EFFECT OF AGILE AND SCRUM ON THE BUSINESS-IT ALIGNMENT AGILITY IN THE BANKING SECTOR

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PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE DEGREE OF
MASTER OF INFORMATION SYSTEM

FACULTY OF INFORMATION SCIENCE AND TECHNOLOGY
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI
2022

KESAN PENDEKATAN AGILE DAN SCRUM TERHADAP PENJAJARAN
BISNES DAN TEKNOLOGI MAKLUMAT DI DALAM SEKTOR PERBANKAN

VU DINH THANG

PROJEK DIKEMUKAKAN UNTUK MEMENUHI SEBAHAGIAN
DARIPADA SYARAT MEMPEROLEHI IJAZAH
SARJANA SISTEM MAKLUMAT

FAKULTI TEKNOLOGI DAN SAINS MAKLUMAT
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI
2022

DECLARATION

I hereby declare that the work in this project report is my own except for quotations and summaries which have been duly acknowledged.

09 March 2022   VU DINH THANG
                                                     P110968

ACKNOWLEDGEMENT

ABSTRAK

Perkembangan teknologi kewangan (fintech) sedang mengubah perkhidmatan kewangan yang mencabar organisasi bank untuk mengembangkan perniagaan mereka dalam era digital hari ini. Salah satu cabaran kritikal adalah untuk mengekalkan penjajaran perniagaan dan teknologi maklumat (IT). Fintech telah mengaburkan lagi perbezaan antara perspektif perniagaan perbankan dan fintech sebagai perspektif inovasi IT. Penggunaan fintech yang masih berkembang dalam organisasi perbankan memaksa mereka untuk menjajarkan semula perniagaan dan IT mereka agar kekal berdaya saing dan tangkas menghadapi gangguan teknologi masa hadapan. Kesedaran itu telah mendorong bank untuk menggunakan pendekatan Agile dan Scrum untuk menyelaraskan perniagaan dan IT mereka. Bagaimanapun, keberkesanan pendekatan khususnya untuk penjajaran perniagaan-IT adalah tidak pasti. Oleh itu, kajian ini bertujuan untuk mengenal pasti kesan pendekatan Agile Scrum terhadap dimensi ketangkasan penjajaran IT perniagaan organisasi bank. Kajian menggunakan pendekatan kualitatif melalui kaedah kajian kes yang dijalankan di dua buah bank. Data dikumpul menggunakan temu bual separa berstruktur, nota lapangan daripada pemerhatian, dan dokumen rasmi yang dianalisis secara tematik. Penemuan utama menunjukkan bahawa Agile dan Scrum mempunyai kesan positif dan negatif terhadap ketangkasan penjajaran IT perniagaan. Pengetahuan tentang kesan menyumbang kepada menyokong organisasi bank untuk mengubah ketangkasan penjajaran IT perniagaan mereka daripada penggunaan fintech.

ABSTRACT

The development of financial technology (fintech) is changing financial services which challenge bank organizations to evolve their business in today's digital age. One of the critical challenges is to maintain its business and information technology (IT) alignment. Fintech has further blurred the distinction between the banking business perspective and fintech as the IT innovation perspective. The use of fintech that is still evolving in banking organizations forces them to realign their business and IT in order to remain competitive and agile to future technological disruption. That realization has pushed banks to adopt the Agile and Scrum approach for aligning their business and IT. However, the approach's effectiveness, particularly for the business-IT alignment, is uncertain. Therefore, this study aims to identify the effect of the Agile Scrum approach on the bank organization's business-IT alignment agility dimension. The study applies a qualitative approach through a case study method conducted in two banks. The data is collected using semi-structured interviews, field notes from observation, and official documents that were thematically analyzed. The main finding showed that Agile and Scrum have both positive and negative impacts on the business-IT alignment agility. The knowledge on the impacts contributes to supporting bank organizations to transform their business-IT alignment agility from fintech.

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LIST OF ABBREVIATIONS

BITA	Business-IT Alignment
SAM	Strategic Alignment Model
SAMM	Strategic Alignment Maturity Model
KYC	Know Your Customer
EKYC	Electronic Know Your Customer
EA	Enterprise Architecture
SOA	Service-Oriented Architecture
BPM	Business Process Modelling
COBIT	Control Objectives for Information and Related Technologies
ITIL	IT Infrastructure Library

INTRODUCTION

1.1 CHAPTER INTRODUCTION

Nowadays, the world is growing increasingly digital, and it is constantly evolving. Banks are attempting to adapt to changing economic conditions by aligning their information technology (IT) strategy with their overall business plan. Agility and business-IT alignment have become increasingly relevant and crucial subjects for the banking sector due to the rise of financial technology. This chapter explains the topic's research background, scope, issue statement, and research question, as well as the study's structure.

1.2 RESEARCH BACKGROUND

Business IT alignment (BITA) is defined as "the degree to which business and IT depend on the other and share their domain knowledge to achieve a common goal" (Njanka et al. 2021). It is frequently ranked as one of IT managers' top ten management concerns (Kappelman *et al.* 2019). Many firms across most industries have acknowledged the relevance of aligning business strategy with IT strategy to enhance performance and compete more successfully.

One of the industries in which BITA has become an essential component in the banking industry. The use of information technology to deliver banking services to consumers efficiently and effectively and allow customers to access financial services has become more crucial than ever. For several decades, banks have made significant investments in technology to increase the efficiency of the financial innovation system (Omarini 2018). The introduction of checks as a payment method in 1945 marked the beginning of the history of technological innovation in the financial industry. Following

that, the Bank of America produced the first credit card in 1958. Nine years later, ATMs were introduced to help in the processing of financial transactions, followed by the introduction of a debit card as a transaction tool. Internet banking was introduced in the 1990s, aided by the advent of the Internet (Suryono et al. 2020). Various technology innovations focused on financial/banking services, such as electronic fund transfer at the point-of-sale (EFTPOS), have emerged in the financial environment. During this stage, banks shape business models based on technological advances, and they achieved remarkable success, especially with Automated Teller Machine (ATM cash dispenser), Mobile banking, and Internet banking. As a result, technology enables financial institutions to provide their services, transactions, operations, and facilities in novel ways. As the usage of the internet increases and includes all parts of people's lives, consumers become happier due to the more comfortable, gratifying, and inexpensive techniques and without decreasing the standard quality of services.

Internet technologies have had a significant impact on banking because almost every banking business process relies heavily on data processing. The introduction of information technology has significantly increased the speed of these processes while lowering operating expenses and improving internal interactions between banking units and interrelations with current and new customers. As a result, banks have placed a greater emphasis on technological factors and the application of new technology in financial services (Omarini 2018). In general, banks are continually adapting to new technology, changing their business strategy via means of mergers and acquisitions, introducing new initiatives based on their IT skills, and responding to legislative changes (Labidi Pascal et al. 2016).

However, the appearance of financial technology (fintech) has changed the game. FinTech is materially changing financial services itself (King 2019). Technologies that allow rapid scaling because they are solving the big problems of financial. Artificial intelligence, blockchain, and cloud architectures are radically altering financial organizations daily. There is now a slew of huge, high-value fintech start-ups with established and successful client bases. These start-ups are transforming financial services far quicker than the banking institutions can adapt. Because of the fast emergence of fintech startups, conventional banks see substantially higher turnover on goods such as credit cards, loans, and payments (Wewege & Thomsett 2020). As

fintech firms have captured a share of this industry, and if this trend continues, it might be disastrous for traditional banks.

Normally, information technology (IT) in banks is viewed as a support factor that facilitates the business goal. However, this approach leads to a huge gap between them and fintech companies when technology plays a key role. Technology is currently affecting directly how business strategies are formed. The digital transformation is "the driving force of the new industrial revolution, which is concerned with the development of new information and communication technologies, where increased use of digital devices and platforms is changing the way customers do their banking, changing market expectations, and will also change the model of financial intermediation" (Dhar & Stein 2017). Consequently, misalignment in banks happens when banks cannot catch up with new technological trends and adapt business models to fit them.

1.2.1 The rise of fintech

The term "fintech" is a contraction of the two words "finance" and "technology". Following Leong & Sung (2018), fintech is introduced as "any innovative ideas that improve financial service processes by proposing technology solutions according to different business situations". Blake et al. (2016) referred to fintech as "the use of technology in the design and delivery of financial services". According to PwC (2016), "fintech" is the developing nexus between financial services and technology.

A broader definition, fintech is defined as "technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions, as well as the provision of financial services" by the Financial Stability Board (2017). Also, fintech is largely regarded as one of the top significant achievements in the financial area, and it is rapidly increasing, fuelled by favorable laws and information technology (I. Lee & Shin 2018). Initially, the word fintech was assigned to start-ups that employ cutting-edge financial technology; nowadays, the major participants in the financial industry, such as Apple, Yandex, Google, Samsung, Lending Club, and others, are also referred to be fintech businesses.

Fintech firms use innovative technology to improve the efficiency of financial services. Active companies in this sector are typically start-ups that offer customers services such as payments, financing and lending, retail banking services, investments, insurance, and wealth and asset management while attempting to navigate the robust traditional financial system that is trying to shape the financial market and generating a tough situation for traditional financial institutions and banks.

Banks have already been challenged for a few years, with the emergence of fintech businesses around 2015, mostly owing to stronger value propositions (M. Siek & A. Sutanto 2019). The phenomenon is known as 'Digital Disruption,' and it occurs when fintech affects the value proposition of a bank's products. Fintech businesses are referred to as disruptors because they pioneer disruptive innovation. They have the potential to "reshape the financial industry by cutting costs, improving the quality of financial services, and promoting a more diverse and stable financial environment" (Mackenzie 2015). Infrastructure, big data, data analytics, and mobile device technical advancements enable fintech companies to disintermediate established financial organizations by providing unique, specialized, and personalized services (Darolles 2016).

The rapid speed of payments (P2P payments), the ease of monitoring personal accounts, the availability of loans (crowdfunding), and other features distinguish fintech firms' services. Fintech firms are creating highly specialized financial services applications that lower customer expenses dramatically. As a result, fintech draws a greater number of clients. According to a report by (KPMG 2019), global investment in fintech companies rose from only US$50.8 billion in 2017 to US$135.7 billion in 2019, an increase of over 250 percent in two years. The figure for the investment increased significantly from 2015 and has not had a sign of slowing down yet.

Traditional banks are under increasing pressure to update their core business operations and services as technology-driven enterprises that provide financial services become more prevalent. As stated in (PwC 2016), 83 percent of financial institutions acknowledged that fintech start-ups threaten various elements of their organizations. Fintech has brought a surge of competition to the traditional banking industry, and it has the potential to disrupt pipeline value chains. (KPMG 2019). Ernst & Young (2017)

discovered that over 30 per cent of digital product users now utilize at least two fintech services, illustrating the hunger for new technologies, particularly where access to financial services was previously difficult or inconvenient. Almost 90 percent of banking executives believe they will lose business to disruptors in the near future (PwC 2017). Banks have become more concentrated on technological factors and the application of technology in financial businesses. (Omarini 2018).

1.2.2   How fintech dominated the financial industry

Fintech startups are leveraging technology innovation to capitalize on these aspects of banks' business models. These digital technologies frequently challenge conventional business models by introducing new and more efficient services. Startups and global technology corporations established customer-centric digital mobile applications in the banking services by inventing new technologies enabled service models, contributing to the growth of digital financial products. Fintech usually covers all aspects of the bank-customer relationship and creates digital alternatives that are more efficient, offer lower cost, better convenience, and provide an excellent customer experience. It covers the online provision of services, including lending, remittances, real-time cross-border payment, settlements, etc. It enables individuals and business owners to conduct various financial transactions without bureaucratic hurdles (Mehrotra & Menon 2021).

Cost savings suggested by digital technology improvements, enhanced and creative goods for customers, and a low regulatory load provide traditional financial institutions, such as banks, the capacity to influence almost all services they traditionally deliver. Fintech operators benefit from technological advancements in the following ways: decreased search costs, allowing for better financial market matching, Cost advantages in obtaining and processing massive amounts of data, less expensive and more secure data transport, and reduced verification costs (Navaretti et al. 2018).

The key technologies are AI, big data, cloud computing, blockchain, cybersecurity, machine learning, IoT, biometric identification and recognition, social networking, and mobile computing. They are becoming easier for accessing, less costly, and more trustworthy, frequently in smartphone applications. Moreover, big data, blockchain, and AI are three critical technologies for fintech's penetration of the Internet

and mobile internet. (M. Lee et al. 2018). In (Bhaskaran et al. 2019), the authors claimed that three emerging transformative technologies are driving the digital disruptions:

- Secure and Trusted cloud Platforms: The emergence of hybrid clouds with unprecedented security and trust that is optimized for AI and Blockchain at enterprise scale will be a differentiation in building the new digital financial services

- Enterprise AI for Smart Processes: AI is increasingly augmenting human decision-making and automating processes to transform Financial Services.

- Blockchain-powered Ecosystem: Financial institutions are connecting and partnering through new decentralized forms of trust enabled be Blockchains or distributed ledger technologies

Greater data availability and rapid developments in data processing skills are already allowing new rivals to compete with banks in various industries and areas.

1.2.3 The bank's response

Nowadays, most financial institutions and banks are giving special consideration to fintech and are paying close attention to their strategies for rivalry, cohabitation, and collaboration with fintech firms (Soloviev 2018). There are two main ways to catch up with this situation.

To begin, banks may gain a competitive edge by partnering with fintech companies creating or have already created a better method of providing financial services. By investing in fintech startups, banks may be granted exclusive right to use a certain application or license, allowing them to outperform competitors. This partner relationship helps banks safeguard their main activities (Hagedoorn & Duysters 2002). Furthermore, those investments give the bank direct control of the fintech's product development and service plans (Hornuf et al. 2021).

The majority of banks chose to develop their system. They concluded that "because fintech businesses have already had a substantial influence on the financial industry, every financial institution needs to establish skills to leverage and/or invest in

fintech to remain competitive" (I. Lee & Shin 2018). Today, banks continually produce new products, introduce new technology, and alter their business strategies. (Kokh & Kokh 2020). In the scope of this study, research subjects are the banks that choose the second approach.

1.2.4 Business alignment challenges in banks

There is a rivalry between banks and fintech firms. In the battle between fintech firms and banks, banks are being pushed to catch up with fintech firms, losing customers to them.

Fintech businesses with well-designed infrastructures and a low degree of organizational complexity may be nimbler, develop quicker, and take a more radical approach to innovation (Brandl & Hornuf 2020). On the other hand, traditional banks find it more difficult to react to new technology innovations because they must follow more strict regulatory standards. When implementing significant organizational changes in a typical bank, many stakeholders must generally be persuaded. (Klus et al. 2019). Furthermore, online service developments frequently drown out the current distribution networks of banks (Vendrell-Herrero et al. 2016), creating new distribution channels. Traditional banks' slowness to react to digital issues has ramifications at a single bank and the total financial ecosystem. Due to the increasing organizational complexity and the legacy infrastructure, banks must reorganize their ecosystem to deliver better digital services to retail and commercial customers.

Since more activities are made available online and technology begins to disrupt value chains, banks seem to become victims of disintermediation. One of the key factors why the banking sector is compelled to acclimate to this new reality is that fintech owns agility (Anagnostopoulos & Ioannis 2018). Fintech companies are constantly, first of all, in the marketplace with strong points on a technical platform that accounts for the vast bulk of everyday access to financial services.

To adapt to the new situation, many banks partner with fintech firms. According to Anand & Mantrala (2019), 54 percent of banks collaborate with fintech companies when asked. On the other hand, a lack of agility can harm this cooperation with more dynamic fintech and technology enterprises. If a start-up delivers a new version of its

app every few weeks, whereas banks have a product release cycle of three to six months, the cultural clash will be in danger. Most organizations are just not able to operate at a faster pace. As a result, the benefits of partnering with an agile firm may be entirely missed, or worse, the relationship may fail.

Nowadays, banks are confronted with quick and dynamic changes in the new business situation, making agility a crucial step in gaining a competitive edge. To stay afloat, most banks must continuously change their tactics. They fight to keep up with new technology, build new projects based on their available IT skills infrastructure, and modify their business strategy through mergers and acquisitions.

The grand challenge for today's banking sectors, which is focused in this research, is the agility of business-IT alignment in a rapidly changing environment. Gartner (2014) defined the 'digitalization' age as "a time defined by profound innovation beyond process optimization, exploitation of a bigger universe of digital technology and information, better-integrated business and IT innovation, and a requirement for much quicker and more flexible capabilities". Today's businesses must be able to deal with the uncertainties of a constantly changing environment (Mingay & Mesaglio 2016).

Boar (1994) also claimed that organizations need to "build, align, and develop competitive advantage through the empowerment of information technology/ systems in response to the challenges of global competition". Furthermore, expanding complexity and competitiveness create an environment with a high level of inherent uncertainty in which senior management can no longer forecast or anticipate strategically crucial movements by other market participants. Organizations must thus become more agile, and their changes must be implemented on a considerably quicker timetable than previously. In summary, agility remains the optimal solution for this alignment to remain scalable and dynamic despite the events that did not trigger over time.

1.2.5 Agile approach for banks

According to King (2019), more and more banks are following the Agile approach to catch up with the new situation. Compared with the traditional approaches the banks are using such as Waterfall or V-shaped, Agile has an outstanding advangace with the

ability to deliver products early and connect business and IT. This is the reason why 70 percent of surveyed companies indicate an ambition to integrate both Business and IT-enabled Agile transformation in the next year (KPMG 2019a). According to Digital.ai (2020), financial services ranked second in top industries using Agile, and 47 percent of respondents applied Agile for improving business-IT alignment.

Under the umbrella of Agile, there are many frameworks that have various characteristics. However, they all have the same goal which is helping the organization to conduct Agile Transformation and achieve maturity later. Many notable names can be listed: Scrum, Crystal, Kanban, and Extreme Programming. Among them, Scrum is the most prominent name with 58 percent of companies are using Scrum as their Agile framework. Overall, it can be seen that Agile and Scrum are the most preferred approaches in software development and aim to enhance business-IT alignment. Therefore, Agile Scrum and its influence need to be thoroughly investigated and that is also the goal of this study.

1.2.6   Business-IT Alignment approaches

Recognizing the importance of business-IT alignment to an organization, many approaches have been established. They used different frameworks and methods from various aspects of information technology to maintain business-IT alignment after a disruption. Differentiate perspective of each approach to aligning business and IT, consequently resulted in different aligning methods. Approaches to BITA have been classified by Chen (2008) into three groups:

- Alignment via architecture: This approach utilizes architecture analysis and design techniques to assure proper alignment. They provide a way to enable cross-functional, cross-discipline collaboration essential to articulating and implementing strategic business requirements. The architecture approach focuses on architectural adaptability and integration of applications via enterprise modeling. Enterprise Architecture (EA) and Service-Oriented Architecture (SOA) are two representatives of this group. They seek to align enterprise processes and structure with their supporting IT systems so that

enterprises can flourish in their environments. So far, there have been quite a lot of BITA studies conducted with EA and SOA (Zhang et al. 2018).

- Alignment via governance: There are some technical models and frameworks for achieving this kind of alignment such as Business Process Modelling (BPM), Control Objectives for Information and Related Technologies (COBIT), and The IT Infrastructure Library (ITIL). IT Governance such as COBIT, ITIL presents a comprehensive set of guidelines for defining, designing, implementing, and maintaining management processes for IT services from an organizational as well as from a technical perspective. They provide a management policy and align IT strategies with business goals, setting priorities and allocating resources. Therefore, business and IT become true partners when they can agree on realistic IT service levels that deliver the necessary value to the business at an acceptable cost (Esmaili et al. 2010). Meanwhile, the BPM tries to align business and IT domains by letting business analysts and application architects work on the same readily understandable model to obtain a software system. The BPM aims to almost no transformation between analysis, design, implementation, and execution (Dahman et al. 2011).

- Alignment via communication: The state in which business and IT executives/personnel within an organizational unit understand and are committed to the business and IT mission, objectives, and plans. Efforts are made to narrow the "culture gaps" between business and IT people, which have been a major cause for system development failure such as Strategic Alignment Maturity Model (SAMM).

Different from the above approaches, Agile Scrum affects all 3 dimensions. They change architecture (by forming Scrum team), change governance (by defining titles, laws, and events), change their way of business and IT communication (by collocating the team and creating transparency). Therefore, they can be considered as a new approach to sustain business-IT alignment and need to be studied thoroughly.

1.3   RESEARCH SCOPE

With the domination in the number of fintech services, banks are looking for solutions to protect and enhance business-IT alignment. Applying Agile Scrum in the software development process is one of them. Given this situation, the study covers the changes when the team moves from the traditional approach to Agile. The scope of the study is restricted to banking product development. This study's empirical investigation is limited to two banks in Vietnam, where the viewpoints of six managers were explored in interview sessions. As a result, the focus of this research is restricted to Vietnam and more especially, to banks developing their financial products.

1.4   PROBLEM STATEMENT

While there is substantial and well-established literature on business-IT alignment (BITA) in traditional IT systems, the agility argument is seemed to be disconnected from alignment research (Liang et al. 2017). Despite the high degree of social alignment that promotes agility (P Tallon & Pinsonneault 2011; Paul Tallon 2008), comprehensive direction on accomplishing this level of alignment is still missing. Current methodologies for integrating agility across an organization provide limited insight into the implications of BITA, because "most approaches primarily focus on the acceleration and optimization of IT delivery, despite agility becoming a more enterprise-wide goal" (Horlach et al. 2020).

Recurring implementation of new IT will disrupt any organization's business and IT alignment as there are significant changes to the roles and relationships of the new IT and the business. Such context is relevant to all organizations; hence the banks' use of fintech in their business is no exception. The bank business model is in danger of falling apart when there is a significant misalignment between the business and the current IT innovation, such as fintech. The consequences of a business-IT mismatch can be severe, including creating technological artefacts that are unfit for purpose, resulting in major financial losses, reputational damage, a loss of market share, client goodwill, and so on. Aligning IT with business objectives and a working, responsive approach in IT projects is critical in establishing a competitive edge in a fast-paced market like financial services. Therefore, it is urgent for BITA processes to be agile to let business

and IT remain continuously aligned. For banks opting to develop fintech applications or systems in-house, the Agile and Scrum methods are expected to facilitate the bank's management in the development and ensure the business, and IT are aligned. The target of Agile methodology and Scrum framework is increasing agility, and they handle it efficiently and effectively (Salah et al. 2014). However, studies on the effect of Agile & Scrum on Business-IT alignment are still limited (Aarnink & Kruithof 2012; Zhang et al. 2018). Addressing this problem will help provide an insight into the effect of Agile and Scrum with BITA at the bank and help managers decide whether to apply them to the organization.

1.5   RESEARCH QUESTION

The following research question is formed from the problem statement:

> What are the impacts of Agile and Scrum practices on the agility of Business-IT alignment in a banking organization?

1.6   RESEARCH OBJECTIVE

The objective of this research is to identify the effect of the Agile & Scrum approach being applied by banks towards the agility of its Business-IT alignment in two perspectives: Technology Potential and Competitive Potential.

1.7   SUMMARY

This research is organized and reported in five chapters. The essential principles, the issue description, and the study question are all introduced in the first chapter. The literature review chapter is the second chapter. The agility, business-IT alignment principles, and Agile & Scrum are examined and discussed in Chapter 2. The research approach is discussed in depth in Chapter 3. The results and discussion of the case studies are presented in Chapter 4. Chapter 5 formulates a response to the research question, provided in the conclusion.

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CHAPTER II

LITERATURE REVIEW

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2.1   INTRODUCTION

In order to introduce the issue statement and study question, the ideas of agility and business-IT alignment were briefly described in the introduction. These ideas will be further upon in this chapter. This chapter also covers the Agile methodology and the Scrum framework.

2.2   AGILITY

2.2.1   Introduction of Agility

Agility is defined as the capacity to detect changes in the environment (Lu K. et al. 2011) and react with dexterity, speed, and innovation (Roberts 2012). According to Tallon & Pinsonneault (2011), agility refers to an organization's capacity to recognize and react to dangers and opportunities in the environment. Roel J. Wieringa et al. (2003) concluded that business agility is the ability to notice possibilities in the situation and react swiftly and unexpectedly by collecting the necessary resources. For instance, the capacity of an organization's business operations takes advantage of environmental changes and carries out competitive activities with speed and efficiency. According to Tseng & Lin (2011), Agile firms should be able to adapt to a dynamic, uncertain, and unexpected business environment. As a result, agile businesses require several talents to adapt to the environment. "Responsiveness, Competency, Flexibility or Adaptability, and Quickness or Speed" are the four main characteristics of these capabilities (O.-K. Lee et al. 2015)suggested the capacity to promptly monitor and recognize changes, modify tactics flexibly, and adapt quickly to changing client needs are all important. Although there are different views, the common feature of these studies is that they all mention two characteristics: identify changes and respond to changes.

2.2.2 Agility Model

Holsapple & Li (2008) proposed combining principles from both disciplines into the two key components of the agility build: alertness to change (opportunities/disturbances) and response capabilities to change.
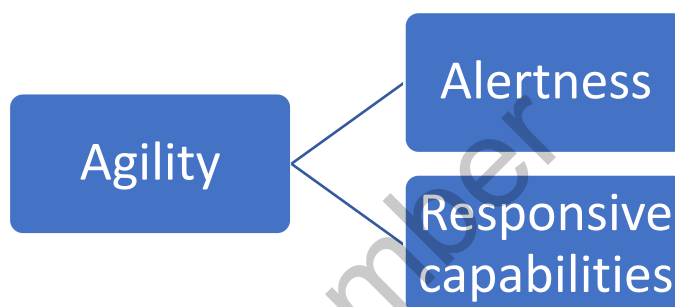
Figure 2.1   The components of agility (Holsapple & Li 2008)

From both external and internal perspectives, the alertness component stresses agility as an opportunity-seeking capacity. In contrast, the responsive capabilities dimension emphasizes agility as the "change-enabling capabilities ingrained in organizational processes" (Holsapple & Li 2008). The ability to select activities and activate actions are responsive capabilities to opportunities and disruptions. When an important change is identified or predicted, an organization must choose between many options. Intelligent decision-making based on insightful problem descriptions and excellent value propositioning abilities is required for good response-ability. The two elements of the agility construct are complimentary, notwithstanding their differences. Some scholars have suggested that awareness, or timely knowledge of changes (current or predicted) that might influence an organization, is a prelude to successful actions (Dove 2005; Holsapple & Jones 2005). Entrepreneurial alertness, according to Sambamurthy et al. (2003,) is also essential for response capacity activation.

2.3   BUSINESS-IT ALIGNMENT

The notion of business-IT alignment is explained in this section, followed by an examination of the strategic alignment model. It also underlines the advantages of aligning business and IT in enterprises.

2.3.1   Business-IT Alignment concept

Henderson & Venkatraman (1993) defined the business-IT alignment idea as "the degree to which the information technology mission, objectives, and plans support and are supported by the business mission, objectives, and plans". It is described by Reich & Benbasat (1996) defined as the connection between the business domain and the IT domain. In addition, various terminology such as bridge, harmony, and fusion was employed to describe alignment (J Luftman & Brier 1999; Smaczny 2001). Although there are slight distinctions between these words, they are all used as synonyms for business-IT alignment.

Several studies have recently demonstrated the favorable impacts of strategic business and IT alignment in enterprises on financial and economic criteria such as sales, growth, revenue, productivity, and reputation, especially in the digital age (Jorfi et al. 2017). The main advantages of IT-business alignment in a firm include improved cooperation, better competitive advantage, smoother organizational procedures and growth, higher return on investment, and performance enhancement (Njanka et al. 2021). According to other research, businesses that successfully link their operations with technology outperform those that do not (Arjan, 2012; Zhang et al., 2018). Precisely, they collected data from different companies and found that the companies that focus on the alignment achieved significantly higher financial performance, productivity, and customer benefit. Overall, the better business-IT alignment organizations have, the higher performance they achieve.

However, it is difficult for organizations to achieve sustained BITA in the highly competitive period, particularly facing the changes in IT, and rapid product lifecycles (Setyadi 2019). Imgharene et al. (2018) suggested that the BITA needs to be agile if the organizations aim to remain competitive by responding swiftly and changing as needed, and they proposed a model of change for Business IT Alignment (Imgharene et al.

2020). Many other researchers recognize Agile Scrum as an influencer to the BITA agility but mainly based on analysis of experienced scholars in the research field (Aarnink & Kruithof 2012).

2.3.2 Strategic Alignment Model

In 1993, (Henderson & Venkatraman 1993) created the Strategic Alignment Model (SAM), which is a conceptual model that has been used to explain strategic alignment from the viewpoints of four components: IT Strategy, Business Strategy, IT Infrastructure, Organizational Infrastructure and Process, and their interdependencies. This classic model is widely used and serves as the primary reference in business and IT alignment studies (Jambari & Hamid 2017). The SAM is also the most referenced alignment model, as stated by Chan & Reich (2007). A number of scholars utilized the SAM model as a foundation for developing and expanding the model for different sectors (Singh et al. 2017; Tafti et al. 2019). The SAM is demonstrated in figure 2.2
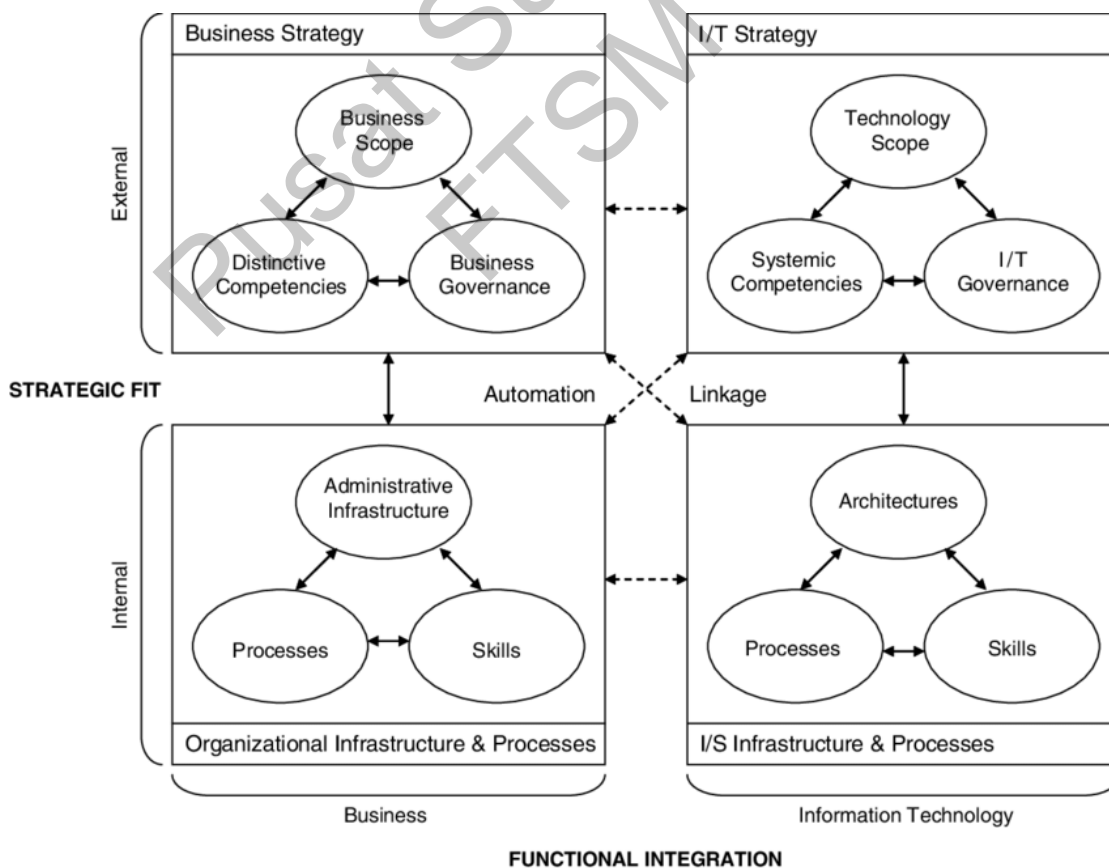

Figure 2.2   The SAM Model (Henderson & Venkatraman 1993)

Henderson and Venkatraman (1993) defined strategic fit and functional integration as two forms of alignment. The strategic fit refers to "the alignment of external domain business and IT strategy with internal domain business and IT infrastructure (internal domain)". The term "integration" refers to two different forms of business-IT integration. The four components of the model are:

- Business Strategy: the decisions about the company's stance in the product-market arena.
- IT Strategy: refers to the decisions made regarding the company's position in the software industry.
- Organizational infrastructure and processes: the decisions about specific internal arrangements and the work procedures and configuration of management structure.
- IS infrastructure and processes: internal arrangements and procedures govern the range and kinds of I/S products and services delivered to the organization.

From the outside, business strategy entails a link between the company's scope and specific skills. The IT strategy is a connection between the scope of the technology, the actual information technology, and systemic competencies, such as dependability, cost-effectiveness, and adaptability. Internally, the business strategy links administrative infrastructure skills and procedures, whereas the IT strategy links administrative infrastructure, skills, and processes.

Each domain has different factors, which are made up of three parts. This is described by J. Luftman (2000) as follows:

a.   **Business strategy**

Business strategy includes business governance, business scope, and distinctive competencies. The markets, goods, services, customer/client groups, locations in which a firm competes, and decisions such as product-market offering are all part of the business scope. The crucial success elements and core abilities that provide a company with a competitive advantage are distinctive competencies. This comprises its brand (the sort of product it makes), research, sales, production, cost, product development, price structure, distribution networks. The relationship between multiple parties,

including managers, investors, shareholders, and the board of directors is defined by business governance. It also covered how government laws impact the organization, how the corporation maintains partnerships and alliances with key partners and various "make-versus-buy" issues.

b.   Organizational infrastructure and processes

First, the administrative structure of a company refers to how it arranges its operations. Some examples are decentralized, functional, horizontal, central, vertical, matrix, geographic, and federal. Processes are a company's operational or flowing operations, including value-added activities and process optimization. Human resource skills such as training, acquisition, and development are essential to achieve the requisite organizational competencies.

c.   IT strategy

The significant information applications and technologies that support existing business strategy activities or potentially define a new one for the organization are referred to as technology scope. This is similar to the concept of business scope, which is concerned with product-market offers in the output market. The second component is Systemic competences, which are IT strategy capabilities (for example, system stability, interconnection, and adaptability) that may help enhance existing business strategies or even develop new business strategies. This is similar to the concept of company distinct capabilities, which is concerned with the components of strategy contributing to a firm's distinct advantage compared to competitors. Selecting and using strategies for achieving the requisite IT competences is referred to as IT governance. This is similar to business governance, which entails making or buying decisions in corporate strategy. The strategic partnership, technology licensing, marketing exchange, and joint ventures are just a few of the interfirm connections chosen. This section also covers project selection and prioritizing difficulties.

d.   IS/IT infrastructure and processes

The architecture specifies the technical goals, decisions, and policies that enable integrating hardware, software, application, networks, and data management in a single platform. This is similar to the internal business strategy area in articulating the firm's administrative organization, which includes roles, duties, and authority hierarchies. Practices and actions used to design, manage, and maintain applications are called processes which support the company's capacity to execute IT strategy. Skills refer as the individuals' knowledge and competencies necessary to properly manage and run the IT infrastructure inside the company is acquired, trained, and developed through skills acquisition, training, and development.

Henderson and Venkatraman propose four approaches for keeping IT and business in sync: Technology Transformation, Strategy Execution, Service Level, and Competitive Potential. The first two perspectives are influenced by business strategy, whereas the latter two are affected by IT strategy. Each perspective represents the interaction of three essential areas, which appear to form a triangle. This study specially deals with the Competitive Potential perspective and the Technology Transformation perspective as they are consistent with the objectives to identify the effect of the Agile & Scrum approach being applied by banks towards the agility of its Business-IT alignment in these two perspectives. This is because organizations that applied Agile will have one of two of these perspectives (Kanavittaya et al. 2010).   Moreover, Agile and Scrum require matching business strategy and IT strategy throughout the project from the planning phase. They play crucial key roles for the banks to face the current situation.

In Strategy Execution and Service Level perspectives, one of two sides is only considered as strategy implementer, and it does not influence the strategy. This is a "top-down" approach and not suitable for Agile methodology.
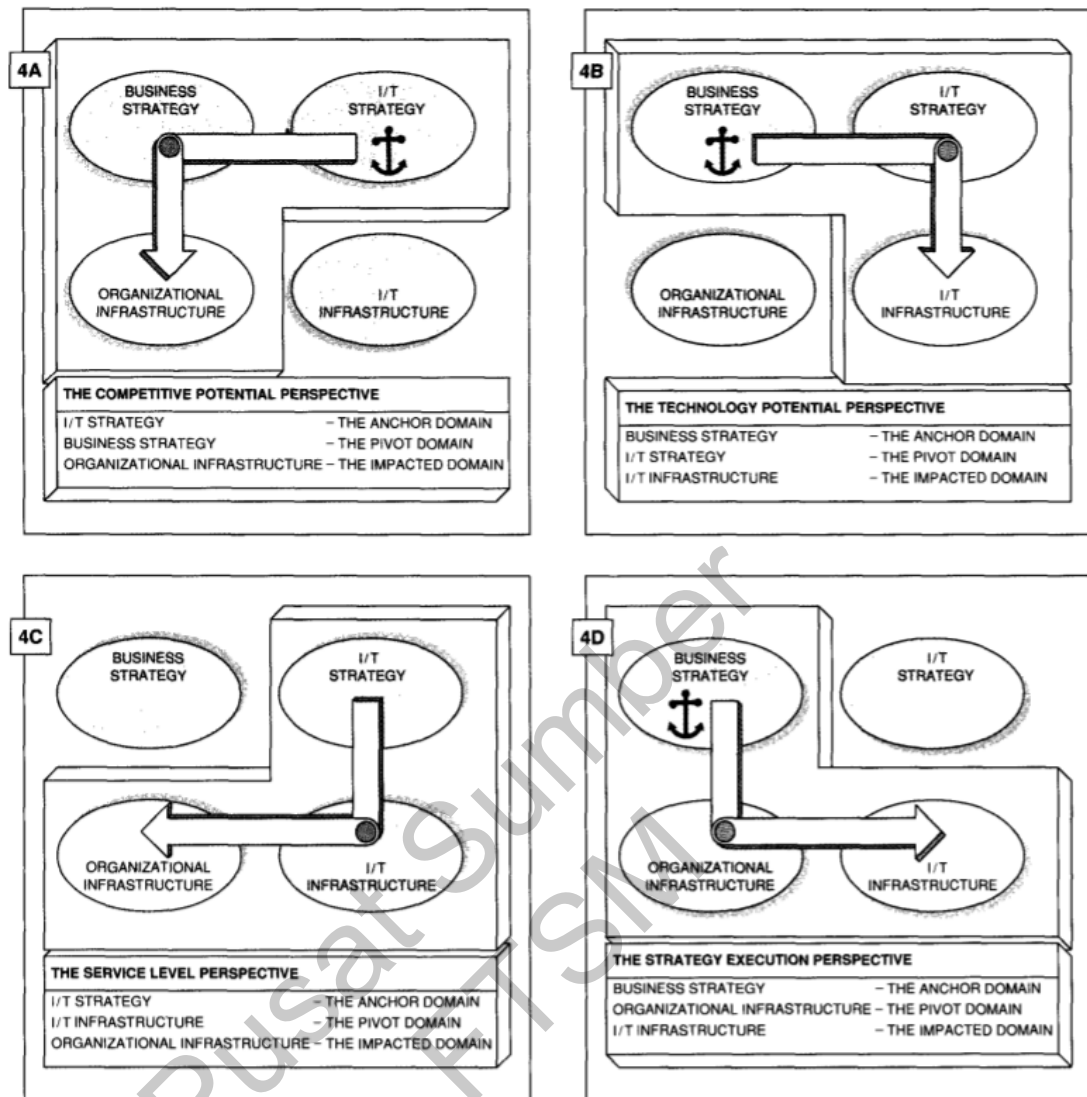
Figure 2.3　Alignment perspectives of the Strategic Alignment Model
(Luftman et al. 1993)

Figure 2.3 shows the four alignment perspectives and the relationships between the indicated domains. In addition, the domain roles of each perspective are highlighted. First, the anchors symbol represents the starting domain of the alignment flow. In each perspective, the first of the three boxes are called the domain anchor, the enabler of the perspective. It is the change driver and is in a strong position to direct the planning process. In other words, the domain anchor is the catalyst to help address the problems/opportunities of the domain pivot. Pivot is the intermediate domain involved in the alignment sequence. The domain pivot is usually the area where the problem or opportunity is addressed. The impacted domain is the end point of the alignment flow, represented by the arrowhead. It is the region that is impacted by the domain pivot shift.

i.   **Competitive potential.**

It is an operational approach that specifically assesses how information technology may be utilized to better a company's strategy, resulting in the transformation of its infrastructure (re-engineering). The strategy focuses on raising awareness, finding possibilities, and positioning the company to use information technology creatively, either individually or in combination. This viewpoint allows for business strategy change by increasing IT potentiality and underlines the need for a two-way relationship in which IT strategy may influence business strategy. The executive actively examines how to use technology to bring about significant change (which may lead to business transformation). It's vital that top executives be aware of information technology's potential, that their visioning processes are woken to new business or service prospects, and that they can assess the strategic value of information technology to their plans. It is crucial to employ technology scan techniques (finding or anticipating future technologies and mapping them). Rapid prototyping is a great way to see how technology will operate in a corporate setting.

ii.   **Technology potential / Technology transformation**

This alignment perspective entails evaluating the feasibility of implementing the specified business plan through adequate IT capabilities to facilitate new services and products. Moreover, it facilitates the adaption of business strategy through developing IT potentialities and determining the relevant internal IT architecture. Beginning with IT strategy, this perspective attempts to reveal the greatest potential IT skills through suitable IT market positioning and the related IT infrastructure and procedures. The company strategy is viewed as the driving force in this viewpoint. However, it does entail the development of an IT strategy to support the selected business plan and the definition of the necessary IT infrastructure and procedures. Technology Transformation entails evaluating the feasibility of implementing the chosen business plan via an effective IT strategy and defining the necessary IT infrastructure and procedures (Coleman & Papp 2006; J. N. Luftman et al. 1993).

2.4   AGILE METHODOLOGY AND SCRUM FRAMEWORK

Many organizations use agile as a development approach to produce high-quality systems (Rehman et al. 2018). Agile approaches emphasize people, their interactions with one another, working software, client cooperation, and change, rather than processes, tools, contracts, and plans. According to Digital.ai (2020), 95 percent of informants report their organizations practice Agile development methods and 47 percent of them adopt Agile to achieve business-IT alignment.

Agile and Scrum have claimed their usefulness in many decades. In 2019, a survey was conducted (Hayat et al. 2019) in over 21 companies. The result showed that Agile and Scrum have a highly positive effect on many aspects: scope, risk, time, cost, and human resources. Carneiro et al. (2018) claimed that Scrum benefits the organization by improving transparency, communication and facilitating higher quality deliverables. An analysis of the data indicated that there are three primary impacts brought by agile adoption (1) A temporary business stagnation; (2) Improvement in product quality; (3) Positive evolution in corporate culture (Hsu & Lin 2018).

2.4.1   Agile

Agile is a set of methods and methodologies that assist teams in working more effectively and making better decisions. (Stellman & Greene 2014). These approaches and processes address all aspects of conventional software engineering, such as project management, software design and architecture, and process improvement. Each of those approaches and methodologies is made up of practices that have been simplified and refined to make them as simple to use as feasible.

Agile is also a mindset because the appropriate mentality may make a major difference in how efficiently a team applies the techniques (Stellman & Greene 2014). Rather than having a leader make all the decisions, this model empowers team members to exchange expertise and make critical project decisions cooperatively. An agile mindset requires including the whole team in process improvement, design, and planning. As a result, the team creates procedures so everybody can receive the same information and has voices in how the practices are carried out.

Agile began when a small group of creative individuals got together to come up with a new way of thinking about these issues. The first thing they did was create the Manifesto for Agile Software Development, a collection of four basic ideals shared by successful teams and projects. They emphasize the new elements: "Individuals and interactions", "Working software", "Customer collaboration" and "Change responding" and argue that these factors are more important than traditional values such as "processes and tools", "documents", "contract negotiation", "following plan". The old values are not denied, but they are encouraged to prioritise the new values.

The Agile Manifesto contains 12 principles that developers must follow. These principles provide an idea of the type of culture technology companies are building based on the principles they apply among their teams. Furthermore, the principles focus on welcoming change and making the customers the focus of the developers' reason for building the software.

The main content of the 12 Principles of Agile includes:

1. Encourage early change and build flexible systems
2. Promote simplicity, reduce the waste compared to the traditional approach, the team can make both workflow and final solution themselves in a more cost-efficient way.
3. Prioritize early value delivery to receive immediate feedback from the market.
4. Create a healthy working atmosphere where everyone feels good and contributes more to satisfying the customers' needs by motivating individuals, coordination between business and IT, and self-organizing teams.

a. Agile in fintech companies

For a long time, large financial institutions have depended on waterfall-inspired software development approaches, which have yielded excellent results (Stellman & Greene 2014). However, in a changing corporate climate, traditional strategies can no longer meet current demands. Financial institutions frequently have many products built on legacy infrastructure, whereas fintech firms focus on a limited number of specialised

products built on modern technology. Fintech firms compete with traditional financial institutions by offering a limited number of goods and leveraging their competitive advantage in responding quickly to consumer requirements and delivering innovative solutions.

Fintech businesses, in contrast to traditional financial institutions such as banks, focus on a few products that they constantly adapt in response to client requirements. In other words, the entire company is agile, and employees are allowed to create the software from the ground up using agile development approaches. Traditional software development approaches are less adaptable to shifting business demands than agile software development methodologies (Beck et al. 2001). Agile emphasizes flexible planning, incremental and iterative development, and early and frequent delivery instead of traditional waterfall software development methodologies. Furthermore, Agile emphasizes open communication within the Scrum team and ongoing cooperation with consumers. Last but not least, Agile places a great importance on a self-organization team, which comprises a group of inspired and cross-functional members empowered to make choices and continue to improve to adapt to changes.

b.   Main Agile Frameworks

Agile has become the most successful software development framework within the last two decades. Consequently, this success has led to various Agile frameworks and approaches. According to Mersino (2019), Scrum, XP, Kanban, and hybrids are the most popular frameworks in agile methodologies. Other frameworks exist but are no longer favorable. 54 percent of organizations preferred Scrum, while 14 percent preferred other hybrids, 10 percent Scrum and XP hybrid, 8 percent ScrumBan, 5 percent KanBan, 3 percent preferred Iterative Development or was unsure, while 2 percent chose Lean Startup, and 1percent Extreme Programming (XP). Thus, Scrum is the preferred Agile Methodology (Mersino 2019).

2.4.2   Scrums

Scrum is a "lightweight framework" that assists individuals, organizations, and teams create value by providing adaptable solutions to difficult issues (Schwaber &

Sutherland 2020). Scrum was created in the early 1990s by Ken Schwarber and Jeff Sutherland. Scrum is the most widely used agile development methodology. Transparency, inspection, and adaptability are the three primary pillars that a company must possess in Scrum.

Scrum pushes us to adopt principles like respect for others, transparency, and dedication to help the team deal with uncertainty and solve complicated challenges. It encourages the formation of self-organizing, cross-functional teams capable of delivering workable software independently and in the face of constantly changing external demands and conditions. While software development teams are the most common users of Scrum, its concepts and lessons apply to every sort of workgroup. Scrum's popularity stems from the fact that it is a combination of tools, responsibilities, and meetings all work together to assist teams in structuring and managing their work. It's also recognized as a framework for agile project management.

The fundamental Scrum project structure is as follows:

- There are three primary roles on a Scrum project: Scrum Master, Developers, and Product Owner.
- The Product Owner collaborates with the other team members to manage the product backlog of features and prioritize requirements, which are in the form of user stories, must be created. The Product Owner is in charge of the product, starting with defining the product backlog and providing a precise description so that the development team may begin the development process. The Scrum Master maintains the project going ahead by collaborating with the team to overcome obstacles that they have identified and requested assistance. In contrast, the Developers are in charge of making the shippable product.
- Sprints are timed iterations that are used to build the product. The team undertakes sprint planning at the start of each sprint to select which features from the backlog will be built. This is how sprint backlog is created, then the team works on all of the things in it throughout the sprint.
- Every day, the Scrum team has a 15 minutes face-to-face meeting called the Daily Scrum to inform each other on their working progress and address the next barriers.

At the sprint review, working software is given to the product owner and stakeholders, and the team gathers in a retrospective meeting to highlight lessons learned to improve the way Sprints and software product are developed in the future.

The Scrum framework is made up of three parts:

- The Scrum Team: A self-organizing, cross-functional group of individuals to deliver usable software.
- Scrum Events: A set of time-boxed activities that assist to establish regularity, offer feedback, encourage self-adjustment, and support an iterative and incremental lifecycle.
- Scrum Artifacts: Items that reflect work or added value and visibility the team's progress and accomplishments. Artifacts also serve as a foundation for inspection and adaptation.

The Scrum Team participates in Scrum Events and produces both Scrum Artifacts and functioning software. At predefined intervals, events are attended, resulting in the creation or change of artifacts. Artifacts may be examined by the team as well as by outside inspectors.

2.4.3 Scale Scrum

Software development in banks has some unique characteristics compared to other organizations. Firstly, banks usually only have a maximum of 2 application products, one for customers and one for bank employees. However, each product has many sub-products, divided by domains such as insurance, mobilization, loan, payment, etc. Although different domains, the sub-products are still interconnected. and may affect other sub-products when one of them is modified. Second, banks are usually medium to large. Therefore, the bank's organizational system is often complex with many layers. Many large organizations are applying Scale Scrum (Atlassian 2019).

Frameworks like Nexus, SAFe, LeSS, Spotify, and others have become popular tools for enterprises on this path, with so many elements impacting contemporary software development and a vast number of process, team, and cultural changes necessary to grasp agility at scale. Scaled agile frameworks can be useful for getting

started, especially if the business is still in the early phases of adopting agile (Atlassian 2019).

2.5 THE RELATIONSHIP BETWEEN BUSINESS-IT ALIGNMENT, AGILITY, AND AGILE SCRUM

In the four perspectives proposed by SAM, the two perspectives Strategy Execution and Service Level are considered in the traditional approach, one of the two domain sides is only considered as strategy implementer, and it does not influence the strategy. On the other hand, Agile and Scrum require the equivalent interplay of IT strategy and business strategy from the very first step to develop Sprint Goal. Therefore, Business-IT Alignment in this study is preferred with two alignment perspectives which are the Competitive Potential perspective and Technology Potential perspective. Besides, agility is considered with two dimensions Alertness and Responsive Capabilities as in the literature. From this view, business-IT alignment agility is examined with these two dimensions of each nominated alignment perspective which are Alertness and Responsiveness Capabilities.

In the Competitive Potential perspective, the two agility dimensions refer to how quickly the organization is aware of the changes in IT and respond by adjusting business. On the other hand, in the Technology Potential perspective, they refer to how rapidly the organization is aware of the changes in business and respond by modifying IT. Thus, the improvement of the two agility dimensions promotes processes in two business-IT alignment perspectives, allowing them to be executed faster and more frequently. This helps the organization sustain its alignment.

In short, this project identifies:

- Effect of Agile & Scrum on the Alertness of Competitive Potential perspective

- Effect of Agile & Scrum on the Responsive Capabilities of Competitive Potential perspective

- Effect of Agile & Scrum on the Alertness of Technology Potential perspective

- Effect of Agile & Scrum on the Responsive Capabilities of Technology Potential perspective

2.6   SUMMARY

In this chapter, the concepts of agility, business-IT alignment, and their perspectives have been introduced. Business-IT alignment is how IT and business support each other and their relationship. Following the concept of agility, Business-IT alignment agility can be understood as the alertness and responsive capabilities of the connection between two domains. Besides, Agile and Scrum definition and their general benefits have been further elaborated, they can change the whole processes and development life cycle when applied. Therefore, Agile Scrum is expected to affect business-IT alignment agility in banks positively. In the next chapter, the research methodology will be discussed.

CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

The preceding chapters covered the introduction, research question, and literature review. The literature study in Chapter II discussed the concepts of agility, business-IT alignment, and Agile Scrum concisely. The approach for gathering data, including the research technique, the method of analysis, and the materials employed, will be detailed in the next chapter. In general, the methods and approaches selected are:

- Research Approach: Qualitative

- Research Method: Case Study

- Methods of data collection: Interview, Observation, Document

- Methods of data analysis: Thematical Analysis

3.2 RESEARCH FRAMEWORK

Qualitative research is widely used to learn people's worldviews. While qualitative research methods differ, they always aim to preserve rich meaning while evaluating data. This research aims to identify the manifestation of Competitive Potential and Technology Potential perspectives and the effect of Agile & Scrum on business/IT alignment. Hence, a qualitative approach seemed appropriate. Qualitative research is used to understand experiences and enables the researcher to gather in-depth insights on the poorly understood objective. In order to achieve the objectives, open-ended questions, observations described in words should be conducted.

The case study research method is applied for this study. As reported by Yin (2014), case studies are excellent for studying complex topics involving various players,

goals, and processes without changing the features of real-life occurrences. Denscombe (2014) also claimed that case studies have the advantage of presenting an in-depth description of connections, processes, and experiences in a distinct environment. Moreover, this research looks at contemporary events and the researcher does not control the events. Both objectives require deep understanding while the case study method also allows the researcher to get in-depth knowledge of the events suitable for this research.

3.3   CASE STUDY PROFILE

In recent years, the perception of Agile in banks has shifted dramatically, with an increasing number of institutions realizing the benefits of agile project development. One reason for this shift is that projects are growing more complicated, and old approaches are nearing their limits. Furthermore, the banking industry has become considerably more dynamic and fast-paced. The two banks listed below have switched to Agile methodology and the Scrum framework in response to these possibilities and difficulties.

The case study investigation was carried out in two commercial banks in Vietnam. They were selected as case study objects for the following reasons: (1) they greatly use information technology in their daily operations. (2) They have a complex organizational structure. (3) They experienced Agile transformation.

Table 3.1   Targeted banks information

	Bank A	Bank B
Size	Large	Large
Number of employees	~3000	15.932
Agile Transformation Time	2020	2019
Organization Structure before transformation	Functional	Functional
Organization Structure after transformation	Strong Matrix	Projected
Scale Scrum framework	Nexus	SaFe 4.0

a.   Bank A

Bank A belongs to one of Vietnam's largest industrial and information technology groups. Since its start in 2016, the bank has grown significantly. It is one of the major full-service providers of consumer and business banking, wealth management, mortgages, and insurance products and services. The banking network includes 50000 payment points, with approximately 3,000 employees serving customers across the country. The targets of Bank A are

- Universalization of services from urban to rural areas
- Exploding digital payment with Mobile Banking application

The products include:

- Financial sector: Digital banking and financial ecosystem, Bank Plus, Mobile Money.
- Service areas: Deploying credit scoring services, Digital marketing, Digital advertising based on electronic data, Big data

Although born late compared to other banks, Bank A has had a remarkable development thanks to technology. Bank A has invested heavily in information infrastructure and online application development during the past years. The development in the form of a digital bank brings many advantages such as saving traditional costs such as opening branches and building ATMs. Bank A connects with other banks and turns their ATMs and branches into points of accepting payments and providing their services. Bank A's focus on technology is the main strategy and financial services will be developed based on this digital system.

Before converting to Agile, bank A had a functional model which is the most commonly used organization type. In a functional organization structure, the organization is grouped into departments where people with similar skills are kept together in forms of groups. The CEO is at the top of the board of directors, followed by four vice presidents for four major segments: back office, operations, customer care, technology, and sales & marketing. Departments are also divided vertically by the organization. Regarding software development, there are two divisions: product center

and technology center. This is the most important resource of the company and the concentration of the most members. The Product Centre is responsible for making development requirements. This request comes from many sources such as the human resources department, sales department, customer care department, etc. Members of the product center themselves also have to research to develop new features for the application, banking system. The Technology center is organized in a matrix with 8 departments: security, programming, testing, operations, processes, PMO, system operation, and infrastructure. In which, PMO is the department responsible for project coordination. Each PM will lead several projects based on their area, connect other departments, and report to the board of directors.

After implementing Agile Transformation in 2019, bank A has had many organizational changes. The model changes from placing heavy emphasis on departments to projects. The technology center's PMO was moved up under the board of directors' management. As a result, the project manager's reach increases, and resources can be mobilized from all stakeholders. The projects are run according to the Agile development methodology and the Scrum framework. At the corporate level, the framework chosen is Nexus. The product owner position is selected from the product center in bank A. This person is authorized to develop a set of features. The difference from the past is that the Product Owner has full control over the product, including prioritizing requests from other departments. The project manager will handle the Scrum Master. Developers are selected from departments based on skill sets as before. Since bank A has only one mainstream product, Scrum teams are formed around this product and form Nexus. The product Integration Team consists of POs, Scrum Masters, and technical leaders. The integration team at the highest level consists of the Product Manager and CTO.

b.   Bank B

Bank B is a joint-stock commercial bank located in Vietnam, directly under the Ministry of National Defence (Vietnam). According to the Annual report 2020, the bank's charter capital was VND 21,605 trillion while the total assets of the bank in 2018 were VND 362,325 trillion. Not only does bank B focus on banking services, but it also engages in debt management, real estate trading, fund management, securities brokerage services,

insurance, and asset exploitation by holding controlling shares of the many enterprises in this field. Bank B operates a countrywide network of approximately 100 branches and 190 transaction sites in 48 cities and provinces. It also has representative branches in Russia, Laos and Cambodia. With a vision to become the most convenient bank in Vietnam, bank B aims to develop a wide range of banking services and bring them to consumers quickly and efficiently through the power of technology.

Before Agile Transformation, the organizational model of bank B is as follows. At the head of the bank is the general meeting of shareholders, with the highest person being the chairman of the board of directors. The operating apparatus includes the board of directors, units, and blocks within the unit. Units include Sales, administration - control, support. There are banking services, investments, deposits, and loans in the business unit. In the management-control unit, there are risk and process management blocks, financial blocks. Support units include human resources, research, information technology, and operations. Realizing the outstanding development of digital banks, Bank B has built a separate digital bank and upgraded the information technology block into a specialized unit to develop digital services. The head of this unit is a director. Like Bank A, this unit is organized in matrix form. The departments are organized by function, including operations, testing, business analysis, programming, DevOps, security. However, in bank B, the project teams are concentrated and divided by domain. For example, members of the infrastructure team will sit close to each other and work directly. Bank B's approach emphasises the project than the function rooms.

After implementing Agile Transformation in 2019, bank B has had many organizational changes. Bank B established a division to produce features for digital banking services. Here, projects are moved from the waterfall model to the Agile development methodology and the Scrum framework. PMO was founded with the titles PMO head, Agile Coach in charge of transformation, and Scrum Masters. The Product Owner position is selected from the business unit. Even though POs have full authority over the product features in their domain, they still have to align with each other and with the product vision constantly. Scrum Master is newly hired or transferred from the Project manager. Developers are selected from departments based on skill sets as before. Since bank B has only one mainstream product, Scrum teams are all formed around this product. Product Integration Team consists of Product Owner, Scrum

Masters, and technical leaders. At the corporate level, the chosen framework is SaFe 4.0.

3.4 RESEARCH STRATEGY

3.4.1 Data collection

Data collection techniques such as interviews, observations, and archival sources in the case study were combined. The use of many data sources has been shown to produce more reliable, diverse, and solid reality creations, a process known as triangulation (Yin 2014).

a.   Interview

Data for this study is mostly gathered through interviews. According to Yin, (2014), interviews are useful for capturing opinions, experiences, and ideas in detail. Interviews were chosen as the best instrument for getting practical experience and a broader viewpoint in response to the study topic, which needed interaction with various key business and IT decision-makers. The interviews were used to explain how bank executives and managers describe the effect of Agile and Scrum in their businesses for this study. In addition, to supplement the data gathered through interviews, various internal corporate papers such as annual reports, online posts, and other publicly available information were acquired.

The informants were chosen using a non-probability sampling technique that took into account their availability and potential to provide meaningful data that may aid in addressing the research question (Denscombe 2010). As an exploratory sample, non-probability sampling was employed, and individuals were chosen as informants who had competence and experience in the study topic under consideration (Showkat & Parveen 2017). This sampling method allows the most appropriate samples, which relate to the study objectives, to be chosen by the researcher using their expertise. It is commonly used in qualitative research when the researchers want to obtain a detailed understanding of a particular occurrence rather than making statistical judgments, or when the population is relatively small and specific.

The researcher employed interviews with informants about business-IT alignment in their firms to acquire qualitative data in the examined organizations. As a result, the interview informants in this study have to fulfill the following requirements: they had to be a business or IT manager with at least two years of experience. Also, they must take an active role in Agile transformation in their businesses. According to Yin (2014), the interviewees should directly connect to the study issue and be familiar with the research region. The interview questions were tailored to the two agility aspects identified in the research study. Therefore, they were grouped into four (Competitive Potential Awareness, Competitive Potential Responsive capabilities, Technology Potential Awareness, Technology Potential Responsive capabilities).

The interview followed a semi-structured format that included open-ended questions that allowed the informants to share their thoughts and viewpoints and explore what was important to them. Respondents were invited to respond to questions by telling stories and providing examples for researchers to extract useful information from the stories and instances. Appendix A presents the interview questions and motivation.

Before the interviews, the informants were informed in advance of the content and duration of the session to allow the informants to make the necessary arrangements to commit to the session. Clarifying the interview's purpose has assisted possible informants in preparing for the interview, acknowledging the research's general idea, and easily informing their contribution throughout the interview sessions. Informed permission was given to the informants to agree to the study's parameters while maintaining their anonymity. All informants were requested to record the meetings, which would then be transcribed to aid in the analysis phase. Face-to-face interviews were performed at the bank, private room, and a coffee shop outside. They were taped with an audio recorder, allowing the researchers to transcribe the interviews for analysis and follow-up study. Table 3.2 lists the informants in the interviews, the dates of the interviews, their positions in the investigated banks, and the length of the interviews.

Table 3.2   Interview information

Participant	Position	Organization	Date of interview	Duration of interview
Interviewee A1	Agile Coach	Bank A	13/12/2021	30 minutes
Interviewee A2	PMO Head	Bank A	15/12/2021	30 minutes
Interviewee A3	Project Manager	Bank A	15/12/2021	30 minutes
Interviewee B1	Agile Coach	Bank B	30/11/2021	30 minutes
Interviewee B2	PMO Head	Bank B	30/11/2021	30 minutes
Interviewee B3	Business Manager	Bank B	30/11/2021	30 minutes

In total six interviews were carried out with IT and business managers in Vietnam (bank A, bank B) between November and December 2021. Each interview lasted for around 30 minutes. Each formal interview was recorded, transcribed, and forwarded to the appropriate informant to check the accuracy of the material gathered.

b.   Observation

According to Denscombe (2014), interview results cannot automatically reflect what happened. Therefore, an observation was conducted to understand "what people do". Observation is a suitable data collection method, provides an excellent platform for acquiring a comprehensive understanding of social processes and is well-suited to coping with complicated situations. Moreover, it opens a distinctive opportunity to understand how Agile & Scrum are applied in the working environment.

Participant observation was chosen because of its emphasis on discovering the meanings that people attach to their actions. In this study, the researcher took part as an observer. The researcher's identification as a researcher is freely acknowledged – allowing informed permission from those participating – and takes the guise of "shadowing" a person or group as they go about theirs.

Collection process

The researcher observed a Scrum Team in bank A for 1 week. This team was chosen because it had been formed for a long time. After many iterations, the team achieved a high maturity level so the team can reflect the effect of Agile & Scrum correctly. Besides, the team members are informed of the appearance of the researcher before

observation. This made them feel comfortable in the presence of an observer. The project aims to allow customers to pay for transactions using telecommunications accounts. The project uses a prominent technology, ICT automated transaction processing, which centralizes cash flows from telecommunications accounts and makes them payable like transactions with bank accounts. The team has 15 members, including Product Owner, Scrum Master, and Developers.

Four events of the team which are Daily Meeting, Sprint Review, Sprint Retrospective, Sprint Planning were observed by meeting the following criteria:

- Relevant: They are the official Scrum Events, so they are related directly to the purposes of the investigation
- Complete: These events are completed, vary from 15 minutes to 4 hours.
- Clear-cut and self-evident: These events are observable and do not need any interpretation by the researcher
- Sufficient regularity: The events occur at least two times per month on fixed dates, making them easy to record.

To be systematic, observation schedules were established. Observation plans outline what will be observed and how it will be evaluated. They are described as below:

Table 3.3   Observation information

Event	Frequency	Duration of the events	Location	Members	Date
Sprint Planning	Biweekly	4 hours	Organization's meeting room	Product Owner Scrum Master Developers Solution Architect (external)	13/12/2021
Daily meeting	Daily	15 minutes	Organization's public workspace	Product Owner Scrum Master Developers	14/12/2021 15/12/2021
Sprint Review	Biweekly	2 hours	Organization's meeting room	Product Owner, Scrum Master Developers Stakeholders	24/12/2021
Sprint Retrospective	Biweekly	1.5 hours	Organization's meeting room	Product Owner Scrum Master Developers	24/12/2021

Overall, the researcher joined the team for 2 weeks, observed 1 Sprint Planning, 2 Daily Meetings, 1 Sprint Review, and 1 Sprint Retrospective. Following Galton's suggestion in (Galton et al., 1983), The observer utilized field notes to explain the background and record their impressions on the events or behavior being seen. The collected information was various, containing people's emotions, verbal and non-verbal communication, group management techniques. Documents and meeting notes of these events were also collected during the observations (Holsapple & Li 2008).

c.   Document analysis

The most significant use of documents in case study research is to confirm and supplement evidence from other sources (Yin 2014). In this study, the researcher collected documents to support interviews and observation.

First, documents can confirm the correct spellings and titles or names of persons and organizations stated in an interview. Second, documents such as meeting minutes and reports are explored to find new questions about communications and networking within an organization. They provided a good insight into the organization and improve the interview efficiency. In addition, all forms and events meeting notes of the Scrum Team in Bank A were collected fully. They include:

- Sprint Retrospective form
- Daily meeting notes
- Sprint Planning notes
- Sprint Review notes

These documents not only reinforced the points of the researcher but also minimized any prejudice from the observer. In addition, images, documents about tools and teamwork are also saved for research purposes.

Official documents relevant to the study have been granted permission from the bank's administrators. The documents consist of the organization's information systems, forms, reports, notes in public folders. No resources beyond the study research scope or may harm the organizations were collected.

3.4.2 Data analysis

Thematic analysis of all obtained data was deemed the best method for discovering fresh ideas and insights into the study topic. One of the most often used qualitative analysis approaches is thematic analysis since it allows a researcher to be flexible (Roulston 2001). Because the approach is not bound to a certain theory or philosophy, it is suited for case studies (Yin 2014).

As a result, the data interviews, various publicly accessible documents papers, and field notes were all collected and categorized in a database to be quickly retrieved. The transcripts of the interviews and field notes were coded and categorized into themes by categorizing the link between codes and themes based on similarities, and variances. The two initial main themes are Awareness and Responsive capabilities that have been discussed in the literature review.

To conduct the thematic analysis, Braun & Clarke (2006) advised the following steps: "(1) acquaint yourself with the data; (2) develop initial codes; (3) search for themes; (4) review themes; (5) define and label themes; and (6) write the report". As a result, the approach began with a meticulous study of transcribed interviews, fieldnotes, and internal papers to acquire an overall sense of what was going on. In order to maintain confidentiality, informants were rendered anonymous in the case organizations. quick notes were scribbled in the margin. Following that, the text segments were categorized into three smaller manageable groups: critical for the study questions, those that may or may not be important, and those that were not. The transcripts of each interview and observation field notes were then reviewed. Various sentences in this extract were highlighted in different colors to correlate to different codes. Each code indicates the concept or emotion represented in that section of the text.

Following that, all the data was grouped into code-defined groups. These codes offer the researcher a brief overview of the data's major points and often occurring meanings. The codes were created to reflect the four basic themes identified by the model at the start of the investigation. Even though the coding procedure was influenced by the specific model used in this study and associated articles, the researcher was open to any emerging themes that may arise and be coherent with the research topic. Some

of the codes are eliminated at this step because they are too imprecise or not relevant enough (for example, because they do not appear frequently in the data). Other codes could be sub-themes.

3.5   SUMMARY

In this study, the case study was used as a research strategy. Two banks were selected based on matching criteria. Six managers were interviewed, four Scrum events were observed, and relevant documents were collected to identify the effect of Agile Scrum after the Agile transformation. Thematic analysis analysed interview transcriptions, observation notes, and collected documents. The next chapter will present the result and discuss findings.

4.1   INTRODUCTION

The previous chapter presented the research methodology and described how the research was conducted. The following chapter will focus on the result and discussion. First, the manifestation of the two researched perspectives at banks will be discussed. After that, the findings of the theme analysis will be introduced along with the discussion.

4.2   THE MANIFESTATION OF COMPETITIVE POTENTIAL PERSPECTIVE AND TECHNOLOGY POTENTIAL PERSPECTIVE IN BANKING PRACTICE

When asked about the current process of acquiring new financial technologies, the answers of the two PMO Heads of the two banks are similar. Bank leaders first identify the targeted financial technology. CTOs and high-level members focus on researching applicable technologies for innovation. This step assesses the pros and cons of new technologies and compares them with those the company is already using. This phase includes the basic contents: learning about new technology, applicability to the bank, requirements, and estimated costs. Then, based on the IT strategy, the business strategy is developed to take advantage of new technologies. Adaptation of business strategy is an outcome of this phase. To respond to technological change, the organizational structure must also change. The business will normally assign staff to develop new business models based on technology. A new group will be created for emerging technologies such as blockchain, big data, and AI. Business processes, for example, customer service, product distribution, product development, and quality management must also be updated to keep up with the pace of technology innovation. Another aspect that the business also needs to change is technological skills. New technology requires

personnel on the business unit to understand it to create business requirements. For example, product owners need to understand big data to map out the functional direction.

Referencing the Strategic Alignment Model, banks A and B fit into the Competitive Potential perspective. In these circumstances, IT strategy drives the selection of new fintech to improve software development skills. Because both banks want to improve their capacity to provide software products and compete in the market, high-tech solutions are viewed as an enabler. According to the PMO Head of bank A: The bank wants to use the strategy of "acquisition first, process second".

In the next step, the business unit determined which business strategy to focus on, customers, and most importantly, areas to apply technology to bring profit. The technology will develop an IT strategy based on the exchange and agreement with the business strategy. They will have to adjust the scope, including defining the core technology, adding or removing small components. Based on the analysis of the interview transcriptions, it was recognized that both banks A and B also followed the Technology Transformation perspective of SAM. The IT/IS strategy is the enabler to help the bank achieve its business goals. The above process will also trigger the change of IT infrastructure to meet the changing requirements of the business department. The architecture will be designed based on product requirements. Technology objectives, rules, and decisions enable the integration of various components into a single platform.

Bank B's PMO Head provided an example of implementing EKYC (Electronic Know Your Customer) to e-banking products, a technique for identifying and verifying a customer's identification. Know Your Customer (KYC) is a procedure that consists of a series of tests done at the first stage of the customer connection to verify their true identity, taking into account his identity papers and personality. EKYC (Electronic Know Your Customer) is a remote, paperless method that reduces the expenses and conventional bureaucracy required in KYC operations.

Informant B gave an example:

> *After understanding the IT Strategy, the sales department set up campaign programs to encourage users to create new accounts using eKYC, creating a*

great competitive advantage over other banks in terms of convenience. After the bank has mastered the technology, the business side submits a request for the product to research user behavior through this eKYC system. The development team sought to fulfil this requirement by connecting the eKYC system with the bank's built-in BigData system.

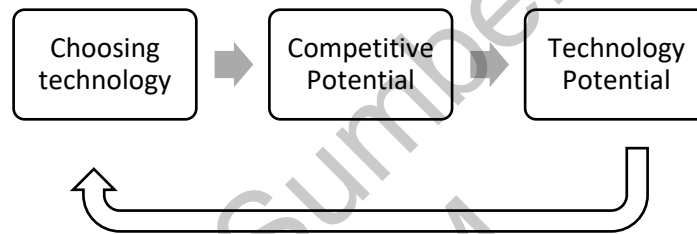The process of acquiring new financial technology can be represented as follows:

Figure 4.1   The manifestation of Competitive Potential Perspective and Technology Potential Perspective in banks

It can be seen that this process has one perspective and both exist and complement each other. There is no specific phrase or time between the two perspectives through the collected information. This process does not end but starts with the first stage of acquiring new financial technology.

4.3   EFFECTS OF AGILE&SCRUM ON BITA AGILITY IN BANKS

The data extracts were examined using thematic analysis. From the literature review and the relationship between business-IT alignment, agility and Agile Scrum discussed in Chapter 2, four initial themes are established by the applicable theory at the start of the research: Competitive Potential Perspective – Alertness, Competitive Potential Perspective – Responsive Capabilities, Technology Potential Perspective – Alertness, Technology Potential Perspective – Responsive Capabilities. Throughout the thematic investigation, the researcher attempted to add codes based on the collected data. After reviewing generated codes, 12 of them became subthemes that were unique and

significant. Thus, these subthemes were grouped into the four initial themes. Figure 4.2 is the thematic map that depicts the four themes and 12 subthemes are used in this study.
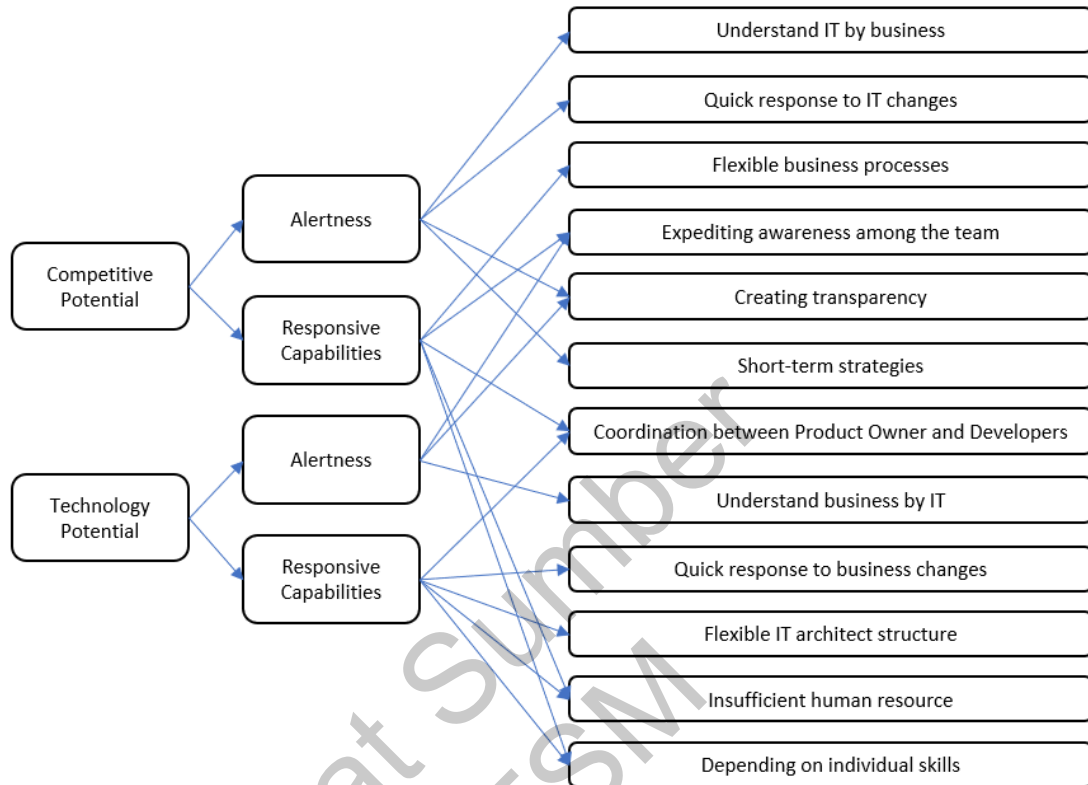

Figure 4.2   Thematic map

The empirical findings are evaluated and summarized in the next section. Each sub-theme was found and discussed using remarks from interviewing informants, observation notes, and other documentation. The unique findings of each perspective will be presented sequentially. After that, the impacts of Agile & Scrum on both perspectives will be covered.

4.3.1   Competitive Potential perspective

This section will discuss sub-themes unique to the Competitive Potential perspective. The shared sub-themes that appear in both perspectives will be presented in section 4.3.3. In detail, the content of understanding IT by the business will be covered in the Alertness theme while Responsive capabilities include Quick response to IT changes and Flexible business processes.

a.   Alertness in Competitive Potential perspective

i.   Understanding IT by business

Understanding IT by business refers to the ability to capture information from the IT unit of the organization. This includes understanding IT terminology and how the IT products are built. Enhancing this ability helps both business and IT units exchange information more effectively.

Before the transition, sales team members were assessed as having "no knowledge" and "no desire to understand" about IT - Interview B2, B3. However, they are said having willing to gain more IT knowledge.

"They were awkward at first, but after a few Sprints, the Scrum Masters had positive feedback about the Product Owners". – Interview B3

At the time of observation, the Product Owner has almost no knowledge problems obtaining information from the IT unit. This is the result of continuously working with the development team. Through Sprint Planning and Sprint Review sessions, the Product Owner gets access to how Developers turn requirements to Increment. Having IT knowledge helps Product Owners to be aware of the changes from IT and it is easier for them to communicate with Developers.

b.   Responsive capabilities in Competitive Potential perspective

i.   Quick response to IT changes

As discussed before, the advent of new technologies requires banks to adapt quickly. Quick response to IT changes refers to changing the business strategy in response to changes in the IT unit so that alignment is not interrupted.

The analysis from the interview of A1 and A2 claims that Scrum has great significance for updating new technologies. The sprint duration in Scrum is only between 1 to 4 weeks, allowing developers to update the latest financial technologies for products, avoiding the risks of technology obsolescence when launching products

to the market. In addition, continuous technology updates also limit potential 3rd party errors through patches. Having a continuous version at the end of each Sprint allows the sales department to adjust their business plan in short periods to maximize profits. For example, the marketing department can map out campaigns based on current banking application functions, while customer service updates information to answer customer inquiries.

ii. Flexible business processes

With the constant technology change, a fixed long-term strategy is completely unreasonable. "We've outlined a vision for the product, but we'll only outline short-term strategies. Long-term campaigns don't mean much at this point." - Interviewee B3. Flexible business processes mean changing processes without losing their essence or being completely superseded.

Under the influence of the Agile approach, the business site builds highly flexible structures and processes, ready for change. Therefore, even when there is a change from the IT unit, it will not change the entire structure.

At Bank A, the organization defines a common process framework and lets business members create detailed content based on the IT strategy. When there is a change, they can refer back to the general process framework and update the changed process flows.

4.3.2 Technology Potential perspective

This section will discuss sub-themes unique to the Technology Potential perspective. The shared sub-themes that appear in both perspectives will be presented in section 4.3.3. In detail, the content of sharing business knowledge will be covered in the Alertness theme while Responsive capabilities include Quick response to business changes and Flexible IT infrastructure.

a.   Awareness in Technology Potential perspective

i.   Sharing business knowledge

By reading the business documents and software requirements specifications, developers can understand the business flow. However, that is not enough to create a good product. Sharing business knowledge refers to the business unit sharing business knowledge so that the development team can understand the purpose of the product and how it is profitable.

According to the investigation's conclusions, there was a lack of adequate understanding between IT and business at both bank organizations before Agile transformation. The Agile coach pointed out that employees in the organization were truly lousy at communicating and had no idea how to interact with their opposing unit. The IT unit will not properly support and drive the company if it does not comprehend the business environment.

In Scrum, Developers are allowed to ask the Product Owner about stories until they understand exactly what they are for and what effect they will have on the product. During the development process, the Product Owner also regularly updates information about the product roadmap, the features required when releasing the product, and the deadlines. These things are small, but help developers deeply understand the product they are working on. When they have business knowledge in hand, it will be easier to align their development plan with the business side.

b.   Responsive capabilities in Technology Potential perspective

i.   Quick response to business changes

This sub-theme refers to the ability to change IT strategy in response to changes in the business unit so that alignment is not disrupted and provides a competitive advantage.

All informants claimed that Scrum helps the business achieve a competitive edge and quick response to the business environment changes. One of the top concerns of banks is that IT supports business strategies for profitability and competitive

advantage. Scrum accelerates this process by allowing change during any phase of the Sprint, helping to reduce the wasted effort in fulfilling expired requirements and in response to market demand. Rapid development to get software early and having a new releasable version every Sprint gives great advantage in applying business policies and collecting feedback.

Besides, in the traditional model, business members are not facilitated to interact and detect problems. Before deployment, the business unit is only involved in the product evaluation process (UAT). Therefore, they will not be able to evaluate the software after it is completed and if the software does not work as expected, the whole team will have to go through the steps again. This cost a lot of money and time. When working within the Scrum framework, the Product Owner can inspect the working software at any time after every Sprint (only 1-4 weeks) which lets them check if the features are working as intended. If not as expected, the Product Owner can ask Developers to resolve problems.

ii. Flexible IT infrastructure

The term "flexible IT infrastructure" refers to the various methods of building goods. Rather than being constrained by a single architect, high flexibility architecture entails an active ability and desire to detect new choices, overcome inertia, and accept unstructured conditions.

In Agile projects, the uncertainty is very high because the requirements are volatile, and it is impossible to shape the product from the start. Scrum is founded on empiricism; all decisions are based on facts. This is best seen in Scrum's artifacts, which can change at any time, as long as the goal remains. As a result, IT infrastructure is designed flexibly to be changed easily if there are additional requirements in the future.

"We took a lot of lessons and realized that the architectural design has to be able to extend to other features or new services in the future." – Interviewee A3