

# How to capture maximum value through minimizing transaction costs for a digital E-healthcare platform

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## **ABSTRACT,**

*With the increasing pressure on healthcare systems and the growing importance of preventive healthcare, platforms like Samen Kwiek have emerged to connect service providers and users in rural areas, aiming to enhance economic growth and improve citizens' quality of life. However, to maximize the value generated by the platform and ensure its long-term sustainability, it is crucial to understand the interplay between platforms, value capture, and transaction costs. The study is theoretically based on the theoretical frameworks of platform business models, transaction cost theory, and value capture. The platform business model approach highlights the role of intermediaries in the efficient linkage of actors in a multi-sided platform, while transaction cost theory explores the costs related with transacting in markets and the strategies to minimize them. The research focuses on three key dimensions of transaction cost theory: transaction frequency, asset specificity, and uncertainty. Transaction frequency focuses on the frequency of exchanges between actors on the platform, while asset specificity examines on what level an investment is customized for specific transactions. Uncertainty assesses the extent to which information sharing and detailed service information reduce information asymmetry among participants. These dimensions have been measured before and after the connection to the Samen Kwiek platform, providing insights into the changes in transaction frequency, asset specificity, and uncertainty brought about by the platform. The findings contribute to the existing literature on collaborative business modeling, value capture, and transaction cost analysis, providing practical recommendations for Samen Kwiek and similar platforms to optimize value capture, and minimize transaction costs. Overall, this study aimed to shed light on the factors influencing value capture and transaction costs in a platform-based ecosystem, offering valuable insights for platform developers, service providers, and policymakers in the domain of preventive healthcare.*

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## **Keywords**

Platform, ecosystem, transaction costs, value capture, healthcare

## 1. INTRODUCTION

In the Netherlands, the pressure on the healthcare system is increasing and therefore there is a continuing recognized trend for preventive healthcare. In response to this trend, the European Union has invested in the development of a service platform known as dRural. Designed as a service marketplace, dRural bridges potential end users and service providers in rural areas, delivering a broad spectrum of services while stimulating economic growth and enhancing citizens quality of life (<https://drural.eu/>).

A local manifestation of this initiative in the Netherlands is the development of the Samen Kwiek platform. The intent of this platform is to foster a balanced ecosystem between service providers in health, social, and welfare sectors and consumer segments, including municipality professionals, citizens, and other health, social, and welfare providers (dRural -Regional Platform Strategy Work, 2023). The platform primarily targets obese youngsters, Type II diabetes patients, and vulnerable elderly citizens within the consumer segment (Sahhar & Von Raesfeld, 2022). The services offered will cover diverse areas such as physical activities like walking and football, nutritional advice, mental wellbeing, and personal care (dRural -Regional Platform Strategy Work, 2023).

At its nascent stage, it is crucial to define and investigate the mechanisms by which the Samen Kwiek platform can deliver maximum value to both service providers and customers. This platform capitalizes on a platform business model, which focuses on capturing value and facilitating interactions between external participants beyond the boundaries of the organization itself (Allweins et al., 2020). The process of connecting and matching these external groups results in value creation (Parker et al., 2017). Fehrer et al (2018) further refines the understanding of the platform business model by adopting a targeted approach towards value cocreation and value capture, integrating complementarity theory (Milgrom and Roberts, 1995), transaction cost theory (Coase, 1937; Williamson, 1983) and network externalities (Katz and Shapiro, 1985). This research will zone in on value capture through an analysis of transaction costs within a platform. To add to this, it is important to make the distinction between the practicality of Samen Kwiek and the overall dRural project. The literature states that value capture in collective business modelling should get systemic attention through analyzing complementarity, transaction cost analysis and network externalities. This research aims to provide useful insights regarding collective business modelling, value capture and transaction costs.

In the initial phase of Samen Kwiek's development, the key stakeholders will prioritize connecting with service providers. These providers will offer their services via Samen Kwiek, and any inconsistencies within the platform will subsequently be identified. The objective of this research is to provide Samen Kwiek with practical insights into the potential advantages or disadvantages that service providers may experience regarding transaction costs once they are connect to the platform. To address the question of how to maximize value capture by minimizing transaction costs on a digital e-healthcare platform,

the research will be guided by two sub-questions which will be explored in the theoretical framework:

1. What insights does the current literature offer on transaction costs in platforms?
2. What are the positive and negative implications of transaction costs on value capture in platform business models?

This research will extend the existing body of knowledge on collaborative business modelling, particularly focusing on value capture through minimizing transaction costs. Collaborative business modelling, as described by Dietrich, Frankenberger, and Weiblen (2019), involves the strategic organization of business activities that are shared across stakeholders, leading to mutual value creation. This research aims to connect this to transaction cost theory. The seminal theories on transaction cost economics were introduced by Coase and Williamson and have been instrumental in examining the organization of economic activity (Nagle et al., 2020). Transaction costs can be characterized by asset specificity, uncertainty, and frequency, subject to the behavioral constraints of bounded rationality and opportunistic behavior (Cuypers et al., 2021). In light of the digital revolution, these theories have been continuously refined to remain relevant within evolving business environments, including platforms. A platform business model can be conceptualized as a collaborative infrastructure that 'connects a variety of different actors and allows for various resources to be integrated with larger sets of resources' (Fehrer et al., 2018). Limited work has been done on how this platform business model and transaction cost theory interconnect to maximize value capture.

The practical implications of this research are twofold. For Samen Kwiek and similar platforms, understanding the operational dynamics before the launch is crucial to maximize benefits and minimize risks. Given that the EU's financial support for Samen Kwiek will end in 2024, the platform needs to be self-sustaining. Therefore, comprehensive research into various aspects of the platform is necessary to identify potential opportunities and threats. Furthermore, with the extensive ongoing research into collaborative and platform business models, it is paramount to apply these theories to collaborative business modelling and examine their contribution to value capture. While the concept of business models has been gaining extensive attention in contemporary research, the aspect of value capture remains understudied (Massa et al., 2017). Thus, the practical importance of this research lies in guiding developers of platforms like Samen Kwiek on how to utilize transaction cost analysis and collaborative business modelling theories to maximize value capture. When this research is completed, the platform developers can apply the findings to the Samen Kwiek platform. The subsequent chapter will present the primary concepts and a framework for analyzing transaction costs on the Samen Kwiek platform

## 2. THEORETICAL FRAMEWORK

### 2.1 Transaction costs

The first work on transaction cost theory was presented by Ronald Coase in 'The Nature of the Firm' (Coase, 1937). Coase

presented a new way of thinking whereas it used to be that the mere costs that should be considered were costs of transportation and production, based on the assumption that for all economic agents in the market there was full information. Coase modified the aforementioned assumption by presenting that limited information is held by economic agents and therefore that there are many costs associated with transacting in markets (Henten et al., 2016). This theory was an explanation as to why entities were created by economic agents to lower transaction costs.

After presenting this theory, it became clear that there were internal- and external transaction costs. Internal transaction costs deal with managing a company and external transaction costs lead to the establishment of firms by being powerful economic mechanisms (Henten et al., 2016). Williamson (1979) extended the theory on transaction costs by developing a framework which was designed for understanding and explaining transaction costs through the terms bounded rationality, uncertainty, opportunism, asset specificity and transaction frequency (Williamson, 1979). These terms are the basis transaction cost theory with frequency, uncertainty and asset-specificity being most widely used.

This research will use the following definitions regarding transaction frequency, uncertainty and asset-specificity. Firstly, transaction frequency refers to the recurrent or occasional exchanges over a time span that happen with the same parties (Akbar et al., 2022). Secondly, transaction uncertainty in terms of platforms refers to what extent the identity of the involved parties is known and what the context of the transaction is (Akbar et al., 2022). Lastly, asset specificity refers to the degree of how specific an investment is regarding a certain transaction (Hennart & Silverman, 2020). An asset is specific if the value of the asset in the current transaction is higher than the value of the asset in a following 'next-best' transaction. The following paragraph introduces the concept of value capture and transaction costs.

## 2.2 Value capture and transaction costs

It is necessary to define the concept of value capture. Fehrer et al (2018) define it as a platform owner's ability to appropriate a portion of the value created inside the ecosystem (Fehrer et al., 2018).

Massa, Tucci, and Afuah (2017) write in their work "A critical assessment of business model research" that "there is general agreement that business models—as attributes of real firms—involve performing value-adding activities to create and/or capture value." This concept of value capture is relevant in our platform context since value capture in platform-based business models is closely linked to transaction costs.

In Fehrer's et al "Logic for systemic value capture in platform business models." (2018) three critical elements of the platform business model are provided: network externalities, network complementarities, and transaction costs. This research will focus on transaction costs.

According to Fehrer et al (2018) a central mechanism of value capture within platforms is the reduction of transaction costs between multiple actors (Fehrer et al., 2018; Dasilva and Trkman, 2014). The following paragraph introduces the link between transaction costs and platforms.

## 2.3 Transaction costs in platforms

On a multi-sided platform, groups of actors are linked efficiently and effectively through acting as intermediaries on the market (Thomas et al., 2014). This linkage happens as of scalability in the technology of the platform and through standardizing processes (Fehrer et al., 2018). These platforms form a basic infrastructure on which actors can exchange services among each other and customers. To fully take advantage of the collaborative infrastructure, one must realize the potential of the platform business model (Tiwana, 2013).

When referring to actors within an ecosystem it is important to understand the definition. Vargo and Lusch (2008) define an actor as any social or economic actor and the role of them extend beyond the traditional customer-firm roles. In later research by Vargo and Lusch, they explain that there is an interdependence among actors where all actors are dependent on their capabilities within the boundaries of a complex ecosystem (Vargo and Lusch, 2011). Actor interdependence within these service ecosystems leads to value cocreation and emergence (Taillard et al., 2016). Lusch and Vargo (2014) define service ecosystems as self-contained, self-adjusting systems which grow dynamically and generate value by strengthening relationships between actors. This definition will be used regarding service ecosystems. Within these ecosystems, actors work and create value together.

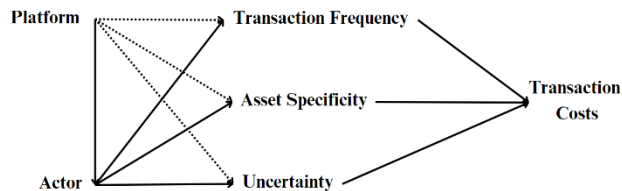
Tiwana (2013) found that growth mainly occurs on the outside of the boundaries of the platform within the service ecosystem. Hence, actors on the platform thus take the responsibility next to the platform owners of governing the platform. Therefore, actors need to be discouraged for negative behavior and encouraged for positive behavior (Fehrer, 2018). The cooperation of these actors within the ecosystem ensure collaboration and sharing and therefore explain the logic of value cocreation on a platform. Fehrer (2018) describes a platform as being a 'central node for actors to connect'. This study focuses on value capture within platforms through analyzing transaction. Amit and Zott (2015) state that in order to do this it requires a balancing act. In other words, 'long-term value capture is not possible if the relationships within the network do not create value' (Fehrer, 2018). Hence, value can only be captured when value creation is in place as pre-requisite (Storbacka, 2011). A way to capture value in a platform is through minimizing transaction costs and therefore the next part of the theoretical framework provides a model through which transaction costs within platforms can be understood. The following paragraph introduces a causal model through which transactions costs on platforms can be analyzed.

## 2.4 Analyzing transaction costs in ecosystems

Value networks provide a powerful tool for analyzing transaction costs in ecosystems and platforms, as they allow for a comprehensive understanding of the complex interdependencies among various actors, revealing potential areas for cost reduction and efficiency optimization through the coordinated exchange of services. To address the theory on transaction costs in platforms it is important to understand how certain actors in the network interact. A value network role is performed by a specific value network actor who performs the actual activities in the value network (Kijl et al., 2010). In the context of platforms these actors can be users, service providers, IT staff etc. For each of the primary value network roles the main activities will be presented and analyzed through the lens of transaction cost theory. We want to know whether transaction costs will increase or decrease once the main network roles are connected to the Samen Kwiek. We will analyze these costs and benefits through

the three main principles of transaction cost theory: asset specificity, transaction frequency and uncertainty.

Figure 1 presents a causal model which illustrates the relationships between a platform, actors and the core transaction cost elements. In the subheadings 2.4.1, 2.4.2 and 2.4.3 the theoretical connection between the terms in the model will be presented.



(Figure 1: Causal Model Platform, Actor and Transaction cost characteristics)

#### 2.4.1 Transaction Frequency

##### Pathway 1: P-A-TF

The platform is critical in facilitating interactions among actors and can boost transaction frequency by widening an actor's consumer base and providing efficient transaction processes (Tiwana, 2013; Cuyper et al., 2021). Transaction frequency is also affected by the type of the actors and their offerings. Depending on client demand and the actor's capabilities, certain services may be used more frequently than others (Vargo and Lusch, 2008). According to Cuyper et al. (2021), increasing transaction frequency allows businesses to take advantage of economies of scale, resulting in enhanced ability to manage transactions and lower transaction costs.

##### Pathway 2: P-TF

The platform itself can have a significant effect on the transaction frequency as of features like availability of information, ease of use and transaction support mechanisms. This implies that the more user-friendly platforms are, higher the likelihood of higher transaction frequencies (Parker et al., 2016).

##### Pathway 3: TF-TC

As per Coase (1937), increased transaction frequency can lead to economies of scale and hence, lower transaction costs.

#### 2.4.2 Asset Specificity

##### Pathway 1: P-A-AS

The platform's features and guidelines have an impact on the level of asset specificity. For example, if the platform enables customized services, this may result in greater asset specificity. The nature of the actor's services will also have an impact on asset specificity (Tiwana, 2013; Vargo & Lusch, 2008). For example, a physiotherapist's services are more complex than a sports association and therefore the asset specificity is higher.

##### Pathway 2: P-AS

The platform itself may demand certain asset specificity. To function efficiently on the platform, for example, specific technological requirements, unique business processes, or specialist talents may be necessary (Parker et al., 2016).

##### Pathway 3: AS-TC

According to Williamson (1979), greater asset specificity increases transaction costs due to the unique investments required for specific transactions. In context of Samen Kwiek this is regarding how the functionalities of the platform compare to the current systems used by the target groups. If the target groups can make good use of the functionalities of Samen Kwiek, it will reduce transaction costs, if not, it will increase transaction costs

#### 2.4.3 Uncertainty

**Pathway 1: P-A-U** The level of information the platform provides about actors and their services influences uncertainty. Additionally, the nature of the actor and their transparency could impact uncertainty levels (Tiwana, 2013; Vargo & Lusch, 2008). Uncertainty regarding platforms is how participants of the platform currently share information as signaling mechanism and to what extent detailed information about services is shared. Increased information sharing reduces information asymmetry which in turn decreases transaction costs (Nagle et al., 2020; Akbar et al., 2022).

**Pathway 2: P-U** The platform can directly affect uncertainty through its, review mechanisms, governance practices and information disclosure policies. Greater transparency reduces uncertainty (Parker et al., 2016).

**Pathway 3: U-TC** Uncertainty, as per Williamson's theory (1979), increases transaction costs due to increased risk.

In the following chapter the methodology is explained to provide an overview of how the research was conducted.

## 3. METHODOLOGY

### 3.1 Research context

In this section the exact research strategy will be discussed together with how the research has been conducted. An introduction will be given on what was needed to be done and how this was operationalized. The Samen Kwiek platform is currently being developed and the aim is to provide users and service providers with an ecosystem which supports and interconnects healthcare providers within the Gelderland-Midden area. The main focus of the platform is preventive healthcare. We have conducted research regarding transaction costs on four target groups and one representative of the Samen Kwiek platform.

### 3.2 Data Collection

To collect data for this research, relevant parties were found which were in line with the producer segments stated in the platform business model of Samen Kwiek. These producer segments identified by the developers of the platform are health, social, and welfare providers. There has been an open call with 20 service providers which will be the first parties to offer their services on the Samen Kwiek platform. I categorized the list of these 20 service providers into six categories in which the service providers are operating. This analysis was done through accessing all web pages on the website to get a clear overview of what business the companies were in. The following categories were identified: 1. physiotherapists/pedologists; 2 lifestyle coaches; 3 sports associations; 4 healthcare software companies; 5 Job placements for disabled people; 6 Associations for organizing activities and; 7 others. Of category four, no representative was able to conduct an interview. Of category five, the conducted interview did not provide any useful information which correlated with this research. From category seven, no conclusions could be drawn as the companies involved were in different businesses. In the following table (Table 2) an overview of the interviewees and their target group is provided:

**Table 1: Interviewees, target groups and time interviewed**

Target group	Interviewed Subject(s)	Time interviewed
Physiotherapist/pedologists	Physiotherapist practitioner in Apeldoorn	1h 27min
	Physiotherapists quality network company which operates country-wide	47min
Lifestyle coach	Lifestylecoach practitioner in Apeldoorn	1h 13min
	Lifestylecoach operating in Enschede	24min
Sports association	Board member of an organization which organizes sports and movement for people above 55 in Enschede	57min
	Board member of a football club in Apeldoorn	36min
Organizing of activities	Board member of an association in Enschede which organizes activities for elderly	1h 13min
	Board member association of an in Apeldoorn which organizes activities for elderly	49min

Next to the interviews of the target groups, another three exploratory interviews were analyzed which were conducted by a researcher at the University of Twente. These three interviews included a physiotherapist, a representative from the municipality of Lingewaard and a sports coach of a founding which focuses on wellbeing. These interviews were conducted with these parties to gain knowledge on the overall activities which they were performing and to see how the platform of Samen Kwiek would fit into it. Thirdly, an interview was conducted with an expert of the Samen Kwiek platform to gain knowledge on the functionalities of the platform and how service providers and users interact. The interview with the expert of Samen Kwiek was conducted first to gain extensive knowledge on the platform which later guided the interviews with the target groups.

To be able to generalize transaction costs for the target groups, the following six questions were asked:

**1. What is your primary value network role?**

This question aimed to answer the role that the actor currently has within the ecosystem and once connected to the Samen Kwiek platform.

**2. What are the main activities associated with your role?**

This question aimed to answer what activities the actor is currently undertaking and how these activities would change once the actor is connected to Samen Kwiek.

**3. How does the patient's journey look before and after the connection to the Samen Kwiek platform?**

A patient journey was mapped out portraying how a patient is currently treated and how this process would be different once the actor is connected to the Samen Kwiek.

**4. How does connecting to the Samen Kwiek platform potentially affect the frequency of transactions?**

This question aimed to answer the current transaction frequency and how it would potentially change once connected to Samen Kwiek. To measure the potential impact, I looked at the following elements: 1. How will the visibility of the service change when connected to Samen Kwiek (Tiwana, 2013; Cuypers et al., 2021) 2. Will the platform ensure higher user-friendliness and efficiency than the current state (Parker et al., 2016) and 3. Will the Samen Kwiek platform ensure economies of scale thus reducing transaction costs (Coase, 1937)

**4. What are the costs and benefits related to the activities in terms of asset specificity?**

This question aimed to answer how Samen Kwieks functionalities could benefit the service providers by providing solutions regarding the booking of appointments, providing information to potential clients, payment processing and communication. Asset specificity was measured by assessing what systems the service providers are currently using and assessing whether the Samen Kwiek platform could add value by providing a central solution for the management of the organization. This was done to measure the asset specificity regarding the Samen Kwiek platform capabilities. However, there is also asset specificity regarding the interaction between the actors on the platform. Here I looked at to what extent the relationship between the service provider and client was asset specific. This was measured by how the clients were in need for a specific solution and whether this could be offered by the service provider. In terms of a physiotherapist this can be the ability of the client to address their need for healthcare and the ability of the physiotherapist to identify the problem.

**5. How uncertain are transactions currently and how would connecting to the Samen Kwiek platform increase or reduce uncertainty?**

This question aimed to answer the amount of uncertainty that there currently exists within a transaction and how this would increase or decrease when connected to Samen Kwiek. Here I looked to what extent information is currently shared and how this changes once connected to Samen Kwiek. Secondly, to what extent the functionalities of Samen Kwiek influence the amount of uncertainty. For example, what will the impact be of Samen Kwieks rating and review system on uncertainty.

**3.3 Data Analysis Procedure**

After the interviews were conducted, a patient journey was made to compare the situation as it is right now and how it would be once the parties are connected to the Samen Kwiek platform. Costs were connected to each of the steps within the patient journey to see how the target groups could benefit from being connected to the Samen Kwiek platform. To add to this, the theories on transaction frequency, asset specificity and uncertainty were laid out against the functionalities of the Samen Kwiek platform whereafter findings were reported on how the parties would benefit once they were connected to the platform. These functionalities were specified in the interview with the professional of the Samen Kwiek platform. The information from the interviews has been carefully transcribed, then analyzed by looking for recurring themes and color-coding them. Since the interviews involved a flowing conversation, the format was very different each time, therefore color coding was done manually. With this many interviews, it was simpler and more productive to use this approach.

**3.4 Data Validation**

Regarding the validation of the data collection in this research the sample was carefully selected to represent a profound perspective on each of the specific target groups. Although there

was a limited sample size, the approach for the in-depth interviews captured a diverse set of opinions and experiences. Together with the in depth interviews, desk research was used for the verification of the received information and to gain better understanding of the environment that the target groups were operating in. To add to this, established theories on transaction cost theory were operationalized to systematically examine the effects of transaction frequency, asset specificity and uncertainty on the target groups once they would be connected to the Samen Kwiek platform. Due to the limited sample size, it is important to keep the limitations in mind because of this. However, this does not undermine the insights and value of this research as it can serve as foundation for future research on the topic.

## 4. FINDINGS

### 4.1 Samen Kwiek platform

The primary value network role of Samen Kwiek is to offer a platform that connects residents with care, social and welfare organizations in the area (Samenkwiek, 2023). In the current healthcare system, there is little cooperation between the parties offering preventive healthcare services. The main activity on which the Samen Kwiek platform is focused is to increase the visibility and availability of service providers in a certain area. The representative from the municipality of Lingewaard mentioned in the interview that currently the service providers are mainly referring clients to service providers within their own network as there currently is no overview of the healthcare ecosystem for that specific area. The platform Samen Kwiek aims to solve this by providing an overview of the available services.

The platform, however, will not replace a patient's medical record. Instead, it aims to provide a comprehensive overview of various activities available within a region, enabling service providers to make informed referrals. For instance, a physiotherapist collaborating with a dietician may refer a patient to the dietician, providing an opportunity to address any dietary deficiencies hindering the patient's optimal movement.

The platform will offer several functionalities to customers. Firstly, customers can locate and book appointments with their preferred service providers. For example, if a general practitioner (GP) diagnoses a patient with a psychotherapeutic condition, the GP can refer the patient to a lifestyle coach via the Samen Kwiek platform. Here, the patient can browse through available lifestyle coaches in their vicinity, book an appointment, and initiate the treatment process. Similarly, a physiotherapist can suggest a patient join a walking club as part of their treatment plan. The patient can then locate the walking club through the platform and partake in the activity.

Having discussed the Samen Kwiek platform, the following section of the findings will delve into the individual target groups and their interaction with the platform.

### 4.2 Physiotherapists And Pedologists

A physiotherapist belongs to the 1st line in the healthcare network. The 1st care line means that a patient can make an appointment without a referral from a GP or specialist. A patient can make an appointment with a physiotherapist himself or after a referral from the general practitioner about a specific problem. The primary value network role of the physiotherapist in the Samen Kwiek platform is cooperation and referrals to other parties affiliated with the platform. These can be parties in the

0th and 1st care line. A physiotherapist can refer a patient under treatment to a walking club or a similar activity which ensures that the patient spends less time at the physiotherapy practice hence reducing the pressure on the system.

Table 2 displays a patient's journey which is connected to physiotherapy. From representatives in the interviews the approximate time per step in the journey of a patient was estimated whereafter the hourly wage of an average worker in the Netherlands was connected to get an overview of the costs. This average wage is 25 euros per hour (CBS, 2022). As seen in the table, when a physiotherapist is connected to the Samen Kwiek platform, it will approximately save twenty minutes per transaction which leads to a reduction in transaction costs of 42,86%. This reduction is regarding the patient journey per subject treated.

**Table 2: Patient journey physiotherapist**

	Time	Cost
<b>physiotherapist currently</b>		
Subject has complaint	na	na
subject navigates for physiotherapist on internet	30	12.5
subject calls to physiotherapist for appointment	10	4.17
subject and physiotherapist plan intake	5	2.08
physiotherapist refers to GP/physiotherapist researches complaint	na	na
start treatment	na	na
treatment in practice/treatment at home	na	na
end report	na	na
<b>Total cost</b>	<b>35</b>	<b>18.75</b>
<b>physiotherapist SK</b>		
Subject has complaint	na	na
subject navigates for physiotherapist on SK	10	4.17
subject books intake appointment on SK	5	2.08
physiotherapist refers to GP/physiotherapist researches complaint	na	na
start treatment	na	na
treatment in practice/treatment at home	na	na
end report	na	na
<b>Total Cost</b>	<b>15</b>	<b>6.25</b>

#### 4.2.1 Transaction frequency

Regarding transaction frequency for a physiotherapist the e-healthcare platform can bring both service and economic advantages. Being connected to the Samen Kwiek platform will ensure a higher visibility for a pool of potential clients. A GP or potential client can use the Samen Kwiek platform to look for specialists in the area of the subject whereafter the schedule can be checked to ensure quick treatment. In the interviews the representative mentioned that regarding physiotherapists the majority have long waiting lists. The scheduling function could reduce the pressure regarding waiting lists by spreading patients more evenly among multiple physiotherapists. To add to this, as both representatives stated that the majority of the colleague physiotherapists are already fully booked, increasing the transaction frequency and workload would not lead to a lower transaction cost. Transaction Cost Economics (TCE) dictates that the transaction frequency be considered not just for the platform itself, but also for the participating actors—physiotherapists, other service providers, and citizens. Increased transaction frequency may result in faster access to healthcare services for residents, but it may also result in increased costs, both monetary and non-monetary, such as time and effort spent navigating different service providers.

#### 4.2.2 Asset specificity

Regarding asset specificity, the Samen Kwiek platform may decrease the necessity for physiotherapists to make investments in specialized software as Samen Kwiek provides physiotherapists with a range of tools (williamson, 1985). However, it is important to note that in the interviews, both

representatives mentioned a key concern regarding asset specificity. This concern is the system integration and operability, as physiotherapists currently work with a range of systems that need to be kept up to date. For example, there is a Vip live system for administration and declaration and Zorgdomein for references and collaboration amongst health professionals. As these software systems deal with private information that cannot be publicly shared, it will be hard for the Samen Kwiek platform to be of value for physiotherapists as the representatives stated that the adaptation of yet another system will be extra time and work. The platform specialist stated that in the future of the Samen Kwiek platform there is an aim for being able to refer patients in the future, however, currently this is not possible. Hence, regarding asset specificity it will increase transaction costs. Citizens, on the other hand, might experience lower asset specificity, as their primary investment would be in learning to navigate the platform which is a skill transferable to other similar platforms. Nevertheless, if users find the platform difficult to use or if it fails to deliver the expected benefits, the transaction costs from the users' perspective could increase.

### 4.2.3 Uncertainty

As for a subject which needs to go to a physiotherapist, the subject is able to go directly to the physiotherapist or get a reference from the GP or specialist. If the subject gets a reference from the GP or specialist, there is little uncertainty as the diagnosis is done by a certified specialist. However, if subjects go directly to the physiotherapist, there will be uncertainty regarding the ability of the patient to find the right physiotherapist for the issue. The Samen Kwiek platform can help to solve this problem in the following ways. Firstly, the platforms rating and reviews system will mitigate the behavioral uncertainty as it will enhance the participants of the platform to share information as a signaling mechanism (Akbar, Tacogna, 2022). Secondly, as the Samen Kwiek platform will enable the service providers to share detailed information about their service, it reduces uncertainty for the user which decreases information asymmetry (Nagle, 2020). With the Samen Kwiek platform, the level of uncertainty can vary for different actors. For service providers, uncertainty might stem from the lack of clarity about the platform's potential benefits and the possible increase in workload. For citizens, uncertainty relates to identifying the right healthcare provider for their specific needs.

## 4.3 Lifestyle coach

Just like a physiotherapist, a lifestyle coach falls under the 1st line in healthcare. Lifestyle coaches are advised to be under contract with a GP group. The main value network role of a lifestyle coach is to treat a patient who has been referred by a GP to better their lifestyle through the help of a professional. After speaking to several experts in the landscape of lifestyle coaches, it was established that a distinction can be made between two types of lifestyle coaches. On one side, there are lifestyle coach practices with multiple coaches who use software for scheduling and maintaining patient records. On the other side, there are lifestyle coaches which make limited use of software. There are different implications of the Samen Kwiek platform for both sides. However, for transaction cost and frequency the implications will be the same.

The following table displays a patient journey which is connected to a lifestyle coach. From representatives in the interviews the approximate time per step in the journey of a patient was estimated whereafter the hourly wage of an average worker in the Netherlands was connected to get an overview of the costs. This

average wage is 25 euros per hour (CBS, 2022). As seen in the table, when a lifestyle coach is connected to the Samen Kwiek platform it will approximately save twenty minutes per transaction which leads to a reduction in transaction costs of 33.3%. This reduction is regarding the patient journey.

**Table 3: Patient Journey lifestyle coach**

Lifestyle currently	Time	Cost
Subject searches for suitable lifestyle coach on internet	30	12.5
Subject contacts lifestyle coach via mail/phone for information	10	4.17
Subject goes to GP/specialist	na	
GP/specialist refers patient to lifestyle coach	na	
Lifestyle coach gets reference out of system	na	
lifestyle coach contacts subject	10	4.17
subject plans intake	10	4.17
subject undergoes treatment	na	
<b>Total cost</b>	<b>60</b>	<b>25</b>

Lifestyle Samen Kwiek	Time	Cost
subject navigates to SK	5	2.08
subject finds lifestyle coach on SK	10	4.17
subject navigates to preferred lifestyle coach for information	10	4.17
Subject goes to GP/specialist for reference	na	na
GP refers patient to lifestyle coach	na	na
Lifestyle coach contacts subject	10	4.17
Subject plans intake via SK	5	2.08
subject undergoes treatment	na	
<b>Total cost</b>	<b>40</b>	<b>16.7</b>

That information is regarding the practical implications of when a lifestyle coach will be on the Samen Kwiek platform. Now the findings will be elaborated based on how the functionalities of the platform will benefit lifestyle coaches when they are connected to the Samen Kwiek platform.

### 4.3.1 Transaction Frequency

Firstly, when the lifestyle coach is connected to the Samen Kwiek platform, this will lead to a higher visibility as not only the lifestyle coach is visible on the internet but on the platform as well. This will lead to an increased number of potential clients thus increasing transaction frequency. This will ensure that the hierarchical governance of overseeing transactions will be easier and thus will lower transaction costs (Cuypers et al., 2021). Furthermore, the Samen Kwiek platform will enable that clients of the platform are able to repeat transactions together with digital trace information which means reputation will be built thus mitigating asymmetric information (Nagle, 2020). However, for clients, the frequency of transactions could lead to higher search costs or potential commitment to sub-optimal service due to the overwhelming number of choices.

### 4.3.2 Asset specificity

Asset specificity in transaction cost economics refers to what degree there is a specific investment needed to accommodate the transaction. According to Williamson (1985) it means to what degree an investment is 'made' for a transaction and in how far that investment has less value for any other use. During the interview the representatives mentioned that for lifestyle coaches there is only one software system which supports the daily operation and documentation of lifestyle coaches. In the context of Samen Kwiek this implies that the lifestyle coach will have the ability to make use of the standardized tools of the platform like booking an appointment, client communication and providing information about their specific services. For clients, asset specificity may be seen in the time and effort invested in navigating the platform and understanding different services

offered by lifestyle coaches. To add to this, there is asset specificity involved regarding the treatment of a patient as the patient must identify their need for a lifestyle coach and the lifestyle coach must identify the problem and provide accurate treatment. The more difficult it is both on patient side to identify the need for a lifestyle coach and for the lifestyle coach to treat the patient the higher the asset specificity will be.

### 4.3.3 Uncertainty

The main finding for uncertainty for lifestyle coaches when offering services on the Samen Kwiek platform is that behavioral uncertainty is reduced through the reputation system of Samen Kwiek which offers reviews. Trust is enhanced on platforms through a review function as it enables the participants to share information as a signaling mechanism (Akbar & Tracogna, 2022). Furthermore, as the Samen Kwiek platform will enable the service providers to share detailed information about their service, it reduces uncertainty for the user which decreases information asymmetry (Nagle et al., 2020). For clients, uncertainty may stem from the challenge of choosing among multiple service providers, deciphering the quality of services, and concerns over privacy and data security.

## 4.4 Sports associations

One of the primary roles in the value network under examination is embodied by sports associations, specifically those focusing on activities for the elderly. The subject of the interviews conducted for this research was primarily these sports associations or foundations. Generally, these entities are governed voluntarily by a board of directors, a characteristic observed in the sports associations engaged for this study.

The sports associations are ran as follows: an individual gains knowledge about a particular sports association, typically through word-of-mouth or internet search. They then proceed to locate the association's official website by typing the association's name in the search bar. The website hosts a catalogue of activities and services offered by the association. In the case of the interviewed sports associations, an additional resource was available in the form of a municipal website that provided an overarching view of available activities within the city. Individuals interested in participating in an activity or becoming part of a sports group could initiate contact with the association via email or telephone to register. A representative from the association would then confer, through phone or email, with the person in charge of the relevant sports group. Upon reaching a mutual agreement, an email confirmation would be sent to the individual, who could then join the activity.

It is essential to note the differentiation between commercial and non-commercial sports clubs within this context. Commercial sports clubs typically utilize a software system, enabling the scheduling of appointments and facilitating self-booking of activities by clients. The focus in this research is on non-commercial sports associations.

The following table displays a patient journey which is connected to a sports association. From representatives in the interviews the approximate time per step in the journey of a patient was estimated whereafter the hourly wage of an average worker in the Netherlands was connected to get an overview of the costs. This average wage is 25 euros per hour (CBS, 2022). As seen in the table, when a lifestyle coach will be connected to the Samen

Kwiek platform it will approximately save thirty-one minutes per transaction which leads to a reduction in transaction costs of 63.08% per subject. This reduction is regarding the patient journey.

**Table 4: Patient journey sports association**

Sport currently	Time (Min)	Cost (Euro)
subject looks on internet for sport activity in the area	10	4.17
subject navigates websites till preferred sport activity is found	30	12.5
subject mails/calls sports association for information	10	4.17
sports association checks availability at activity	10	4.17
subject and association plan activity	5	2.08
subject joins activity (intake)	na	na
subject becomes member/pays per activity	na	na
<b>Total cost</b>	<b>65</b>	<b>27.08</b>

Sport Samen Kwiek	Time (Min)	Cost (Euro)
Subject navigates to Samen Kwiek	5	2.08
Subject searches for preferred activity	2	0.83
Subject navigates to preferred activity on Samen Kwiek	2	0.83
Subject finds information and availability	10	4.17
Subject books & pays via Samen Kwiek	5	2.08
<b>Total cost</b>	<b>24</b>	<b>10</b>

### 4.4.1 Transaction Frequency

Firstly, when the sports association is connected to the Samen Kwiek platform, this will lead to a higher visibility as not only the association is visible on the internet but on the platform as well. This will lead to an increased number of potential clients thus increasing transaction frequency. To add to this, according to Cuypers et al. (2020) economies of scale ensure hierarchical governance and the ability to oversee transactions hence lowering transaction costs. The representative of the sports association currently was handling all transactions regarding the connection of subject and sport activities. The whole contact process took a day until completion and therefore connecting to the Samen Kwiek platform will greatly improve transaction frequency for similar sports associations. To add to this, similar to lifestyle coaches, asymmetric information will be mitigated when sports associations join the platform as the subject know extensively what the sports activity is about as for markets to be efficient, buyers and sellers must possess the same information (Cuypers et al., 2021). However, users might face higher search costs due to the increased number of options and potential information overload. Meanwhile, the increased transaction frequency might also increase the management complexity for the platform, potentially impacting the service quality.

### 4.4.2 Asset specificity

As for the sports association and the connection to the Samen Kwiek platform, it was found that the representatives mentioned that for non-commercial sporting associations there was little to no software implemented for the operation of the association. Therefore, the sport association will be able to leverage the tools of the platform regarding the visibility of information, booking, and payment system thus reducing the need for investing in other systems and assets that are specific to those transactions. Yet, the platform itself might need to make significant investments in terms of technology and infrastructure to accommodate an increased number of sports associations, resulting in platform-specific assets. From the client's perspective, they might need to spend time and effort learning how to use the platform effectively, constituting a form of asset specificity in terms of human capital investment.



#### 4.4.3 Uncertainty

A sports association can manage uncertainty when connecting to a digital e-healthcare platform. As a platform grows, transactions which are new and involve unknown parties can become high in behavioral uncertainty (Akbar & Tracogna, 2022). This is currently the case as new subjects which join a sports association does not know how the interaction will go. Therefore, the Samen Kwiek platforms rating and reviews system will mitigate the behavioral uncertainty as it will enhance the participants of the platform to share information as a signaling mechanism (Akbar, Tacogna, 2022). To add to this, the standardized processes and terms will reduce the uncertainty around contractual agreements between the sports associations and the subject (Boudreau & Jeppesen, 2015). From the platform's perspective, it must manage uncertainty related to ensuring the quality of service providers and mitigating potential disputes between service providers and clients.

### 4.5 Organizing of activities

The focus group for organizing activities is mainly in the area of community centers and community centers. The representatives I interviewed indicate that new members who sign up for the activities come via the website. With these activities one should mainly think of coffee afternoons, support groups, music lessons, game days and everything you can think of around a community center. Many of the community centers we have examined have a website where people can get into contact. If a client wants to sign up for an activity, contact must be made by telephone or e-mail so that he or she can join the activity.

The following table displays a patient journey which is connected to an organization which organizes activities. From representatives in the interviews the approximate time per step in the journey of a patient was estimated whereafter the hourly wage of an average worker in the Netherlands was connected to get an overview of the costs. This average wage is 25 euros per hour (CBS, 2022). As seen in the table, when activity organizing organizations will be connected to the Samen Kwiek platform it will approximately save thirty-six minutes per transaction which leads to a reduction in transaction costs of 40% per subject. This reduction is regarding the patient journey.

**Table 5: Patient journey organizing of activities**

Activity currently	Time	Cost
subject looks on internet for activity in the area	10	4.17
subject navigates websites till preferred activity is found	30	12.5
subject mails/calls for information	5	2.08
Activity organization checks availability at activity	10	4.17
subject and organization plan activity	5	2.08
subject joins activity (intake)	na	na
subject becomes member/pays per activity	na	na
<b>Total cost</b>	<b>60</b>	<b>25</b>
Activity Samen Kwiek	Time	Cost
Subject navigates to Samen Kwiek	5	2.08
Subject searches for preferred activity	2	0.83
Subject navigates to preferred activity on Samen Kwiek	2	0.83
Subject finds information and availability	10	4.17
Subject books & pays via Samen Kwiek	5	2.08
<b>Total cost</b>	<b>24</b>	<b>10</b>

#### 4.5.1 Transaction Frequency

In the interviews it was found that subjects that were interested in doing an activity needed to contact the preferred organization to check the availability through calling or sending an email. This

is a timely process through which the transaction frequency is low. According to Ceccognoli, Forman, Huang & Wu (2012), there is a potential to increase transactions as platforms offer a larger customer base. As for the Samen Kwiek platform this could translate into a higher frequency of bookings for neighborhood activities. To add to this, according to Cuyper et al. (2021) economies of scale ensure hierarchical governance and the ability to oversee transactions hence lowering transaction costs. The organization of neighborhood activities were currently using email as a system to oversee transactions and thus switching to the Samen Kwiek platform will provide more governance over the transactions. From the platform's perspective, an increase in transaction frequency strengthens its position in the market, attracting more providers and users. However, from the user's perspective, the ease of booking might lead to a higher frequency of bookings, and users might have to invest more time choosing between different activities due to increased options.

#### 4.5.2 Asset Specificity

The representative of the neighborhood organization mentioned that currently there is no system in place to handle bookings and to oversee communication and payments. Hence, connecting to the Samen Kwiek platform will provide the organization with a centralized solution for bookings, customer communication and payments thus reducing the need for investing in asset specific investment. As the organization will have a one-fits-all solution for their operation, it will reduce transaction costs regarding asset specificity. For the platform, however, it means having to maintain and upgrade its infrastructure to accommodate increasing demand, leading to high asset specificity. From the client's point of view, they might need to learn how to effectively use the platform, which requires an investment of time and effort, potentially leading to increased asset specificity.

#### 4.5.3 Uncertainty

The Samen Kwiek platform will be able to mitigate uncertainty for the organizations which organize activities in the following ways. Firstly, currently whenever a person wants to sign up for an activity, contact needs to be sought with the preferred association whereafter required information is exchanged. The subject does not know how the interaction and process will go. Therefore, the Samen Kwiek platforms rating and reviews system will mitigate the behavioral uncertainty as it will enhance the participants of the platform to share information as a signaling mechanism (Akbar & Tacogna, 2022). It will reduce uncertainty and thus reduce transaction costs. To add to this, the standardized processes and terms deployed by the Samen Kwiek platform will reduce the uncertainty around contractual agreements between the activity organization and the subject (Boudreau & Jeppesen, 2015). However, from the platform's perspective, managing these reviews and maintaining the standardization process might be challenging as the number of providers and users increases. On the user's end, while reviews can reduce uncertainty, they might also create new uncertainties about the validity and reliability of the reviews, potentially affecting their decision-making process.

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## 5. DISCUSSION AND CONCLUSION

The purpose of this thesis was to investigate how a digital E-healthcare platform, such as Samen Kwiek, can maximize value capture while minimizing transaction costs. The fundamental components of transaction cost theory - transaction frequency,

asset specificity, and uncertainty - were used to calculate transaction costs for four different target groups in their current state and in a hypothetical scenario in which they would connect to the Samen Kwiek platform.

The findings suggest that, in theory, a digital e-healthcare platform has the potential to reduce transaction costs, though the phrase 'in theory' is used because the parties interviewed are not the same parties who will initially operate on the platform.

The impact on transaction frequency is one of the most important findings in this research. It can be deduced that increased transaction frequency, facilitated by the digital platform, can lead to economies of scale and improved transaction governance, resulting in lower transaction costs.

When considering asset specificity, it is critical to distinguish between asset specificity as it relates to the platform and asset specificity as it relates to the distinct requirements of various actors. There is, in particular, a fundamental dyadic relationship between patient/citizen and care provider that carries its own inherent specificity. The care provider must correctly identify the patient's problem, which is heavily dependent on their professional capacity, skill set, and availability. Simultaneously, the citizen/patient must be able to accurately articulate their needs. This dyadic relationship is inherently uncertain on both sides, resulting in a unique form of asset specificity.

The Samen Kwiek platform provides an opportunity to centralize service offerings for a variety of actors, including lifestyle coaches, sports associations, and community activity organizers. This reduces the need for specialized asset investments, such as software. Nonetheless, for some actors, such as physiotherapists, existing systems are more technologically advanced than what the platform currently provides. This means that the platform must aim to accommodate the unique asset specificity inherent in this particular group, aligning its functionalities and offerings to meet their technological and professional needs.

To summarize, it is critical that the platform effectively navigates these layers of asset specificity, acknowledging the unique requirements of each actor and the uncertainties inherent in the patient-care provider relationship, in order to successfully minimize transaction costs and maximize value capture.

Moreover, uncertainty plays a vital role in the transaction costs for Samen Kwiek. The ability to integrate a review system on the platform can lower uncertainty for users, thereby facilitating easier identification and booking of preferred providers. It's important to underscore, though, the dyadic relationship between patient/citizen and care provider that inherently carries uncertainties on both sides. For the provider, uncertainty may arise regarding capacity, skills, availability, while citizens may question who can fulfill their needs and when. This aspect merits further exploration in future research.

In practice, this research provides insights into the advantages and disadvantages that target groups may face when connecting to the Samen Kwiek platform. By highlighting these potential benefits and drawbacks, it can help similar parties considering joining a digital e-healthcare platform make informed decisions. The findings emphasize the importance of tailoring the platform

to the diverse needs of different target groups for platform developers.

This study advances our understanding of value capture, transaction cost theory, and digital platforms in the context of e-healthcare. It enriches the application of transaction cost theory in digital platforms by taking into account the perspectives of representatives in the field of healthcare, sports associations and organizing of activities. However, it also points to the necessity of more granular analysis, taking into account the varying needs and dynamics of different target groups and the inherent uncertainties in the patient-care provider relationship.

## 6. LIMITATIONS AND RECOMMENDATIONS

One of the fundamental limitations of this research stems from the fact that the investigation primarily relied on the perspectives of one or two representatives from each target group. As such, the findings may not fully capture the collective outlook of the corresponding target groups. This is because different representatives may possess contrasting experiences and views regarding a digital e-healthcare platform, largely influenced by variables such as member count, geographical location, and demographic of the target audience. Another limitation is the narrow focus on the Samen Kwiek platform, implying that the conclusions that were drawn may not be generalizable to other digital e-healthcare platforms. It is crucial to recognize that the results and findings of this study are unique to the Samen Kwiek platform, which is still in the early development stages, and thus may differ from the findings concerning other platforms with different features or capabilities.

For future research, there are several recommendations. Firstly, a more broad investigation involving larger samples across diverse fields would provide a more holistic perspective on digital e-healthcare platforms. This would allow more robust conclusions and a broader generalization. Secondly, a comparative analysis of multiple e-healthcare platforms would provide insightful differences in transaction costs based on platform design and functionality. A third recommendation is to conduct longitudinal studies that track the same target groups over time, providing insights into how transaction costs evolve as platforms like Samen Kwiek develop.

Practical recommendations emerging from this research revolve around the design and operation of the Samen Kwiek platform. The developers must prioritize understanding and addressing the diverse needs and challenges of different target groups. For instance, there could be an enhanced focus on system interoperability for specific target groups such as physiotherapists. For service providers, collaboration and regular communication with platform developers is advised, facilitating valuable feedback and cooperative information sharing. Furthermore, it is essential for Samen Kwiek's developers and practitioners to provide support during the transition phase, ensuring seamless operation and coordination. This will empower service providers to optimally leverage the platform and subsequently reduce transaction costs

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