

Digital Transformation: A Flow Perspective

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Abstract

As we move along the ever-transforming world of digital technology and organizations, the perspective of how we view digital transformation (DT) also transforms. The episodic and continuous nature of changes requires an in-depth, nuanced temporal perspective. Through a case study on an incumbent maritime organization chasing new digital value propositions, we explore the flows of actions within DT. We discuss 1) DT as flows of action, 2) the challenges of planning and measuring DT, and 3) how resistance can spur action. Moving further, we argue that this view will enable future research on how to perform DT in a way that considers the convergence of flows of action.

Keywords: Digital transformation, digitalization, digital innovation, flow, case study

1. Introduction

Digital transformation (DT) has become a focal point for organizations, signified by the creation of specific roles such as chief digitalization officers (Singh & Hess, 2020), a rise in the number of new frameworks (Barthel, 2021; Vial, 2019), and considerably increased research interest (Baiyere et al., 2020; Barthel, 2021; Bosch & Olsson, 2021; J. Reis et al., 2018; Vial, 2019; Wessel et al., 2021). For all its merit, DT research considers DT an intentional and strategic change in value proposition due to technological and environmental change.

However, planned and linear interpretations downplay the potential radical effect of digital technology. Digital technology allows open-ended recombination (Henfridsson et al., 2018), whereas digital technology allows for editability, interactivity, and distribution (Kallinikos et al., 2013; Yoo et al., 2012). All of this translates into a possibility for DT to provide an unprecedented generative potential for

organizations beyond what can be planned and strategized.

Accounting for digital technology's generative potential necessitates capturing the non-linear and unpredictable character of DT, such as continuous change and episodic bursts of change (Hanelt et al., 2021). In contrast, organizational responses can be increasingly rapid, complex, and downright chaotic due to the ever-increasing turbulence and unpredictability (Baiyere et al., 2020). Consequently, a middle ground needs to be sought considering DT differs from upfront strategic planning (Chanias et al., 2019). Planning should coincide with the dynamic ebb and flow of breaking away from existing plans and practices that digital recombination can potentially provide. Therefore, we ask the following research question: *How do dynamic ranges of actions condition DT?*

To achieve this, we report findings from a case study of an incumbent maritime company that is undergoing DT. The maritime industry is currently under immense pressure to decarbonize and maintain safety extensively through digital technology, making it a particularly interesting area. To analyze our findings, we use the concept of flow (Baygi et al., 2021), which highlights flows of actions and continuous change, thus capturing the fluidity, ongoing evolution, and episodic nature of DT.

We aim to contribute by teasing out a balancing perspective, showing the conditions for DT beyond linear accounts and planned change. We suggest a flow-based model of DT in organizations, discuss the implications for planned approaches to DT, and how the resistance between distinct entities can be recast as a source for correspondence between flows.

The rest of the paper is organized as follows: Section 2 provides a brief overview of DT literature and the concept of flow. Section 3 shows the case company and the case study method. Section 4 presents our findings from a flow perspective. In Section 5, we discuss the results. Finally, Section 7 concludes the paper and outlines future work.

2. Background

2.1. Understanding DT

There is an ongoing discussion in information systems on what, if anything, is new with DT as compared to previous accounts of IT-driven organizational transformation (Vial, 2019; Wessel et al., 2021). Some argue that DT alters the value proposition and the organizational identity. At the same time, IT enabled organizational transformation (ITOT) does not have such a profound effect on companies and is mostly about optimizing existing processes (Wessel et al., 2021). The case of Netflix can illustrate this difference. By utilizing data on how users consume and like content (ITOT), Netflix started producing content on its own, effectively changing its identity from a provider of physical DVDs into an online streaming service and even a film producer (Lindič & Marques da Silva, 2011). Although some can argue whether a change of organizational identity is a sufficient or a deficient criterion for DT, it is becoming clear that DT suffers from a lack of distinct theorizing (Markus & Rowe, 2021).

2.2. DT, linear, and circular accounts

A premise in DT is that it is driven by the disruptions created by digital technology (Bosch & Olsson, 2021; Vial, 2019; Wessel et al., 2021) and that organizations, in various ways, must respond to this. There is a start of the transformation wherein the environmental and organizational context is changed, leading to a change in how the company perceives its organizational identity, which digital technology leverages (Wessel et al., 2021). Bosch and Olsson (2021) describe that organizations move sequentially across five distinct steps to mature as digital companies. Other research has focused on different aspects of a maturity model for assessing and evaluating the linear climb of DT (Gökalp & Martinez, 2021).

Circular models also used to explain DT (Mikalsen et al., 2018), wherein agile methodologies such as Scrum (Sutherland & Schwaber, 2007) and lean startup (E. Reis, 2011) are utilized. Here, the fundamental concepts assume cycles of transformation where, for example, information-feeding decisions are gathered, treated, and developed in an orderly and circular fashion.

2.3. Strategic alignment of distinct entities

Recognizing digital technology's disruptive potential, organizations have responded by planning and implementing digital business strategies and DT strategies (Kahre et al., 2017; Vial, 2019). A fundamental premise for such initiatives is that organizations seek to plan transformation. The DT literature on planned, strategic change has largely focused on how a vital issue is to fuse or align *distinct entities* in organizations. It begins at the strategic level, where there needs to be a fusion between organizational strategy and digital strategy (Bharadwaj et al., 2013). Another issue is to ensure cross-functional collaboration, such as aligning distinct business and IT units (Kappelman et al., 2020).

Reich and Benbasat (2000) developed a strategic perspective on IS alignment in which they suggested two dimensions: intellectual and social alignment. Although these two forms of alignment suggest a top-down process, others have found that alignment occurs at several levels (Horlach et al., 2017). For example, at the individual level (understanding perspectives of people from other units), the group level (ensuring that, e.g., an IS project or program fits with strategies), and alignment between groups in different organizational units or levels (such as between IT units and business units).

In addition to the levels, extant research points to the necessity of understanding alignment as a dynamic and emergent process rather than a static end state (Chan & Reich, 2007). Research on operational alignment is pertinent in environmental turbulence and organizational complexity during DT (Walraven et al., 2018). Distinct, bounded entities will potentially result in friction (resistance) between units (Tkalic et al., 2021), especially when change is involved.

Digitalization fundamentally changes not only how people work but also how the changes are implemented (Khanna et al., 2018).

To summarize, the DT literature focuses on linear evolution, distinct entities, and the friction/emergence between them. However, the research assumes an orderly and sequential passing of events that allows for planning and execution. Although, in reality, DT is much more fluid and ongoing, which is why in the next section we introduce the *flow* perspective as a theoretical lens for DT.

2.4 Toward DT as flow

As stated above, existing explanations of DT focus on spatial relationality as interactions between categories and actors, or as intra-actions among boundaries of actors, at the expense of the temporal

confluences along flows of action. To study flow in the DT context, an accepted and applicable definition of flow is required.

Many interpretations of the term ‘flow’ have been adopted in IS from other fields. For example, in software development, Dennehy and Conboy (2019) showed how contradictions interrupted the flow of work, often with unintended consequences. Csikszentmihalyi (1997) depicts the psychological state of ‘flow’ referring to, “the state in which one is so involved in an activity that nothing else seems to matter.” In this study, we adopt the interpretation of flow as Bagyi et al. (2021) developed, which draws on social anthropology literature to develop a theoretical vocabulary of flowing lines of action and their correspondences. A *flow* is a continuity of action with temporal characteristics (modalities) (rhythm, direction, or momentum) but does not necessarily have intentionality (an actor that initiates the action). The interactions of several flows are called *correspondence*. Bagyi et al. (2021) propose three constituent modalities of correspondence: *attentionality*, *kairotic timing*, and *undergoing*. These modalities also form the basis for our study of flow in a DT context. We now discuss these modalities in turn.

Attentionality: Attentionality reveals how sensing possibilities for action regards being exposed and attuned to corresponding flows of action – something that is significantly increasingly difficult in a kairotic context where flows of action continuously change and evolve. Although existing DT literature indeed considers the context and to some degree the changing nature of these changes, these are typically part of a linear process, for example, a reflection or retrospective phase (Babb et al., 2014), rather than continually sensing for minor reverberations in the flows of action.

‘Kairotic’ timing: Unlike most DT studies, which assume a linear, sequenced passage of time where DT is implemented and actualized in phases and distinct weeks, months, or years, correspondence assumes kairotic time – the quality of chaotic and random time, of being the “right” or “best” time for DT or a piece of the DT process to occur. Kairotic timing goes beyond a single universal timeline. Instead, it recognizes that DT will have various lines of action and that each of these will have its unique temporal characteristics, that is, each will have its unique rhythms, timelines, urgency, temporal pressure, and so on.

Undergoing: According to most DT frameworks, for example, (Vial, 2019), DT is something the organization ‘does’; undergoing is something that also happens “to you” (Bagyi et al., 2021; Ingold, 2017), and thus in the context of this study, to the organization. Bagyi et al. (2021) use the analogy of how individuals are often swept along by a conversation. Therefore, in this study, we propose that a DT is not just something that simply

and prescriptively is executed. The very nature, core, and direction of the DT are also pulled along as the transformation unfolds.

Note that Bagyi et al. (2021) use a social movement (the TCOT movement) to illustrate the concept of flow. However, the first part of the paper conceptualizes and explains the flow concept, which we believe is also suitable for application to a DT on the company level, as we do in this paper.

3. Method and the case context

Regarding the research approach, we chose a case study because it is recommended when a research question requires an “in-depth description” of the phenomenon under investigation (Yin, 2018), which in our case was DT. The selected case was MarComp (the real name suppressed for anonymity), a maritime division of a well-established multinational provider of various B2B services. We chose the firm because it was undergoing both digitalization (optimizing the existing processes through digital technology) and DT (introducing new data-driven products that gradually changed the company’s value proposition and identity). MarComp considers software crucial for offering value to its worldwide customers, which is why it has been increasingly focusing on developing novel software products and services since 2016. In 2018, MarComp established a stage-gate innovation process based on “*The corporate startup*” approach (Viki et al., 2017). Employees could pitch ideas for new software solutions and they were allocated internal resources to develop them. Some solutions intended to improve internal work processes, whereas others were to improve customer facing. In 2022, the new corporate strategy introduced an even stronger focus on software products and services, which aimed to digitize MarComp’s core operations and develop new products that would differentiate the company from its competitors.

We collected data between December 2018 and July 2022 by gathering various data sources (see Table 1). We interviewed key stakeholders and customers, wrote minutes from meetings, and collected documents (e.g., text files and PowerPoint presentations). We also participated in numerous workshops (both online and face to face) and gathered photos and screenshots. The interviews were recorded either as notes or as audio files and subsequently transcribed.

The collected data were analyzed iteratively, which resembles the Constant Comparison Method that (Seaman, 1999) described. In other words, the iterations of data collection and preliminary coding were followed by the new rounds of data collection that refined the initial codes. First, the data were coded using the qualitative analysis tool NVivo (version

1.6.2), which resulted in 293 codes. Then, each subsequent data collection was planned according to the latest results of the data analysis (e.g., updated interview guides and interviewing additional stakeholders). We then connected the codes to

correspondences and how the informants perceived them or how the documents referred to them.

Throughout the whole process, the research team either wrote memos or discussed the findings together to capture the latest understanding of the data.

Table 1. Data Sources

Data sources	Description	Source
I1	Product manager for the new service environment insight (P2).	3 interviews
I2	Program owner for the decarbonization program at MarComp and responsible for developing (P1).	Transcribed meeting
I3	Innovation manager, responsible for creating IP1	1 Interview
I4	Program manager for the transformation project	1 Interview + meeting notes
I5	Product manager for a digitalization project ran in the IP1.	1 Interview + meeting notes
I6	Project manager for a digitalization project	1 Interview + meeting notes
I7	Project manager for a digitalization project	2 Interviews + meeting notes
(I8)	Head of software development	1 Transcribed meeting, workshop, and meeting notes
P1	Digital service validating regulatory requirements for ship's emission.	Document descriptions and mentions in interviews and meetings
P2	Environmental insight, a new solution enabling ship owners to understand their emissions	Document descriptions and mentions in interviews and meetings
IP1	Innovation process to increase the innovation capacity of the company. A 6-step stage-gate process based on lean startup principles	Documents describing the framework. Status report from the stage gate process. Mentions in meetings and interviews
IP2	Digitalization project based on ID2	Interview, Documents, and meeting notes
ID1	Internal memo, used as input to corporate strategy	Document
ID2	Strategy document for MarComp.	Document

4. Results

Based on the data analysis, we found a distinct evolution of the becoming of DT by observing digitalization and innovation. We first show how the flows of actions related to the digitalization effort of a digital product that was recently introduced to MarComp's portfolio (P1) and their correspondences in becoming DT. Then, we outline how the innovation process the company applied (IP1) conditioned the continuous transformation of a product (P2) with a new value proposition and its correspondences through DT. Lastly, we outline how the previous events transformed the digitalization flows. The numbers in the parenthesis (#) refer to correspondences as shown in Figure 1.

4.1. 2017–2018

Due to changes in EU regulations in 2017 and International Maritime Organization (IMO) regulations

in 2018, MarComp needed to develop a new service providing certification of ships' fuel system (P1) to meet these regulations. MarComp had two options: 1) *Develop a manual reporting system*, or 2) *develop the service as a data-driven digital service*. Option 2) could create new opportunities as a program manager (I2) explained: "*The new digitalized service can act as an enabler for working differently both internally and with customers.*" There were massive discussions around these two options and whether the cost of setting up a service based on live data from the fuel system was worth it. The action of choosing option 2) would transform the becoming of DT, as we outline later. The service was put into production in 2018 (1).

In 2019 (2), the company performed a companywide survey to map out the innovation capacity, which they discovered was weak. As a result, an innovation framework (IP1) was initiated, which became a new process for formulating, testing, and developing novel digital products and services. The innovation manager

(I3) explained, *“If we change how people work through the framework, we start to change the culture.”* The framework was based on *lean startup* principles and outlined how the ideas for new services should be captured, evaluated, and matured (stage-gate maturity process). A venture board decided whether ideas were mature enough to progress from stage to stage.

4.2. 2019–2020

In 2019, MarComp arranged an event called Next-Generation Summit (4). The event was for employees to learn more about innovation and the potential for innovation in the company. Management had prepared ideas for new products that the participants could choose to work on during the event. One of the ideas was how MarComp could use data from *PI* to build new products. *I1* decided to work on another idea, reflecting, *“I probably read that idea but did not really understand what I needed it for. It was perhaps in the back of my mind.”*

A few months after setting up the innovation process, MarComp called for new ideas (5) to motivate the employees to suggest new products/services that could enrich the portfolio. The product manager (*I1*) proposed a service similar to existing MarComp services, explaining: *“I wanted to combine the existing rating service for ships with the emissions part because that was something we already were doing.”* Through participation in the innovation process, the product manager (*I1*) had the opportunity to use 20% of the work time to develop this service. *I1* also received a sponsor who assisted on multiple topics related to the decarbonization of shipping.

When the product manager (*I1*) reflected on the motivation for working on solving environmental challenges, *I1* referred back to an event in 2017 that took place in Singapore (3): *“I realized that all the goods I buy are shipped through Singapore and saw that there is a massive environmental impact of shipping [...] We have no idea whether or not the goods are shipped with a crappy or a great ship.”*

At first (6), the product manager (*I1*) planned to develop a product that required customers to enter data manually. However, the sponsor and the key stakeholders perceived the usage of data from the product (*PI*) as essential for the new service. *I1* explained, *“Due to the previous discussions around additional work of developing PI, I got a lot of pitches and pressure to use the data.”* At the same time, the product manager started to investigate the regulations behind *PI* and learned more about the decarbonization market. At the end of this process, the product manager (*I1*) had a customer meeting. Based on a new insight, *I1* decided to change the idea, as this quote demonstrates:

“We understood that we could not move forward with the idea in the current form but needed to pivot.” Although the product manager continued to work on the product (*PI*), the customers who were interested in decarbonization were routed to this effort from all over the company.

A customer asked if MarComp could certify the emission numbers (7). A solution was presented to the customer, but it was rejected. The product manager explained, *“It was a misunderstanding, the customer thought the financial institutions required a document, but that was not the case. We then went back to the drawing board.”* However, there was a key takeaway: the product manager realized that the financial institutions were interested in knowing how the ship operators were doing regarding emission management. The program owner (*I2*) explained: *“These external stakeholders such as banks and owners of the cargo come in, and we need to understand their needs, which challenges the current way we are organized.”* The product manager (*I1*) explained that the customers’ potential benefit was not in merely acquiring certifications and advice (which MarComp already provided) but also receive advice on how to improve their carbon footprint. *“MarComp could be at the forefront of the green transition by providing data insight to our customers, not advice.”* One informant (*I4*) noted, *“This represented a shift for us from providing a ticket to trade towards providing something with a different value proposition to our customers.”* This new outlook on the product resulted in a higher number of users representing top management who participated in product demonstrations, as outlined in the report to the stage-gate committee (*IP1*) and further corroborated by *I1*, *“There were more representatives from top management than in the other services we provide.”*

In this way, the product was again pivoted to provide the customers with insight into their emissions data. The product sponsor brought up for discussion the data from *PI* (8) because it was already harvesting relevant data from the customers. *I1* explained: *“It was so much easier to have a fruitful discussion with the customer*

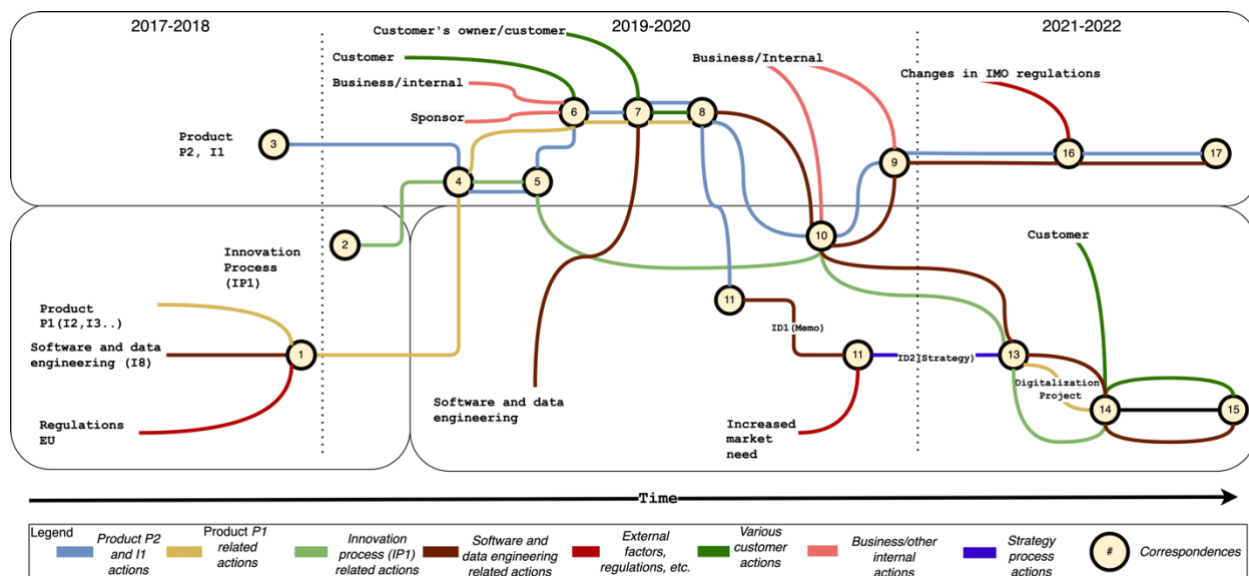


Figure 1 Flows of action in the digital transformation at MarComp

when I could show them their own data.” Again, the product owner experimented with a simple mockup and showed it internally before contacting customers for feedback. After verifying the mockup’s value, the product manager started working with software developers and data scientists to develop a full-blown technical solution. Even though there was data already in the digitalized systems, software developers did not have access to all the needed data sources. The head of software development (*ID8*) explained, “What we did on the software side was that we had to get those data, and we could not do it properly because it would take too much time. So, we did the hack and moved forward.” The need for the hack was attributed to the software engineers’ late involvement and unrealistic mockups.

During the development of *P2*, the business development department wanted more control (9) over the product development. First, a steering committee was set up in 2020. Then, later in 2021, the product was transferred to a program overseeing all similar products within decarbonization. The program was set up with a product sponsor as well as a program leader (*I2*). The program provided the product manager (*I1*) with a place and authority to anchor and prioritize decisions. The timing of this was critical because new regulations were expected to take effect in early 2021 (16). Due to the regulations, the steering committee opted to extend the product, thus requiring additional functionality (17). This decision conflicted with the intentions of the product manager (*I1*), who was hoping to continue improving the existing product and not build even more new functions.

In 2020, the innovation framework spawned many different product ideas that were then in development. A common reaction affecting the development of these products was resistance (10) in the company toward a

lean approach. One product manager (*I5*) outlined in a meeting, “We have a culture of risk awareness, and we are actively trying to find faults while innovating. We need to train ourselves to be more attentive to solutions.” The innovation process’ focus on working directly with customers to develop new solutions led to adverse reactions (resistance) from the communications department.

The company realized that it was actively running its digitalization and transformation but without a clear direction. *I4* outlined, “We were challenged about our approach for digitalization. We are working on it, but was asked whether or not we were working on it ad-hoc. So, we needed to establish our position and what we really mean when we talk about digitalization.” The lack of a straightforward approach prompted formulating a digitalization agenda in an internal memo (*ID1*) (11). The memo outlined how the company saw the role and importance of accessing and using data for existing and new products and employing artificial intelligence (AI) and machine learning (ML) to run on top of the data.

Further, the memo highlighted how *P1* utilized the existing data and algorithms to provide new value for the customers. In addition, the memo pointed to several ongoing initiatives built on the same concept as *P1*, utilizing streamed and contextualized data with ML and algorithms to perform analyses. These solutions were akin to the company’s existing value proposition. The memo recognized this and emphasized the new value proposition that *P2* exemplified, how it used data from *P1*, and that this service held more relevance to other parts of the customer organizations than previous services did. Upon its completion, the memo became a part of the company’s strategy process (11) and was subsequently used to acquire further resources for the

digitalization effort. *ID2* was the final version of the strategy document released in late 2020, showing a transformation agenda for MarComp with a clear driver for digitalization. In addition, the new strategy supported both the current value proposition of the company and the new services with a different value proposition. In this way, the strategy served as a dual transformation agenda for the company (*ID1*).

4.3 2021–2022

The strategy and anchoring with management led to resources being allocated (**13**) to meet the digitalization strategy for a new digitalization program (*IP2*) in 2021 with a clear goal of digitalizing the existing service portfolio and meeting the strategy. *IP2* was set up with multiple projects covering the breadth of the company's service delivery.

The digitalization projects were run through the innovation framework's lean stage-gate process (**14**). This was explained due to the uncertainty of customer needs in one instance. One project manager explained they needed to work iteratively through the digitalization project due to the scale of changes and their uncertain implication. The involvement of software engineering and data scientist resources also increased through more dialogue and joint workshops.

The company understood that providing digital versions of existing services would require data from customers and their vendors. The project manager understood there was more potential in getting the data from the vendor and had a meeting (**15**) with the vendor representative, quoting, "*However they could see themselves wanting new functionality, and working together with us to develop that functionality.*" The vendor explained that they lacked the capability to develop this type of solution. However, MarComp had this capability. The vendor thus received an incentive to share the data with MarComp due to the potential new value proposition.

5. Discussion

In our case study, the digitalized service providing insight and data about customer ships to the customers represents a radically new value proposition for the company (Wessel et al., 2021). It builds not only on the existing services providing certifications or advisory but also on top of the existing data to give the customer the insight to improve. Seeking to move beyond linear and planned explanations for how this was accomplished, we have sought to answer the RQ *How do dynamic ranges of actions condition DT?* In the following, we detail a flow perspective on DT and discuss what it

means for linear accounts, distinct entities, and resistance.

5.1. DT: A flow perspective

Figure 1 outlines the identified flows of action as they move throughout time and their correspondences, illustrating the fluidity and temporal dynamics of DT. Our findings show different flows of actions related to the digitalization of processes, innovation processes and frameworks, software and data engineering, products, customer, and external factors such as changes in customer behavior and customers of the customers. Our findings show episodic bursts transforming the flows of actions (Hanelt et al., 2021).

Crucially, for DT to happen, flows of action must correspond. Baygi et al. (2021) argue that flows of action transform through three modalities of correspondence: *attentionality*, *timing*, and *undergoing*. These modalities are present in our findings, supporting the concept of flow.

Attentionality. In correspondence (**3**) (Figure 1), the product manager (I1) *senses* the external factors and necessity for the potential for transformation related to emissions management. This sensemaking is an example of attentionality, where a product manager (I1) sees a concrete case for possible action, becoming further attuned to the potential of innovation in the company, but is not yet able to actualize it.

Timing. We observed that in correspondence (**4**) (Figure 1), the different flows for digitalization, innovation, and product manager (I1) were present. However, there is no attentionality between the flows of action of *I1* and the action of adding *P1* as a concept on which to work, showing that it was not the *right timing*. The informant noted that there was an increased attentionality for innovation due to increased knowledge and competence about the practice of innovation.

Undergoing. In correspondence (**5**) and *I1*, the innovation framework steering committee proposes and accepts the idea, as well as secures the product manager with resources, time, a project sponsor, and tools to further transform and actualize the product timeline.

We identified 17 correspondences with different modalities based on the empirical data (Figure 1). Even though this is a subset of the total correspondences affecting the DT, they still show the multitude of timelines necessary for developing a new digital product with a new value proposition.

These changes did not only occur due to changes in digital technology but also the convergence of flows, including creating a framework, regular meeting places with internal resources, and involving customers and stakeholders. This illustrates how the creation of *new value propositions*, *work practice change*,

reconciliation actions, and development of *digital technology*, as (Wessel et al., 2021) reported, are intertwined in continuous flows of actions that interact with each other (i.e., correspond).

5.2. The challenge of planning and measuring timing

Some DT accounts depict a linear transition (Bosch & Olsson, 2021). Our findings, which show flows of action, paint a less linear picture. As correspondences (7) through (8) demonstrated, the customer's flows of action via the correspondence of the owners and customers of the customer, transform the path of action related to product *PI* through *timing* for the product manager to approach the customers and bring attentionality through a previously established internal attentionality. Moreover, the initial contact from the customer (correspondence 7) was based on a customer mistake. This happenstance led to the product's final pivot. Linear or cyclic approaches, such as maturity models (Bosch & Olsson, 2021; Gökalp & Martinez, 2021) or circular models including agile (Mikalsen et al., 2018), assume there is a clear problem to improve and test against, which was not the case here. We also see that contrary to what maturity models predict, the transformative flows of action started *before* the DT strategy process and not because of it.

This implies that linear accounts can be nuanced, at least regarding focusing on overall order (phases) either in an agile (circular) or in a linear model (maturity), where the phases do not necessarily account for the element of *timing* or consider that *attentionality* takes time to develop.

5.3. From resistance to undergoing

The DT literature is rich with accounts of how digital initiatives and change (e.g., agile methods) emerge in a distinct unit (e.g., an IT department) and how other units not undergoing similar change resist this (Nwankpa & Roumani, n.d.; Sporse et al., 2021; Tkalich et al., 2021; Wessel et al., 2021). Suggested solutions align regarding co-location, shared work practices, and shared goals interpreted considering correspondence of flows. However, timing is a less distinct notion. Timing happens when flows converge. An example of convergence in our case was when the concept of the new transformative product needed several entangled flows from correspondence 3 through 6. The timing of increasing the attentionality and bringing in the right sponsors was critical for actualizing the possibilities for actions. Such findings illustrate how strategic alignment, that is, having all relevant units involved in

one shared process, is not sufficient if the timing is not right.

Are flows thus impossible to manage? No. We observe through correspondences, such as introducing an innovation process, that the company nudged flows of action within the company toward correspondences. However, they were not attentive to each other's flows before they inevitably met resistance because the timing and the undergoing between the paths did not match. This lack of modality in the correspondence can be interpreted as concerns and barriers (Sporse et al., 2021; Tkalich et al., 2021). However, an alternative view is that the resistance forced attentionality, transforming the future path of product development, wherein the company introduced mitigating actions, such as arranging arenas where flows of action could correspond and begin undergoing. Resistance comes with a possibility for attentionality, and working through such resistances can result in undergoing; this corroborates well with Baygi et al.'s (2021) view on resistance as a competition and being swept along the flows, not resisting them. To reiterate, DT is something the organization 'does'; undergoing is something that also happens "to you."

5.4. Practical implications

Our work has several practical implications. First, timing and the uncertainty of which flows need to correspond imply that it can be challenging to know in advance what will work. This means that practitioners involved in DT should be attentive to the flows (or lack thereof) that are part of the transformation.

Second, we recommend introducing arenas/meeting places, such as communities of practice (Wenger, 1998), to facilitate DT. Such arenas enhance knowledge sharing, organizational development, and coordination, and may thus improve the competition and eventual undergoing between the flows.

Third, the chance of convergence of correspondences increase through companywide innovation processes or other frameworks that involve diverse actors. However, it is essential to be aware that the frameworks are typically cyclical and phase oriented and do not consider kairotic timing.

Finally, practitioners driving DT should acknowledge resistance as a part of attentionality, and instead of removing or avoiding it, they should use it to guide the flows of action through the information exchange occurring in the correspondences.

6. Conclusion

In this paper, we analyzed how organizations' quests for DT can be considered as flows. We have taken

forward a model of DT based on identified flows and correspondences, highlighting a richer conception of DT compared to existing linear paths, cyclical models, distinct entities, and resistance. These contributions have implications beyond this case.

First, flow perspectives on DT can be an antidote to overly technology deterministic DT accounts. In cases where digital technology (such as AI or ML) is suggested as a solution or a capacity, the various flows of action that go into such a capability should be considered.

Second, and similarly, it could be used as a correction to the reliance on frameworks (innovation or software development). As we have seen, such initiatives may trigger some reactions, but the goal state can be hard to plan.

Third, flows allow appreciating the necessity of a collective perspective on organizational initiatives. Focusing on digitalization and business as isolated entities would effectively disregard how these flows can and should converge.

Our study is a first step. Future studies could further our understanding of how one can enable/enact/govern/undertake DT in a way that effectively considers the convergence of flow. This research could be done through rich case studies and it could explore how flow can be used to not only understand but also guide and enable DT in practice.

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