

# Understanding the Complexity of Benefits Management in an Interorganizational eHealth Effort

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## Abstract

*Information and communication technology (ICT) is an intervention for the future provision of healthcare services and diverse types of technologies are being implemented. However, realizing the benefits of such efforts is challenging. Moreover, collaboration among organizations has become common, which increases the complexity level and making the benefits of ICT efforts even more challenging to realize. As benefits management (BM) practices have not been designed for complex situations, a deeper contextual understanding of BM practices is required. To address this issue, a case study was conducted in a Norwegian interorganizational eHealth effort. The results provide an overview of four central concepts describing interorganizational complexity, as well as organizational and external concepts that challenge current BM practices. The case study findings highlight the need for updated BM practices and provides three novel suggestions for improving BM practices in interorganizational eHealth efforts.*

## 1. Introduction

Innovation has become a well-known phenomenon in public healthcare services, especially in relation to information and communication technology (ICT) [32]. As health organizations become increasingly dependent on the implementation of diverse technologies, this trend will likely continue [18]. Among others, Barnett et al. [3] have suggested that healthcare service providers will face service provision challenges in the coming years due to both an increased number of patients with chronic and comorbid diseases, in addition to lower work effort per inhabitant [3]. To be able to manage these challenges, the health sector needs to innovate their way of providing services [32].

The recent acceleration of ICT implementation in healthcare services has put forward an adequate effort in solving these challenges. eHealth efforts are expected to improve a patient's quality of life and contribute to the provision of efficient and effective services [5]. Although there is ambition and enthusiasm towards the use of ICT in healthcare services, realizing their expected benefits is difficult. As a result, studies have reported positive and negative effects related to these efforts [1]. To improve ICT implementation, several benefit realization tools adopted by practitioners exist for use by the public sector [17, 35].

Digitalization has caused rapid societal change, and there has been substantial growth among organizations collaborating to reach common goals [4, 14, 36]. However, these collaborations are challenging, where competing stakeholder visions, interprofessional relations, various forms of trust, political issues, and technical standards have been reported as obstacles [6, 16].

Although researchers have reported complex ICT efforts, the phenomenon is not yet well understood. Complexity is either mentioned as a consequence of interorganizational collaboration [13] or is briefly described without further detail [32]. Little research has been done to help understand the multi-faceted complexity of benefits management (BM) in interorganizational collaborative ICT efforts. As such, further research should be conducted [13, 21].

Furthermore, suggested BM tools and work methods [35] seem to disregard multidimensional contexts [13]. Though the world is changing, the models used for guiding complexity have not followed suit. Without a thorough understanding of complexity, it is difficult to improve existing BM practices.

The purpose of this study is to examine the multi-faceted complexity of interorganizational eHealth efforts and BM implications. Two research questions have been developed for this study, which ask:

- 1) What are the central complexity concepts in regards to interorganizational eHealth efforts?

- 2) What challenges do the central complexity concepts introduce for the BM of interorganizational eHealth efforts?

## 2. Background and theory

Two types of theory are presented within this section. First, eHealth literature is described to provide an overview of the study context. Second, BM literature is introduced as a theoretical lens. The BM literature highlight benefits realization in ICT investments, including organizational development and innovations, and suitable for the public sector [35].

### 2.1. eHealth

The term eHealth is used widely in society. The World Health Organization defines eHealth as the use of ICT for health [37]. This definition is broad and can be seen as an umbrella term applied to different technological solutions used in healthcare specific contexts [5]. While telemedicine is the most cited term across countries, several terms and definitions explain the different areas of eHealth [12]. Telemedicine is defined by the European Commission as “the provision of healthcare services, through use of ICT, in situations where the health professional and the patient (or two health professionals) are not in the same location. It involves secure transmission of medical data and information, through text, sound images, or other forms needed for the prevention, diagnosis, treatment, and follow-up of patients” [11, p. 3].

Telemedicine solutions have been an integral aspect of hospital service provisions for several years [28], but studies also have examined projects conducted within primary health services [34]. The health sector has high expectations for eHealth solutions [5]. For example, ICT is viewed as an intervention designed to meet the future challenges related to, among other factors, a changing demographic with an increasing number of comorbid disease cases [23]. As the volume of eHealth innovations continues to grow, related research can easily be found.

A 2017 study conducted by Askedal et al. [1] reviewed the effects of ICT on primary healthcare services from a public value perspective. Positive effects of ICT included improved work processes, improved health conditions, and patient empowerment. The study also identified negative effects of ICT, including increased workloads, negative changes in professional roles, and technical and usability issues. To summarize the research, both positive and negative effects related to eHealth efforts were documented.

In general, when public values such as citizen involvement, service improvement, and administrative

efficiency are at stake, the diverse interests of the involved stakeholders need to be balanced by the public sector [30]. In such a complex environment, managing and defending progress and decisions can be difficult when conflicting interests are present [26]. Efforts in eHealth are no exception. Defining, identifying, and involving stakeholders are crucial to eHealth development as they play a significant role in decision-making and in the adoption of new technology [22].

Stakeholders involved in eHealth efforts represent different institutional contexts, including multidimensional institutions. Dissimilarities among stakeholders, such as goals, tasks, competences, technologies, cultures, structures, systems, and power, do exist [32]. Thus, contradictions between professional roles within and across departments or organizations may occur [5]. However, literature pertaining to such complex efforts is limited [6], and more research is needed to provide a deeper understanding of how these collaborations can lead to success [14].

### 2.2. Benefits management

All organizations strive for sustainability, whether they are organizations in the public sector seeking to maximize their effectiveness or private firms looking to maximize their shareholder value. ICT has become instrumental in ensuring profitability and sustainability. However, such implementation is far from straightforward, and many organizations struggle to realize the intended benefits of ICT investments [9]. For BM to succeed, Ward and Daniel [36] have suggested to not only focus on the deployment of technology, but also pay attention to process changes, the role and work practices of individuals or groups, and the culture of the related organization. Failing to pay close attention to these organizational aspects is a factor responsible for the non-realization of benefits. For example, knowing the organization’s culture allows managers to select the right management strategies, which in turn sets the foundation for successful changes [36].

Several methodologies and processes working to improve the implementation of ICT have been developed over the past 30–40 years. At the Cranfield School of Management Information System Research Centre (ISRC) in the United Kingdom, a BM process model was developed in the mid-1990s [35]. The model has been refined over the years and has built upon the experiences of several organizations [35]. Thus, Ward and Daniel has defined BM as “[the] process of organizing and managing such that the

potential benefits arising from the use of IS/IT are actually realized” [35, p. 36].

Several BM models have been adopted by practitioners [17] wherein the BM model [35] still serves as a reference of good practice [13]. The model is iterative and is comprised of various stages. In addition to focusing on ICT implementation, the model includes dimensions of organizational change and innovation that emphasize stakeholder involvement. The model also highlights the importance of those who take responsibility for planning the actions needed to realize the benefits, known as benefits owners. If no benefit owners are known, the literature suggests that the benefits will not be realized. This is because a lack of ownership indicates the aforementioned benefits are not wanted or credible [36].

Although the BM model is useful during the process of benefits realization, some work needs to be addressed in advance. The approaches to implementing ICT differ slightly and depend on the goal at hand. As issues pertaining to expected risks and change management strategies differ, improvement targets must be made clear and consistent. Before the benefits analysis of specific investments can be conducted, thorough strategy work must be completed. However, such work is carried out at the strategic level and is infrequently communicated to employees [25, 27, 35].

As a part of the initial strategy work, it is important to understand the strategic context of where ICT investments are made [35]. Although organizations may consider implementing the same ICT application, they may start from different points. Thus, organizations require different efforts to achieve the same benefits. Organizational strategies may also have an impact on the ways in which benefits are viewed. Ward and Daniel [36] argue that it is impossible to develop a generic set of changes and benefits for specific technologies.

Principles deriving from BM literature [35] are widely used in public and private sector models, but little research regarding how benefits realization processes occur in practice has been conducted [8]. However, some studies have investigated the outcome of such research. Paivarinta et al. [25] reported stakeholder complexity in the public sector and tensions between stakeholder groups (e.g., political contemporary priorities or longer-term priorities, qualitative or quantitative benefits) as issues facilitating the adoption and implementation of BM for IT investments. Coombs [7] studied the inhibitors and facilitators of realizing benefits for IT efforts. The outcome was divided into technically oriented factors, such as training, stable systems, and poor reports, and organizationally oriented factors, including organizational culture, lack of involvement, and user

engagement. Askedal et al. [2] presented insights from a benefits realization process within an eHealth effort where communication and the combination of competence, stakeholder involvement, organizational support, and organization acceptance were reported as individual learning of the process. The researchers concluded that agreeing on and developing a benefits realization plan in one organization is challenging, and developing the same plan for a collaboration of organizations is assumedly even more challenging [2].

Increased collaboration in this complex context could be related to the extensive growth in use and implementation of ICT [4, 21, 36]. However, the realization of benefits is challenging with the involvement of several organizations as each party may have different strategic starting points [36]. The increase in interorganizational collaboration seems to be unaffected by this challenge, and BM does not fit with the multiple facets of stakeholder complexity occurring in ICT efforts today [13]. To refine the BM model for current and future ICT efforts, more knowledge about this phenomenon is needed [13, 21].

### 3. Research approach

A qualitative approach was considered the most appropriate method for this project due to the nature of the research questions established. When investigating an unknown phenomenon, a qualitative approach is useful. This is because the purpose of a qualitative approach is to obtain a richer description of the case [19]. Moreover, case studies allow for a phenomenon to be examined within a real-life context [38]. As differing definitions of the term case study exist [15], Eisenhardt’s definition has been applied to this study. It states that “The case study is a research strategy which focuses on understanding the dynamics present within single settings” [10, p. 534].

Responding to the call for research on interorganizational ICT efforts, the present study was designed as a single case study with an interpretive approach. Interorganizational complexity represents the unit analysis of this study, and how this influences BM in ICT efforts within the public healthcare context is examined.

To collect the data, 24 semi-structured interviews with key stakeholders from the presented case (see section 4.1 for details) were conducted from September 2017 to February 2018 based on a stakeholder analysis. An interview guide was used to address the following relevant themes: current and future health services (practice, technology, and telemedicine) and questions regarding the specific case (drivers, success, enablers and inhibitors, and experiences). The interviews were recorded, transcribed, and then inductively coded in

NVivo (guided by a qualitative methodology of first and second cycle coding provided by Miles et al. [24]). The interviews were first coded and were then organized into different categories to integrate them as part of a system. Finally, the categories were grouped into concepts for general and higher-level constructs [31]. Table 1 provides an overview of the respondents, including the attributes of the organization, the type of sector, and the role and number of interviews, demonstrating the multiple stakeholder levels.

**Table 1.** Overview of respondents.

Organization	Role (N)	Number of interviews
Municipality 1 (Public)	<ul style="list-style-type: none"> <li>• Top manager (1)</li> <li>• Service/department manager (3)</li> <li>• Project manager/work package leader (2)</li> <li>• Advisor (1)</li> <li>• General practitioner (2)</li> <li>• Nurse/other healthcare professional (1)</li> </ul>	10
Municipality 2 (Public)	<ul style="list-style-type: none"> <li>• Top manager (1)</li> <li>• Service/department manager (2)</li> <li>• Project manager/work package leader (1)</li> <li>• Nurse/other healthcare professional (1)</li> </ul>	5
Hospital (Public)	<ul style="list-style-type: none"> <li>• Service/department manager (1)</li> <li>• Doctor (2)</li> <li>• Nurse/other healthcare professional (1)</li> </ul>	4
University (Public)	<ul style="list-style-type: none"> <li>• Service/department manager (1)</li> <li>• Project manager/work package leader (1)</li> <li>• Professor/researcher (1)</li> </ul>	3
Technology Vendor (Private)	<ul style="list-style-type: none"> <li>• Top manager (1)</li> </ul>	1
Consulting Company (Private)	<ul style="list-style-type: none"> <li>• Project manager/work package leader (1)</li> </ul>	1
<b>Total</b>		<b>24</b>

## 4. Results

In this section the analysis results are presented. First, a description of the case is provided. Second, the central concepts of interorganizational eHealth complexity are presented in Table 2. Third, the results pertaining to BM challenges for interorganizational

eHealth efforts are presented in Figure 1 and Tables 3 and 4.

### 4.1. Case description

Norway is a parliamentary democracy in Scandinavia with roughly five million inhabitants. The country is divided into three administrative levels: the state, 18 counties, and 422 municipalities. The healthcare system is semi-decentralized, where specialist care responsibilities lie with the state and are managed by a board of trustees. Funds for hospital care are allocated through a combination of block grants and activity-based funding. Municipalities are governed by local democracy, have freedom in organizing health services, and are responsible for providing primary care. Primary care is financed by specific-purpose and block grants from the central government and municipal taxes. General practitioners (GPs) have a key role as gatekeepers for patients, as GPs can access specialist care. Most GPs are self-employed but have contractual relationships with municipalities [29].

From 2016–2019, the Telemedicine Innovation Project (TIP) is evolving among several Norwegian organizations (Table 1). The goal of the TIP, stated in the project proposal, is “to test and evaluate a common telemedicine solution for remote monitoring of patients with chronic diseases or comorbidity among 30 municipalities, providing good healthcare services with less use of healthcare resources”. This project is a continuation of a European Union project and developed for patients with chronic diseases such as chronic obstructive pulmonary disease, heart failure, type 2 diabetes, mental health issues, or a combination of these (comorbidity). Two municipal telemedical centers have been established, and municipalities select which patients to include based on defined criteria. The services provided by the TIP are individually customized and provided through a tablet, in addition to the different medical devices used remotely by the patient. Triage is triggered by the input of patient data (e.g., measurements and questionnaires). Depending on the outcome of the triage, different actions are performed by healthcare professionals located at the telemedical centers.

During the first two years of the project, an enormous effort has been put forward regarding the development of services and chosen technologies. However, the TIP has also experienced several challenges. These challenges were recently discussed in a workshop held for TIP stakeholders, and include fewer patients than expected, major delays, a lack of resources, and to demonstrate the socioeconomic benefits of the TIP. Based on a pre-analysis of the

collected data, interorganizational complexity was identified as an unexplored inhibitor of benefits realization. Because of this, the TIP is an excellent case for the examination of complexity in interorganizational eHealth efforts. Furthermore, how complexity affects BM can also be studied through this case. The project is still in an early phase, and thus, there is time to adjust the strategy for ensuring benefits realization.

## 4.2. Central concepts of complexity in an interorganizational eHealth effort

Table 2 outlines the analysis results of the present study. These results address the following research question: What are the central complexity concepts in regards to interorganizational eHealth efforts?

**Table 2.** Central concepts of complexity in an interorganizational eHealth effort

Concepts	Concept categories	Quotation Example
Collaboration structure and strategy	<p>Strategy:</p> <ul style="list-style-type: none"> <li>Collaboration objectives (good healthcare services, less use of healthcare resources)</li> </ul> <p>Structure:</p> <ul style="list-style-type: none"> <li>Decision authorities</li> <li>Equal service provision across organizations</li> <li>Juridical clarifications</li> <li>Collaboration contract</li> <li>Project design (schedule, structure, tasks)</li> </ul>	<ul style="list-style-type: none"> <li><i>We'll find good services for citizens and for employees. We'll find sustainable services, and we'll try to find services that don't make it more expensive for either municipalities or citizens (#1)</i></li> <li><i>It is a challenging project because we didn't define tasks and responsibilities clearly at the start...concretized what this should be and also possible sources of error (#14)</i></li> <li><i>It's a point to have equal service provisions, I think, which we must agree on in the TIP (#11)</i></li> </ul>
Collaboration culture	<ul style="list-style-type: none"> <li>Collaboration climate (early conflicts, some distrust, improving at present)</li> <li>Individual characters (enthusiasm and ownership, seeing healthcare services beyond own organization, some feelings of inadequacy)</li> <li>Various perspectives regarding key concepts (e.g., telemedicine, TIP technology, benefits realization, success, inclusion criteria for preventive or decisive needs)</li> <li>Individual and interorganizational learning</li> </ul>	<ul style="list-style-type: none"> <li><i>This project may have been a bit cluttered... constantly affected by human irrationality (#10)</i></li> <li><i>You got three different cultures on how to manage a project, thoughts about how a project should be, thoughts about what is seen as a successful project, how to measure the project and such things. It is a very big challenge (#1)</i></li> <li><i>It's about learning from what we do, so that not everyone has to start from scratch. We must learn from each other constantly and build it forward (#6)</i></li> </ul>
Collaboration technologies	<p>For health service provisions:</p> <ul style="list-style-type: none"> <li>Patient data needs to be managed</li> <li>Exchanging patient data across organizations/service levels</li> <li>Lack of system integration</li> <li>Uncertainty and vulnerability regarding TIP technology responsibility and logistics</li> </ul> <p>For project activities:</p> <ul style="list-style-type: none"> <li>ICT tools for project collaboration across organizations</li> </ul>	<ul style="list-style-type: none"> <li><i>A challenge to telemedicine, which we have not yet fully understood, is that it will generate a bunch of data that we didn't have before which someone must deal with. Who is going to do that? (#2)</i></li> <li><i>Now we see clearly the possibility for interaction and sharing of information...how weak we are...and that is a prerequisite to get the improvements we are aiming for (#18)</i></li> <li><i>Technology logistics are a challenge; the end-user needs equipment. They have a tablet and measuring devices, and maybe training. Who will take care of it? (#19)</i></li> </ul>
Collaboration management	<ul style="list-style-type: none"> <li>Perception of ambition and complexity</li> <li>Project progress (several dependencies, time-consuming processes)</li> <li>Stakeholder involvement</li> <li>Communication (e.g., purpose of the project, external advertising)</li> <li>Resource management (heavy workload, turnover)</li> <li>Support and empowerment</li> <li>Clear and authoritative leadership</li> <li>Economy (more organizational economic efforts than expected)</li> </ul>	<ul style="list-style-type: none"> <li><i>There are many cooks in the kitchen... that is my impression. Can we soon agree about anything at all, good—but it is insanely resource intensive (#4)</i></li> <li><i>We need clear leadership in such a complex project...to pull everyone in the same direction and to be clear about the purpose of the different work packages. If not, we may end up with work packages running their own race (#7)</i></li> <li><i>Some project funds should have been allocated to operations. There are millions, and if you want this to succeed, you have to prioritize something for operations as well (#21)</i></li> </ul>

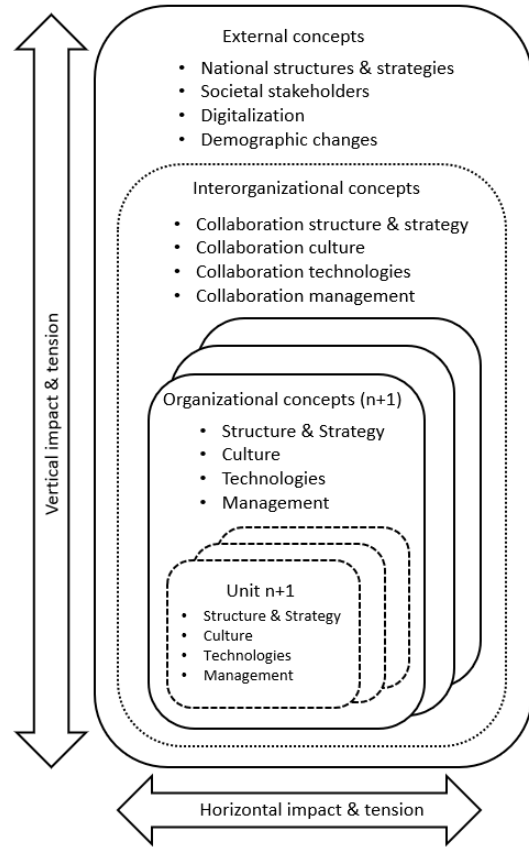
### 4.3. Challenges of BM in an interorganizational eHealth effort

The second research question of this study asks: What challenges do the central complexity concepts introduce for the BM of interorganizational eHealth efforts?

This analysis revealed that the concepts of complexity identified for the TIP affect the degree to which the goal will be realized. The analysis also showed that concepts were influenced by the organizations and units which the TIP stakeholders represented and vice versa. Further, the different organizations represented within the TIP, along with the TIP itself, were influenced by external concepts and vice versa. This has led to project challenges, horizontal between organizations and vertical between e.g. organizations and the interorganizational eHealth effort.

Bringing about external and organizational concepts expands the already complex BM situation (as outlined in Table 2) for an interorganizational eHealth effort. However, the inductive analysis of the present study has identified these concepts as fundamental for understanding the complexity of BM. Figure 1 gives an overview of the identified external, interorganizational, and organizational concepts, including an illustration of the vertical and horizontal impacts and tensions that introduce BM challenges.

As seen in Figure 1, related concepts identified in interorganizational eHealth complexity (e.g., collaborative culture) are also present in single organizations, including their units (e.g., culture). External concepts are different from organizational and interorganizational concepts to some extent.



**Figure 1.** The context of BM in an interorganizational eHealth effort

Tables 3 and 4 provide an overview of the organizational and external concepts identified in the TIP, as well as some examples of challenges the complexity concepts introduce for BM in the TIP.

**Table 3.** Organizational concepts that challenge BM in an interorganizational eHealth effort

Concepts	Example of challenging categories	Quotation Example
Structure and strategy	Criteria for providing healthcare services differ across organizations and are not necessarily aligned with the criteria for the inclusion of TIP patients	<i>Talking about structure...The management in the organization says: that's how we should do it, and that's how it works. Period. But then, you have project managers who disagrees...It is really difficult for us...I cannot do something that my employer or manager disagrees with, right? There will be a conflict of interest (#13)</i>
Culture	Project fatigue and resistance to change	<i>I have occasionally felt annoyed at everything...sometimes I want to say that it was so much easier to keep on with operation without this (ref. TIP) extra! (#21)</i>
Technologies	Diverse types of electronic health record (EPJ) and patient administrative systems (PAS) across organizations	<i>We have no experience with technology like the one used in the TIP...so it must be customized to our EPJ, both the layout and its usability (#23)</i>
Management	Anchoring in own organization	<i>Anchoring in own organization and definition of roles can never be defined enough...managers need to know for future large-scale projects that it will take a lot of resources (#15)</i>

**Table 4.** External concepts challenging BM in an interorganizational eHealth effort

Concepts	Example of challenging categories	Quotation Example
National structures and strategies	Democracy challenges equal service provisions across organizations  Semi-decentralized healthcare systems challenge collaboration and prevent sustainable telemedical services	<i>Think about the democracy. We choose politicians. Who decides? Yes, politicians. So, if you think that you can get all those politicians to think the same...I don't think so, because it's actually a part of our democracy...do you see how difficult it will be? (#14)</i>
Societal stakeholders	The TIP is dependent on patients and municipalities in the region to realize project goals	<i>How to recruit, where to pick up the patients? If we don't reach the patients, then it's unsuccessful (#9)</i>
Digitalization	Competing technologies and services are developed and provided parallel to the TIP, which challenges attention among societal stakeholders	<i>When the data revolution came, it was not necessarily the solution one thought would come that came... It can make things come from commercial hold that trumps slightly what we do in public (#9)</i>
Demographic changes	Citizens have increased expectations for healthcare services, which may challenge the level of perceived service quality and effective services	<i>New expectations, new tasks...we have to hang out with everything...new technology and all new within patient treatment...It's quite demanding to stay up-to-date on all fields at all times. It's almost impossible (#23)</i>

## 5. Discussion

In this section, the analysis is discussed through the theoretical lenses of eHealth and BM and are then applied to the research questions.

### 5.1. Central concepts of complexity in an interorganizational eHealth effort

As shown in Table 2, four central concepts were defined by the inductive analysis, including categories of complexity within an interorganizational eHealth effort. The four concepts will be elaborated upon further in this section.

While it may sound simple to define, collaboration structure and strategy has been proven complex. Several obstacles may occur when partners representing different aspects of a service chain collaborate [5]. Due to space limitation, only one example from the TIP will be given. The TIP's intended collaboration strategy of providing good healthcare services with less use of healthcare resources aligns with the general purpose of implementing technology as an intervention for future service provisions [23]. However, previous research states that different organizational strategies view benefits in varying ways [36], and balancing public values such as quality and efficiency is a possible challenge [30]. Similar findings have also been identified in this case as the TIP organization collaborators represent different parts of the Norwegian healthcare system, and diverse views and roles are thus held. In particular, good healthcare services are a naturally focus in the TIP, as healthcare professionals are responsible for developing

telemedical services. As suggested by Askedal et al. [29], a combination of different competences could be the solution for balancing different values when designing future interorganizational healthcare services.

Collaboration culture seems to grow in complexity when considering the number of collaborative organizations and units within the TIP. As each organization consist of individuals, each stakeholder is a participant in the existing collaboration culture. However, individuals may be influenced by their organization or unit in regards to their values and perspectives, which can ultimately impact their personal behaviors and reflections. Coombs [7] points to the importance of organizational culture in the success of BM. In contrast, Ward and Daniel [36] emphasize the identification and involvement of stakeholders during the whole process, but place less importance on organizational culture.

To succeed with benefits realization in an interorganizational eHealth effort, the present analysis identified collaboration culture as a central concept and implicit aspect of the organizational culture for which the stakeholders represent. Further, the analysis data demonstrates various perspectives regarding key terms such as benefits realization, success, and technology. These varying perspectives have caused misunderstandings and time-consuming discussions during the project. One example of this was the perception of the term "telemedicine" [11]. Individual experiences combined with organizational affiliation played a role in how stakeholders defined this specific term. Based on the perception of this simple term, other more important sub-categories led to different perspectives (e.g., the type of patient

groups suitable for the TIP, the inclusion criteria, the level of competence at the telemedical center, and the level of service provisions). Differing benefits and success expectations among collaboration partners are also reported in previous research [21, 27]. Based on this and the TIP results, identifying stakeholders' perceptions of key terms is relevant for avoiding potential misunderstandings.

Collaboration technologies are used for two purposes in the TIP. The first purpose of collaboration technology is to provide health services with technological solutions to be used by patients and healthcare professionals in telemedical centers. Previous research has described the identified categories of healthcare service technologies [1, 16, 32], and this study supports these findings. Although this is well-known, it is still a central concept of complexity that must be managed when considering interorganizational eHealth efforts. The second purpose of collaboration technology is for the communication and handling of project documents across organizations. This type of technology plays an important role in project progress but seems to be forgotten when a collaborative project is begun across multiple organizations.

Collaboration management is an important and demanding concept of interorganizational eHealth complexity. Most of the categories related to this concept have been previously established by studies investigating single ICT efforts [22, 26]. These categories demonstrate a comprehensive effort to manage, and thus increase, the knowledge, skills, and updated tools required for understanding such complexity. Although most categories are already known, a new category has emerged from the present study: external advertising and the sale of public services (the TIP). To reach its intended goal of a common telemedicine solution among 30 municipalities, the TIP depends on municipalities in the region for buying telemedical services from the telemedical centers. This task requires marketing skills, which is an unusual communication method between public organizations.

Retrospectively, the central concepts of complexity can be identified among different research contexts and disciplines [21, 32]. However, Table 2 provides a detailed explanation of the central concepts, including the categories of complexity that have emerged specifically from this case study. In addition to understanding these concepts separately, each concept has an impact on the other concepts, and should thus be evaluated in relation to one another. As such, Table 2 contributes to the limited literary resources regarding complex ICT efforts [6]

and provides the foundation for better understanding BM in such contexts.

## **5.2. Challenges of BM in an interorganizational eHealth effort**

Tables 2–4 present overviews of the concepts and examples of challenging categories from an interorganizational eHealth BM context. Further, Figure 1 illustrates how external, interorganizational, and organizational concepts influence each other vertically and horizontally. In sum, this image helps to reflect upon and further understand why BM in an interorganizational eHealth effort is challenging and can be seen as the main contribution for answering the second research question. Because of space limitations, only one example of a combined vertical and horizontal challenge will be given to demonstrate the complexity of BM in the TIP.

The TIP collaboration structure consists of a steering committee, a project group, and different work packages. It is natural to think that the steering committee is the main decision-making authority in the TIP, which aims to test and evaluate a common telemedicine solution for remote monitoring of patients with chronic diseases or comorbidity among 30 municipalities, providing good healthcare services with less use of healthcare resources.

As telemedical centers provide TIP services to real patients, juridical clarifications about who is responsible for the services occur. The structure that deems the steering committee to be the primary decision-making authority in the TIP is challenged by collaborative organizations that actually provide the telemedical services. For this challenge, organizational structure and strategy plays a significant role. Criteria for how, and to whom, healthcare services are provided in each municipality can differ depending on the organizational strategy, economy, and local politicians. This category is further affected by external national structure and strategy related to the Norwegian healthcare system, where municipalities have the freedom to organize and are responsible for providing primary healthcare services [29]. In turn, this challenges the thought of equal service provisions across all organizations. This brief example underscores the BM literature that points to the challenges of realizing unified benefits across multiple organizations with different strategic perspectives [36].

In the TIP, it seems almost impossible to realize the ambition of common praxis among organizations when democracy is part of the national structure. Stronger national governance or motivating incentives could be the key to creating equal service



provisions across all municipalities. However, there is no indication of change in national regulations at present.

BM literature underscores the importance of understanding the strategic context in which ICT investments are made [35]. Based on this example and the other identified concepts, paying attention to vertical and horizontal implications and tensions in interorganizational eHealth efforts is crucial. Though some concepts are beyond interorganizational control, it is essential to define realistic ambitions in advance to establish a reliable basis for entering the different steps in the BM model [35]. For identifying possible challenges in interorganizational eHealth efforts, Tables 2–4 provide a useful and systematic experience overview of this case study.

Ward and Daniel [36] argue it is impossible to develop a generic set of changes and benefits regarding specific technologies. The TIP and other interorganizational efforts challenge these thoughts through the collaboration of many organizations to meet one common goal [4, 14]. Based on the experiences of the TIP and the presented BM literature [36], reflections regarding whether it is realistic to develop a benefits realization plan across organizations must be made. Moreover, who are the benefit owners [36] of such contexts, and further, will they have the power to initiate the needed changes across all organizations? These reflections need further exploration.

To summarize, existing BM models lack multi-dimensional perspective. This study answers the call to explore and further understand the complexity of improving BM practices in ICT efforts. However, to refine the results further research is needed. A possible way of proceeding with this research is to deductively use theory that adjoins identified concepts e.g. from public administration or organization and management disciplines, such as governance networks [20] or institutional theory [33, 36]. Due to space constraints, these theories cannot be further explained in this paper.

## 6. Conclusion and implications

This study investigated the central complexity concepts and BM challenges in a Norwegian interorganizational eHealth effort. The results are based on 24 semi-structured interviews that are summarized in Figure 1 and Tables 2–4. The results demonstrate that a variety of concepts impact one another on both vertical and horizontal levels. As a result, these concepts challenge BM in the interorganizational eHealth effort examined.

This research has implication for both theory and practice. The results provide a deeper understanding of complexity, and also gives examples of why BM in interorganizational eHealth efforts is challenging. As such, this study contributes to the quest for gaining more knowledge on the multi-faceted complexity of BM in interorganizational ICT efforts [13, 21]. Despite these results, more research is required to improve existing BM practices. A possible analytic lens for further research could be governance network [20] or institutional theory [33].

Both the analysis results and the established challenges of the TIP highlight the relevant need for updated BM practices. Specifically, this research suggests that project management addresses the following three issues as an aspect of the initial strategy work:

- 1) Identify the key categories of the central complexity concepts based on the structure presented in Table 2.
- 2) Identify organizational and external concepts, including categories that are affected and challenged both vertically and horizontally based on Figure 1 and Tables 3 and 4.
- 3) Develop and agree upon realistic ambitions based on an understanding of the interorganizational BM context.

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