an understanding of diverse foreign market environments and their dynamism. "*We had previous experience, but we needed to remind ourselves to see whether we misunderstood* [some things] *due to stereotyping*" (CEO, Case A).

After multiple rounds of discussion in 2010, Case A established a data analysis team focusing mainly (but not exclusively) on analyzing the information from the digital customer service platform (embedded within customer relationship management) and online communities in social media. The TMT hoped that the data analysis team would facilitate product adaptations that were more responsive to local market conditions and relieve information overload in other departments. However, adding the new team in the absence of data responsibility clarification intensified the information silo problem. For example, "*Who should produce data was not communicated and specified between the digital and the marketing teams*" (MKT, Case A). It was not clearly agreed which team should regularly manage social media and website content. The marketing team and the data analysis team passed on the responsibility to each other. This caused both data duplication and analysis delays. "*Due to the increasingly connected and overlapping teamwork in the digital working environment, we could not imagine what the difficulties would be or how we would be able to address them. The answers to the questions of what a clear data governance structure is, and how we could build it, were not readily available*" (CEO, Case A). Such unclear task specification resulted in staff being increasingly overburdened and confused.

The firm moved forward by adding a modified digital business model to support the existing business. In 2010, it abandoned its cheap laser-sewing products and concentrated on selling its existing 3D printing laser machines. Digitally customized laser machines were also introduced to cater for different foreign customer requirements, but it remained a supplementary offering. The TMT was confident that they did not need to spend money and effort extensively on R&D and stated that their main challenge was a lack of digital capabilities to support their international business. "*We had to learn how to build networks in a virtual and cross-cultural setting, how to establish an aligned digital identity, and how to collect data online without violating local data regulations or leaving users uncomfortable*" (CEO, Case A). Given the increasing focus on establishing a digital culture, the staff were encouraged to pay close attention to data-related details, such as changes in international markets and client requirements, and learn more quickly while familiarizing themselves with digital processes, besides persistently emphasizing greater data streams. However, while the resulting information overload pushed the firm to learn more, it also reinforced the difficulties in managing digital transformation.

In this phase, dealing with digital transformation challenges was both resource- and time-consuming and left no room for additional changes, as shown in Fig. 2. "*The digital-related initiatives were not all ready to be used immediately and required time and money for a run-in*" (CEO, Case A). Considering these, the firm re-entered only previously exited foreign markets and decided to defer new product development and new foreign market expansion. By doing this, the management team and the employees were not distracted by developing new products and familiarizing themselves with new geographical markets. They could concentrate on adapting to digital working and dealing with digital transformation challenges effectively.

4.1.2. Phase 2: strategic digital transformation extension

Even though the learning tasks were different in this phase, the information overload and silos were still a major concern, since the firm was exploring the best digital integration options and developing digital international business capabilities. In this phase, Case A continued to renew and develop the best digital integration practices that could be replicated in both re-entered and new foreign countries. New digital applications were also installed, such as chatbots and "AI production managers" with more accurate algorithms and more tasks on processing data were added (FIN, Case A). Case A rebuilt its digital team and spent more on gaining access to datasets. Drawing lessons from the earlier mistake of unclear team responsibilities, the digital team was upgraded by bringing in

Table 2
Key capabilities required during digital transformation.

Required international digital capabilities	Complete re-internationalizers						Partial re-internationalizers				
	Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H	Case I	Case J	Case K
Design products digitally across cultures	●	●	●	●	●	●		●	●		
Extend digital networks across countries	●	●	●	●	●	●	●	●	●	●	●
Unify technological specifications with international customers	●	●		●	●			●	●		
Establish consistent digital identities across countries	●	●		●	●	●		●	●		
Adapt to local data protection regulations	●	●	●	●	●	●		●	●	●	
Establish replicable digital infrastructure across countries	●	●	●	●	●		●	●	●	●	●
Develop cross-cultural teamworking virtually	●	●	●	●	●		●	●	●	●	●
Build flexible data architecture for international cross-silo data	●	●		●	●			●	●		
Manage virtual risk management (e.g. international digital fraud)	●	●		●	●	●	●	●	●		●

experienced members from other departments. One key task for the team was to negotiate across departments to explore the best digital integration practices across countries. As international sales recovered, the firm could devote more resources to the digital team to reiterate and establish the most effective but flexible digital architecture for international cross-silo data, including digital working regulations and data handling routines. "*We were trying to find a solution to design a clear, consistent but flexible digital structure*" (CEO, Case A). However, the system iteration was subject to lengthy negotiations with the system provider. "*We had spent a long time negotiating with the system provider for a redesign in terms of a system authority structure and data interface between the external data and our working system*" (FIN, Case A).

Although the employees did familiarize themselves with the digital applications, new challenges emerged as a result of new foreign market expansion, and this gave the firm more learning tasks. Case A started entering new foreign markets in pursuit of more foreign revenues after it stabilized the previously entered key foreign markets. For example, 2011–2013 it started exporting to new European, South African and Latin American markets by spreading digital sales networks into new foreign countries and forming virtual partnerships with companies whose long-term goals were in line with theirs. This exposure to diverse local environments and digital regulations—along with foreign market expansion—compelled the firm to develop digital capabilities to support digital businesses across territories. Increasing the scope of re-internationalization made it more crucial and resource-demanding to understand how to manage digital risks across countries, manage multiple digital sales channels, comply with local digital and privacy regulations and form virtual network relationships. Moreover, finding and collaborating with suitable partners digitally was difficult and time-consuming. The process of building trust was similar to "*walking in a dark forest*" (MKT, Case A). "*We understood that misleading information was everywhere, and we tried to avoid being deceived. Our counterparts probably had the same feeling*" (MKT, Case A).

In this phase, the firm focused on foreign market expansion while optimizing an effective digital infrastructure. Despite new foreign market expansion bringing additional challenges, it offered the firm a great opportunity to test and optimize digital infrastructure across countries. In assessing its existing resources and capacity, the management team decided to defer new product development once again.

4.1.3. Phase 3: synthesis of strategic digital transformation and new product development

In this phase, Case A shifted its focus to new product exploration while continuing to expand into new foreign markets. It opted for an asset-light financial structure and shifted its strategic focus from laser machine manufacturing to 3D printing technical solution services, industrial 3D system design and digital platform design. Despite encountering learning challenges, such as how to meet client requirements and deal with technological simplification, the firm addressed these quickly with well-informed decisions. After several years of implementing digital transformation, Case A became experienced in dealing with various forms of international digital challenges, as specified in Table 2. The firm persistently extended its digital networks alongside its foreign market expansion, which facilitated connectivity with foreign R&D network partners who could support new service launches and innovative ideas. The digital department developed proper collaboration patterns with other departments and could ensure and manage large data streams from outside. The accumulation of digital management capabilities and a unified digital infrastructure enabled the firm to react more effectively to new opportunities and local demand changes across countries. The firm became more responsive to the international market and changes in client demand. This led to the enhancement of the firm's managerial confidence, thus ensuring successful new service launches and a rapid commercialization speed. The subsequent quick service transition success led to complete re-internationalization.

4.2. Trajectory II

Cases B, C and F focused on introducing new products from the beginning of re-entry while prioritizing their efforts in new product development. Compared with Trajectory I, these complete re-internationalizers incorporated operational digital transformation to support new product development at the start of their re-internationalization. These three firms commonly experienced three distinct phases: new product development, strategic digital transformation exploration and synthesis of strategic digital transformation and new product development. We selected Case B as an example to detail the process because it showed the most tensions that occurred in this trajectory.

4.2.1. Phase 1: new product development

In the period 2010–2013, Case B focused on re-entering previous foreign markets with their new products leveraging its previous networks and partners, while also expanding into new foreign markets at the same time. Case B was a supplier of taurine to foreign pharmaceutical firms and decided to focus on healthcare products and energy drinks. Intensive managerial efforts and considerable expense were required to tackle the multiple challenges that emerged during the prototyping, such as formula redesigns to build competitive advantages, strategic oversights to avoid prototyping delays and increased research costs.

The prototypes were finished by the end of 2010, but they remained immature, and this was followed by challenges associated with product commercialization. Research costs also escalated to resolve the product commercialization issues due to refining the product designs and standardizing production for efficiency. Going through the pharmaceutical validation process to obtain new product quality certificates needed for entering different foreign markets was costly, and it delayed the realization of profits from new products. Moreover, searching for and collaborating with reliable R&D partners with similar long-term goals to shorten the product revision cycles was an urgent but highly demanding process. Due to the change from B2B to B2C (i.e. the shift from providing products to firms to end-users), most previous sales networks became less useful. The firm at this stage formed partnerships to set up an international B2C sales infrastructure. New product development resource demands increased significantly with the new foreign market expansion.

Due to financial constraints affecting both digital transformation and new product development, the firm took a conservative approach and started with digital applications for operational purposes only: reducing the costs incurred by innovations and boosting new product development efficiency. Case B replaced an outdated enterprise resource planning (ERP) system with an online work system that had multiple terminals. It also initiated a social media strategy to boost its presence on foreign digital media platforms and actively engage with foreign clients and customers to promote its digital identity. Meanwhile, the firm's manufacturing equipment was complemented and upgraded with sensors and AI technology to ensure production cost optimization. AI technologies were also applied to the financial control process to ensure real-time financial data flows. Even though the firm implemented only operational digital transformation actions, digital integration also emerged as a challenge for Case B. Similarly with Case A, the staff were pressured by the urgency of the situation to develop digital skills while also being pushed to speed up new product development and launch preparations. The blurred responsibilities among departments due to this digital coordination required an investment of time to determine the new structure and guidelines. The TMT established a data analysis team in the hope of facilitating new product development with lower learning costs, but it soon recognized the need for analytical capabilities specific to the firm. "*It was not really a technical issue faced by the data analysis team but a challenge of how to analyze data properly with a comprehensive industry and product understanding, including analytical parameters related to customer profile, product specification and industry benchmarks. It was important to make sense of the results in order to inform* [our] *decisions but it required the involvement of marketing and R&D staff*" (CEO, Case B). Recognizing this complexity, the TMT decided to stop further digital transformation investments, since any mismanagement would undermine the progress of their new product development.

Pressured by investors and competitors, launching and benefiting from new products was the priority that squeezed the firm's resources in this phase. "*The key task was to quickly profit from our new products, since the old products were not promising*" (CEO, Case B). The firm had neither the capacity nor sufficient resources to do both simultaneously, since its international sales had not yet recovered. In addition, its international market expansion goals required quick new product development and additional resources for learning and supporting product launches. To overcome the friction between new product development and digital transformation, the firm postponed investments in digital transformation and further foreign market entries. As a result, already-installed digital applications were positioned only as support tools. Mastering relevant digital skills was not a mandate. "*The staff would more or less get familiar with the tools when we had the capacity to do more*" (CEO, Case B). By doing this, the management team and the employees focused on developing new products without wasting too much time and energy on familiarizing digital applications and new geographical markets.

4.2.2. Phase 2: strategic digital transformation exploration

After restoring its international sales, Case B started placing more emphasis on extending and consolidating its digital transformation. A smart manufacturing collaboration platform, including cloud and blockchain technology, was introduced to ensure efficiency and make quality-assurance processes visible to foreign customers. Case B decided to improve connectivity between departments across countries making greater efforts to digitally train staff, which generated extra learning and coordination workload.

The TMT members soon found that difficulties in organizational integration during digital transformation process had increased. Digital skills acquisition by staff was not mandatory previously, and this made the information silo problem increasingly severe. For example, employees did not have sufficient digital training in the early stage of re-internationalization. Most of them still used the previous ERP system, and some of them duplicated their work in both systems. The information overload and unclear job specifications increasingly required the standardization of data processing and sharing practices.

Moreover, the firm changed its business model, offering digital original-design manufacturing, digital applications for health intervention and technical consultation services. A comprehensive understanding of application platform regulations and local data protection policies was required to support app development. For instance, gaining insights into how to get close to, but also maintain distance from, users and collect user information without violating local digital institutional regulations turned out to be important. Meanwhile, the firm built a digital culture to foster greater responsiveness to new opportunities and exogenous changes, which meant that more reports and documents had to be processed. Such changes intensified the learning pressure on the firm to close digital capability gaps.

In this phase, Case B attempted to build international digital capabilities to deal with the challenges created by the strategic digital transformation. It needed to explore new digital business models, close digital capability gaps to promote new digital businesses and simultaneously conducted digital integration. The firm, therefore, limited its foreign market expansion and focused on selected foreign markets. "*Digital tools are easily acquired but benefiting from these tools requires a continuous updating of processes*" (FIN, Case B). To realize the potential of digital transformation, the TMT decided to prioritize resources to establish an effective digital infrastructure within the firm and deferred foreign market expansion due to budget and network constraints. "*We had to try different possibilities to find the replicable practices across different countries. This is something that we had to do and turn to our advantage*" (CEO, Case B).

4.2.3. Phase 3: synthesis of strategic digital transformation and new product development

Between 2013 and 2015, Case B accumulated sufficient experience in managing digital international businesses, which allowed it to establish an effective internal digital infrastructure. The TMT leveraged this digital internationalization knowledge in new foreign market expansion. Although the digital business environment and regulations were different in new countries, the firm could learn and adapt to new opportunities faster than its competitors. Furthermore, a well-integrated digital infrastructure brought connectivity with foreign partners through an extended virtual network, improved firm responsiveness to external changes and speeded up new service developments, which in turn enabled complete re-internationalization.

4.3. Trajectory III

Partial re-internationalizers—cases H and I—displayed a trajectory of withdrawing their digital transformation efforts during the re-internationalization process. They initiated simultaneous pursuits of both new product development and strategic digital transformation at the start of their re-internationalization, which resulted in a shortage of resources to perform well on both sides. Over the course of their re-internationalization, they reduced digital transformation efforts to reduce the complexity of managing both strategic digital transformation and new product development. These two firms commonly experienced three distinct phases of strategic digital transformation: synthesis with new product development, initiative suspension and initiative withdrawal. We use Case I as an example to detail the process.

4.3.1. Phase 1: synthesis of strategic digital transformation and new product development

Case I implemented strategic digital transformation and completely changed to being a service provider as a way of initiating aggressive re-entries into both earlier and new markets. The board wanted to accomplish this change immediately, since they were confident of their previous international experience and networks. The firm leveraged digital services to re-enter previous markets and expand to new markets.

As a meteorological instrument manufacturer, Case I changed focus from its traditional transaction business model to offer digital technical services, such as smart-city operating systems, smart geography, technical consulting and meteorological sensor integration. However, it experienced difficulties developing and internationalizing its new service offerings across countries. Case I made most of its efforts on modelling a consistent and replicable structure of defining, delivering and optimizing service offerings to promote international expansion. "*We urgently needed a structure to ensure we could offer consistent services with lower costs across countries*" (MKT, Case I). Due to the urgency of re-entry, the firm had to quickly learn and understand digital markets and business knowledge in different countries, including data protection and privacy policies, how to set up a digital sales infrastructure to promote service value for potential clients, ways of digitally interacting with clients and localizing the scope and practices of its service offering. "*Previous knowledge was only helpful in finding out which countries had the demand. Providing an international service online was so different that we had to learn it again*" (MKT, Case I).

Given the firm's legacy of being a manufacturer, its digital service skills gap made the service transition process difficult. Staff training programs to develop service skills were aggressively scheduled and a policy was pursued to shift the assumed company identity from being "*a manufacturer to a service provider*" (MKT, Case I). Moreover, designing, selecting and optimizing replicable digital services encouraged the firm to frequently interact with clients from diverse regions and cultural backgrounds. According to the CEO of Case I, "*Some service offerings were too specific or sporadic and not worth further development*". The need to establish a proper framework for selecting services with potential for international replication was clear, but the path was unknown. Consequently, employees were compelled to process overwhelming amounts of information associated with the lengthy service development process to identify solutions.

Meanwhile, digital initiatives by Case I progressively demanded increasing firm resources for the development of the required digital skills and digital coordination within the organization. The employees mostly lacked essential digital skills, and a virtual collaboration approach between staff and external partners made the service design process complicated. "*Sometimes an easy idea needed more time to make sense in a virtual setting*" (MKT, Case I). The firm also experienced other digital coordination challenges, such as information fragmentation and overload, organization silos and unclear departmental integration. These post-integration challenges confounded the heavy learning tasks that stemmed from over-aggressive actions and added more complexity to the TMT's efforts to envisage how to properly utilize the quickly depleting resources of the firm. As a result, the TMT decided to take a step back from the new foreign markets that they could not manage and refocus on foreign markets where they had previous experience and networks (i.e. prior to re-internationalization).

4.3.2. Phase 2: new digital transformation initiative suspension

In this phase, Case I stopped investing in digital transformation but maintained its existing digital transformation activities to stabilize and restore its performance. In part, due to the aggressive actions initiated, the firm was distracted from dealing with the challenges associated with digital transformation and had no time to accumulate the capabilities needed for dealing with integration after digital transformation. The CEO of Case I stated that they should have devoted more efforts to explore possible solutions and create synergies, but "*the firm and staff were already exhausted with the excessively frequent big changes*". Stimulating international sales to restore stability, therefore, became the priority, and as a result, Case I decided to abandon its digital business model and culture and refocus on manufacturing new meteorological devices to avoid resource erosion and further managerial confusion within the firm.

4.3.3. Phase 3: existing digital transformation initiative withdrawal

In this phase, Case I reinitiated foreign market expansion but maintained minimal digital applications as supportive tools for improving operational efficiency to reduce complexity. Digital services were preserved as only occasional value propositions to clients but no longer as an overall strategic vision. The firm returned to its earlier business model producing new meteorological instruments and new portable devices and slightly improved their international sales. The CEO of Case I attributed their partial re-internationalization to over-ambitious actions, which had increased tensions associated with new product development and digital transformation. "*We spent too many resources on both the digital transformation and the service transition and did not do well on either side*" (CEO, Case I).

4.4. Trajectory IV

Three partial re-internationalizers—G, J, K—persisted with operational digital transformation to facilitate the existing product improvement throughout their re-internationalization. Although there were improvements in their re-internationalization performance, these three firms each failed to reach their previous exporting levels. The three partial re-internationalizers adopted operational digital transformation to refine their existing core products. They applied digital technologies to change their understanding of foreign markets and improve the efficiency of product refinement throughout their re-internationalization. We use Case J as an example to explain the process.

Case J introduced a digital work system for efficient administration and online financial monitoring. It applied cloud optimization software to its production lines to optimize its inventory, productivity and production costs. Virtual manufacturing collaboration platforms were established with both suppliers and clients to ensure fast refinement of their existing telecommunication processors.

During re-internationalization, Case J concentrated on the existing products. As CEO, Case J stated, "(We stick to) *what we do best*" and "(aim to) *become a specialist in one product and aimed at using digital technologies for efficiency improvement*". The TMT attributed its partial re-internationalization to the inertial effect of their over-conservative response, which disguised the underlying problems with their existing products and prevented new product development. "*Unfortunately, we focused too much on our core products which had become outdated. When we decided to introduce new products, there were already plenty* [of similar products] *in the market*" (MKT, Case J). Acknowledging these difficulties, the firm intentionally avoided tensions between strategic digital transformation and new product development and focused only on deploying digital technologies to reduce costs and efficiency in existing products. It did not try to use digital investments to extend its business scope. Most interviewees from Case J pointed out that they did not learn significantly from digital transformation investments. They neither realized the full potential of digital transformation nor accumulated essential digital capabilities to compete internationally. The lack of international digital capabilities prevented the firm from seizing emerging opportunities.

5. Discussion

While the re-internationalization phenomenon has been increasingly studied, the extant literature has largely focused on factors influencing the decision or the speed of market re-entry (Aguzzoli et al., 2020; Chen et al., 2019; Surdu et al., 2018). Earlier work suggested that firms may undergo strategic changes during re-internationalization but did not explain how they may do so (Surdu and Narula, 2020; Welch and Welch, 2009). However, this research sets out to explore how SMEs digitally transformed during re-internationalization to make contributions to both the digital transformation and re-internationalization literatures. Our mainly inductive case data converges on two types of digital transformation based on whether digital technologies are applied as an operational or strategic change and further highlights different digital transformation trajectories for managing tensions between new product development and strategic digital transformation during re-internationalization.

The complete re-internationalizers showed trajectories corresponding to a punctuated equilibrium pattern to manage tensions over three distinct phases (Trajectory I and II). Trajectory I started with strategic digital transformation exploration, followed by strategic digital transformation extension and synthesis of strategic digital transformation and new product development. Trajectory II began with new product development, followed by strategic digital transformation exploration and its synthesis with new product development. Although they showed different starting points, these two trajectories prioritized *either* strategic digital transformation *or* new product development at the start of re-internationalization. In contrast, the partial re-internationalizers showed *both* over-aggressive (Trajectory III) and over-conservative (Trajectory IV) approaches to managing the tensions. Trajectory III was an ambidextrous approach in which the firms simultaneously pursued both new product development and strategic digital transformation during re-internationalization. Specifically, it commenced with the synthesis of strategic digital transformation and new product development, followed by suspension of its new digital transformation initiative and withdrawal of the existing digital transformation initiative. Trajectory IV involved neither new product development nor strategic digital transformation.

5.1. Theoretical contributions

We claim to make five contributions to the literature. First, our research establishes two types of digital transformation actions: operational transformation and strategic digital transformation. Consistent with the prior digital transformation literature reporting that digital transformation can be initiated as either an operational or a strategic change (Appio et al., 2021; Cennamo et al., 2020; Correani et al., 2020; Gong and Ribiere, 2021; Hanelt et al., 2021; Lanzolla et al., 2021), our study is the first to conceptualize empirical evidence from SME re-internationalizers into a theoretical framework of digital transformation actions. While the existing literature highlights crucial actions along with digital transformation, including changes in various areas, such as digital customer experience design, business model changes, initiating industry 4.0 and smart manufacturing and instilling the culture of digital transformation (Cennamo et al., 2020; Gurbaxani and Dunkle, 2019; Kane et al., 2015; Singh and Hess, 2017; Tabrizi et al., 2019; Warner and Wäger, 2019), how these actions are differentiated and applied has been underexplored. Using 11 re-internationalization cases, our research integrates previous literature with the case data and conceptualizes operational and strategic digital transformation. As reported by our interviewees, operational digital transformation had lower risks and costs than strategic digital transformation. Our conceptualization elaborates how firms design or implement digital transformation.

Second, our research helps to answer how digital transformation actions are applied in the re-internationalization context. Our findings add insights into which trajectories of digital transformation may lead to complete or partial re-internationalization. Although

Vissak and Masso (2015) distinguished re-internationalizing firms as complete and partial re-internationalizers, the differences in how firms behave during re-internationalization have not so far been investigated. Consistent with the view that digital transformation process is dynamic and iterating between learning and doing (Chanias et al., 2019), our study explains the detailed processes of how digital transformation was implemented during re-internationalization and tensions between new product development and digital transformation emerged. While prior internationalization research argues the importance of digital transformation, no study, at the time of writing, considers how firms digitally transform to re-internationalize. Our cases reinforce the value of using a punctuated equilibrium theoretical lens to balance the extended tensions raised by digital transformation to re-internationalization performance in the context of SMEs. All complete re-internationalizers followed the punctuated equilibrium model and sequentially built synergy between strategic digital transformation and new product development during re-internationalization, not simultaneously. As shown by Trajectories I and II, the complete re-internationalizers prioritized *either* new product development *or* strategic digital transformation to ensure that sufficient time and resources can be invested in developing international digital capabilities (Cahen and Borini, 2020; Chanias et al., 2019; Lanzolla et al., 2021; Tolstoy et al., 2021) and digital infrastructure (Nambisan et al., 2019a, 2019b; Nambisan and Luo, 2021). These two approaches to mitigating tensions between new product development and strategic digital transformation characterize the punctuated equilibrium model, e.g. typically involving temporal separation or sequencing (Gupta et al., 2006; Mathias et al., 2018; Uotila, 2018).

According to the partial re-internationalizers following Trajectory III, simultaneous pursuit of both strategic digital transformation and new product development quickly depleted the existing resources and disrupted the synergy building between these two. Trajectory III represents a simultaneous pursuit of strategic digital transformation and new product development, which characterizes the ambidexterity model of managing tensioned action (Benner and Tushman, 2003; Gibson and Birkinshaw, 2004). Digital technologies may promote openness, flexibility and scalability within a firm, and hence enable firms to learn, innovate and internationalize efficiently (Monaghan et al., 2020; Nambisan et al., 2019a, 2019b; Oviatt and McDougall, 2005). However, our cross-case comparison reveals that the benefits from learning, innovation and internationalization did not manifest themselves immediately after carrying out digital transformation initiatives. Instead, these initiatives added more challenges to international management which demanded additional time, effort and individual capabilities (Scuotto et al., 2021). The firms following Trajectory IV describe a conservative aspect of digital transformation. For example, cases G, J, K avoided committing significantly on both strategic digital transformation and new product development but suffered from inertia.

Third, this research explores the complexity of digital transformation during early re-internationalization. It delineates how and why strategic digital transformation and new product development were tensioned at the early re-internationalization stage of our cases. With regards to strategic digital transformation, both the complete and partial re-internationalizers persistently suffered resource demands to address post-digital transformation challenges across countries. Specifically, digital transformation gave rise to information overload and information silos (i.e. connectivity paradox), unwillingness to share (i.e. performance paradox) and managerial confusions (i.e. transparency paradox) for our cases (Leonardi and Treem, 2020). Realizing the benefits of digital transformation relied on firm investment to develop relevant digital capabilities (Cahen and Borini, 2020; Lanzolla et al., 2021; Tolstoy et al., 2021) and infrastructure (Luo, 2021; Luo, 2022; Nambisan and Luo, 2021). New product development involving new product trials and verifications, increased R&D expenses and prototype redesign/refinement also called for more resources for developing technological capabilities for new products in an international setting. Simultaneous pursuit of strategic digital transformation and new product development at an early stage created competition between these demands. The existing discussions of punctuated equilibrium and ambidexterity emphasize that extending existing competencies and developing new alternatives are tensioned (Gupta et al., 2006; Mathias et al., 2018). Our results offer an additional explanation that these actions of developing new alternatives may create tensions and conflicts rather than strategic synergy.

Fourth, the geographical scope of re-internationalization also plays a crucial role in influencing re-internationalization success in our cases. Compared with partial re-internationalized cases, our complete re-internationalized cases reported a prudent approach when extending their foreign market scope to new geographies. For example, cases showing either Trajectory I or II deferred their new foreign market expansion during their re-internationalization and focused only on their markets previously lost in the early phase of their re-internationalization. As reflected by most of our interviewees, this was because re-entering previously lost geographical markets tended to be less complex than entering new ones. The tensions between strategic digital transformation and new product development tend to be more prominent and severe when firms are extending their foreign market scope. Our study suggests three possible explanations. First, entering new foreign markets often requires time and resource-intensive learning, which compete for slack resources with organizational capacity for new product development and new strategic digital transformation. The prior internationalization literature emphasized the role of the market and technological and internationalization knowledge during foreign market expansion (Fletcher and Harris, 2012; Vissak et al., 2020). Due to firms' exposure to diverse foreign countries, international expansion undoubtedly requires firms to spend constant time and resources on learning local market environment and networks, product technologies and management practices across borders (Pellegrino and McNaughton, 2017). Second, entering new foreign markets made strategic digital transformation more time and resource-consuming. While learning during international expansion is argued to be easier, enabled by digital technologies in the existing literature (Oviatt and McDougall, 2005; Monaghan et al., 2020), our research found that liability of foreignness still existed, and became more intensive in a digital context. For example, our cases engaging with digital transformation had to acquire digital technological, digital market and digital internationalization knowledge to address new challenges along with digital transformation (Fletcher and Harris, 2012; Fletcher et al., 2021; George and Schillebeeckx, 2022; Luo, 2022). Addressing the liability of foreignness in the digital context required constant reiteration and optimization of digital infrastructure and adaptations of digital business models (Chanias et al., 2019), which increased the burden of strategic digital transformation. Third, entering new foreign markets increased the burden of product innovation. Consistent with the tension between

innovation and internationalization explained by Kriz and Welch (2018), our study identified that exposure to new foreign markets brought either the necessity of existing product adaptation or new product development opportunities and added more innovation workload. As a result, we argue that internationally expanding firms would more likely suffer information overload and more intensive tensions between strategic digital transformation and new product development. The initiation of new service development, new market expansion and strategic digital transformation under Trajectory III exemplified this intensified tension. A prudent approach of extending foreign market scope to new geographies (exemplified by Trajectories I and II) tended to be more manageable for digital transforming firms during their re-internationalization.

Finally, while the extant digital transformation literature has delineated the process of digital transformation (Verhoef et al., 2021; Wimelius et al., 2021; Yeow et al., 2018), it has disregarded whether and how digital transformation trajectory differs across industries. Our research helps address this gap by showing the different digital transformation trajectories used by firms from different industries that led to complete re-internationalization. The cases in this study include electronics businesses (cases A, C, D, I, J and K), pharmaceutical businesses (cases B, G and H) and chemical industry businesses (cases E and F) (see Table 2). Although our four digital transformation trajectories are distinct, the tensions associated with new product development and digital transformation featured prominently in most cases, across all these industries. Creating value or benefiting from digital transformation required a consideration of how to balance these tensions. However, our study reveals that Trajectories I and II tended to be favorable for those firms offering products with relatively shorter periods of new product commercialization. Our cases with a relatively shorter gestation period for new product commercialization, e.g. those from electronics and chemical industries, exhibited flexible starting points for re-internationalization, either new product development or strategic digital transformation. In contrast, Trajectory II tended to be preferable for those firms offering products with relatively longer periods of new product commercialization. For example, developing new products tended to be imperative for the pharmaceutical industry cases during early re-internationalization. Introducing new products was the key to restoring re-internationalization performance, but it involved a longer waiting period for new product commercialization due to testing and product validation across different countries (R&D, Case B). The CEO of Case B stated that it was difficult to sustain the continuous costs incurred by digital transformation without a solid product base. He also pointed out that digital transformation could not shorten the cycle of new product development.

Our research further showed that digital transformation process differed according to homogeneous and heterogeneous industrial environments. A homogeneous industrial environment exists where competitive cues are clear and predictable, in contrast with heterogeneous industrial environment (Nadkarni et al., 2016). As reflected by interviewees' accounts, the firms (e.g. Case A) operating in a heterogeneous industrial environment of the electronics industry (where products were diverse) prioritized the strategic digital transformation, whereas those operating in a homogeneous industrial environment (where products were similar) prioritized new product development (e.g. Case B, in pharmaceuticals). For Case A, competitive cues were not clear or predictable in the electronics industry's environment during early re-internationalization, especially for re-internationalizing SMEs, because "*Demands and opportunities were changing very fast*" (CEO, Case A). "*Customers and clients in the industry were flexible and willing to try new things, either totally new products or new digital ways of offering*" (CEO, Case A). The early development of essential digital capabilities and effective data infrastructure enabled the electronics firms to recognize and react to promising opportunities responsively. Meanwhile, the information overload was projected to be more severe by decision makers than for pharmaceutical and chemical industry firms, arguably due to the heterogeneous nature of the electronics industry. Since electronics firms had to work harder to understand the market's dynamism, emerging opportunities and the structure of the competition, a greater amount of information from more diverse sources was necessary. This generated an urgency to initiate an early strategic digital transformation. In comparison, Case B, which was operating in a homogenous environment of the pharmaceutical industry, relied on new product development as the starting point for its re-internationalization. Although the TMT of Case B acknowledged the importance of digital transformation, its postponement and taking fewer investment initiatives were deemed to be more beneficial. Its CEO stated: "*The rules of the game were very clear to us. A solid product was the key to restoring our international markets at first… Digital transformation had to be done but was not urgent*". Moreover, the firms operating in a homogenous industry, like Case B, often had relatively clear and well-defined learning objectives, which made their information overload less severe than firms operating in heterogenous industries. These generated less urgency and confidence to defer strategic digital transformation.

5.2. Managerial implications

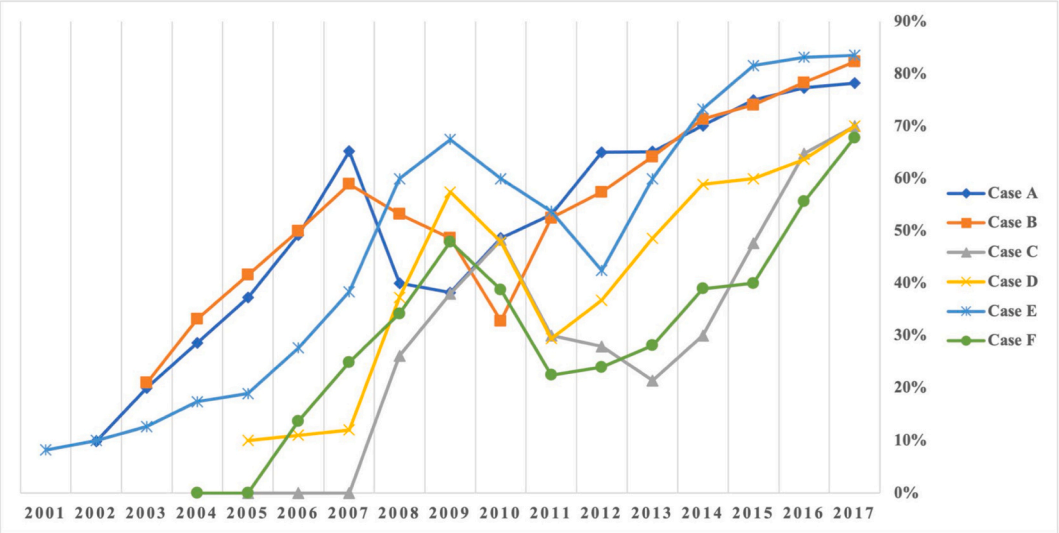
This research claims a number of implications for practitioners. A collapse in world trade in 2020, as a result of COVID-19 and a US-China trade war, adds new weight to the need to understand how firms can re-establish their international presence in a period where digital transformation has become essential. Our research suggests that managers of traditional manufacturing SMEs may wish to consider strategic digital transformation as an important tool for re-internationalization. To realize the full potential of digital transformation for re-internationalizing firms, they may need to consider a long-term and gradual digital transformation plan to mitigate the extended tensions between new product development and strategic digital transformation during re-internationalization. They may also need to evaluate their international digital competence and carefully design a long-term synergistic digital transformation plan before acting. A temporal prioritizing approach to balance investments in digital transformation and new product development may be favorable for complete re-internationalization. However, our research also suggests that advancing strategic digital transformation during re-internationalization could be better for firms with a short period of new product commercialization that operate in a heterogenous industrial environment. Deferring strategic digital transformation during re-internationalization can be a better choice for firms which have a long period of new product commercialization and operate in a homogenous industry environment.

5.3. Future research

Our research has provided potentially generalizable digital transformation actions for re-internationalization. The digital transformation action framework could serve as a basis for exploring digital transformation process of international firms in the context of COVID-19. It, therefore, raises a research question for the future: How does the heritage from previous internationalization (e.g. networks and attitudes toward international markets) affect the choice of digital transformation trajectory (Welch and Welch, 2009)? Further research could examine alternative digital transformation trajectories toward complete and partial re-internationalization, as this research has analyzed only before/after changes, indicating one cycle of change. It would be interesting to analyze special cases that adopt cyclical changes among the four digital transformation actions to examine why these firms change and uncover how they learn from the success or failure of previous digital transformation experiences, as well as other possible trajectories. In addition, the answers to what stimulated the awareness of a punctuated equilibrium approach of digital transforming in re-internationalization or tensions in re-internationalization may be of interest to researchers. The study findings may have limited generalizability for international SMEs from beyond China, so future research could examine large firms and stratified samples from these different research contexts.

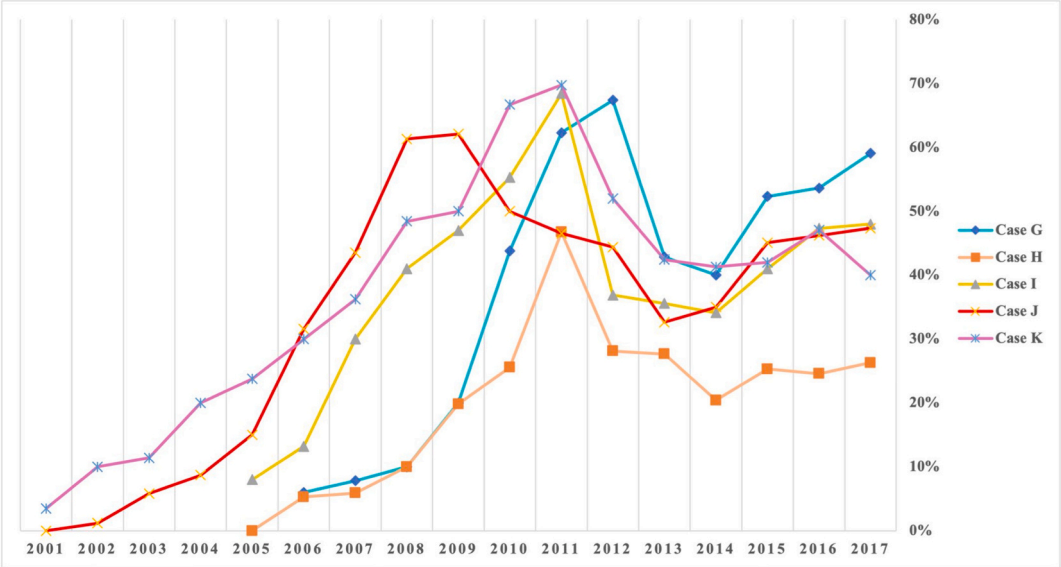
Appendix A

Complete re-internationalized firms: Export ratios 2001–2017.[1]



Source: Research data.
Partial re-internationalized firms: Export ratios 2001–2017.

[1] Note: Exporting intensity is measured by the ratio of foreign sales to total sales (FSTS).



Source: Research data.

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