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Leveraging Network Effects for Global Customer Platform Development

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ABSTRACT:
Digital transformation is disrupting and reshaping processes, products and services in the Testing, Inspection and Certification (TIC) service ecosystem. The digital transformation drives the development of innovative technologies, including platforms that enhance connectivity among diverse stakeholders. The purpose of this master's thesis was to understand the mechanisms of growth in digital B2B platforms. In the context of digital B2B platforms in TIC industry, this thesis identified what mechanisms underpin the network effects that escalate platform growth, and which strategies can amplify the network effect to benefit platform and its users. The first question was approached by literature review and the latter in a workshop which was held as part of strategy formation process. Scenario-based roadmapping method was used to collect data to support the strategy formation and to validate how applicable existing research is for the context. Literature identifies ecosystem orchestration, trust mechanisms and value co-creation as growth mechanisms of digital B2B platforms. The strategic scenarios included establishment of strategic partnerships, leveraging AI capabilities and streamlining user experience to create value. Key findings of the research included identification of growth mechanisms applicable for the case company. An interesting finding was that neither the literature stream nor the outcome of strategy works considered the element of how to maintain growth. Even by applying all identified growth mechanisms, it is possible to accelerate growth, but the gap between scaling and maintaining remains for the future.

KEYWORDS: Digital business, digital platforms, platform strategy, network effect, scenario-based roadmapping, ecosystem orchestration, case study

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TIIVISTELMÄ:
Digitaalinen transformaatio disruptoi ja uudelleen muokkaa prosesseja, tuotteita ja palveluita Testaus-, Tarkastus- ja Sertifiointialan (TIC) palveluekosysteemissä. Digitaalinen transformaatio kiihdyttää innovatiivisten teknologioiden kehitystä, mukaan lukien alustat, jotka lisäävät eri sidosryhmien välistä kanssakäymistä. Tämä pro gradu -tutkielma pyrkii ymmärtämään digitaalisten B2B-alustojen kasvumekanismeja. Tutkimuksessa on keskitytty TIC-alan digitaalisiin B2B-alustoihin. Kontekstin puitteissa on pyritty vastaamaan tutkimuskysymyksiin *mitkä mekanismit voimistavat verkostovaikutuksia* ja *millaisilla strategioilla voidaan vahvistaa näitä vaikutuksia siten, että ne hyödyttävät sekä alustaa että sen käyttäjiä*. Ensimmäistä kysymystä lähestyttiin kirjallisuuteen perustuvan aineiston kautta ja jälkimmäistä osana strategiatyöpajaa. Tiedonkeruussa on käytetty skenaariopohjaista tiekarttamenetelmää ja olemassa olevan tutkimuksen soveltuvuuden arvioimiseksi. Kirjallisuuslähteet tunnistavat digitaalisten B2B-alustojen kasvumekanismeiksi ekosysteemin orkestroinnin, luottamusmekanismit ja yhteisen lisäarvon luonnin. Strategisissa skenaarioissa esiin nousseita keskeisiä tekijöitä olivat strategisten kumppanuuksien luominen, tekoälyominaisuuksien hyödyntäminen ja käyttäjäkokemuksen sujuvoittaminen arvon luomiseksi. Tämän tutkimuksen keskeisiin löydöksiin kuului case yrityksen kannalta oleellisten kasvumekanismien tunnistaminen. Merkillepantavaa on ettei kirjallisuudessa eikä strategiatyön tuloksissa ole käsitelty kasvun ylläpitämisen näkökulmaa. Tutkimus osoitti, että vaikka kaikki tunnistetut kasvumekanismit otettaisiin käyttöön, kasvua voidaan kiihdyttää, mutta skaalaamisen ja ylläpitämisen väliin jää kuilu jatkotutkimusten aiheeksi. Havaittua epäjatkuvuutta on tarpeen tutkia jatkotutkimuksin aiheen ymmärtämisen varmistamiseksi.

KEYWORDS: Digital business, digital platforms, platform strategy, network effect, scenario-based roadmapping, ecosystem orchestration, case study

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Abbreviations

TIC	Testing, Inspection , Certification
B2B	Business-to-Business
SBRM	Scenario-Based Roadmapping
AI	Artificial Intelligence
LLM	Large Language Models

1 Introduction

Digital transformation has fundamentally altered the operational landscape for firms across various dimensions—internally, in their interactions with customers, and in collaboration with external organizations (Bloomberg, 2018). This disruption reshapes processes, products, and services transforming the entire Testing, Inspection and Certification (TIC) service ecosystem. Furthermore, digital transformation drives the development of innovative technologies, including platforms that enhance connectivity among diverse stakeholders.

Streamlined connectivity is crucial for the development of new business models. In today's world, most individual users rely on online applications to access products and services from various companies. Concurrently, this usage generates and collects user data, enabling application providers to analyze customer behavior effectively. The customer data has become a valuable resource, playing a fundamental role in advanced technologies such as artificial intelligence, machine learning, predictive analytics, and personalized marketing. Above mentioned allow businesses to tailor product recommendations, optimize pricing strategies as well as improve customer service and intimacy. In addition, they increase the development of new products and services leading to enhanced operational efficiency.

By leveraging the power of data and connectivity, companies can create more personalized experiences, predict customer needs, and drive innovation across various industries. This data-driven approach has led to the emergence of new business models, such as platform-based ecosystems, subscription services, and data monetization strategies.

Physical touchpoints between customers and their TIC partners have diminished due to digital channels, through which customers seek to fulfil their needs directly. Customers can access their accounts online 24/7, eliminating the need to wait for a message or report. While customers value this convenience, the increasing accessibility of services makes it challenging for a single TIC provider to meet all demands.

Today, customers no longer seek isolated products or services, such as an inspection of an elevator or a non-destructive test of a piping installation. In essence, customers desire an easy-to-use, one-stop solution through cost-effective bundling of products and services.

For the cause described above, a global customer platform stands as a cornerstone for business innovation, providing a nexus for customer interaction across the globe. This thesis explores the pivotal role of network effects in amplifying the platform's value, drawing parallels with biological ecosystems where each new participant enhances the digital platform's overall health and vitality.

This thesis is a case study of a digital *business-to-business* platform which the case company launched in January 2024. The outcome of the thesis is a strategic blueprint for the case company to ensure sustainable growth of the platform. Though the emergence of dominant platforms has been examined from various perspectives, more robust theoretical and empirical evidence about managerial initiatives around platform strategy and structure are lacking (McIntyre et al., 2021).

1.1 TIC industry

The Testing, Inspection, and Certification (TIC) industry plays a critical role in ensuring compliance, quality, and safety across various sectors. The nonfinancial audits have an impact on all companies around the world as products undergo rigorous testing and require essential approvals. Facilities and equipment also demand regular inspections to ensure adherence to health, safety, and operational standards across various settings, including factories, cargo ships, and pipelines. When navigating a complex network of standards and regulations, encompassing both voluntary and mandatory requirements set by customers, governments, and customs authorities organizations require the services of certification bodies (Castka & Searcy, 2023).

This intricate landscape of product testing, facility inspections, and regulatory compliance presents significant challenges for businesses. The complexity of these requirements often necessitates specialized knowledge and resources, potentially creating barriers for smaller businesses or those entering new markets. However, it also drives innovation in compliance technologies and processes, as organizations seek more efficient ways to meet these multifaceted demands (Castka & Searcy, 2023).

Ultimately, this regulatory environment serves to protect consumers, workers, and the environment, while also ensuring fair competition and maintaining trust in global supply chains. As markets become increasingly interconnected, the ability to navigate these regulatory landscapes effectively becomes a crucial competitive advantage for businesses operating in the global marketplace.

The overall worth of the TIC industry is estimated to be approximately 250 billion euros in 2025 (Economics, 2020) and is characterized by robust health converting into steady growth. The nature of the industry is that it leans heavily on regulations which protect the companies from cyclicality of the economy, but at the same time exposes the global TIC companies to heavy local competition in some segments. This challenges companies to argue for their higher prices and forces them to provide additional value such as digital platforms.

1.2 Background

The case company, which is a major player in the TIC industry, has launched a digital business-to-business platform to consolidate all their digital offerings under one umbrella. The platform, gathering all the existing digital services and providing secure single sign-on access throughout the variety of services is also the future infrastructure to distribute new to be developed digital services offering standard building blocks like authentication and user management.

Authentication and user management are essential components of cyber resilience, aligning with the current cyber security trends like the adoption of Zero Trust Architecture. The Zero Trust Architecture is built on notions of least privilege, granular access control and continuous authentication were all resource authentication and authorization is dynamic and strictly enforced by using *identity, credential and access management* tooling and *multi factor authentication* for added security (Syed et al., 2022).

The digital offering of the platform increases rapidly and now there is a need for a platform strategy to ensure sustainable growth and compliant governance. By leveraging network effect, the platform has already become business critical but also offers the possibility to implement new digital revenue models.

1.3 Research scope

The platform has already proven to be successful, by onboarding external service providers and acting as a global distribution channel for scaling a new digital product across countries. New business digital business models such as commissions from distribution of external services provide a new opportunity to expand existing business offering. As the network and traffic on the platform increases new business opportunities occur. To support the platform to reach its full potential, a clear executable strategy has to be in place. The purpose of this thesis is to identify which historical actions have had the most impact on the growth of the network and how the case company should move forward.

This thesis will introduce strategic scenarios derived from theoretical frameworks and historical findings and through workshop iterations choose the best way forward as the foundation for the strategy.

This study is focusing on to TIC industry and B2B platforms to gain answers to the following research questions in this context:

1. *What mechanisms underpin the network effects that escalate platform growth?*

2. *Which strategies can amplify the network effect to benefit the platform and its users?*

1.3.1 Method

This thesis uses scenario-based roadmapping (SBRM) method as strategic planning tool in order to generate a strategy that supports sustainable growth of the digital B2B platform. As stated by Cheng et al. (2016) in the rapidly changing and complex business environments, flexibility is one of the key factors when preparing for the future. Built upon the concept of "strategic flexibility" defined by Lengnick-Hall and Wolff (1999), which combines speed and adaptiveness. Cheng et al. (2016) have created the method of scenario-based roadmapping method for strategic planning and decision-making. The method combines both macro level (scenario planning) and micro level (roadmapping) perspectives.

Scenario-based roadmapping was chosen as a method as there are many studies of scenario and technology roadmapping but only a few combining both, like Cheng et al. (2016) have done. The scenario-based roadmapping method will be discussed further in section 3 – Methodology.

1.3.2 Delimitations

The scope of this thesis is limited to a business-to-business platform. The theoretical framework will focus on economic research stream for digital platforms only and will not discuss engineering design stream of digital platforms. This thesis uses scenario-based roadmapping which contains five phases, prerequisite preparation (Phase 1), scenario team formation (Phase 2), scenario building (Phase 3), scenario assessment and selection (Phase 4), and scenario-based roadmapping (Phase 5) (Cheng et al., 2016).

Since the scenarios serve as a foundation for developing a strategy that requires approval from multiple stakeholders and could influence the completion of this thesis, the

focus will be limited to phases 1 to 3 to provide relevant input for the strategic decision-making process.

2 Theoretical framework

2.1 Digital platforms

In order to understand what a digital platform is has to be defined. A digital platform can be defined as "a foundation created by a firm to enable other firms to build products and services upon it as in a marketplace, which, unlike a firm, does not have definite boundaries nor permeable borders" (Fu et al., 2017). Platform owners act as "network orchestrators" by creating the organizational systems and conditions for resource integration among different players (Fu et al., 2017). This applies to the case company in the sense that the organizational structure is de-centralized, but the platform owner is an overarching corporation which maintains the platform but does not execute specific activities.

A common nominator for digital platforms is that they create new ecosystems which connect different types of users and services or products. When successful the participants of the digital platform can leverage the value of the established connections and compete or even disrupt existing value chains **(**Björkdahl et al., 2024).

2.1.1 Economic research stream on digital platforms

There are two main streams of research on platforms which are the engineering design stream and economics stream **(**Björkdahl et al., 2024). As this thesis aims to provide a strategic blueprint to ensure sustainable growth of a business-to-business platform the focus will be only on the economic research stream which defines the platforms as marketplaces or transactional platforms.

The economics stream defined by Björkdahl et al. (2024) identifies platforms as marketplaces or transactional platforms facilitating exchange. The underlying engine defining the success of the platform is network effects despite whether they are direct or indirect as the value of the network equals to the value of the platform **(**Björkdahl et al., 2024).

Direct network effects occur when users from one user group join the network, and the value of the platform increases for all the users of the same user group. Indirect network effects occur when users from a different, complementary user group join the platform (Cusumano et al., 2019). Direct network effects have a horizontal impact as the increasing number of participants in one user group expands the customers base for service providers in the user group (Kemper, 2010).

A feature of indirect network effects is that the value for one side of the platform for example the service providers increase when number of customers increase. The increased number of customers attracts more service providers. This does create a high barrier to entry as low number of service providers may not attract a lot of customers, but lack of customers does not attract more service providers (Hagiu, 2014). Indirect network effects have a vertical impact as they derive from complimentary offering for all user groups in the network (Kemper, 2010).

To capture competitive advantage and maintain their market leadership position top companies deliver superior customer value in one of the three value disciplines which are operational excellence, customer intimacy and product leadership (Treacy & Wiersema, 1993). Focusing on mastering one of the three value disciplines and meeting industry standards in the other two in their strategies, top companies have engaged in strong customer loyalty that competitors struggle to keep up. Treacy and Wiersema (1993) define customer intimacy as an approach that focuses on building long-term customer relationships and meeting the wishes of a particular customer rather than focusing on the entire market.

The economic research stream does not identify a connection with these three value disciplines and platforms. In today's world there is a link between the value discipline of customer intimacy and successful platforms. While network effects are crucial for platform success, the quality of user relationships also plays a vital role. Strong user

relationships foster trust, loyalty and engagement which will encourage the users to remain active on the platform. High-quality interactions between users can also lead to more meaningful exchanges of value, such as collaborations, feedback, or user-generated content, which further enhances the platform's attractiveness and utility. This aligns with the findings of Banyte and Dovaliene (2014), who argue that "customer engagement into value creation is acknowledged as a factor that makes it possible for companies to survive the competition."

As Parker et al. (2016) argue, "successful platforms create ecosystems that align the interests of multiple stakeholders". By fostering a deep understanding of user needs and facilitating valuable interactions, platforms can strengthen network effects and increase user retention.

As digital platforms leverage vast amounts of user data to create personalized experiences, this can be seen as an evolution of customer intimacy. Hagiu and Wright (2020) note that "Platforms can use the data they collect on users to improve matching and customize their offerings". As observed by Cusumano et al. (2019) all successful digital platforms continuously monitor and from user interactions and adapt their services or offering to create more value for the network. This data-driven approach allows platforms to understand and cater to user needs at scale, potentially surpassing the level of intimacy achievable through traditional means.

In this case study one aspect to consider is what actually are the problems customers encounter and what is the definition of added value in terms of digital services for them. Since the service customers typically pay for in the traditional TIC industry is data provided in the form of a report, certificate, or similar, we can conclude that the primary desire is convenient access to the documentation or other deliverables. This underlines that in today’s world easy access to multiple sources where this data is scattered has become an industry expectation. This draws a connection between the economic

research stream of platforms and the three value disciplines identified by Treacy and Wiersema.

2.2 Mechanisms of growth in digital B2B platforms

Global commerce is evolving as the digital business-to-business (B2B) platforms reshape the traditional ways businesses interact, transact and create value. By utilizing cutting-edge digital technologies, platform owners are able to develop expansive ecosystems that can be scaled efficiently and rapidly. Understanding the intricate mechanisms driving this growth of digital platforms is essential for the operators, referring to the entity or organization that owns, manages, and oversees the platform's operation, and participants.

2.2.1 Value creation through network effect

As stated earlier by Björkdahl et al. (2024) the underlying engine for successful platforms is network effect. The alignment of interests of multiple stakeholders is crucial driver for a virtuous cycle of growth (Parker et al.,2016). The phenomenon is particularly powerful in the context of digital B2B platforms, where the stakes of transactions and partnerships are often higher than in the consumer markets.

The value creation potential of digital B2B platforms is further enhanced by the platforms ability to orchestrate resources and facilitate interactions (Fu et al., 2017). Noted by Kowalkowski et al. (2024), digital platforms are the provider of the technical and organizational infrastructure for the integration of stakeholders and resources within a service ecosystem. This kind of orchestration enables interactions between different types of user groups that might otherwise face barriers such as high transaction costs, which are the time, money, and effort required to negotiate and execute business deals, allowing the platform to create value.

The power of the digital B2B platforms lies within value co-creation. The platforms connect business that might not otherwise interact by reducing barriers such as geographical distance or knowledge gaps. For example, a small service provider or start-up with significant new technology can focus on the core of their business while accessing global markets via digital platform (Yrjölä et al., 2021).

Even though not fully applicable with the model of Porter's five forces (1979), the reduction of transaction costs can reduce the bargaining power of the suppliers by offering access to a larger customer base or new markets. For the platform owner in the context of this case study, managing this barrier to entry creates value in cases where the supplier's product or service is white labelled to be offered on the platform. As the market dynamics have changed since Porter (1979) introduced the five forces model, there is still very limited research about how the five forces model fits into modern digital platform economy.

2.2.2 Ecosystem orchestration

As the orchestration of complex business ecosystems is a vital part of the success of digital platforms and value creation thrives not only from direct transactions, but also from fostering an environment where multiple stakeholders can innovate and co-operate, governance mechanisms have a critical role. Previous research emphasizes that the governance structures must evolve alongside the platform growth, adapting to new challenges and opportunities as the ecosystem expands (Kohtamäki et al., 2019). Such governance structures may include setting quality standards which the new participants must comply with. For the case company this means restricting direct competition from joining the ecosystem.

2.2.3 Scalability and Efficiency

The nature of digital B2B platforms offers an unparalleled scalability, allowing them to grow rapidly without proportionally increasing costs. As traditional business models rely

on significant investments in physical infrastructure, digital B2B platforms leverage their existing digital frameworks to connect businesses across regions. As described by Parente et al. (2018), platforms are "asset-lite," meaning they can grow and scale without owning extensive physical resources. This characteristic enables them to enter new markets efficiently, relying on digital tools such as cloud computing, data analytics, and virtual networking instead of physical storefronts or warehouses.

Network effects inherent in digital B2B platforms further amplifies their scalability. Highlighted by Parker et al. (2016) successful digital platforms build ecosystems aligning the interests of diverse participants to create reinforcing cycles of adaptation and engagement. For instance, as a platform connecting manufacturers and suppliers grows, an increase in the number of manufacturers attracts more suppliers, while a rise in the number of suppliers, in turn, draws more manufacturers. This creates a mutually reinforcing relationship that drives virtuous cycles of growth (Cusumano et al., 2019).

2.2.4 Trust and reputation mechanisms

Trust is one of the cornerstones of the successful digital B2B platform, as transactions often involve long-term commitments and significant stakes. Digital B2B platforms leverage mechanisms such as user verification, rate and review systems and secure payments to ensure transparency, reliability and accountability (Teubner & Dann, 2018).

Most crucial mechanism is user verification to ensure that all participants are legitimate. Platforms may require all participants to provide proof of identity, licensing or financial stability before granting access (Cusumano et al., 2019).

An additional layer of security can be reached with MFA (multi-factor authentication). The multi-factor authentication is an additional layer of security which requires the user to provide additional identity verification when logging in. Most common method is scanning fingerprint or face, or entering a code received by phone or email. (Microsoft, 2024) Highest form of multi-factor authentication is to require a photo with your

passport next to your face and then the administrator of the platform grants access. Such authentication requires manual work from the platform owner and high security measures to store the personal data.

Rate and review systems, which can be also identified as transaction-based assessments, build trust forming prior transactional patterns based on evaluations provided by users. These can be either numeric, like star rating scales or written assessments such as written text or testimonials (Teubner & Dann, 2018). These systems are essential for fostering trust in digital environments where face-to-face interactions are limited.

2.3 Research gap

While digital ecosystems, including platforms, have evolved into a central research topic there are still multiple key trends that might impact the future of digital platforms. Regardless of the substantial progress of understanding digital ecosystems and platform dynamics, a range of research topics including value co-creation, cooperation, strategies for effective management and continuous innovation remain (Cuel et al., 2024).

In the special issue (Cuel et al., 2024) identify several key trends impacting the evolution of digital ecosystems and platforms. From the technological and business model perspectives future trends include seamless integrations and interoperability to create cohesive user experiences and comprehensive digital ecosystems. The trends also include prioritization of collaboration over competition to foster value creation through open innovation, shared infrastructure and cross-platform integrations. From business model perspective evolving monetization strategies beyond subscriptions include incorporating microtransactions or innovative data usage where data is the currency. The trends include also leveraging of emerging technologies like AI, blockchains and IoT to enhance personalization and efficiency, to improve security and enable greater interconnectivity.

As described, there are still gaps to be addressed and in the context of this thesis the research gap is narrowed to TIC industry. This study seeks to address the gaps from

managerial perspective to identify how the trends will impact digital B2B platforms in TIC industry and which kind of strategies could be beneficial for the case company.

3 Methodology

A scenario-based roadmapping was chosen as the research methodology as it combines both scenario and technology roadmapping. The scenario-based roadmapping is a strategic planning and decision-making method that proposes future reflecting situations assessing impact of every scenario and developing roadmaps with both internal and external issues and suggested actions according to the scenarios (Cheng et al., 2016).

The scenario-based roadmapping method consists of five phases shown in Figure 1. These phases are prerequisite preparation (Phase 1), scenario team formation (Phase 2), scenario building (Phase 3), scenario assessment and selection (Phase 4), and scenario-based roadmapping (Phase 5) (Cheng et al., 2016). As stated in section 1.5 – Delimitations, this thesis will only focus on first three phases but will introduce the whole process in this sections for future usage.

Figure 1. Scenario- based roadmapping phases (Cheng et al.,2016)

3.1 Phase 1 – Prerequisite preparation

The first phase of scenario-based roadmapping is initiation of the scenario-based roadmapping activity, determination of needs and scoping (Cheng et al., 2016). The purpose of the scenario-based roadmapping activity is to outline the growth mechanisms of digital B2B platforms, align theoretical insights with the platform's current features, and identify features to be developed, along with strategic actions for future scenarios. Determination of needs will occur from the gap analysis of best practices identified in theory and existing features of the platform.

3.2 Phase 2 – Scenario team formation

In the scenario team formation phase, the chosen participants are grouped into three teams which are *scenario building team, scenario assessment team* and *decision-making team* (Cheng et al., 2016). Each team has their own role in process where the *scenario building team* is responsible for research and formation of the scenarios, the *assessment team* is a sound board which the scenario builders can iterate with. According to Cheng et al. (2016) the *assessment team* should include members of the *decision-making team* who hold expertise from technical, financial and marketing perspectives.

In this specific case, where the whole concept of utilizing platform economy is fairly new to the entire company, the *scenario building team* will involve the people with the best knowledge of technical possibilities and limitations and view on market insights. The scenarios will be presented to the decision-making team for pre-assessment. Based on the feedback received, the selected scenario(s) will go through a series of approval rounds, including reviews by the architecture board, before the roadmap items are finalized.

The *scenario building team* will include a cloud architect, two digital officers and an innovation manager, who all have been part of building the platform and forming the initial go-to-market strategy. All these participants hold required amount of knowledge, mandate and a dedicated budget which sets the boundaries for the scenario building. These

boundaries are not set in stone, like the budget and can be modified by the *decision-making team* if the most plausible scenario(s) are identified to require more resources.

3.3 Phase 3 – Scenario building

The scenario building process will adapt the six thinking hats method by (de Bono, 2010, as cited in Cheng et al., 2016). The six different hats are blue, white, red, yellow, black and green. During the scenario building event, every participant will fill in the scenario framework sheet (Figure 2.) wearing each of the hats and come up with one to two different scenarios. The scenario framework includes clear instructions as guidelines for the thinking process.

The point of view for each hat is the following according to (de Bono, 2010, as cited in Cheng et al., 2016):

- Blue hat is managing the thinking process and focuses on how the other hats contribute to the scenario. For the blue hat, a modified set of questions is derived from the Kipling method of five W's and one H introduced by Cheng et al., (2016). The questions are:
    - *What* is the possible scenario you are thinking about?
    - *When* will the scenario happen?
    - *Who* will get involved in the scenario?
    - *Why* will the scenario happen?
    - *How* will the scenario happen?

  Question *Where will the scenario happen?* was left out of the Kipling method as the scenarios focus on a global digital B2B platform and the *where* factor is not relevant as the platform is designed to facilitate digital services not limited to geographical locations but are rather easily scalable globally.

- White hat focuses on data. This role is responsible for coming up with justifications for the scenario based on known facts, available data and information to be gathered.
- Red had acts based on intuition and feelings. The red hat holder should use system-1 thinking. This is easier said than done as system-1 operates automatically and quickly generating suggestions based on impressions, intuitions and feelings adopted by system-2 thinking which operates on low effort mode, but when system-1 faces difficulties like complexity of the future scenarios, it calls system-2 for help and more detailed and specific processing begins (Kahneman, 2011). This should not be the case, as red hat should respond quickly based on feelings as system-2 thinking should be used by the black hat.
- Yellow hat thinker focuses on benefits and enablers while maintaining optimism. The yellow hat imagines the positive impacts of the future scenarios.
- As stated, the red hat uses system-1 thinking, while the black hat takes a more negative point of view. This requires system-2 thinking which is mobilized when system-1 can't offer an answer (Kahneman, 2011). The black hat identifies potential risks and barriers but excludes mitigative actions from the thinking process.
- Green hat is the creative thinker, who tries to find solutions, alternatives and new ideas. Green hat focuses on how the future scenario(s) can be handled and what kind of solution should be developed.

<table>
<tr><th colspan="2">The scenario:</th></tr>
<tr><td colspan="2">Blue hat: the thinking process</td></tr>
<tr><td colspan="2"> 

What is the possible scenario you are thinking about?
When will the scenario happen?
Who will get involved in the scenario?
Why will the scenario happen?
How will the scenario happen?
</td></tr>
<tr><td>White hat: data and justifications</td><td>Red hat: feelings and intuition</td></tr>
<tr><td></td><td>  </td></tr>
<tr><td>Yellow hat: Benefits and enablers</td><td>Black hat: Risks and barriers</td></tr>
<tr><td></td><td>  </td></tr>
<tr><td colspan="2">Green hat: Creativity</td></tr>
<tr><td colspan="2">  </td></tr>
</table>

Figure 2. Scenario building framework (Cheng et al., 2016)

3.4 Phase 4 – Scenario assessment and selection

In the scenario assessment phase, a framework was established by Cheng et al. (2016) to assess and validate each potential scenario, ensuring its credibility based on five key criteria:

1. **Relevance**: Scenarios must align with the organization's needs, objectives, and the specific purpose and scope of the scenario-based roadmapping (SBRM) activity.
2. **Completeness**: Scenarios should address all aspects comprehensively, structured around the modified Kipling approach (Who, What, When, Why, and How).
3. **Consistency**: Scenarios must adhere to the structured framework provided, ensuring logical coherence and alignment with the scenario-building worksheet.
4. **Plausibility**: Scenarios should be realistic and capable of occurring under foreseeable circumstances.
5. **Creativity**: Scenarios must present fresh, innovative perspectives relevant to the challenges or objectives addressed in the SBRM activity.

Both positive and negative future scenarios developed in Phase 3 undergo validation against the first three criteria: relevance, completeness, and consistency. Only scenarios meeting these criteria are deemed valid for further evaluation regarding plausibility and creativity. This systematic approach ensures that the final scenarios are both credible and insightful for strategic planning purposes.

3.4.1 Further evaluation of scenarios

Each valid scenario is evaluated based on its plausibility and creativity. The scenario-based roadmapping (SBRM) methodology is designed as a practical management tool to assist organizations in creating actionable plans based on plausible future scenarios Cheng et al. (2016).

The evaluation process involves six key criteria, and criterion is scored on a five-point scale where 1 is very low and 5 is very high. The six key criteria are *Feasibility, Degree of*

Innovativeness, Impact, Estimated market share, Estimated investment and *Government support*. The last criteria *Government support* is excluded from the table (Figure 3.) as it is not sufficient for this purpose.

Criteria	Evaluation criterion	Score	Intepretation
Feasibility	**Level of practicality:** How likely is this scenario to occur?		**5 - 4** : Likely to occur **3**: Moderately feasible **2-1**: Unlikely or impossible
Degree of Innovativeness	**Level of novelty**: Will the scenario introduce new concepts to the market?		**5 - 4** : New concepts **3**: Fair innovation **2-1**: Lacks innovation
Impact	**Level of impact:** How significant impact does the scenario have on the market?		**5 - 4** : Significant impact **3**: Modest impact **2-1**: Low impact
Estimated market share	**Level of competitiveness**: Estimation of what could be the market share of the scenario		Defined by senior experts
Estimated investment	**Level of investment:** How much resources and money does to scenario need for implementation		**5 - 4** : Low resource need **3**: Requires some resources **2-1**: Requires significant resources
Total score			

Figure 3. Scorecard for evaluation. Modified from (Cheng et al., 2016)

3.5 Phase 5 – Scenario-based roadmapping

Based on evaluation actionable plans are developed using the scenario-based roadmapping for the chosen scenario(s). This phase includes two stages which are *preliminary scenario-based roadmapping* and *inside-out scenario based roadmapping* (Cheng et al., 2016).

3.5.1 Preliminary scenario-based roadmapping

First phase, the preliminary scenario-based roadmapping aims to create a visual roadmap for each scenario chosen using outside-in perspective. As this is the preliminary phase, a *suggested action plan* is formed including specific steps required to achieve chosen scenario(s). The phase includes mapping of *timeline* and *milestones*, the *drivers*

which are internal and external factors influencing the action plan, *providers* responsible for implementing the plan and *consumers* or *users* benefiting from the action plan (Cheng et al., 2016).

3.5.2 Inside-out scenario based roadmapping

After the preliminary phase, the actual inside-out scenario-based roadmap is developed. The outcome will be a comprehensive organizational roadmap to implement strategy. The framework includes the same elements as the preliminary scenario-based roadmapping with the difference that all aspects are mapped to organizational roadmap with final validation that the objectives reflect the organizational capabilities (Cheng et al., 2016).

3.6 Approach

The *scenario building team* will be formed from a group including a cloud architect, two digital officers and an innovation manager, who all have been part of building the platform and forming the initial go-to market strategy.

Working format will be a workshop which will start with an overview of the current state of the platform and evaluation of how it complies with the company's overall digital strategy. Each participant holds required preliminary insights from their respective roles for the scenario building process. Not to influence the scenario building process of individuals, no theoretical background on growth mechanisms of digital B2B platforms will be provided beforehand.

After filling the scenario building framework, every participant will introduce their reasoning and all templates will be further analyzed to address the research gap.

4 Strategic scenarios

During the scenario building process each participant was asked to fill a scenario-based roadmapping framework template based on given instructions. The process was very informal and for some scenarios iterations were required. The outcome in the end was four different scenarios with the headlines of *Strategic partnerships, Cyber resilience, AI* and *Federation.* Because the concept of platform economy is fairly new to the industry and the case company so some of the scenarios were more feature focused whereas some took a broader approach with a connection to companies' strategic growth objectives like cyber security. In the next section each of the scenarios will be summarized and discussed to find potential commonalities or complimentary elements. In section *5. Results* the outcome will be concluded, and a way forward will be suggested. The scenarios will be discussed in random order.

4.1 Scenario – Strategic partnerships

<table>
<tr><th colspan="2">The scenario: Establishing strategic partnerships</th></tr>
<tr><td colspan="2">  Blue hat: the thinking process</td></tr>
<tr><td colspan="2">

What is the possible scenario you are thinking about? By onboarding all operational T-I-C portals the userbase will grow exponentially. This can be used to raise interest in strategic partners who can offer their services on the platform
When will the scenario happen? Depending on the development and adoption of the operational portals, full potential could be reached in 2 -3 years
Who will get involved in the scenario? Key stakeholders are business representatives and product owners
Why will the scenario happen? As part of the new global ERP roll-out the operational portals will become part of the standard part of the offering as they bring operational efficiency by providing customers with self-service features like report archive
How will the scenario happen? Depending on the Testing, Inspection, Certification frequency every customer interaction after go-live of given portal will turn into potential new user. At the same time engagement with potential strategic partners should take place to promote the opportunity

</td></tr>
<tr><td>White hat: data and justifications </td><td>Red hat: feelings and intuition  </td></tr>
</table>

Current legacy portals have a combined user base of 50 000 – 100 000 users which is a small percentage of total customer base. *From security point of view all of the digital offering should use the chosen authentication architecture which means all users will be in the same user base.*	*With global market coverage and well-known trusted brand the company should be a desired partner. For a strategic partner whose digital offering does not conflict but brings added value for a specific industry niche the partnership should generate a win-win situation for all parties.*
Yellow hat: Benefits and enablers	Black hat: Risks and barriers
The ability to benefit from an organically growing user base enables strategic partners to easily access new regions and markets quickly. *For the platform owner this enables new revenue models like revenue sharing or license-based access to the platform and the user base while development, maintenance and support costs of the services lay with the strategic partner.*	*The platform owner bares the risk of quality in terms of data, customer service and maintenance of the strategic partners service as there is no control over the partners processes.* *If revenue sharing models like commission of sales is applied, how will this be monitored? Will the platform owner or strategic partner manage financial transactions and if it is the platform owner, how will account the be arranged?*
Green hat: Creativity	
To ensure quality of the service offered by strategic partner standard evaluation measures, a kind of mini due diligence should be applied as part of the partnership negotiation. These measures should include functionality, process and cyber security evaluation to mitigate the risks. *The revenue models should include financial KPI's and sanctions if estimates are not met to secure the interests of the platform owner, but the models applied need to be modifiable e.g. applying base license when forecasted revenue is low but switching to only commission-based model if expectations in terms of revenue are high. For the platform owner even a fully commission-based model is a low risk as there is no financial investment required for the partnership. Platform owners need transparency in strategic partners customer interactions and a solution could be to monitor customer engagement by offering a mandatory booking tool or contact point that can be monitored. As the customers are most likely customers of the platform owner, spot checks can be done by the platform owner in case of fraud suspicion.*	

Figure 4. Strategic partnerships

The scenario includes two different scenarios, the primary one being the onboarding of all operational Testing, Inspection and Certification portals to accelerate the organic growth of the user base and secondary being the outcome of the preliminary phase, where strategic partners will be attracted to add their offering on the platform to benefit from the user base. To realize the full potential of the scenario, the primary scenario has to happen but does not hinder the secondary scenario from happening in parallel. Full

realization of primary scenario is estimated to happen in 2 – 3 years and has dependencies with other internal objectives and stakeholders. The rationale behind the scenario is linked to the ongoing roll-out of new global ERP which aims to harmonize processes and enhance cross-border operation efficiency.

From the data and justification perspective the existing legacy portals hold a combined user base of 50 000 to 100 000 users, which is only a small percentage of all the customers of the case company. Part of harmonization is increasing data security, so it will be essential that all digital touchpoints with customers use the chosen authetication and authorization architecture. This will have a direct impact on the size of the user base as all legacy accounts will be migrated to chosen authentication architecture. Combined with the platform owners global market presence and trusted brand, an easy to join platform should seem attractive for strategic partners whose digital offering does not conflict but compliments the needs of the market.

The framework implies confidence in the potential benefits of strategic partners but although it doesn't explicitly elaborate on the feelings and intuition aspect. The benefits and enablers of such partnerships include the ability for strategic partners to easily access new regions and markets, at the same time leveraging the organically growing user base. For the platform owner, the partnerships enable new high margin revenue models such as revenue sharing or license-based access to the platform while the actual maintenance, support and run cost of the service are borne by the strategic partner.

However, the scenario is not riskless as with the visioned model the platform owner has no control over the quality of data, customer service and maintenance of the strategic partners service which might outcome as loss of reputation in worst case. Even though the service is provided by an external partner it will be accessed via case company's platform and the user might interpret that the platform owner is responsible for poor quality of described cases. Also, the monitoring of transactions related to revenue sharing models was identified as a potential risk because there is no intention of providing

transactional services for the strategic partner. Providing such a feature would require changes in accounting and reporting processes and these are excluded for now. To mitigate the risks, it was suggested to set standard evaluation process, a light due diligence, during partnership negotiations to ensure the quality of functionalities, processes and security.

The scenario foresees use of flexible revenue models including KPI's and sanctions to ensure platform owners interests. These models should be adaptable such as applying a base license if forecasted revenue expectations are low and then lifting the base license and switching to commission base model when forecasted revenue expectations are high. Key objective is transparency in the partnership, and this can be leveraged by monitoring customer engagements with mandatory usage of booking tools provided by the platform owner.

4.2 Scenario – Cyber resilience

The scenario: Cyber resilience
 Blue hat: the thinking process
• ***What* is the possible scenario you are thinking about?** *Embedding cyber security in all stages of operations from vendor selection to transaction process will become a must have for business. Adoption of AI driven threat detection, quantum-resistant encryption and decentralized trust mechanisms will become essential part of ensuring business continuity. This will include establishment of cyber resilience testing, rapid response teams and compliance frameworks to comply with regulations.* • ***When* will the scenario happen?** *Regulations will become more intensive during the 2030s but proactive investments in compliance can result in competitive advance.* • ***Who* will get involved in the scenario?** *Governments and regulatory bodies will drive the change whereas large industrial organizations will have to comply in first wave.* • ***Why* will the scenario happen?** *Cybersecurity will become a question of survival for business. In worst case a single breach to centralized data core can lead to financial losses, reputational loss and legal consequences.* • ***How* will the scenario happen?** *Change in regulation will force companies to adopt multilayered approaches including security monitoring, transaction verification and zero trust architectures.*

White hat: data and justifications	Red hat: feelings and intuition
Cloud- based architectures and operational applications will become prime targets for sophisticated cyber threats like AI phishing and brute forcing with quantum technology. Early adopters are already shifting from preventive cyber security approach to proactive cyber resilience strategies. Governments and regulators have introduced and will further introduce strict compliance frameworks which companies have to comply with.	*Cyber threats create both anxiety and confidence depending on the level of maturity of organizations. There is a lot of business potential to ensure trust in digital transactions as especially smaller companies struggle with complexity and costs of cyber security measures. Being able to demonstrate capabilities of handling cyber threats may become a competitive edge which differentiates the company among rivalry.*
Yellow hat: Benefits and enablers	**Black hat: Risks and barriers**
Demand for offering cyber resilience services such as consultation for digital ecosystems will increase in the future. To avoid conflict with accreditation and remain neutrality establishing a network of strategic partnerships and managing the entire supply chain from early consultation to audition of embedded measures should be established leveraging the existing platform infra.	*No matter how sophisticated security measures are, the risk of human error is always possible. The balance with usability and security will remain an eternal debate. Too weak security measures expose to data breaches and risk of being hacked but too heavy measures might become a barrier hindering daily business and cannibalizing efficiency with the cost of profitability.*
Green hat: Creativity	
Establishing partnerships with companies focusing on cyber security services such as self-healing AI tools. Change in regulations open new opportunities like digital identity which enables users to remotely identify themselves digitally and securely store certificates and document like driver's license. As an increasing amount of data will be generated from cyber security audits, a cyber resilience indicator or a trust score can be developed as a service using benchmarking of anonymized data.	

Figure 5. Cyber resilience

The scenario cyber resilience involves embedding of cyber security on all levels of operations all the way from vendor selection to transaction processes. The scenario argues that this will become essential for all business continuity in the future. This will include adoption of AI-driven threat detection, quantum-resistant encryption, and decentralized

trust mechanisms. Establishment of cyber resilience testing, rapid response teams, and compliance frameworks will be crucial to comply with changing regulations. As governments and regulatory bodies will drive these changes, it’s expected that 2030s will be the decade when the regulations will intensify, companies proactively investing in compliance now might gain competitive advantage.

Cybersecurity will become vital for business survival, as a single breach can lead to significant financial, reputational, and legal consequences. Companies will need to adopt multilayered approaches, including security monitoring, transaction verification, and zero trust architectures. Cyber threats create both anxiety and confidence, depending on an organization's maturity. There is significant business potential in ensuring trust in digital transactions, especially as smaller companies struggle with the complexity and costs of cyber security measures. Demonstrating capabilities in handling cyber threats can become a competitive edge.

From data and justification perspective, cloud-based architectures and operational applications will become prime targets for sophisticated cyber threats like AI phishing and brute-forcing with quantum technology. It can already be seen that early adopters are shifting from preventive cyber security to proactive cyber resilience strategies.

Increasing demand for cyber resilience services, such as consultation for digital ecosystems, generates new business opportunities. However the case company must carefully avoid any conflict with accreditation to maintain neutrality. Therefore it is suggested to establish a network of strategic partnerships and manage the entire supply chain from early consultation to auditing embedded measures. The existing platform infrastructure can be used as basis to build on.

Still, one of the main risks is the possibility of human error. Platform owners and service providers have to balance between usability and security, which will always be

challenging. Weak security measures expose data breaches and hacking risks, while overly stringent measures can hinder daily business and reduce efficiency.

The green hat thinker suggests establishing partnerships with companies specializing in cyber security services, such as self-healing AI tools. The upcoming chances in regulatory changes open new opportunities, like usage of digital identity, which enables users to remotely identify themselves and securely store certificates and documents. As more data is generated from cyber security audits, a cyber resilience indicator or trust score can be developed as a service using anonymized data benchmarking.

4.3 Scenario – Leveraging AI

<table>
<tr><th colspan="2">The scenario: Leveraging AI</th></tr>
<tr><td colspan="2">  Blue hat: the thinking process</td></tr>
<tr><td colspan="2">

- ***What* is the possible scenario you are thinking about?** *The platform evolves to leverage AI for predictive analytics, hyper-personalized customer experiences, and automated customer support, while also fostering AI-enabled strategic partnerships.*
- ***When* will the scenario happen?** *Within the next 1-3 years as the company adopts advanced AI technologies and develops customer-focused innovations.*
- ***Who* will get involved in the scenario?**

  Internal Stakeholders: *AI and data science teams, customer success teams, marketing and sales departments, and IT infrastructure teams.*

  External Stakeholders: *B2B customers who will benefit from AI-driven insights, technology partners providing AI solutions, and third-party service providers integrating into the platform.*
- ***Why* will the scenario happen?** *To strengthen the platform's competitive edge, improve customer satisfaction and retention, and capitalize on the growing adoption of AI in business processes.*
- ***How* will the scenario happen?** *By integrating AI models into the platform's analytics and operational workflows, introducing AI-powered tools for customers, and collaborating with AI-specialized partners for added capabilities.*

</td></tr>
<tr><td>White hat: data and justifications</td><td>Red hat: feelings and intuition  </td></tr>
</table>

Studies reveal that AI adoption in B2B platforms can enhance customer satisfaction by up to 30% through improved personalization, demonstrating its potential to transform customer experiences. Feedback from customers highlights a growing demand for more proactive and tailored support, emphasizing the need for solutions that anticipate and address specific needs. Additionally, competitive analysis indicates that AI-driven predictive analytics is rapidly becoming an industry standard, making it essential for platforms to stay ahead.	*The hype around AI has triggered all companies to start experiments with AI tooling. A lot of promising initiatives have been introduced but the struggle to integrate and develop profitable business models exists. Still, confidence is high that strategic AI partnerships will drive significant differentiation and value.*
Yellow hat: Benefits and enablers	Black hat: Risks and barriers 
***Predictive analytics and benchmarking**:* *Combining internal data sources with AI tooling that can collect from externally uploaded documents like maintenance reports analytics and benchmarking services can be developed and offered as premium features for users.* *Current AI capabilities already enable building of proof of concepts and rapid advancements in fields of generative AI and machine learning increase the accuracy of e.g. data capturing to acceptable level of quality.*	***Risks:*** *Spoilt of choice with potential AI partners requires critical analysis of the true capabilities of offered solution. How much effort will the training of the model require and how accurate output can it deliver.* *Is there a risk that after committing it to a supplier the cost multiplies exponentially due to unforeseen elements?* *There might not be enough expertise in-house to make correct evaluations.*
Green hat: Creativity 	
Having an AI assistant or a chatbot is almost a hygiene factor already for platforms so this should be a short term item to tackle. Using it as foundation it can be developed further to empower users in co-creation to design more personalized user experience. *By opening a sub-marketplace for third party AI tool providers, the platform owners could learn by monitoring user behaviors which technologies and use cases thrive among different industry segments. This would mitigate the risk of sunk cost investments as the risk of success is outsourced to third party suppliers with the incentive for them to access a vast customer base covering multiple industries.*	

Figure 6. Leveraging AI

Less surprisingly AI was the theme of one scenario. Focusing on leveraging current and evolving AI capabilities the scenario foresees the platform evolving by utilizing AI for predictive analytics, hyper-personalized user experience and automated customer support.

The scenario also includes fostering of AI related strategic partnerships. The scenario is expected to occur in short term (1 – 3 years) as the case company adopts advanced AI technologies and focuses on customer-oriented innovations. The likeliness of the scenario happening is high as an AI programme manager was lately appointed.

As the scenario involves both internal and external stakeholders who will all benefit from the evolution of technology, the rationale for this scenario is to strengthen the platform's competitive edge, improve customer satisfaction and retention, as well as capitalize on the growing adoption of AI in business processes. This will be achieved by integrating AI models into the platform's analytics and operational workflows, introducing AI-powered tools for customers, and collaborating with AI-specialized partners for added capabilities.

Studies reveal that AI adoption in B2B platforms can enhance customer satisfaction by up to 30% through improved personalization, demonstrating its potential to transform customer experiences. Feedback from users highlights a growing demand for more proactive and tailored support, emphasizing the need for solutions that anticipate and address specific needs. Additionally, competitive analysis indicates that AI-driven predictive analytics is rapidly becoming an industry standard, making it essential for platforms to stay ahead. The hype around AI has triggered many companies to experiment with AI tools, leading to promising initiatives, although integrating and developing profitable business models remains a challenge. Confidence is high that strategic AI partnerships will drive significant differentiation and value.

Benefits from AI integrations include the basis for predictive analytics and benchmarking services, which can be developed by combining internal data sources with AI tools that can analyze external data like maintenance reports. Such services can be offered as premium features for the platform's users. While current AI capabilities already enable the building of proof of concepts, rapid advancements in generative AI and machine learning are increasing the accuracy of data capturing. However, there are risks and barriers to consider. The abundance of potential AI partners requires critical analysis of the true

capabilities of offered solutions. There is a risk that after committing to a supplier, costs could multiply exponentially due to unforeseen elements. This indication refers to common business models with start-ups especially in the field of AI, as majority of services in the market are built on most common large language models (LLM's) and the service providers carry high price per unit cost for using the models. Additionally, there may not be enough in-house expertise to make correct evaluations.

Concrete suggestions to realize the scenario are developing an AI assistant or chatbot to meet the hygiene factor for platforms. This foundation can be developed further to empower users in co-creating more personalized user experiences. Interesting curiosity is the proposal of opening a sub-marketplace for third-party AI tool providers, where platform owners could learn which technologies and use cases thrive among different industry segments by monitoring user behaviors. Such an approach would mitigate the risk of sunk cost investments, as the risk of success is outsourced to third-party suppliers who have the incentive to access a vast customer base ranging over multiple industries.

4.4 Scenario - Federation

The scenario: Growing the network with federation
 Blue hat: the thinking process
• ***What* is the possible scenario you are thinking about?** *To accelerate the evolvement of the platform and increase customer engagement federation with Azure Entra ID premium should be considered. Federation means that customer organization using D365 accounts can connect their organizational accounts to platform owner's active directory.* • ***When* will the scenario happen?** *Base infra Azure B2C SSO is in place so Entra ID can be activated within months. Full customer adoption will take 2 -5 years.* • ***Who* will get involved in the scenario?** *IT departments from both internal and customer organization.* • ***Why* will the scenario happen?** *Increasing number of customers seeks for the functionality and even some tenders are lost due to lack of the possibility. Now there is base infrastructure in place where platform owner's portals are easily accessible for users including the Azure B2C SSO infra.* • ***How* will the scenario happen?** *By enabling Entra ID feature and educating the sales organization how the customers can benefit of it.*

White hat: data and justifications	Red hat: feelings and intuition
On almost monthly basis there comes questions during tenders or customer meetings about this possibility. Some tenders are lost because the feature is not available. *Sales have identified that such feature would increase hit rate of won contracts.*	*Enabling federation is an easy way to increase adoption of the platform and strengthen customer retention. Stronger adoption of the platform will increase the user base which enables other initiatives like building strategic partnerships.*
Yellow hat: Benefits and enablers	**Black hat: Risks and barriers**
Azure B2C SSO is already used for authentication. Microsoft offers an Entra ID premium solution which can be connected to existing authentication. This combined with the user access management tool authentication management can be in chosen cases fully shifted to the customer. *The biggest benefit for users is that there are even less accounts to manage as they can use their organization's account instead of creating an additional one. Also features like MFA can be applied to ensure security.*	*There are no barriers blocking the enabling of the feature. Identified risks relate to sales organizations' capability to adopt the requirements of using the feature. Another risk for the user is that if they use the organizational account to access personal data like welding certificates, in case the user leaves the organization, and the account is deleted by organizations admin all access rights also to platform owners' services will be terminated. This means that user is no longer able to access personal certificates or other data within the portals.*
Green hat: Creativity	
The risk of losing access to personal data can be mitigated by instructing users to use personal accounts when registering to services which contain data that should be accessible even in the case that user leaves the organization. A fallback option is to create a flow for such services where the user can request access to the data. The flow requires strong authentication but there are similar flows in public applications which can be benchmarked. *For sales education a FAQ page with step-by-step guide of the process and requirements should be created and communicated throughout the organization. Also, the clinics should be held on frequent basis to increase awareness.*	

Figure 6. Federation

The final scenario focuses on accelerating the growth of the network by federation. Federation means a process that allows users to access multiple systems or platforms using single credentials, usually the organizations own ones. The scenario foresees that by enabling federation for customers the user base would rapidly grow, similar to scenario *strategic partnerships* with the difference that in federation the organic growth comes

from connecting with external organizations. As the platform already uses Azure B2C for authentication, there is already a technical upgrade possibility to allow federation, but the realization of full potential of the scenario is seen to take some years.

The rationale for this scenario is that an increasing number of customers seek for such functionality, and some tenders have even been lost due to its absence. Data and justifications back up the rationale as sales departments have indicated that enabling federation might increase the hit rate of won quote. It would also increase the adoption of the platform and strengthen customer relations, which would outcome in higher retention rate. It is easy to follow this reasoning as it will tie the customer closer to the platform owner via access to data and increases the substitution costs of supplier in traditional testing, inspection and certification services.

Strong enabler is the current authentication infrastructure which can be upgraded to Microsoft Entra ID. This, combined with the existing user access management tool, allows to shift the authentication management fully to the customer in chosen cases. The biggest benefit for single users will be that there are less accounts to manage, as they can use their organizational accounts instead of being forced to create additional ones. Features like multi-factor authentication (MFA) can also be applied to ensure security.

For the scenario no barriers blocking were identified. However, risks and barriers consider the sales organization's capability to adopt the requirements of using the feature. Another risk related to single users is that if they use their organizational accounts to access personal data, such as welding certificates, and then leave the organization, their access rights to the platform owner's services will be terminated immediately. This means they will no longer be able to access personal certificates or other data within the portals.

To mitigate the risk of single users losing access to personal data, service providers must instruct users to use personal accounts when registering to services that contain data

they need to access even if they leave the organization. This has to be clear for the user registering for the service. Still a fallback option should be in place and such an option is to create a flow where users can request access to the data by using strong authentication. The option of using for example digital identity discussed in scenario *cyber resilience* should be considered as future improvement is such cases. For the sales education, a FAQ page with a step-by-step guide of the process and requirements should be created and communicated throughout the organization. Additionally, "How to" clinics should be held frequently to increase awareness.

4.5 Results

All the scenarios based their reasoning on the growth mechanisms of digital B2B platforms even though these were not discussed or provided in advance or during scenario building. A common nominator for all scenarios was involvement of external parties either via strategic partnerships or customer intimacy using federation. As stated in chapter 2 the power and success factor of digital B2B platforms lies within value co-creation.

The definition of value depends on the context and is always use case and industry specific. From the scenarios it is possible to draw conclusions that in this case study value means ease of use. This can be the option to use and manage just single organizational account to access all the necessary digital hubs, as the modern business models and industry trends scatter the data across different portals and cloud locations. In addition the value for single user can originate from self-service options like AI powered personalization and assistance. Even though such features seem obvious they have not reached the hygiene factor stage where they become industry standards. During tenders or examinations customer retention, price is not usually the differentiator, it is the co-created value and the lock-in it creates.

The reason of existence for any digital B2B platform is growth. The aim of this thesis was to identify and understand growth mechanisms of digital B2B platforms beyond network effect. In the scenarios growth will come both organically from onboardings and from

external partnerships. The scenarios don’t consider how to maintain user activity as part of growth. Clearly, an onetime login from a user is not as valuable as active usage of the platform. Resulting from the identification of value, it can be stated that traffic can be channeled to the platform with digital add-ons to core offering, like a self-service portal to access certificates or reports, such initiatives easily become a hygiene requirement from the industry and the competitive edge will be lost. To maintain competitive edge understanding which actually brings value to the user is more important than mere focus on driving growth.

Additionally an interesting observation is the big role of trust in the whole ecosystem. Not just in terms of user verification, rate systems and other reliability and transparency methods, but in terms of cyber resilience. Trust in this context is not just the architectures and cyber security of specific digital B2B platform, but also it is much broader as most of the industries are evolving towards ecosystems where cloud computing, data sharing and digital transactions will be part of daily business. This evolvement turns into new business opportunities, where having a platform with trust mechanisms in place, will play a central role.

All the scenarios approached the topic from different perspectives, some focusing more on current and upcoming trends when others had sharper focus on customer intimacy and business models. There are similarities in the scenarios as each one focuses on acceleration of growth. In the next phase the original scenario-based roadmapping method would evaluate and score each scenario before handing over to the decision-making team. Based on the results of this thesis it is proposed to have another iteration round on the scenarios, where the focus is in merging the complimentary elements into one framework from where the strategic roadmap can be built.

5 Discussion and Conclusion

This master's thesis aimed to support the strategy formation process for a digital B2B platform developed in the case company. Focusing on understanding the mechanisms of growth in digital B2B platforms the theoretical framework provides insights on the growth factors beyond the obvious network effect. As the research for digital B2B platforms is quite new there is still a lot that have not been studied sufficiently in detail. This thesis managed to highlight and pinpoint some vital factors such as value co-creation, ecosystem orchestration, scalability and efficiency and trust mechanisms.

The research question *What mechanisms underpin the network effects that escalate platform growth?* was examined through the theoretical framework in order to build strong understanding of the elements of succesful digital B2B platform. The purpose of this thesis was to support the digital platform strategy formation process. Part of the process was to find feasible tooling to support the process and the SBRM, scenario-based roadmapping framework was chosen as the best alternative to answer the second research question *Which strategies can amplify the network effect to benefit the platform and its users?*

By using the scenario-based roadmapping framework four future scenarios were conducted for the decision-making team responsible for forming the strategy. The future scenarios identified two approaches, organic growth by technical developments and partnership establishment for inorganic growth. Both above mentioned approaches included identified growth elements of digital platforms. The conclusion of this study is that both above mentioned approached confirmed the theory. From the scenario building process both theoretical and managerial implications can be made which will be discussed below.

5.1 Theoretical implications

Theory identifies that by utilizing mechanisms of growth for digital B2B platform, platform owners can reshape the ways how businesses interact, create value and transact with each other. Growth mechanisms like value creation through network effect, ecosystem orchestration and trust mechanisms all have a vital role in accelerating platforms growth.

There is available research on digital B2B platforms , but very limited amount specifically focusing on TIC industry. Research on digital B2B platforms have identified the above mentioned growth mechanisms as core elements of any digital B2B platform and they are applicable for the case study of this thesis also. The TIC industry leans heavily on regulations and accreditations which brings limitations in how to implement all the core elements of digital B2B platforms to capture maximum value as fast as possible.

The theory builds on value creation through network effect and the scenarios support that it can be seen as the foundation of any digital B2B platform regardless of the industry the platform operates in. Yrjölä et al. (2021) point out that power of digital B2B platforms is in connecting businesses that might not otherwise interact by reducing barriers. This is true but, given to the specific nature of the TIC industry, there are strict limitations in which kind of partnerships a TIC company can establish. In a perfect world where there is no limitations and businesses would rationally focus only in maximizing shareholder value, most logical act for TIC companies would be to partner with maintenance companies and cyber resilience consultants creating an ecosystem where customer can get everything starting from initial audit or inspection, repair of found nonconformities or remarks and a re-audit or inspection from one company. However, this would violate the neutrality requirement.

Traditional value of network effect is captured when the user base expands, making the platform interesting for external parties to join with their offering. In such cases, the platform owner is the gate keeper who can allow selected partners to join the platform.

The situation has benefits as the platform owner can react to changes in regulation by establishing a partnership with a provider related to the change instead of developing from scratch. On the counter side platform owner bares the risk of lost reputation if the extern partner fails to delivery promised value.

The limited number of research regarding digital B2B platforms in TIC industry does not offer large variety of observation frameworks, but the scenario-based roadmapping method (Cheng et al., 2016) was a specific case study of TIC companies. Modifying the approach by leaving out *where* factor from the Kipling method turned out to be successful research method for this specific case study. For future research of digital B2B platforms in TIC industry the scenario-based roadmapping framework could be further developed to further consider external limitations and what kind of actions could change these limitations

Even though the participants were not provided with any theoretical background on the growth mechanisms, this study underlines that the theory and the chosen research method is applicable for the TIC industry.

5.2 Managerial implications

The outcomes of this thesis highlight that traditionally conservative and highly regulated industries, like the TIC industry, can also benefit and gain competitive edge by exploring and utilizing the power of digital platforms. Digital interactions are becoming a standard requirement from customers and for this need digital platforms provide a modern, sustainable framework. The business models from consumer focused platforms like Uber or Alibaba do not directly fit to business-to-business interactions but the same mechanisms of growth apply.

The scenarios underline that the TIC industry will reshape from isolated giants towards ecosystems of strategic partnerships. These ecosystem will form around and will be orchestrated by the top players, but they will need strategic partners whose specific

expertise is in AI technology, machine learning or other high value initiatives. Such strategic partners are too small to compete or even to gain market position on their own, so being able to join an existing TIC ecosystem will bring added value for all parties within the ecosystem.

To excel in future in the TIC industry, companies have to have a digital strategy in place. Establishing digital B2B platforms is one way to increase customer engagement and answer to the requirements of digital interactions, but not the only one. Most important conclusion of this thesis is that all TIC companies need to have an updated digital strategy in place which includes a secure technical architecture, digital channels to interact with customers and an organizational function to explore and implement emerging technologies.

5.3 Limitations and future research

This study was a single case study of a specific industry which limits the extent to which the results can be generalized to. The study does imply that the key trends impacting future of digital ecosystems and platforms are generic and not limited to specific industry. However even the TIC industry itself holds limitations due to its diverse nature and regulations for accredited bodies.

The study identified what growth mechanisms can be generalized for the TIC industry and was able to define what is value in the study's context for user but for future research there are still gaps such as are there other dominant growth mechanisms in less regulated industries and how will the future regulations related to cyber security and cyber resilience impact the future of digital B2B platforms.

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