Incremental Digital Transformation in Finance: Creating an Unstoppable DX Ratchet

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Abstract

Due to the increasing digitalization of business activities, many organizations are going through enormous digital transformations. Surviving in the market competition requires changes, not only in technology, but also in organization structures. This brings new opportunities challenges. In some sectors, like the highly regulated financial industry, this is even more critical than in IT or manufacturing firms. If a transformation project goes poorly, financial institutions might face catastrophic outcomes that will impact to large population and impact severe economic harm. For this reason, this study investigates digital transformation of a major Japanese banking institution. We were especially interested in antecedents, barriers, and lessons learned during the digital transformation process. To collect empirical data, we conducted a total of four interviews with the key decision-makers involved within the process. We found eight barriers and 10 ways they are being overcome. A one-way ratchet moves incrementally toward Digital Transformation along with satisfaction about successes appear to be the most important methods to overcome barriers to Digital Transformation.

Keywords: Digital Transformation, Finance, Banking, Japan, Innovation

1. Introduction

Industries of all sorts find themselves in a time of challenge and opportunity as digital technologies become available bearing immense social and organizational transformations. Traditional financial institutions around the world face similar challenges as new entrants bring services and seek to skirt regulators and norms. Survival issues for incumbent global organization include handling old as well as new competitors, applying new technologies, replacing legacy systems, and creating structures and processes that are more resilient and profitable. Technology, culture, and change, the core concepts of Digital Transformation, however questions remain how these are implemented and processed in practice by managers. In particular, consideration of Digital Transformation at global financial institutions has lagged with notable exceptions considering business versus IT alignment (Kitamura, 2020), barriers to change (Gane, 2020; Karim, 2020), a central bank (Berkani, Causse, & Thomas, 2019), and potential impacts (Hirai, 2021).

While successful digitalization, technology implementation, and Digital Transformation may be a lifeline for firms, the costs of failure can be extraordinarily high for financial institutions. If a manufacturing or IT firms fails in a Digital Transformation, they may lose profits or even face bankruptcy. In manufacturing, however, these issues may often be handled as just another round of investment to be managed through recapitalization. It is different for the highly regulated financial industry. Here, if a transformation project goes poorly, the institution could face additional catastrophic outcomes such as decertification by the authorities, sudden attack by cyber criminals, or even installation of espionage systems by national actors.

In this study, we aim to gain insights into the reality of Japanese managers facing Digital Transformation. In Japan, established banking firms find themselves entangled by a strong mix of behaviors that are typically deeply rooted in the corporate culture. Some frequently found examples include promotion by seniority, and a preference for generalist managers. Often in the banking world, departmental siloes such as front, middle, and back offices with clearly tasks and jobs, are locked in place due to decision taken long in the past. For many such companies, teams able to handle advanced technologies are overtaxed and elite teams are often controlled by vendors. All these elements are not unique to Japan, but the presence of

so many such features in combination makes Japan's global banking institutions an especially interesting hothouse for observing Digital Transformation under challenging circumstances. In particular, conditions in place in advance of change that make it possible, antecedents, can help understanding of success and failures in Digital Transformation efforts. Thus, there may be positive and negative lessons to be learned through examination of Japan's major banking firms as they undergo Digital Transformation.

To learn from such an organization, we investigate the antecedents of BMI and the outcomes. This research elucidates the process and motivations of Digital Transformation at a large Japanese financial institution. Research questions posed in this study include: 1) What are the antecedents of a large, globalized Japanese financial institution to undertake Digital Transformation? 2)What specific barriers does such an institution face when transforming and how do they overcome such barriers? 3) What kinds of lessons can be learned about internal and external stakeholders during Digital Transformation? Additionally, this study contributes to theory around the concept of antecedents in BMI. In order to accomplish our goals, we review literature on BMI and Digital Transformation. We then present the case and thereafter we present and discuss findings from the case.

2. Literature Review

Digital Transformation has been widely explained and commented in management literature. We take the view that it refers to deep changes in the processes, abilities and business models of an organization in ways that take full, systemic advantage of new technologies and associated new thinking and culture to create new value offerings and constellations of actors (Hinings, Gegenhuber, & Greenwood, 2018; I-Scoop, 2016; Kavanagh & Bussa, 2015; Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2019). Digital Transformation can be seen as the logical culmination of a series of phases, for example Digitization, Digitalization, and Digital Transformation (Verhoef et al., 2021). It is further seen as an ongoing process that relies on continuous repositioning of the firm as phases of transformation cycle onward (Kääriäinen et al., 2020). To clarify it further, Digital Transformation does not refer solely to digitizing data, repeating analog processes in digital environments, or merely providing digital versions of conventional products and services. On the contrary, Digital Transformation requires technological changes as well as deep cultural changes. Other authors (Ifenthaler & Egloffstein, 2020; Teichert, 2019) highlight that cultural aspect is of vital importance as transformation involves people as much or more than technologies.

Digital Transformation in banking has been theorized as three phases that start with developing new channels and products, continue with adapting technology infrastructure, and move on to organizational changes (Cuesta, Ruesta, Tuesta, & Urbiola, 2015). This view is echoed by Rachinger et al. (2019). A countering viewpoint is that the three phases would include creating closer alignment between the business and IT, then becoming ambidextrous (able to exploit existing markets while developing new ones), and thereafter reorganizing based on capabilities (Sia, Weill, & Zhang, 2021). Yet others hold that organizational situating must first be clear before implementation of technology can succeed (Stewart & Khare, 2021). The situating process may become and ongoing state of awareness and positioning (Kääriäinen et al., 2020). Meanwhile resistance to change may center on employee acceptance (Kitsios, Giatsidis, & Kamariotou, 2021) as well as leadership by top management (Diener & Špaček, 2021). Another viewpoint is that misalignment of the business and the technology, or IT, sides is of particular importance in banking (Kitamura, 2020); if this is so, the two sides may be at loggerheads unless united in some manner. The external factor of digitalization in the environment of a financial firm, i.e. customers and regulators, may be particularly stimulating to Digital Transformation in financial institutions (Tsindeliani et al., 2022).

2.1 Antecedents to Digital Transformation

Simply, an antecedent means "something that happened before" (Cambridge English Dictionary, 2021). In academic writing, antecedent generally refers to conditions that come before and which possibly enable later states and events (Carnevale & de Dreu, 2006), and is used in business research to refer to chronologically previous conditions (Black, 1991; Hult, Hurley, & Knight, 2004). It is worth noting precisely that an antecedent state is not an event and not a goal, but a condition which may have unclear relationship to outcomes and final states (Carnevale & de Dreu, 2006). Thus, a statement to transform is not an antecedent, merely an event. If the staff actively seek to transform after receiving the statement, they are in a state of attempting to transform; and that is an antecedent. In the case of macro model, summarized by Verhoef et al. (2021), digitization and digitalization are antecedents to Digital Transformation. Antecedents have been considered widely in Digital Transformation as well as BMI as elements in place before Digital Transformation has completed (Foss & Saebi, 2017; Saebi, Lien, & Foss, 2017). The academic world has been charged to learn more about these, "As a minimal starting point, BMI theorizing should clearly identify the antecedents and consequences of the focal phenomenon." (Foss & Saebi, 2017, p. 211). We hold that Digital Transformation cannot happen with BMI as an output. Thus, we must consider the meaning of antecedents in Digital Transformation and BMI, yet no definition of "antecedent" has appeared nor has a method of selecting antecedents to consider.

Antecedents can be divided into internal and external (Böttcher & Weking, 2020; Demil & Lecocq, 2010; Zhang et al., 2021). Zhang et al. specify four external (market opportunity, situational factors, value network, technology innovation) and three internal antecedents (managerial cognition, internal resources and capabilities, and organization characteristics). Similarly, digital maturity has been identified as a necessary condition for Digital Transformation (Westerman, Bonnet, & McAfee, 2014); this would be an internal antecedent. Another internal antecedent is cultural readiness as a necessary precondition for Digital Transformation (Stewart & Khare, 2021). Another internal antecedent identified for Digital Transformation is the ongoing activity of positioning (Kääriäinen et al., 2020) a firm and its management; if the management cannot position and reposition, Digital Transformation is likely to fail.

2.2 Barriers to digitalization

Diener and Špaček (2021) summarize barriers to digitalization in banking from various studies as well as their own executive interviews arriving at eight categories: benefits (i.e. lack of public funding), customer, employee, knowledge and product, market, participation, strategy and management, technology and regulation. Specific barriers such as legacy systems, concerns about cyber security, lack of operations level skills, complexity (Gane, 2020; Khare, Khare, & Baber, 2020; Kitamura, 2020; Vial, 2021) that have been identified in the context of Japan and its banking systems seem to fall appropriately into the eight Diener and Špaček categories. Another challenge is that banks often have weak IT assets and are beholden to elite IT vendors (Slodkowski, 2022). Overcoming barriers, however, has been less well investigated in the literature although it has been identified as a target of investigation (Vial, 2021; Vogelsang, Liere-Netheler, Packmohr, & Hoppe, 2019). Some specific instances of overcoming barriers to digital transformation appear in the literature, such as external pressure in public service (Tangi, Janssen, Benedetti, & Noci, 2020), stakeholder pressure in logistics services (Cichosz, Wallenburg, & Knemeyer, 2020), scaling and coping in introduction of Agile (Fuchs & Hess, 2018), but work remains to be done.

2.3 Path Dependence in Banking

Decisions made in previous eras of an organization can directly impact the current range of action and the framing of issues. This is referred to as path dependence and can be found in corporate organizations including banks in Japan and elsewhere (Bebchuk & Roe, 1999). Specifically, sunk adaptive costs include corporate structures that are appear preferable even if recognized as inefficient (Bebchuk & Roe, 1999). Path dependence may limit or slow the ability of a firm to change for the better until the inefficiency of the status quo limits its own persistence (Schmidt & Spindler, 2002).

3. Methodology

In this study, we apply qualitative case study method that enables a holistic and in-depth overview of the case under the study (Yin, 2017). To study Digital Transformation in a real life context, we selected a major Japanese banking institution for this study. This case was selected as a typifying case, that is one which is likely to hold examples and insights that are similar to its peer organizations (Gerring, 2006). The case was also selected as it offers, based on the authors' network, a rare opportunity and high level access to institutions that rarely discuss their planning and experiences openly. Because of the access to high level decision makers, this case is positioned as a "thick" description of the organization, one which has considerable detail and takes on the case's own issues in its richly developed context (Stake, 2005). As a major MNE headquartered in East Asia, this case helps to work against the bias of selection in academic writing on international cases, wherein only a small number of leading MNEs, mainly Western, are investigated (Collinson & Rugman, 2010).

Two interviews were conducted with the global lead manager for Digital Transformation in September and November 2021. The interview in November was extended to include the head of IT and the global IT architect. In total, four interviews were conducted, each lasting 45-90 minutes. In terms of the conflicting interests of the financial business and IT services, the transformation executive and head IT executive could reasonably claim to embody both – a significant issue in their selection of strategic Digital Transformation goals – while the IT architect was entirely from an IT background. A follow up interview was held with the two senior executives in late February 2022. This follow up interview allowed confirmation of facts, timelines, explanatory graphics, while revealing new insights. The interview in September was completed by taking manual notes only and not recorded. The November and February interviews were recorded, transcribed by software, and notes were made which were scanned and shared among the authors. The automated transcriptions were checked by two of the authors in sequence to correct and clarify transcription errors and poorly audible sections. The transcripts and notes were subjected to a process which identified main themes and subordinate ones which were selected into categories with the participatory knowledge of the authors (Gioia, Corley, & Hamilton, 2013). In addition to identifying themes, data condensing (Miles, Huberman, & Saldaña, 2018) was conducted to simplify, organize, and interpret the data. Various approaches were taken including tabularizing quotes, creating a timeline, generating graphic representations of events and relationships, and establishing chains of states and events. In order to map chains of states and events (Miles et al., 2018), the transcripts and notes were carefully examined to determine sequence as well as possible root causes, triggers, and intermediate steps and states. Where root causes were unclear, they were subjected to a why-why procedure in which each answer to "Why did an event happen?" was iteratively subjected to another why until a root cause appeared.

In this case study analysis, we differentiate trigger events, root causes, antecedents, and milestone states, and milestone events as follows:

Antecedent: An ongoing situation or state, not a brief instant or action; it may be a permanent or short term state that is created or occurs without the effort of the firm; it may be internal or external to the firm; an antecedent may also be a cause or milestone state, but it is not a goal or end state. Example: Customers expect that the case study firm will upgrade a technology to become compatible.

Final (targeted or achieved) state: An outcome whether achieved or not yet achieved; this includes goals. Example: An innovated business model.

Trigger event: An instantaneous event or action. Example: A senior manager indicates that a new Agile process must be followed.

Root cause: An original cause of an event. Root causes may or may not be antecedent or states. Example: An event such as a new national policy change to 0 interest (root cause) caused a state of needing improved revenues, lower cost, and better ROI.

Milestone event: events (instantaneous or brief) that happen in the process of gaining a final state. Example: An expensive consultant is removed and replaced by an internal team.

Milestone state: Temporary states or states of partial fulfillment of final state. Example: Front Office staff become compliant and comfortable with the multiple sign offs required by Agile project management.

To select an antecedent appropriate to the analysis, there was a considerable latitude for maneuver. Our approach was to sort chronological states based on evidence from interviews, media, and collateral materials. Thus, a state of recognizing a need to change or recognition of an environmental input could be an antecedent. However, for example, a statement to change would not be an antecedent, it would be an event after that state. In previous works, researchers have chosen antecedents based on what "many researchers have concluded" as well as their "aim to study" (Bhatti, Santoro, Khan, & Rizzato, 2021). Other researchers have selected antecedents such as industry structure including market maturity (Waldner, Poetz, Grimpe, & Eurich, 2015), demands of partners (Tsindeliani et al., 2022), and firm's innovation capabilities (Kiani, Ahmad, & Gillani, 2019). In this study, a full list of antecedents is not presented, rather those antecedents deemed most pertinent were selected from the case data and are shown in Table 1.

Table 1: Selected antecedents from the case firm

Antecedent in this case	**Zhang et al. categories**	**Other research**
Intention to move from Waterfall project management	Managerial Cognition	(Berkani et al., 2019)
Perceived need to keep up with foreign firms for market share in Japan	Managerial Cognition	
Shrinking of domestic market	Value Network	
Perceived problem of siloes	Managerial Cognition; Organization Characteristics	(Tsindeliani et al., 2022) seek new partnerships
Revenue loss and cost increase due to zero and negative interest rate policies	Market Opportunity; Situational Factors	(Tsindeliani et al., 2022) low profit; loss of monopoly status
Service innovation capability ready	Organization Characteristics	Service innovation capability (Kiani et al., 2019)

Organizational readiness at top management level	Organization Characteristics; Managerial Cognition	Organizational readiness (Stewart & Khare, 2021)

The seven antecedents in the above table have been further explained in Table 2, in the findings section, in the context of related events. The event chains (Miles, Huberman, & Saldana, 2013) are shown from the root cause, progressing chronologically toward the as yet unachieved final targeted state.

4. Case

The case firm is a major Japanese financial institution, a household name in Japan and a recognized organization worldwide. The corporate body comprises independent bodies such as retail banking, securities, and other firms (we investigate securities firm in this case study). The firm is broadly separated into three siloes common in the financial industry: the front, middle, and back offices. The front office trades securities and sells products to investors. The middle office settles transactions. The back office includes siloes such as human resources, planning, and IT. As has been standard in the financial industry until recently, the firm operates on largely traditional lines with a clear divide between what is casually called "the business" and IT. The business generally refers to the commercial activities around finance such as trading securities and developing investment products and marketing those products to investor organizations. IT functions as a support service to the business by providing digital tools as requested. In order to create the large number of tools, IT is supported in turn by external technical consultants who outnumber the IT staff five to one. IT manages these projects and the business interacts with these workers through IT. The IT and business managers traditionally follow career paths that are in siloes, never to converge.

This traditional structure remains the status quo for the case firm and the transformation to a new structure is the subject of this case study. The firm's current situation and environment is an example of path dependence as the front, middle, and back structures were designed early in the firm's development in line with industry norms. The transformation is built on a variety of antecedents that came together chance and design.

The top management of the case firm recognized, perhaps 8-10 years ago, that problems and inefficiencies abounded. Profitability was especially under pressure because of Japan's zero interest rate policy. Fears were widespread in the industry that there would be a move to negative interest rates, which indeed occurred briefly in 2013 and restarted in autumn 2016. The experience of zero and negative interest rates created a key antecedent to Digital Transformation: recognition of the urgent need to improve profitability through operations improvement. To this Mr. H said a key issue is to "optimize the IT expense IT cost and then deliver more." The greatest motivation however comes from recognition of market challenges, "If we do nothing, we may lose opportunity." Meanwhile the Japanese market continues to shrink, Mr H pointed out and even the Japan based business now earns more from foreign customers than domestic ones. Mr. U underlined the symbolic importance of this recent shift. Additionally, there is recognition of other problems such as siloes, communication, project management, and managers lacking specialist skills. Recognition of problems has led to desire and willingness to undergo digital transformation. Ability to transform, however, remained lacking. Two major efforts, in 2014 and 2016, had been made to update traditional processes digitally, however these efforts failed in part because of not having suitably skilled leadership. In autumn 2017 and summer 2018, the case firm hired the two key informants of this study into global decision-making positions in order to overcome the barrier of management inability.

Mr. H was hired in autumn 2017 to a senior position to lead the modernization process. Mr. H arrived from a technology leadership position at a New York technology firm and with start-up experience at another firm as well as having been CTO at the Japanese branch of a major European bank. In short order he brought from the London office, on secondment, the global lead for technology architecture. Thereafter he hired Mr. U from the top operations position at the Japan branch of another leading European bank.

Mr. U had previously worked for the case firm as a back office business analyst but left in 1999 to work for other global banks. Over the following 20 years he lived in London and visited regional banking centers around the world. He was exposed to old problems, new solutions, and advanced technologies. In summer 2018, he returned to the case firm to work as the global head of transformation. Upon returning, he found many of the same legacy systems that had been identified as problematic when he had left the company in 1999. Moreover, there were more systems patch worked together by consultants to handle communications between legacy systems and new interfaces. Worse, a leading IT consulting firm had control of key operations technology, locking itself into a vital, and expensive, position. There was no strategy for correcting these issues, and many other issues had not even been specifically identified.

Despite the arrival of experienced talent, initial efforts and digital transformation did not succeed. The first steps toward transformation by Mr. U and Mr. H were to persuade senior management through logical argumentation about the right steps and urgency of action. However, these efforts largely failed due to resistance of top management to authorize major changes. The next approach was to institute a large scale modernization project with focus on Digital Transformation. This effort failed too. The following step was to have a leading technology manager from the London branch provide a training session to upper management about Agile development. The training was conducted but Agile processes were generally rejected. Nonetheless, our informants stated that this training made some positive impact on senior management and they were better prepared to perceive the needs and challenges facing the firm.

After these events, Mr. U and Mr. H committed to a novel way forward in which every new project develop according to Agile project management with more interactions and sign offs and all digitalized processes. They posited that each new project would bring satisfaction to both the business side and the IT side. No new projects would be done in the old way with waterfall processes and timelines; meanwhile old processes would slowly become extinct. Thus, a sort of Digital Transformation ratchet would be implemented that would eventually cause a major transformation bringing together the business and IT siloes while saving time, improving satisfaction, creating new financial products, and building in-house expertise.

Mr. U and Mr. H are of similar minds about leading the Digital Transformation at the case firm: every new, small project, will proceed with Agile, digital processes until all parties have transformed. The result will be an organization that has been de-siloed, is comfortable with Agile and Continual Delivery practices, has career paths for talented IT workers to develop into with higher pay and greater agency. Their advancement will in time mean an organization with greater technology capacity and less reliance on external consultants. This result will also allow for greater control of technology. To this end, Mr. H seconded the firm's Global IT Architect, Mr. K in this study, from London to conduct his work in Tokyo as a direct report to Mr. H. This long term process will have begun, but not completed, but the end of the current 5-year plan, 2019-2024.

While the new, transformed organization will not appear for some time, the ratchet devised by Mr. U and Mr. H appears to be working. By adapting and persevering, they have brought steady change to the organization.

Mr. K, the technology architect, is the “thin edge of the wedge” that Mr. U and Mr. H are using to incrementally bring the organization to the tipping point of change. Mr. K manages a key team that is globally spread out with about half the individuals in Tokyo. He is a technologist, but is fully aware of the nature of the social changes and interactions that must be conducted bit by bit to manage the intended changes. His position as a direct report to Mr. H, and, in matrix management, to an IT hierarchy, allows him to creatively play one part of the organization against another as the hierarchy elevates disagreements to Mr. U who naturally decides in favor of Mr. K. This interaction is part of the Digital Transformation ratchet. Although the Digital Transformation ratchet is already underway, only time will tell if the process can successfully lead to Digital Transformation of the case firm.

4.1 Inside the firm

Broadly speaking, top management, who are stakeholders at the case firm, support the mission of Mr. U and Mr. H to update and modernize the firm. Nonetheless they also represent a source of resistance to the specsifics of that mission. It is not clear how well they understand the benefits of removing siloes within the company and the steps toward that. It is also not clear that they fully understand, as the case informants do, that Digital Transformation is not a one-time project with a clear resolution, but a transmutation into an organization that constantly changes with or in advance of the environments that impact it. Thus, the top management may not always fully support the effort and may hinder it.

Stakeholders such as workers and middle level managers also are a source of resistance that blocks change. In some instances, resistance comes from the front office workers who need support from the back office – the old ways work from their point of view so new procedures may be hard to understand or seem pointless. This resistance is likely to fade, the case interviews tell us, as new projects resolve faster with better results and as the two siloes merge into one. Middle level managers often have an additional concern: namely that the process of managing Waterfall style projects is clear where as Agile management seems confusing. In Waterfall, the more they complete the more they justify their presence. However, in Agile, confirmation of progress and quality devolves to the individuals initiating and conducting the development work. These managers may then reasonably fear for their jobs and purpose. As workers in a Japanese firm, they do not face a direct threat of firing, however they may face irrelevance or removal to less compelling work and positions and even eventual loss of job through restructuring. In any case, they are not well motivated to support Digital Transformation. The arrival of Covid highlights this point about the employees in general. Of the workers sent home, only about 70% could in fact conduct work remotely, yet productivity remained the same, according to the case firm informants. The firm is thus tasked with repurposing 30% of the staff for other positions at a time when new and different skills are increasingly asked for.

4.2 Outside the firm

The environment around the firm includes an increasingly complex world of derivative products, savvy new fintech entrants, tough compliance policies, and competitive incumbent firms. The case firm has to maintain or improve its position by adjusting to the technology standards of customers and improving its reputation as technologically savvy. If it cannot do this, not only may customers leave, but employees, especially in key overseas locations, will likely leave to join companies they feel can pay better or more successfully defend their jobs. Technology is judiciously developed in house or outsourced, depending on its centrality to the business and the degree to which it differentiates the firm from the competitors. The case firm has made partnerships with individuals and a university to create advanced technologies that differentiate them from competitors in relationships that will allow the firm to control the technology. At the same time a multi-year strategy is in place to replace at least some of the 2000 on-site IT contractors

with a subsidiary, bringing control and expertise to the firm. In these ways they are overcoming the barriers around limited technology skill.

5. Findings and Discussion

5.1 Antecedents

The general motivations of the case firm to attempt Digital Transformation are as one would expect: concerns about profitability and worries about losing market share. These motivations are also antecedents to Digital Transformation. Certain antecedents are of particular interest as requirements to or part of the mechanism of Digital Transformation. Nonetheless, the academic conversation has moved beyond the antecedents such as digitization and technological ability that inherent in any Digital Transformation. Of the other antecedents found in this case study, using the categories of internal and external (Zhang et al., 2021), the authors identify the following as required for the case firm to make progress:

Internal Antecedents:
- Intention to move from Waterfall project management;
- Perceived problem of siloes;
- Service innovation capability ready;
- Organizational readiness at top management level;

External Antecedents:
- Revenue loss and cost increase due to zero and negative interest rate policies;
- Shrinking of domestic market;
- Perceived need to keep up with foreign firms for market share in Japan;

The seven antecedents are set within causal chains (Miles et al., 2018) in Table 2 below. The causal chains trace change from root causes through triggers that set the process in motion to antecedents to milestones to final states. From these causal chains we learn how the antecedents came to be and how the changes they presage proceed. Each chain leads to current states that are new; nonetheless, all the chains are in progress and none have completed. The chains show see the process overall and in detail.

Table 2: Event-state chains

	Chain 1	**Chain 2**	**Chain 3**	**Chain 4**	**Chain 5**	**Chain 6**	**Chain 7**
Root cause	Outsourcing practices of past 20-30 years	Concerns about low relative profitability	Awareness of technology gap	Legacy structures of previous decades	National policy	Concerns about low relative profitability	Pre-Transformation
Trigger(s)	Realization that cost is too high and technology is not under control	Arrival of Mr. U and Mr. H with inside knowledge about foreign banks in Tokyo.	NA	Realization that front and back offices are not aligned	NA	Hiring of Mr. U and Mr. H	Failures in 2014 and 2016
Antecedent	Intention to move from Waterfall project management	Perceived need to keep up with foreign firms for market share in Japan	Shrinking of domestic market	Perceived problem of siloes	Revenue loss and cost increase due to zero and negative interest rate policies	Service innovation capability ready	Organizational readiness at top management level
Milestone event(s)	Individual projects done by Agile	New technology partner appeared; New AI marketing technology created; New price prediction tool created; Strategy to reduce the 2000 consultants	Hiring of Mr. U and Mr. H	Individual projects done by Agile	Decision to seek substitute revenues; Development partners found; New development started; Resources allocated to create substitute revenue sources;	Mr. U and Mr. H became aware of low capacity of innovation; Mr. U and Mr. H built innovation capacity	Willingness to hire Mr. U and Mr. H
Milestone state(s)	Recognition from Front Office that Agile works; Recognition	Confidence in ability to make new products	Successful project deliveries	Recognition from Front Office that this works;	Development in process	Development in process; Successful project deliveries	Hiring of Mr. U and Mr. H

	from upper management						
Achieved state	Recognition of successes	New product on market	Some products created	NA	New product on market	Proven ability to create	New processes in place; New processes normalized
Final targeted state	Full implementation of Agile practices	Improved profitability	New cadre of highly skilled IT workers; Closing of the gap.	Career path from IT to front office	Improved profitability	New products to offer; New revenue streams	Transformed organization

Key points from Table 2 are as follows.

Chain 1
Decades of outsourcing have left the firm with a rigid process where IT gains little skill and users (front office) have low expectations and no sense of shared responsibility. Incremental move to Agile is gaining recognition, an important part of gaining support and overcoming barriers among management and workers.

Chain 2
Recognition of poor profitability has galvanized Mr. U and Mr. H to create new products. These are part of the Digital Transformation as they are early successes that allow new thinking and revenues. As a result of the intervention of Mr. U and Mr. H, this chain has been very productive with four milestone events that have high impact on the firm.

Chain 3
There was awareness of the technology gap before the hiring of Mr. U and Mr. H. With them, however, came precise knowledge of the gap and strategies to close it. Thus this chain is of key early importance in the firm's movement towards transformation.

Chain 4
In siloes, IT and Front Office have no mutual interests other than as client and customer. Faster and better product development is possible if they are aligned. A career path from IT to Front Office would create motivated specialists who could add value to the firm and their own work. This chain represents the most important thread in the overall success because it should unify the motivations of groups that are central to the bank's profitability and competitiveness.

Chain 5
Revenue losses from lending (zero and near zero interest rates) and the expense of holding money (negative interest rates) made it necessary to seek new products and revenues. Multiple states have been achieved, and the firm's operating profitability may be improving.

Chain 6
Recognition of poor profitability has caused Mr. U and Mr. H to gain cognizance of the weakness around innovation. In turn, this awareness galvanized them to create new products. These are part of the Digital Transformation as they are early successes that allow new thinking and revenues.

Chain 7
This is a historical chain which set the ground for the hiring of Mr. H and Mr. U who built on the lessons of previous failures. This new team selected an incremental approach after trial and error. The vision for the final targeted state is not fully clear.

Previously we introduced three approaches to understanding Digital Transformation in three phases. One is that new channels and products lead to adaptation of the technology infrastructure and that leads to organizational changes (Cuesta et al., 2015; Rachinger et al., 2019). Another is that alignment of the business and IT is followed by organizational ambidexterity and reorganization (Sia et al., 2021). The third is that misaligned business and IT can become aligned and a united, situated organization can move into technological change and transformation (Kitamura, 2020; Stewart & Khare, 2021). The case firm's

experience lends credence to the last of these three as it is the changes at the top of the organization that are leading to alignment that develops incrementally from the bottom up in addition to the acquisition of new technological skills and infrastructure. It is too early in the arc of this story to know if an ongoing state of positioning (Kääriäinen et al., 2020) will develop, but currently and over the past year, awareness in the case firm's top management has become strong and continues growing. Thus, there is partial confirmation of organizational change leading technology and culture transformation as posited by Kitamura (2020) and Stewart and Khare (2021).

5.2 Barriers

Barriers include the top management, middle management, the mindsets of the business (Front Office) and IT sides, previously weak leadership, the siloed structural relationship of IT and consultants to the Front Office, and the lack of technical ability. These barriers are however dynamic and currently becoming weaker. Top management largely agrees that Digital Transformation must happen in order to prevent a long term downward spiral of the case firm. However, they are not fully comfortable with Agile management and the updated practices proposed by Mr. U and Mr. H. The barriers related to the top management are becoming weaker due to repeated messaging, explanations, and the arrival of various successes. At the same time, pressure from outside the organization grows, for example 2021 was the first year in which the domestic share of the case firm's total business was less than the share of foreign business. This decrease is part of a well understood long term trend, nonetheless Mr. H and Mr. U described it as an important psychological event that built support for their transformation efforts. This kind of pressure from outside an organization has been described in other industries (Cichosz et al., 2020).

The mindset of Front Office and IT staff is also changing and becoming more favorable toward the targeted changes. As Mr. H pointed out, "Maybe front office already switched to that model." For the Front Office workers, the benefits are clear in that they get better project results faster from IT. As for IT, they may have a tendency to resist until they are aligned more closely with the business as represented by the Front Office (Kitamura, 2020). Withal, Mr. K shows some pessimism saying, "we have two defensive organizations ... things could get very difficult." New procedures brought an uncomfortable feeling to some IT managers of losing control, "But the rest of the management, ...obsessed with control. …because in Agile way you do pass the control," said Mr. K. Nonetheless successes may make these parties more accepting of change. As Mr. U indicated, "IT and Front Office can see this is better." Additionally, once a procedure is established, those individuals may not return to previous management and interaction protocols. There is "no going back" as Mr. H and Mr. U flatly declared; they enforce the ratchet as a matter of operations policy. Employees at the middle of the organization appear to remain weak in leadership talent, especially regarding technology, Agile management, and horizontal work. Thus employees as well as knowledge remain issues as found in other banking cases (Diener & Špaček, 2021). Meanwhile new partnerships have given rise to new services and products. Alignment of IT and business motivations and goals (Kitamura, 2020) will allow organizational evolution (Stewart & Khare, 2021) that seem poised to enable deeper transformation.

The most important way barriers are being overcome is the ratchet mechanism that allows expansion of digital and Agile processes but blocks a return to Waterfall (see Table 3). Thus far, three years into the five-year plan and two years after the start of transformation activities, the ratchet appears successful. Project managers, workers, and consultants have no choice but to use digital Agile processes. For the time being, it is successfully moving the firm bit by bit closer to its Digital Transformation goals, as seen in Table 2 above. The question remains, however, as to whether or not the ratchet will prove fast enough at delivering new products and cost efficiency to prevent the firm from losing market share irretrievably.

Table 3: How barriers have been overcome

Barrier	**How overcame or overcoming**
Upper management	Iterative messaging; New products now available; Increased external pressure
Front Office worker mindset	Satisfied with outcomes
IT worker mindset	Not allowed to return to Waterfall; Preparing new career paths
Middle Managers	Not allowed to return to Waterfall; Satisfied with outcomes
Weak leadership talent	Hired Mr. H and Mr. U from outside the firm
IT and Consultant relationship to Front Office	Not allowed to return to Waterfall; Developing core group that will become a subsidiary; Preparing new career paths
Siloed Front Office and IT	Preparing new career paths
Lack of strong technical ability	Developing core group that will become a subsidiary; New partnerships; Preparing new career paths;

5.3 Lessons

Although the case firm's transformation is in process, there are several lessons to be drawn from their progress so far. Regarding internal stakeholders, a key issue is to gain the support of top management through repeated messaging and presentation of new outcomes, especially new technology based products. In order to gain those new products, it is necessary regain control of core technologies instead of hiring consulting firms. This in turn requires making partnerships with manageable individuals and organizations based on contracts. Regarding digital restructuring of the organization, the most important point however is to create career paths that unifies the motivations and purpose of workers in the IT and business siloes and which allow them to transcend the siloes as they cooperate.
With consideration of internal stakeholders, we draw the conclusion that preparing the organization itself is a suitable approach as proposed by Stewart and Khare (2021) rather than seeing technologies as a prerequisite to Digital Transformation as has been widely proposed. New technologies and the products and services based on them are instrumental, but not prerequisite, for Digital Transformation. This case demonstrates that the top management needs to gain sufficient awareness and willpower to move forward. In part this may come through hiring of figures powerful enough to act even without the wholehearted support of the top management. The sequence of major events in the case firm was the at least partial realization of the top management of the need to act, the hiring of skilled upper level executives, introduction of new management techniques, development of new products and services, and the implementation of a gentle but irreversible move towards new practices and ultimately realignment within the organization.

Lessons regarding external stakeholders are to control and minimize those IT consulting firms which own key segments of technology. Because the external IT consultants may not directly communicate with the business side due to labor laws around dispatched and permanent workers, they must largely be eliminated or brought into new structures inside the firm. Any new relationships must be contractually designed to minimize development risks and to maintain decision making power over use and development of any output. The most important lesson of this case firm however may be development and use of the Digital Transformation ratchet which works in small but irreversible steps to win over workers and management while imprinting digital processes on workers at all levels and slowly removing the silo barriers to cooperation.

5.4 Limitations

Some limitations in this study include the qualitative nature of the data. Such data cannot be reliably interpreted however the authors have used a process of writing and confirming with the informants to be reasonably sure of their understanding. Where the researchers have not been accurate or have introduced errors, the informants have corrected and explained further. Additionally, the researchers have posed specific follow up questions to the informants to gain clearer understanding. Lastly, in order to triangulate (Urquhart, 2001) meaning, the researchers have reviewed information from the case firm website and news media. Due to the strategic level of decision making needed to create Digital Transformation, the researchers have interviewed only three members of the organization, each with significant decision making power. In the future, the authors plan to interview also lower level staff to discover their experiences. Ultimately, qualitative studies are generalizable only with caution and expertise. Case studies may not be generalizable, though application of theory such as path dependence may help to expand validity beyond the immediate horizon. We hope that this study contributes insights to those studying and transforming major financial institutions in Japan and around the world.

6. Conclusions

Important findings in this case study are that barriers are being overcome through small steps, enforcement of new management policy, and consistent messaging. The small steps have allowed individuals to experience success and built confidence, and awareness, among the workers and managers. Enforcement of the policy to employ digital processes and Agile techniques with no return to analog processes and Waterfall management has consolidated gains made by individual successes. Meanwhile, consistent messaging from top managers such as Mr. H and Mr. U has led to clarity about and confidence in the transformation process.
Further, a longer term vision proposes purposeful development and creation of opportunity for IT staff who have been previously locked into an engineering silo. The benefits of this goal are unclear as insufficient time has passed for examples of success to appear.

To conclude this case study, we must answer whether or not the changes created by the ratchet mechanism are transformative or not (Table 4). To be transformative, Digital Transformation must change the organization, its digital infrastructure, and its digital building blocks of the organization (Hinings, 2018). Additionally, the thinking of managers and the culture of the organization must show change (Ifenthaler & Egloffstein, 2020; Teichert, 2019). All these changes must be substantial, not superficial, temporary, or trivial (Westerman et al., 2014). Lastly, the organization should enter a state in which digital change is constant and iterative (Kääriäinen et al., 2020).

Table 4: Transformative or not

Transformational Goal in Progress	**Example**	**Transformative?**
Organizational Structure	Siloes between business and IT broken down.	Not yet. This will be a radical change from current practice and radical for the industry.
Digital Infrastructure	Digital processes of Agile management are in place. While algorithmic trading has been in place for some years, the upcoming level of sophistication will see humans removed from the trading loop.	Partly. A complete change is underway from analog process to new, digital only process.
Digital Building Blocks	Rather than separated job descriptions managed by traditional HR, one former silo provides human talent to the other as the siloes merge.	Not yet. These changes are not yet fully developed.

Cognition	IT workers can see a path that improves their careers and incomes while benefitting the firm. IT workers' successes build corporate success. From IT engineers as servants to becoming digital capable traders.	Yes. Current cognition is only about engineering.
Culture	From Waterfall micromanagement to Agile horizontal management.	Yes. Agile represents a sharp departure from previous practice.
Change becomes constant	The Digital Transformation ratchet makes constant progress. Meanwhile the business and IT workers have embarked on a continuous journey of building their skills and tools.	Yes. The experience of change is evolving from rare, large projects to constant small steps.

6.1 The verdict on success

As of this writing, it is too soon to confirm that the Digital Transformation in the case firm is fully successful. For the moment however the Digital Transformation ratchet is in place and bringing satisfaction to workers and managers. This shows that a path dependent status quo in the banking industry can be approached by an incremental process. A major future milestone will be when an IT engineer moves to the trading group and builds their own tools with support of IT workers. In conclusion, the Digital Transformation ratchet appears to be a successful approach for this global corporation that is catching up to its overseas peers.

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