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Quadruple helix collaboration for eHealth: a business relationship approach

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Abstract: Collaboration between various stakeholders is crucial for healthcare digitalisation and eHealth utilisation. Given that valuable outcomes can emerge from collaborative interactions among multiple stakeholders, exploring a quadruple helix (QH) approach to collaboration may be fruitful in involving the public sector, business, citizens, and academia. Therefore, this study aimed to explore stakeholder views on eHealth collaboration from a QH perspective using the grounded theory methodology. First, an inductive qualitative study involving all stakeholders in the QH was conducted. Subsequently, the findings were related to the actor-resource-activity (ARA) model of business relationships. The results emphasise the role of considering diverse perspectives on collaboration because digitalisation and eHealth require teamwork to benefit the end users within various settings. A model depicting the various aspects of the ARA model related to digitalisation in a healthcare QH setting is presented.

Keywords: quadruple helix perspective; collaboration; healthcare digitalisation; business relations; ARA model; global healthcare.

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1 Introduction

Digitalisation is of great importance for the development of global healthcare (Lapão, 2019), not least when utilising eHealth (Andreeva et al., 2020). eHealth is different from digitalisation, which explicitly refers to the transformation of all sectors and society based on digital technology adoption (OECD, 2022), as eHealth involves the usage of electronic methods and tools to enhance and facilitate health and healthcare (Rowlands, 2019). Utilisation of eHealth requires collaboration between various stakeholders. In the context of eHealth, prior studies have emphasised the relevance of bringing stakeholders together by adopting a quadruple helix (QH) approach to collaboration (Askenäs and Aidemark, 2020). As an extension of the triple helix perspective, which involves actors from academia, government, and industry (Leydesdorff, 1995), the quadruple helix (highlighting the inclusion of a fourth actor) also acknowledges the growing role of the human-centred perspective (Leydesdorff, 2012). This fourth viewpoint, influenced by end-user perspectives (Cunningham et al., 2018; Kriz et al., 2018), has repeatedly been defined as the civil society (Carayannis and Campbell, 2009; Carayannis et al., 2017; Ivanova, 2014; Roman et al., 2020).

When this methodology is applied in collaboration, each stakeholder can represent their role in addition to the societal context (Jia et al., 2015). Thus, the stakeholders' unique knowledge resources and different worldviews may bring the representatives together, thereby promoting mutualistic co-existence and co-creation (Cannon et al., 2012). For the purpose of this study, 'societal' is defined as a setting open to consequences for anyone in society affected by interventions in general, such as digitalisation (Culyer, 2021).

Collaboration, as defined for this study, is an interactive process with a shared purpose characterised by explicit voluntary membership and joint decision-making (Roberts and Bradley, 1991). Collaboration occurs when stakeholders engage in processes using shared rules and structures related to co-creation. This term slightly differs from the concept of collaboration, as co-creation involves actors working together toward a shared goal, collectively generating something of mutual interest (Galvagno and Dalli, 2014); for example, in projects regarding public health. Co-creation acknowledges and promotes the diversity of stakeholders, for instance, representatives from health departments and citizens' representatives (Trischler et al., 2019). Value may be one of the outcomes of collaboration (Castro-Martinez and Jackson, 2015), as value may be generated through co-creation (Galvagno and Dalli, 2014). The value outcome usually takes multiple forms, since value is defined based on every different stakeholder perception and preference (Lombardo and Cabiddu, 2017; Greenhalgh et al., 2016). For individuals, value may be related to experiences. For organisations, value is often linked to economic aspects such as improved productivity or a societal benefit (Greenhalgh et al., 2016).

Previous studies have explored QH stakeholder engagement in healthcare digitalisation from an organisation-wide perspective (Roman et al., 2020; Steenkamp, 2019). However, these studies' findings lack an understanding of the complexity of value-creating in societal settings (Håkansson et al., 2010). Furthermore, the aim of identifying and engaging suitable stakeholders in eHealth ensures that the functionalities of eHealth are in accordance with end users' needs, thereby ensuring the applicability of eHealth solutions (Broekhuis et al., 2021). Complex challenges within eHealth implementation can be dealt with by adopting a participatory approach across various sectors (Moore et al., 2019), such as by eliminating senior citizens' technological uncertainty (Brabham, 2012; Jia et al., 2015). Thus, a QH approach to eHealth collaborations may be suitable, as this model can foster synergy among public authorities, the healthcare industry, academia, and citizens (Magnaye, 2020).

1.1 Study rationale and purpose

Utilising eHealth in the public sector and society poses numerous intricate challenges, particularly in navigating the complexities of stakeholder involvement (Nilsen et al., 2020). However, recognising that valuable outcomes may arise from collaborations among diverse stakeholders in the eHealth domain (Breeman et al., 2021), we aimed to explore the application of a quadruple helix (QH) approach to eHealth collaboration, including the public sector, business, citizens, and academia.

The scientific basis for this study is the grounded theory methodology (Glaser and Strauss, 1967). An inductive approach is the vantage point for findings to be maximally relevant. The findings from the inductive phase should later be related to theory to increase the results' conceptual depth. Accordingly, we first collected and inductively analysed the data. Second, we searched for a suitable theoretical model to conceptualise the findings. eHealth development must include a business model feature, taking a business case approach as part of the implementation (van Limburg et al., 2011). As past results indicate that relationships are crucial for effective collaboration, a model including the view on business relationships may be useful. One of the most commonly used

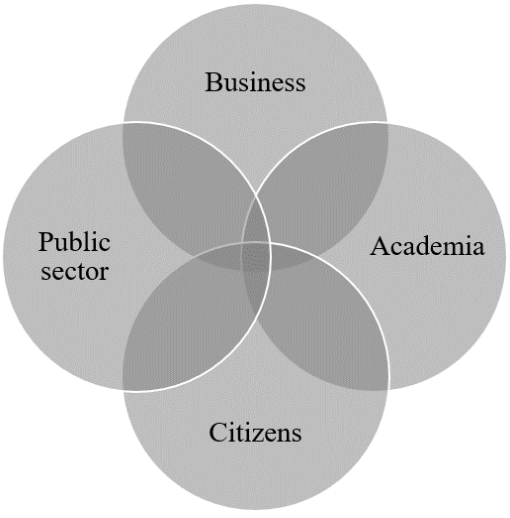
models that focuses on business relationships is the actor-resource-activity (ARA) model (Håkansson and Snehota, 1995). Therefore, this model was chosen for the present study.

1.2 Theoretical concepts

1.2.1 The QH approach to collaboration

A QH approach to collaboration is considered an enabler of digitalisation development as it promotes a holistic view of these developments (Camarinha-Matos et al., 2019). The QH approach involves four essential components, hereafter referred to as 'stakeholders', crucial for collaboration regarding eHealth. In the present study, the citizen part of the QH setting explicitly concerns senior citizens (hereinafter referred to as 'citizens'), as discussed later in this paper. Hence, in accordance with the previously defined stakeholder arrangement in a QH setting (Arnkil et al., 2010), the QH setting in this study consists of stakeholders from the public sector, business, academia, and citizens' perspectives (Figure 1).

Figure 1 The stakeholders of the quadruple Helix include the public sector, business, academia, and citizens



Source: Arnkil et al. (2010)

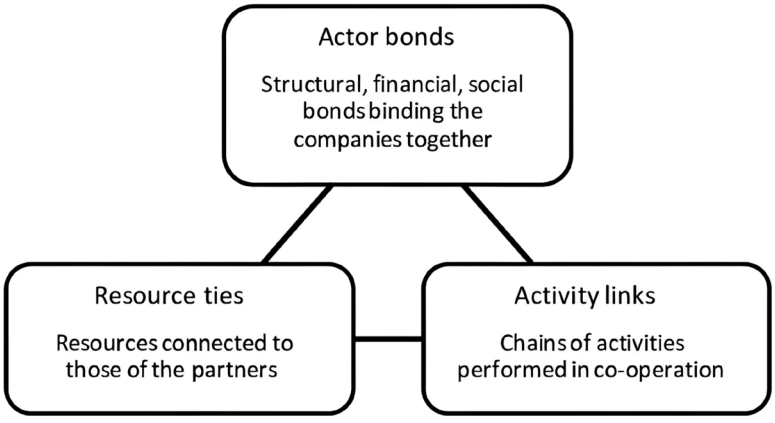
1.2.2 The ARA model

The ARA model is a network model initially presented by Snehota and Håkansson (1995). It has three components of stakeholder interaction, including actors, resources, and activities, that are different yet interrelated (Håkansson and Johanson, 1992). The purpose of the model is to analyse these dimensions as interacting aspects focusing on relationships (Håkansson et al., 2010). According to this model, companies, organisations, or individuals that represent technical or organisational resources, such as materials, machines, and competence, could exemplify the *actors*. The *resources* are used

by actors when planning and operating, for example, when collaborating, that may be viewed as an *activity*.

The ARA model reveals the relationships between the three dimensions (Håkansson and Snehota, 1995) present; for example, when stakeholders engage in collaborations wherein the activities and resources are enmeshed synergistically. In such processes, the actors may shape various forms of interactions. However, when utilising the ARA model, it is essential to recognise that all actors depend on each other for activity and resource allocation. Controlling activities and resources requires mutual engagement among the actors (Håkansson et al., 2010). In this way, actor bonds, activity links, and resource ties bind actors together (Håkansson and Snehota, 1995) (Figure 2).

Figure 2 Actor bonds, resource ties, and activity links may function as a glue, such as within networks, as these aspects develop the relationships between stakeholders in collaborations



The relationships between stakeholders develop when actor bonds, activity links, and resource ties are created. In this process, actor bonds are crucial in understanding the interactions between activity links and resource ties. Although activity links and resource ties are partly derived from the logic of the stakeholder network, the actors' expertise, resource establishment, and strategic intentions are significant as independent operating elements when establishing actor bonds (Håkansson and Snehota, 1995).

The ARA model is applicable in various collaborations for several reasons. Firstly, the dynamics of networking, involving actors and resources, are considered in the model. Simultaneously, it typically shows its versatility in collaborations but also explicitly within organisations (Corsten and Kumar, 2005). Working through actor bonds, resource ties, and activity links (Håkansson and Snehota, 1995), the ARA model aligns with relationship building and values knowledge and knowledge-sharing as a resource (Valkokari et al., 2016).

In this study, the ARA model was related to inductive empirical findings to raise the abstraction level from a purely empirical level to a more conceptual level, in line with the grounded theory methodology (Glaser and Strauss, 1967).

2 Methods

Following the grounded theory approach (Glaser and Strauss, 1967), this study began inductively with a qualitative phase, not based on theory. A two-step qualitative methodology for data collection was utilised in one county of southern Sweden. Initially, a Quality Café (Lagrosen, 2017) was held involving the quadruple helix stakeholders and representatives from the county's public healthcare sector, business, academia, and citizens. During the second step, individual interviews were conducted with representatives from every part of the quadruple helix. The two-step methodology–first performing group-wise data collection through a Quality Café followed by qualitative interviews–may enable a more comprehensive understanding of the topics that appear in the group-wise data collection phase. Furthermore, this setting may enable identifying 'key respondents' who will further enrich the dataset, with follow-up interviews performed to advance the researchers' understanding (Morgan, 1996).

2.1 Sampling

A purposeful sampling strategy was used to recruit respondents for the representative sample (Black, 1997). Thus, participants were recruited from diverse parts of the county's healthcare sector. Similarly, for business and academia, respondents were recruited based on their connection to digitalisation or digital transformation.

Some respondents belonged to various senior citizen associations. The term 'senior' is in accordance with the term 'older adults', which is conventionally defined as individuals aged 65 years or older (Orimo et al., 2006). Senior citizens were chosen because eHealth can manage the increasing proportion of older adults in society (Bujnowska-Fedak and Pirogowicz, 2014). These aspects of senior citizens have already been acknowledged in recent years (Perdana and Mokhtar, 2022), suggesting that this population explicitly requires digitalisation guidance (Bujnowska-Fedak and Pirogowicz, 2014; Gordon and Hornbrook, 2018).

2.2 Data collection

Step one: Quality Café

In December 2020, a Quality Café was held with the participation of representatives from all parts of the quadruple helix. Of the total 22 participants, 14 were women (64%), and 8 were men (36%); participants comprised those from the healthcare sector ($n = 6$; 27%), business ($n = 5$; 23%), academia ($n = 5$; 23%), and citizens ($n = 6$; 27%).

Typically, a Quality Café is held in a physical setting. However, due to coronavirus disease 2019 (COVID-19) restrictions, the Quality Café in this study was held online using the voice-over internet protocol tool Zoom©. The Quality Café was held in Swedish, continued for approximately 3 h, and was hosted by two researchers. Initially, the first researcher introduced the respondents to the Quality Café's method and purpose, followed by a presentation declaring their position within the quadruple helix. The second researcher was responsible for the technicalities and data collection practices, such as taking notes during the respondents' joint discussions.

The Quality Café session started with a contextual introduction to the discussion topic held by the first researcher. Respondents were divided into five discussion groups of four or five participants each. The groups were then assigned to five different Zoom breakout rooms to begin the first group session, with a total of three group sessions. Each group session lasted approximately 30 min, and the respondents regrouped prior to every round, resulting in a new group composition for each round. In each breakout room, one of the respondents acted as the room's host; thus, stayed in this particular room for all sessions. The purpose of hosting was to take notes related to the conversations during the sessions. After all three sessions ended, the respondents gathered in the main Zoom room, and the hosts of each room presented what the groups had discussed.

For the next step in the Quality Café, all respondents were assigned to two discussion groups, each with a separate Zoom breakout room and host. Each group had access to a 'Padlet' (a real-time collaborative web platform with a virtual bulletin board). Following the Padlet session, the group presented what was discussed in the Padlets.

In accordance with the inductive grounded theory approach, the discussion topic for the Quality Café was open-ended and expressed as follows: 'How can collaboration between the county's public healthcare sector, business, academia, and citizens be best supported to evolve towards digital services needed by the citizens?' that aligned with the aim of this study, which was to explore the application of a QH approach to eHealth collaboration, involving the public sector, business, citizens, and academia, as previously stated.

Step two: Individual interviews

Between February and April 2021, 11 in-depth individual interviews were conducted with respondents who were recruited from all parts of the QH, including seven women (64%) and four men (36%). The respondents were sampled from the Quality Café study population. Interview questions for the interview guides can be derived from the data collection methods of the same study (Busetto et al., 2020). In accordance with the inductive approach, the open-ended interview questions were based on the findings of the Quality Café and resulted in four different interview guides (comprising two to four interview themes and excluding background questions), deemed most suitable for the diversity within the QH and following the guidelines for developing interview guides suitable for each topic and population (Boyce and Neale, 2006). The mean interview length was 43 min, ranging between 22 and 54 min. The interviews were recorded on an external sound recorder and transcribed verbatim by one of the researchers prior to analysis.

2.3 Data analysis

The Quality Café and interview data were separately analysed using the constant comparative method (CCM), and categories were derived inductively from the data on separate occasions with respect to their uniqueness (Tobin and Begley, 2004). Individually analysing the data from the Quality Café prior to the interviews enabled the researchers to construct an interview guide based on the findings of step one. However, the results of the two analyses were later integrated.

Data from the Quality Café and individual interviews were analysed qualitatively using CCM. One of the researchers examined the data content, familiarised themselves with it, and arranged it into preliminary codes and categories. During the analysis, the researcher took notes on possible themes and preliminary interpretations of the relationships between the categories. Later, the researchers went through the codes and categories once again, using paraphrasing, if necessary, as part of the iterative analysis process. In this step, the codes were compared with each other to distinguish the similarities and differences in accordance with CCM. Finally, the researchers reviewed the analyses together to reach a consensus (Rodham et al., 2015).

3 Results

Data were collected inductively in accordance with the grounded theory approach (Glaser and Strauss, 1967). The Quality Café was based on an open-ended and general question, and its results were utilised to develop the guide for the interviews. The analysis resulted in the following categories that can be viewed as a substantive theory describing this specific case: one main category: *Viewing collaboration from different angles: having humility for stakeholder differences*, and the following three sub-categories:

1 views on collaboration

2 emphasising the end users and their needs

3 gaining value in collaborations

Together, these categories offer insight into the QH respondents' views regarding collaboration in terms of their diversity related to the goals, aspects, and suggestions for activities within collaborative initiatives, such as projects, programs, partnerships, ventures, or undertakings. A visualisation illustrating the emergence of categories is shown in Figure A1 of Appendix 1.

3.1 Viewing collaboration from different angles: having humility for stakeholder differences

3.1.1 Views on collaboration

The expected engagement of various stakeholders should be less demanding or burdensome. Clarifying the expected stakeholder engagement may be exemplified by clarifying different roles, such as being active in different activities. For example, activities could entail fulfilling different tasks in projects, and the roles could be exemplified by conducting research on various topics, such as digital readiness (academia), conducting evaluations (business), or other ways to contribute to project planning as active stakeholders (business and citizen). The identification of individual roles should be realised before the initiation of activities to mediate and promote a realistic and sustainable view of stakeholder engagement. From the business perspective, engaging activities can be exemplified by conducting business intelligence and fund-applying procedures. However, for these activities to be realised, collaborative efforts with other stakeholders, such as academia, were highly emphasised.

Representatives of businesses emphasised the need for effective communication with the healthcare sector. Furthermore, the business representatives expressed that healthcare organisations generally developed slower than other sectors, such as business, specifically for digitalisation. In addition, standards and prerequisites for innovative activities must be reasonable, as it is not always effortless or easy for an organisation to embrace innovations. Having an innovative perspective when collaborating is a highly valuable trait, especially concerning digitalisation.

The key to collaborating with stakeholders outside the QH sector is overcoming different collaboration agendas, such as when stakeholder A relies on profitable grounds (e.g., a business) and stakeholder B relies on non-profitable grounds (e.g., a civil society organisation).

Attempts to reframe organisational standards in initiatives, such as projects and undertakings, from a business-oriented process to a citizen-oriented one, in which the public organisation meets the needs and perspectives of the citizens, were made to promote collaboration.

3.1.2 Emphasising the end users and their needs

Considering the users' perspectives, diversity, and variety of end-user groups, digital healthcare accessibility for all populations must be ensured. Additionally, resources must be allocated for a particular purpose. Thus, the respondents stated a need to ensure that the resources would be allocated for investments regarding eHealth in general and for engaging in digitalisation developments that emphasise end-user diversity. Therefore, it is crucial to design digital solutions while considering citizen diversity rather than as 'one-size-fits-all', aimed at all populations.

There is a need to explore how to engage various end-user groups when developing strategies and processes within eHealth. For example, how to target the younger population and how digitalisation should be coordinated with health-promoting efforts. The roles of service design and resource allocation for specific objectives, such as creating tailored solutions, have been considered important to ensure end-user value and improve the quality of citizen engagement. Accordingly, all respondents agreed that it is critical to incorporate each case-specific user need into the collaboration.

As digitalisation is related to digital literacy, which is having the skills required for technology use regarding gathering information and being communicative, eHealth interventions should be tailored to various user perspectives while acknowledging the diversity of end-user groups. In addition, the participants emphasised the requirement for needs assessment and education to promote sufficient knowledge for end-user digital and (organisational) health literacy. Therefore, older adults' experiences related to the difficulties, advantages, and accessibility of technology can be considered for user-friendliness development regarding eHealth. The citizen respondents further suggested that researchers must comprehensively understand individual attitudes and behaviours associated with digitalisation.

3.1.3 Gaining value in collaborations

Aspects such as co-creation, striving for transparency, and mutual agreements between stakeholders were considered essential to gain value through fruitful collaboration. Most

respondents stated that knowledge sharing could facilitate joint learning, a value-creating attribute.

Furthermore, most respondents emphasised the importance of establishing and implementing a unified digitalisation strategy. Adopting a cohesive approach held potential benefits and facilitated easier cross-border implementation across diverse application areas. The respondents from academia emphasised the value of a 'seamless' collaboration process in initiatives. Thus, fewer steps between the project initiator and academia in collaboration are preferable, stating that a close, business-oriented collaboration holds possible benefits for all stakeholders involved. Most respondents stated the need for coordination of the collaborations, their structure, and resource allocation.

The respondents further highlighted the importance of supporting innovations, particularly local ones. Promoting collaboration initially requires stakeholders to establish goals and pathways that emphasise transdisciplinarity along the collaboration process. The respondents stressed the importance of creating an environment that enables increasing and exchanging knowledge and experience through both local and national initiatives. However, despite the need for a common arena for collaboration, most respondents expressed a lack of such spaces where possible partners could raise awareness while fostering dialogue and possible collaborations.

4 Analysis and discussion

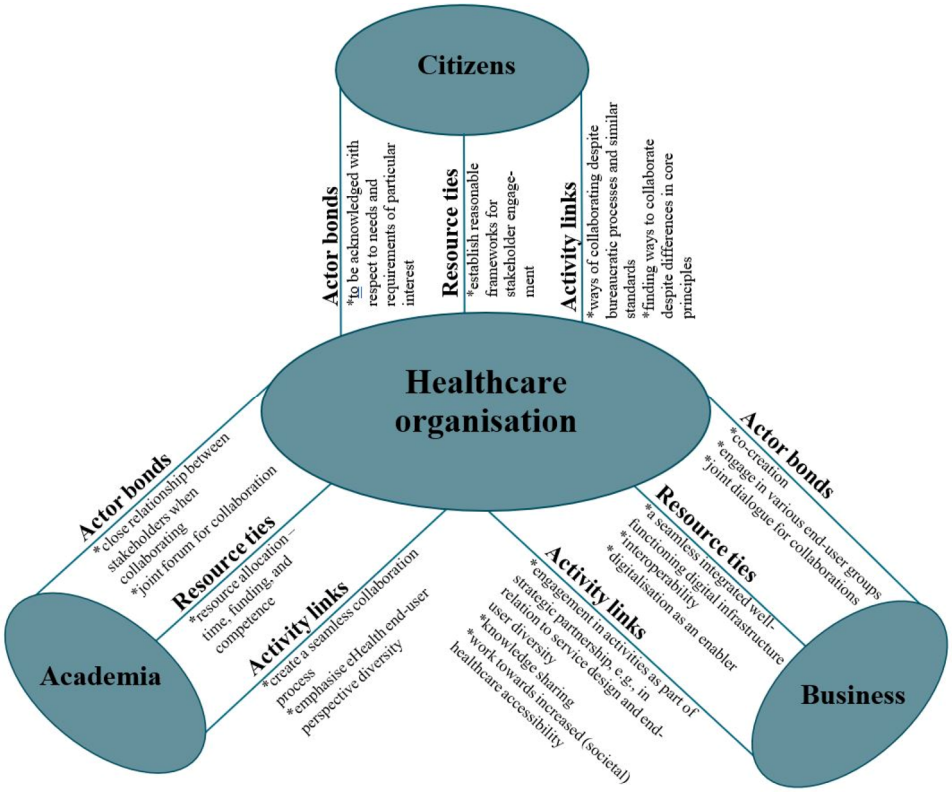
To proceed to the formal theory, it is useful to relate these findings to previous theories. Evidently, relationships between different organisations and individuals are pivotal for successful collaboration, and using business relationship theory as a theoretical template may be fruitful. The ARA model is mainly used in business relationship research (Ford et al., 2010), for example, when exploring the impact of digitalisation in business relationships (Pagani and Pardo, 2017), and conceptualising networks from a business perspective (Lenney and Easton, 2009). However, the model has also been used in addition to social network theories (Wilson et al., 2010) and when exploring value-creating within a regional QH setting (Hasche et al., 2019).

As value-creating activities are closely related to the collaboration process within the domain of the public sector (Vargas et al., 2022), we decided to use the ARA model to embrace a cross-border setting to our research scope that aims to explore a QH approach to collaboration. Applying a cross-border setting (Miller, 2007) in addition to theory, as in adopting a theory from a different research field, may enhance understanding of a phenomenon significant within social or scientific contexts. This strategy promotes the utilisation of multiple theories, such as to discover relationships and evidence (Miller, 2007).

The findings of this study are visualised in Figure 3, illustrating the stakeholders in a QH setting in alignment with the ARA components. In the figure, stakeholders are denoted as actors, encompassing the healthcare organisation, citizens, academia, and business. These actors are interconnected through the dimensions of the ARA model, involving actor bonds, resource ties, and activity links. The model aims to visualise the

importance of addressing and balancing the diverse needs of stakeholders from all perspectives within the context of a quadruple helix collaboration for eHealth.

Figure 3 *Quadruple helix collaboration for eHealth*: the healthcare organisation as the public sector actor, citizens, academia, and business, are interconnected through the dimensions of the ARA model (see online version for colours)



4.1 Actors and actor bonds

Engaging in various end-user groups, such as younger populations and senior citizens, is crucial. Additionally, understanding the optimal ways to reach various end users was considered crucial. This was suggested to be achievable through a collaborative process that involves fewer steps and a closer relationship between stakeholders. In addition to co-creation, this feature was valued highly as an important aspect of collaborating with respect to creating bonds between actors (Figure 3).

In line with the present results, it has been suggested that engaging in various end-user groups as part of the collaboration between stakeholders is key to building effective stakeholder relationships (Rajhans, 2018). Ultimately, this may lead to more successful and sustainable outcomes through a better understanding of the goals of organisations and the collaborations intended, as demonstrated in the present study, such as regarding the academic perspective (Boaz et al., 2018). Additionally, the respondents stressed the

importance of citizen involvement in collaborations to form actor bonds based on cultural and ideological characters (Håkansson and Snehota, 1995).

To stimulate and foster stakeholder actor bonds within a QH context in addition to addressing the future global challenges in healthcare (De Luca et al., 2021), it may be beneficial to include senior citizens in these activities, as they form a population group that requires attention to foster healthy living (Malva et al., 2018). Hence, including citizens in collaborations, along with other stakeholders such as the public and private sectors, may support citizenship independence within the healthcare domain, particularly in complex cases wherein citizens are highly impacted (Brabham, 2012). Engaging citizens as stakeholders has also been proposed to address societal contextual power imbalances (Storeng and de Bengy Puyvallée, 2018).

This study's findings suggest that stakeholders' characteristic diversities must be addressed in the collaboration. The citizen representatives stated that initiating activities in the business sector was difficult, leading to challenges for the business sector to collaborate with the public sector. Previous research confirms that the creation of actor bonds in stakeholder engagement is challenging (Murphy et al., 2021); for example, it is difficult to announce possible collaborations effectively (Schütz et al., 2019). To overcome the challenges of stakeholder engagement, providing an open space for collaboration with a neutral approach (Carayannis and Rakhmatullin, 2014) may enable individuals to create actor bonds while nurturing the important bonds between stakeholders (Kitson et al., 1998). Thus, creating a forum to foster collaboration would be fruitful given the findings of the current study, which highlight perspectives from academia, the public sector, and the business sector expressing a need for such a forum.

It has been previously described that implementing activities focusing on shared goals may function as a glue between various stakeholders productively meeting in a collaborative relationship (Yang and Maxwell, 2011). When creating actor bonds (Håkansson and Snehota, 1995), the respondents in this study stressed the benefits of co-creation when collaborating to progress towards joint goals, thereby ensuring outcome value. Additionally, previous research implies that digitalisation activities often require co-creation as a central aspect (Bria et al., 2015). In particular, bonds may be strengthened in a supportive environment for collaboration, as exemplified by reciprocal stakeholder engagement (Sonderegger, 2010).

4.2 Resources and resource ties

Within the present context, resource ties describe the connections and dependencies among different resources, particularly associated with resource allocation in stakeholder engagement. To promote stakeholder engagement, resource allocation should be reasonable in terms of time and effort to avoid excessive burdens. For stakeholders from academia, who may place particular importance on time and human resources, these aspects are crucial to consider in collaboration. Enhancing overall healthcare accessibility was perceived as crucial for civil society. In addition to the digital infrastructure, which encompasses interconnected networks of organisations, people, and technologies (Bygstad et al., 2017), ensuring improved communication channels for healthcare access was also identified as essential. This aspect is important to consider during the development and implementation of digital healthcare. In addition, considering the business and public sector, a well-functioning digital infrastructure with seamless

integration, emphasising interoperability, was crucial. This integration was believed to be integral to sustainable thinking when it comes to the development of eHealth (Figure 3).

Regarding value creation and the importance of co-creation, stakeholder participation and the collaborative process depend on each stakeholder's role and, consequently, on their facilitation of the resources. Additionally, the expected value may have various characteristics depending on the stakeholder's profile, such as individual or organisational (Lombardo and Cabiddu, 2017). This may be of particular interest when forming resource ties because resources are provided in relation to their specific counterparts (Håkansson and Snehota, 1995). This corresponds with the stakeholder diversity and importance of adopting an inclusive and co-creation-friendly mindset identified in the present study. This has previously been acknowledged, for example, in relation to digital infrastructure between sectors (Busch, 2008) and regarding digital requirements of the citizens (Hustad and Olsen, 2021), emphasising the umbrella term of eHealth as including digitalisation, public health, and business (Stephanie and Sharma, 2020).

Moreover, in line with the present results, resource ties have been previously described to combine different resources, such as the knowledge of stakeholders (Ford and Håkansson, 2006). This highlights how resource ties are closely connected to the activities within stakeholder engagement and gaining value that combines both knowledge sharing and resources in practice. Additionally, access to data, information, knowledge, and learning resources within a network has been previously suggested to be crucial for desirable outcomes of collaborations, and how these resources are managed can either hinder or support the collaborative process (Goodman et al., 2017).

Moreover, from the citizen and healthcare organisation perspective, eHealth may bring forth the value of end users since it was stated that the shift to digital solutions has streamlined tasks, enhancing efficiency and convenience. For example, the citizens expressed having meetings to be conducted via digital platforms saved time and enhanced accessibility, e.g., due to the decreased need for travel. From the business and the healthcare organisation perspective, similar experiences were expressed since the digital format for meetings mitigated challenges arising from the COVID-19 pandemic as the businesses and organisational tasks could continue rather seamlessly due to digitalisation, contributing to the creation of value for end users in terms of improved accessibility and convenience. However, as earlier research indicates, motivation and a personal interest in technology become a prerequisite for keeping pace with digital advancements (Wiggberg et al., 2022).

As resource ties result from the development of stakeholder relationships, they also constitute a resource (Håkansson and Snehota, 1995); therefore, it may be important to foster relationships within the network to promote efficient collaboration. Similarly, the ARA model components and network relationships appear closely related not only in theory (Gadde and Håkansson, 2001) but also in the findings of this study, for example, in the interconnection between activities and striving for stakeholders' shared goals.

4.3 Activities and activity links

As part of collaborative activities, activity links can be exemplified by defining the stakeholder roles based on expertise and possible synergies. Knowledge sharing and

agreements, despite the differences in stakeholders' core principles, may be realised for value creation. However, policy formulations and bureaucracy may hinder collaboration, as demonstrated by standardisation and regulations being considered fixed and not innovation-friendly. Regulations may constitute a hindrance when working towards eHealth tailored to end-user diversity, even though end-user diversity was expressed as crucial. The respondents also expressed that a common arena would facilitate collaboration by fostering knowledge sharing and reinforcement of ideas and promoting seamless collaboration (Figure 3).

The respondents in this study expressed that although innovations and transdisciplinarity are important, they are not always easy to implement because of policies and regulations. Accordingly, activity links within the ARA model refer to links within the cooperational actors (Håkansson and Snehota, 1995), representing joint dialogue, planning of activities, and barriers such as digital culture clashes. In addition, participants expressed difficulties in identifying, approaching, and engaging with various stakeholders for collaborative purposes, in accordance with previous findings (Bria et al., 2015). Moreover, the challenges in getting a heterogeneous variety of stakeholders to benefit from society's knowledge in collaborative matters have also been previously acknowledged (Palmatier et al., 2006). This corresponds with the present study's findings, as the respondents expressed a need for increased collaboration with civil society.

With respect to various stakeholders, defining stakeholder roles is usually associated with several elements of collaboration, such as resource allocation, competence outlining, and networking (Lindberg et al., 2014). However, from the healthcare organisation perspective, a growing interest among various stakeholders in collaborating on eHealth was noticed. This increased interest has facilitated the progress of various projects related to healthcare activities, suggesting that digitalisation and eHealth utilisation could enable primary healthcare to function as a central hub. While the potential benefits of eHealth and digital progress for primary care have been previously suggested, there is a need to better understand eHealth usage from a diverse end-user perspective, such as for technology resistance and acceptance (Iyanna et al., 2022).

From a QH perspective, previous studies have indicated the challenges in defining the role of citizens in the context of collaboration (Palmatier et al., 2006). This is because it is crucial to include stakeholders from various backgrounds in collaboration (De Luca et al., 2021). Multistakeholder collaboration typically occurs within a network that shares common interests or experiences similar outcomes to be valuable. This approach is nearly a prerequisite when addressing complex societal challenges, such as healthcare for an ageing population. In this collaborative framework, stakeholders contribute their knowledge, experiences, and unique skills to collectively explore and define the parameters of different situations (Jia et al., 2015). Accordingly, having multi-perspective activities in collaborations may be fruitful in domains of the implementation of eHealth in healthcare (Nilsen et al., 2020) along with eHealth working methods (Kaipio et al., 2020) and technology acceptance in senior citizens (Jia et al., 2015).

Activities such as the establishment of joint goals to ensure outcome value are crucial aspects to be considered while striving for collaboration between diverse stakeholders. Therefore, a thorough understanding of the variability of expectations is important to meet all stakeholders' needs (Lemon et al., 2002). To further reflect on bond creation

between stakeholders, understanding stakeholder diversity somewhat relies on a project's success or failure, which may be strongly influenced by how well the project meets the stakeholders' expectations and value perceptions (Lemon et al., 2002).

In this study, activities for stakeholders from academia can focus on addressing research areas that demand attention, such as understanding end users' needs in the context of digitalisation. Previous findings support this and emphasise the importance of integrating behavioural science alongside digitalisation within society (Sacula et al., 2020). This aligns with the results of this study's findings, as the citizen representatives highlighted the importance of exploring digitalisation regarding the behaviour of senior citizens. In addition, given the interconnection of eHealth with a business approach, factors like design may influence the implementation and acceptance of digital solutions, affecting the sustainable usage of such solutions. However, this process requires stakeholder engagement, with emphasis on research insights (Breeman et al., 2021). Hence, developing a relationship between academia and society is also linked to resource ties, as allocating resources considering eHealth may enable valuable scientific evaluations (Kelders et al., 2020).

4.4 Conclusion

The results of the present study indicate that engaging in collaborative initiatives is important for all stakeholders of the QH. The need to promote value and quality in collaborations was emphasised, along with the identification of several views on collaboration. Applying the ARA model to introduce an additional dimension to potential collaboration structures, discussions delved into actor bonds, resource ties, and activity links within initiatives such as projects or undertakings. This emphasises the significance of knowledge and competence as crucial resources and bonding elements among actors. The results of the present study taken together reveal that eHealth development requires an integration of different stakeholders' needs and preferences. Further, our findings emphasise the need to consider and balance the diverse stakeholder needs (from every user perspective) when addressing eHealth within the societal process it embodies. However, challenges in initiating collaboration, such as the lack of open space for promoting collaborations, may impact the relationship-building features of stakeholder interaction.

4.5 Methodological considerations and suggestions for future research

When integrating the different forms of qualitative data emerging from focus groups and individual interviews, the reliability of the findings may be threatened if each method's particular methodological underpinnings are neglected and the datasets are assumed to be equivalent (Tobin and Begley, 2004; Barbour, 1998). To increase the rigour of the method combination used in this study, we considered the correspondence of the study aims with the data collection methods, the rationale for the combination of methods, and how the methods harmonise. Hence, each method is reported separately in the Results section without assuming their equivalency (Tobin and Begley, 2004).

A limitation of this study is that all respondents who represented the citizens within the QH were exclusively recruited from senior citizens' associations, which may limit the

sample's representativeness of all older adults. Limiting the representative profile to senior citizens further narrows the perspective of all citizens in the society. Nonetheless, we argue that the senior citizen population is important while considering eHealth increasingly highlights their digital inclusion needs (Martínez-Alcalá et al., 2021; Sampaio et al., 2019). However, as eHealth concerning the internet and technology literacy may relate to social inclusion, levels of empowerment, and quality of life for all citizens (Merskin, 2019), research focusing on senior citizens, societal digitalisation, and eHealth may also benefit other members of society.

Future research should broaden the research motive regarding various populations and explore collaborative methods to acknowledge the diversity in society. The impact of co-creation, inclusion, and healthcare accessibility regarding increased access [e.g., digital health(care)] for various end users should also be further explored, such as in the digitalisation of society and maintenance and improvement of citizen health. Furthermore, future studies could utilise innovative and sustainable eHealth solutions to develop and improve stakeholder collaboration and networking for it to be sustainable and rewarding.

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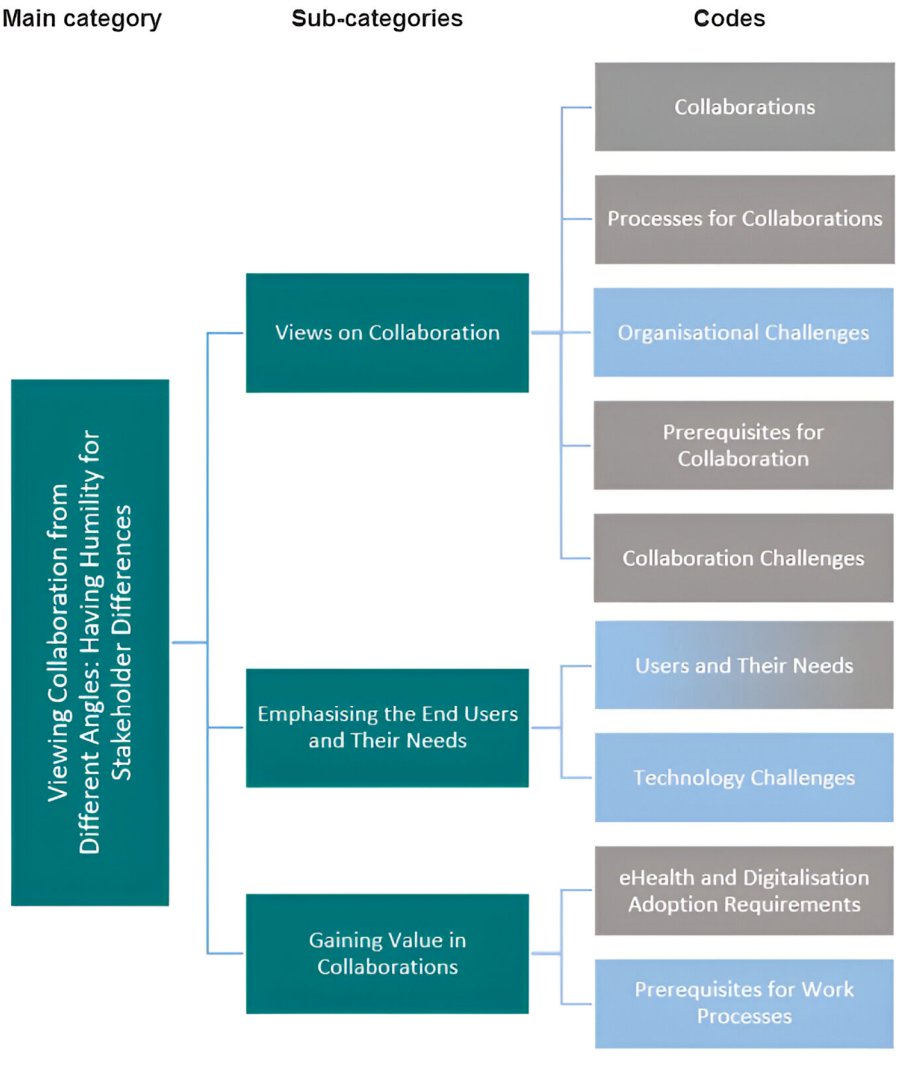
Appendix 1

Figure A1 A visualisation of how the codes and categories emerged qualitatively from the Quality café (grey codes) and from the individual interviews (blue codes) (see online version for colours)



Nine codes contributed to the development of three subcategories, which are argued to reflect the main category-viewing collaboration from different angles: having humility for stakeholder differences.